Australian Bureau of Statistics

2005 **8158.0**

INNOVATION IN AUSTRALIAN BUSINESS

EMBARGO: 11.30AM (CANBERRA TIME) THURS 7 DEC 2006

CONTENTS

INQUIRIES

For further information about these and related statistics, contact the National Information and Referral Service on 1300 135 070 or Peter Hodgson on Perth (08) 9360 5367.

NOTES

INTRODUCTION

This publication presents the results from the fourth Australian Bureau of Statistics (ABS) survey of Innovation. The survey collected innovation activity and characteristics data for the two calendar years 2004 and 2005 and innovation-related financial data in respect of the financial year 2004-05. The 2005 Innovation Survey draws on the concepts included in the '*Oslo Manual, Guidelines for Collecting and Interpreting Innovation Data*' (Third Edition, 2005).

COMPARABILITY WITH 2003 INNOVATION SURVEY

Since the conduct of the 2003 Innovation Survey, a number of improvements have been made that impact on the comparability between the 2003 published estimates and those presented in this publication. The two most significant changes were: the move from a three year reference period to a two year reference period for innovation activity and characteristics topics; and the scope of innovative activity was extended to include work that started but was not yet complete or was abandoned during the reference period. Therefore, users are cautioned against making comparisons between innovation activity and characteristics topics included in the 2003 issue and this publication. Where comparison is possible, modelled 2003 data have been included in the commentary and tables presented in this publication. Please see the Appendix for more details.

REVISIONS IN THIS ISSUE

Revisions have been made to 2003 estimates of innovation expenditure, innovation expenditure as a proportion of total business expenditure and expenditure on Research and Experimental Development. See Explanatory Notes paragraphs 15-19.

PUBLICATION CONTENT AND OTHER DATA RELEASES

This publication presents summary results for all topics collected in the 2005 Innovation Survey. This publication is considerably reduced in content in comparison to the 2003 issue. The more detailed information that was included in the 2003 issue, plus additional and expanded outputs, will be released progressively in spreadsheet format available free of charge from the ABS web site. Release dates and content details are summarised in Explanatory Notes paragraph 21.

Comprehensive and updated data for the European Union were not available at the time of publication preparation, therefore, the international comparisons tables presented in the 2003 issue have not been updated for inclusion in this publication. International comparisons will be made available via the ABS web site as soon as possible.

FUTURE COLLECTION OF INNOVATION STATISTICS

The 2005 Innovation Survey was the last stand-alone Innovation Survey to be conducted by the ABS. From the 2005-06 reference period, innovation data will be collected through the new Business Characteristics Survey, in conjunction with a wide range of business characteristics data. As part of this new approach, key indicators of innovation will be collected annually and more detailed information about innovation activity will be collected every second year. The first detailed innovation activity collection will take place in respect of the 2006-07 reference year and results are expected to be released in the latter half of 2008.

Dennis Trewin
Australian Statistician

LIST OF TABLES

CHAPTER 1 MAIN FEATURES

INTRODUCTION

Innovation is a key driver of economic growth. The development, introduction or implementation of new or significantly improved goods, services or processes is generally considered to be innovation. Innovation is often seen as a continuous process. Therefore, it can be difficult to measure and aspects of the process can also be intangible. An international framework, the '*Oslo Manual, Guidelines for Collecting and Interpreting Innovation Data*', has been developed jointly by Eurostat and the Organisation for Economic Co-operation and Development (OECD) to aid in measuring the process of innovation (including innovation activities, expenditures and linkages), the introduction or implementation of an innovation, the factors that influence innovation and the outcomes of innovation. This manual forms the basis of concepts used and content included in the 2005 Innovation Survey.

INNOVATION BASED ON TYPE AND STATUS

The 2005 Innovation Survey collected information about three types of innovative activity:

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

There are three indicators of status for each of the above activities:

- Implemented or introduced - the business has successfully implemented or introduced an innovation (although the innovation does not need to have been commercially successful).
- Started but not yet complete - the business has ongoing activity which is intended to result in the implementation or introduction of an innovation.
- Abandoned - the business has abandoned innovative activity before implementation or introduction.

While there are three indicators of status, the 2005 Innovation Survey collected the latter two as a combined indicator.

Based on the combination of type and status of innovative activity, two measures of business innovation have been produced:

- *Innovating businesses* - businesses that introduced or implemented an innovation during the reference period.
- *Innovation-active businesses* - businesses that had undertaken any innovative activity, including introduction or implementation of an innovation and/or businesses with an incomplete and/or abandoned innovative activity.

2005 MEASURES OF INNOVATION

During the two calendar years ended December 2005, innovating businesses in Australia represented 33.5% of all businesses. This is an increase of 3.9 percentage points from the 29.6% recorded for the two year period ended December 2003.

INNOVATION IN AUSTRALIAN BUSINESS, 2002 & 2003 AND 2004 & 2005(a)

	2002 & 2003(b)(c)	*2004 & 2005*(c)
	%	%
Proportion of businesses which introduced or implemented		
Any new or significantly improved goods or services	13.4	19.4
Any new or significantly improved operational processes	18.9	21.6
Any new or significantly improved organisational/managerial processes	18.4	24.9
Any new goods, services or processes (innovating businesses)	**29.6**	**33.5**
Proportion of businesses which started but did not yet complete or abandoned any innovative activity(d)	. .	12.2
Proportion of businesses that were innovation-active	. .	34.9

. . not applicable
(a) Proportions are of all businesses.
(b) Data for 2002 & 2003 are from the 2003 Innovation Survey and have been adjusted for the change in reference period from three years to two years. See Appendix paragraphs 2-6 for more information.
(c) Calendar years.
(d) Innovative activity includes any work that was intended to result in the introduction or implementation of new or significantly improved goods, services or processes.

Innovation in new goods or services occurred in 19.4% of businesses. 21.6% of businesses reported new operational processes and 24.9% reported new organisational/managerial processes. Compared with 2003 data, these were increases of 6.0 percentage points, 2.7 percentage points and 6.5 percentage points respectively.

The most frequently reported type of innovation in the 2005 survey was implementation of new organisational/managerial processes whereas in the 2003 survey it was new operational processes.

During the two calendar years ended December 2005, 34.9% of Australian businesses were innovation-active. Innovation which was incomplete at the end of the reference period, or had been abandoned during the reference period, was undertaken by 12.2% of all businesses.

Innovative activity which was incomplete at the end of the reference period, or had been abandoned during the reference period, was not collected in 2003. The 2005 survey outputs include data from businesses that only reported incomplete or abandoned innovative activity (1.4% of all businesses), i.e. did not report any introduced or implemented innovation. The contributions of these businesses are relatively minor and therefore are not excluded from the estimates in Chapter 2 of this publication.

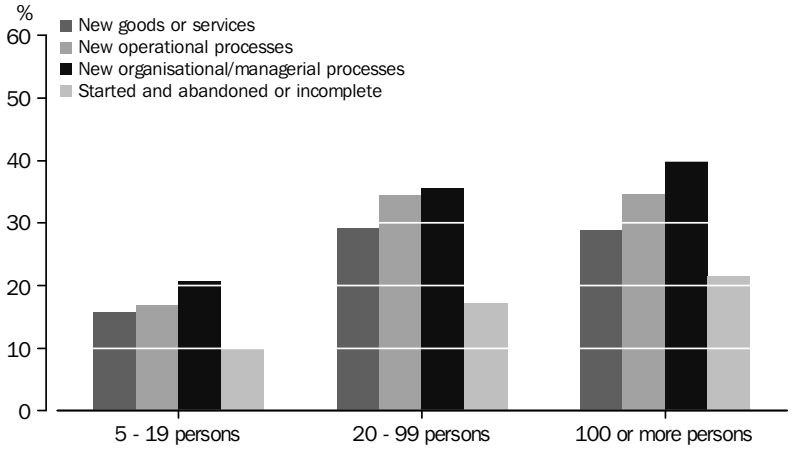
BUSINESS SIZE

The proportion of innovating businesses increased with business size. This is most noticeable in the difference between innovating businesses that employ 5-19 persons (28.4%) and the results for businesses that employ 20-99 persons and 100 or more persons (46.6% and 51.5% respectively). This pattern is followed for each type of

BUSINESS SIZE
continued

innovation with the exception of businesses that employ 20-99 persons which recorded the highest proportion of businesses that introduced new goods or services.

PROPORTION OF BUSINESSES INNOVATING, 2004 AND 2005, Types of innovation undertaken, by employment size



Across all types of innovation, businesses that employ 20-99 persons recorded the largest increases since 2003 (up by 11.4 percentage points for new goods or services, 8.2 percentage points for new operational processes and 7.5 percentage points for organisational/managerial processes). For each of the key indicators except organisational/managerial processes, decreases for businesses with 100 or more persons employed are shown between 2003 and 2005. Investigation undertaken as part of quality assurance found that these decreases were largely confined to businesses with 100-199 persons employed and were genuine changes in innovator status between the two survey periods.

STATE/TERRITORY

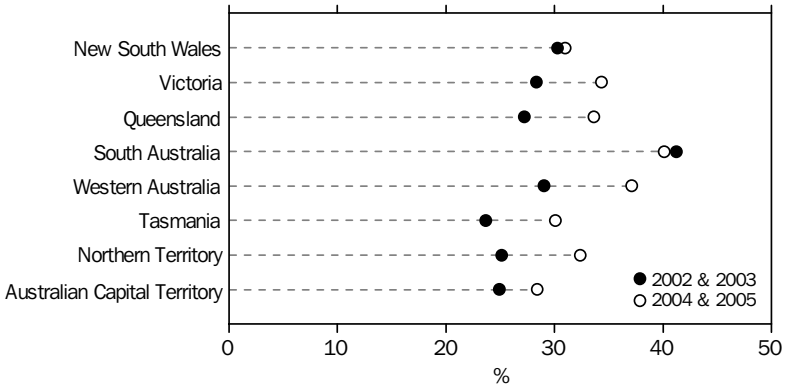
Most states and territories reported proportions of innovating businesses between 30% and 35%. The exceptions were South Australia (40.1%), Western Australia (37.1%) and the Australian Capital Territory (28.4%).

Across all states and territories, introduction of new organisational/managerial processes was the predominant type of innovation introduced. Businesses in South Australia reported the highest proportion for this type of innovation (32.4%). For the other two types of innovation (new goods or services and new operational processes), businesses in Western Australia (25.8%) and South Australia (26.6%) had the highest proportions respectively.

STATE/TERRITORY

continued

INNOVATING BUSINESSES, 2002 & 2003 AND 2004 & 2005, by states and territories(a)



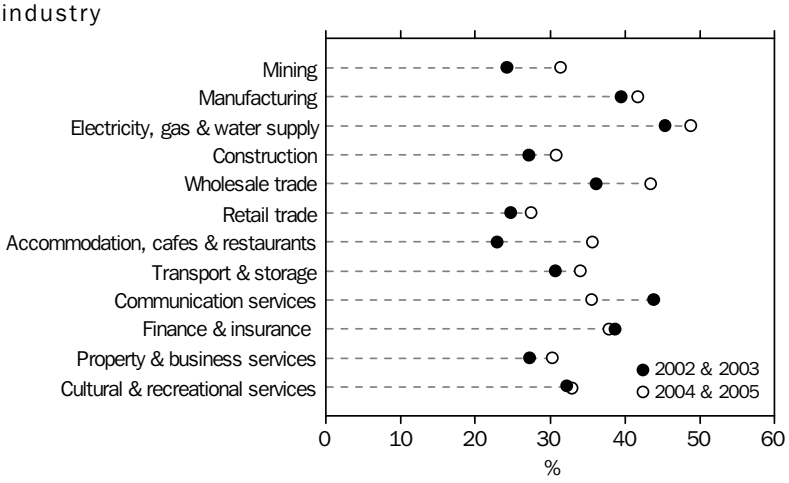
(a) For businesses with operations in more than one state or territory, any innovation was classified to the state or territory of the head office.

South Australia had the highest proportion of businesses innovating in both 2003 and 2005, although the proportion declined slightly from 41.2% in 2003 to 40.1% in 2005. All other states and territories recorded an increase in the proportion of businesses innovating between 2003 and 2005. Western Australia recorded the largest increase in percentage point terms, from 29.0% in 2003 to 37.1% in 2005, an increase of 8.1 percentage points. Western Australia also had the highest increase for new goods or services introduced, up 14.4 percentage points to 25.8%.

INDUSTRY

In the ELECTRICITY, GAS AND WATER SUPPLY industry, innovating businesses represented 48.8% of all business. Of businesses in the MANUFACTURING and WHOLESALE TRADE industries, 41.7% and 43.4% were innovating. Businesses in the RETAIL TRADE industry recorded the lowest level of innovation (27.5%). The COMMUNICATIONS SERVICES industry, had the highest proportion of businesses that introduced new goods or services (28.5%).

INNOVATING BUSINESSES, 2002 & 2003 AND 2004 & 2005, by industry



The ELECTRICITY, GAS AND WATER SUPPLY industry had the highest proportion of businesses innovating in both 2003 (45.3%) and 2005 (48.8%). All other industries had increases in the proportion of businesses innovating with the exception of COMMUNICATION SERVICES and FINANCE AND INSURANCE. The industry that showed the largest increase between 2003 and 2005, in percentage point terms, was ACCOMMODATION, CAFES AND RESTAURANTS, increasing by

INDUSTRY *continued*

12.7 percentage points to 35.6% in 2005. This industry also recorded the highest increases since 2003 across each of the three types of innovation introduced or implemented: new goods or services up by 14.4 percentage points to 23.6%; new operational processes increasing by 10.2 percentage points to 25.0%; and new organisational/managerial processes up by 13.6 percentage points to 27.8%.

Manufacturing industry

Overall, the proportion of businesses innovating in the MANUFACTURING industry increased from 39.5% in 2003, to 41.7% in 2005. The most noticeable change in the proportion of businesses innovating was in OTHER MANUFACTURING, increasing from 28.6% in 2003 to 47.0% in 2005. Decreases were recorded in the FOOD, BEVERAGE AND TOBACCO and PETROLEUM, COAL, CHEMICAL AND ASSOCIATED PRODUCT industries (down by 3.7 and 10.0 percentage points respectively).

MANUFACTURING INDUSTRY(a)

	2002 & 2003(b)(c)	*2004 & 2005*(c)
	%	%
Food, beverage and tobacco	43.8	40.1
Textile, clothing, footwear and leather	30.3	37.5
Wood and paper product	35.8	36.6
Printing, publishing and recorded media	41.2	44.4
Petroleum, coal, chemical and associated product	52.4	42.4
Non-metallic mineral product	33.4	33.8
Metal product	33.6	35.8
Machinery and equipment	47.5	47.9
Other manufacturing	28.6	47.0
Total Manufacturing	**39.5**	**41.7**

(a) Proportions are of businesses in each output category.
(b) Data for 2002 & 2003 are from the 2003 Innovation Survey and have been adjusted for the change in reference period from three years to two years. See Appendix paragraphs 2-6 for more information.
(c) Calendar years.

The proportion of businesses in the MANUFACTURING industry that introduced new or significantly improved goods or services increased from 23.0% in 2003 to 26.9% in 2005. With the exception of businesses in the PETROLEUM, COAL, CHEMICAL AND ASSOCIATED PRODUCT industry (down slightly by 0.3 percentage points), all other industries recorded increases ranging from 0.9 to 7.4 percentage points.

The proportion of businesses in the MANUFACTURING industry that introduced new or significantly improved operational processes increased from 24.5% in 2003 to 27.3% in 2005. Within the MANUFACTURING industry, the largest increases in percentage point terms were in the OTHER MANUFACTURING industry (up 10.4 percentage points) and the TEXTILE, CLOTHING, FOOTWEAR AND LEATHER industry (up by 9.7 percentage points). The main industries to show a decrease between 2003 and 2005 were MACHINERY AND EQUIPMENT (down 1.3 percentage points) and WOOD AND PAPER PRODUCT industry (decreased by 0.9 percentage points).

Manufacturing industry continued

MANUFACTURING INDUSTRY, by selected type of innovation(a)

	2002 & 2003(b)(c)	*2004 & 2005*(c)
	%	%
Proportion of businesses which introduced any new or significantly improved goods or services		
Food, beverage and tobacco	22.3	27.2
Textile, clothing, footwear and leather	19.0	26.3
Wood and paper product	17.6	21.2
Printing, publishing and recorded media	23.5	24.9
Petroleum, coal, chemical and associated product	31.3	31.0
Non-metallic mineral product	18.2	22.1
Metal product	21.3	22.2
Machinery and equipment	29.3	36.7
Other manufacturing	17.0	22.9
Total Manufacturing	*23.0*	*26.9*
Proportion of businesses which implemented any new or significantly improved operational processes		
Food, beverage and tobacco	27.9	31.6
Textile, clothing, footwear and leather	16.9	26.6
Wood and paper product	23.8	22.9
Printing, publishing and recorded media	28.9	31.5
Petroleum, coal, chemical and associated product	27.6	27.5
Non-metallic mineral product	19.2	23.1
Metal product	20.5	24.4
Machinery and equipment	28.6	27.3
Other manufacturing	19.1	29.5
Total Manufacturing	*24.5*	*27.3*

(a) Proportions are of businesses in each output category.
(b) Data for 2002 & 2003 are from the 2003 Innovation Survey and have been adjusted for the change in reference period from three years to two years. See Appendix paragraphs 2-6 for more information.
(c) Calendar years.

INNOVATION RELATED FINANCIAL INDICATORS

Caution should be exercised when using estimates of income from and expenditure on innovation (excluding expenditure on Research and Experimental Development) as many businesses do not keep records that allow accurate estimates of these items to be provided.

Income from innovation

Businesses were asked to report the proportion of their total income from sales of new goods or services, in the 2004-05 financial year, that could be attributed to new goods or services introduced during the survey reference period. Innovating businesses reported that approximately 4.5% (or just over $40 billion) of their total income from sales of goods or services during 2004-05 could be attributed to new goods or services introduced or implemented in the reference period.

Expenditure on innovation

Subsequent to the release of the 2003 issue of this publication, more up-to-date information for innovation expenditure has been obtained for the 2002-03 financial period and estimates presented in that issue have been revised in this issue. See Explanatory Notes paragraphs 17-19 for more details.

Since the 2003 publication was released, a decision has been made to source estimates of expenditure on research and experimental development from the ABS survey Research and Experimental Development - Businesses. An R&D activity indicator is available and this will assist in understanding expenditure by innovating and non-innovating

Expenditure on innovation continued

businesses as well as who performed the R&D. Please refer to Table 2.15 for more details.

EXPENDITURE ON INNOVATION RELATED ACTIVITIES(a)

	2002-03(b)		2004-05(b)	
	Expenditure	*Proportion of total expenditure*	*Expenditure*	*Proportion of total expenditure*
	$m	%	$m	%
Expenditure on new goods or services	na	na	14 853.7	1.8
Expenditure on new operational processes	na	na	10 458.9	1.3
Expenditure on new organisational/managerial processes	na	na	5 270.3	0.6
Total expenditure on innovation(c)(d)	r**21 897.7**	r**2.9**	**30 582.9**	**3.7**
Expenditure on research and experimental development(e)	6 903.4	0.6	8 068.0	0.6

na not available
r revised
(a) Expenditure estimates should be used with caution, see Technical Note paragraph 4.
(b) Businesses reported for the relevant financial year ended on or before 30 September.
(c) Includes any expenditure related to the development, introduction and implementation of new goods, services or processes. Only innovation-active businesses were asked to report these data.
(d) When using the revised 2002-03 estimates, users are advised to take into consideration the 95% confidence interval described in Explanatory Notes paragraphs 17-19. Caution should be exercised when comparing 2002-03 to 2004-05 estimates of innovation expenditure.
(e) Estimates of expenditure on research and experimental development are sourced from the ABS survey 'Research and Experimental Development - Businesses'. See Explanatory Notes paragraphs 15-16 for more detail. It is not possible to provide separate estimates for innovating and non-innovating businesses.

Total expenditure on innovative activity (including Research and Experimental Development) by all business was $38,650.9 million. Expenditure on innovative activity by innovating businesses was $30,582.9 million and represented 3.7% of their total business expenditure.

Expenditure on Research and Experimental Development by all businesses increased by $1,164.6 million from the 2002-03 estimate of $6,903.4 million to $8,068.0 million in 2004-05.

Innovating businesses introducing new goods or services spent 1.8% of their total business expenditure on this activity. Expenditure on implementing new operational processes or organisational managerial processes was 1.4% and 0.6% of total business expenditure respectively for innovating businesses.

The proportions of businesses reporting new operational processes (21.6%) and new managerial/organisational processes (24.9%) are higher than the proportion reporting new goods or services innovation (19.4%). However, the reverse appears to be true for proportion of business expenditure on innovative activity. This suggests that the process type innovative activities do not require as much investment in comparison to introducing new goods or services. This is not unexpected as much of the activity included in organisational/managerial innovation are strategies, structures or routines that aim to improve the performance of the businesses. These are not necessarily items

Expenditure on innovation continued

that require substantial direct expenditure or expenditure that is readily measurable. Operational innovation which includes new or significantly changed methods of producing or delivering goods often includes acquisition of technology where the novelty or new knowledge is already embodied in the product and the business only has to pay for the purchase and possible adaptation to their environment.

1.1 INNOVATION IN AUSTRALIAN BUSINESSES, 2004 AND 2005(a), by selected business characteristics(b)(c)

	Total number of businesses as at 31 December 2005(d)	PROPORTION OF 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*
	no.	%	%	%
Employment size				
5–19 persons	103 416	15.8	16.9	20.7
20–99 persons	32 268	29.2	34.4	35.6
100 or more persons	5 571	28.9	34.7	40.0
Total income				
Less than $1m	57 568	15.2	15.4	18.9
$1m-Less than $5m	56 839	18.9	22.8	24.7
$5m or more	26 847	29.5	32.3	38.1
State				
New South Wales	49 599	18.8	18.6	23.0
Victoria	35 764	18.4	22.9	25.9
Queensland	26 360	19.3	22.3	23.6
South Australia	9 099	19.5	^ 26.6	^ 32.4
Western Australia	14 008	25.8	25.0	27.4
Tasmania	2 678	^ 17.0	^ 18.2	^ 19.5
Northern Territory	1 310	^ 15.9	^ 23.3	^ 28.6
Australian Capital Territory	2 435	16.6	^ 20.1	^ 24.3
Region				
Capital cities	99 067	19.6	21.2	25.3
Other areas	42 188	18.9	22.6	23.9
Industry				
Mining	771	10.6	17.6	22.2
Manufacturing	18 201	26.9	27.3	27.9
Electricity, gas and water supply	187	23.0	31.5	40.7
Construction	13 774	16.5	22.0	26.2
Wholesale trade	13 299	25.5	26.4	33.2
Retail trade	30 644	15.8	15.4	18.8
Accommodation, cafes and restaurants	13 591	23.6	25.0	27.8
Transport and storage	5 477	18.1	25.1	26.9
Communication services	446	28.5	25.3	27.1
Finance and insurance	4 359	18.9	25.7	30.7
Property and business services	36 019	16.4	20.1	22.6
Cultural and recreational services	4 487	18.0	18.9	26.3
Total	(e) **141 254**	**19.4**	**21.6**	**24.9**

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

(a) Calendar years.

(b) Proportions are of businesses in each output category.

(c) See Explanatory Notes paragraphs 4-10 for the scope, coverage and definition of business used in the Innovation Survey.

(d) See Explanatory Notes paragraphs 13-14 for guidance in the use of business counts.

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

1.1 INNOVATION IN AUSTRALIAN BUSINESSES, 2004 AND 2005(a), by selected business characteristics(b)(c) *continued*

	PROPORTION OF		
	Businesses innovating	*Businesses which started but did not yet complete or abandoned any innovative activity*	*Businesses which were innovation-active*
	%	%	%
Employment size			
5–19 persons	28.4	10.1	29.8
20–99 persons	46.6	17.2	47.9
100 or more persons	51.5	21.4	54.8
Total income			
Less than $1m	25.4	10.6	27.1
$1m-Less than $5m	34.7	11.5	35.9
$5m or more	48.3	16.8	49.6
State			
New South Wales	31.0	11.3	32.6
Victoria	34.3	13.8	36.3
Queensland	33.6	7.9	34.2
South Australia	^ 40.1	^ 21.6	^ 41.4
Western Australia	37.1	14.2	38.4
Tasmania	^ 30.1	10.4	^ 31.7
Northern Territory	^ 32.4	6.1	^ 33.0
Australian Capital Territory	^ 28.4	9.5	^ 28.5
Region			
Capital cities	33.8	13.2	35.5
Other areas	32.6	9.8	33.4
Industry			
Mining	31.4	14.9	34.5
Manufacturing	41.7	16.5	43.1
Electricity, gas and water supply	48.8	26.6	52.1
Construction	30.8	10.0	31.0
Wholesale trade	43.4	17.2	46.8
Retail trade	27.5	7.5	28.2
Accommodation, cafes and restaurants	35.6	9.6	35.7
Transport and storage	34.0	10.9	34.3
Communication services	35.5	18.2	36.3
Finance and insurance	37.9	15.1	39.5
Property and business services	30.3	13.4	32.7
Cultural and recreational services	32.9	12.6	34.4
Total	**33.5**	**12.2**	**34.9**

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

(a) Calendar years.

(b) Proportions are of businesses in each output category.

(c) See Explanatory Notes paragraphs 4-10 for the scope, coverage and definition of business used in the Innovation Survey.

1.2 SUMMARY OF INNOVATION, 2002 & 2003 AND 2004 & 2005(a), by innovation type, by selected business characteristics(b)

	TOTAL PROPORTION OF BUSINESSES INNOVATING		BUSINESSES WHICH INTRODUCED OR IMPLEMENTED ANY NEW OR SIGNIFICANTLY IMPROVED GOODS OR SERVICES	
	2002 & 2003(c)	*2004 & 2005*	*2002 & 2003*(c)	*2004 & 2005*
	%	%	%	%
Employment size				
5–19 persons	25.0	28.4	11.2	15.8
20–99 persons	41.0	46.6	17.8	29.2
100 or more persons	55.6	51.5	33.7	28.9
State or territory				
New South Wales	30.3	31.0	14.1	18.8
Victoria	28.3	34.3	14.1	18.4
Queensland	27.2	33.6	11.5	19.3
South Australia	41.2	^ 40.1	19.5	19.5
Western Australia	29.0	37.1	11.4	25.8
Tasmania	23.7	^ 30.1	8.7	^ 17.0
Northern Territory	^ 25.1	^ 32.4	10.2	^ 15.9
Australian Capital Territory	^ 24.9	^ 28.4	7.5	16.6
Industry				
Mining	24.2	31.4	7.4	10.6
Manufacturing	39.5	41.7	23.0	26.9
Electricity, gas and water supply	45.3	48.8	17.2	23.0
Construction	27.2	30.8	7.8	16.5
Wholesale trade	36.1	43.4	21.8	25.5
Retail trade	24.7	27.5	7.4	15.8
Accommodation, cafes and restaurants	22.9	35.6	9.2	23.6
Transport and storage	30.7	34.0	12.4	18.1
Communication services	43.8	35.5	25.8	28.5
Finance and insurance	38.7	37.9	18.2	18.9
Property and business services	27.3	30.3	13.0	16.4
Cultural and recreational services	32.2	32.9	16.0	18.0
Total	**29.6**	**33.5**	**13.4**	**19.4**

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

(a) Calendar years.

(b) Proportions are of businesses in each output category.

(c) Data for 2002 & 2003 are from the 2003 Innovation Survey and have been adjusted for the change in reference period from three years to two years. See Appendix paragraphs 2-6 for more information.

1.2 SUMMARY OF INNOVATION, 2002 & 2003 AND 2004 & 2005(a), by innovation type, by selected business characteristics(b) *continued*

	BUSINESSES WHICH INTRODUCED OR IMPLEMENTED ANY NEW OR SIGNIFICANTLY IMPROVED OPERATIONAL PROCESSES		BUSINESSES WHICH INTRODUCED OR IMPLEMENTED ANY NEW OR SIGNIFICANTLY IMPROVED ORGANISATIONAL/MANAGERIAL PROCESSES	
	2002 & 2003(c)	*2004 & 2005*	*2002 & 2003*(c)	*2004 & 2005*
	%	%	%	%
Employment size				
5–19 persons	15.7	16.9	14.9	20.7
20–99 persons	26.2	34.4	28.1	35.6
100 or more persons	40.1	34.7	35.6	40.0
State or territory				
New South Wales	18.7	18.6	18.2	23.0
Victoria	18.4	22.9	17.4	25.9
Queensland	18.0	22.3	17.3	23.6
South Australia	25.6	^ 26.6	27.1	^ 32.4
Western Australia	19.0	25.0	19.4	27.4
Tasmania	15.6	^ 18.2	15.3	^ 19.5
Northern Territory	13.6	^ 23.3	^ 16.5	^ 28.6
Australian Capital Territory	^ 19.5	^ 20.1	17.4	^ 24.3
Industry				
Mining	14.8	17.6	15.5	22.2
Manufacturing	24.5	27.3	21.8	27.9
Electricity, gas and water supply	28.2	31.5	30.6	40.7
Construction	17.3	22.0	19.3	26.2
Wholesale trade	19.6	26.4	24.1	33.2
Retail trade	17.0	15.4	13.2	18.8
Accommodation, cafes and restaurants	14.8	25.0	14.2	27.8
Transport and storage	20.4	25.1	20.0	26.9
Communication services	32.2	25.3	27.6	27.1
Finance and insurance	24.6	25.7	28.3	30.7
Property and business services	18.5	20.1	18.3	22.6
Cultural and recreational services	16.3	18.9	22.0	26.3
Total	**18.9**	**21.6**	**18.4**	**24.9**

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

(a) Calendar years.

(b) Proportions are of businesses in each output category.

(c) Data for 2002 & 2003 are from the 2003 Innovation Survey and have been adjusted for the change in reference period from three years to two years. See Appendix paragraphs 2-6 for more information.

CHAPTER 2 CHARACTERISTICS OF INNOVATIVE ACTIVITY

INTRODUCTION

This chapter presents summary data for characteristics of innovative activity. More detailed data for most of the topics included in this chapter will be released progressively over the next three months. Please see Explanatory Notes paragraph 21 for the schedule.

There are two issues users should be aware of when reading this chapter:

- The changes in reference period from three years to two years and how the reference period was specified in the questionnaire have had a major impact on the comparability for characteristics data between 2003 and 2005 outputs.
- It was not possible to exclude businesses that solely undertook innovative activity that has been started but not yet completed or abandoned from the estimates for the characteristics topics.

Please see the Appendix for more information.

Innovating businesses were required to complete all sections of the survey. Non-innovating businesses were only required to provide data for a small number of characteristics topics. This differentiation between items collected from innovating businesses and non-innovating businesses is clearly outlined in the text and tables within this publication.

BUSINESS LONGEVITY

Businesses operating under current ownership for under 9 years had a higher propensity to innovate than businesses under current ownership for 9 years or more. The highest proportion was among innovating businesses that had been under current ownership for *1 year to less than 4 years* (38.4%), which was not dissimilar to the proportions for businesses under current ownership for *Less than one year* and *4 years to less than 9 years* (37.3% and 37.4% respectively). Businesses operating under current ownership for *9 years or more* had the lowest proportion of innovating businesses (32.6%).

FOREIGN OWNERSHIP

Foreign ownership appeared to have an influence on the likelihood of businesses undertaking innovative activities. Of wholly Australian owned businesses, 33.6% innovated during 2004 and 2005. In contrast, 58.9% of businesses with *Greater than or equal to 10% and less than or equal to 50%* foreign ownership, and 58.5% of businesses with *Greater than 50%* foreign ownership indicated they had undertaken innovation.

BARRIERS TO INNOVATION

All businesses were asked to report barriers to innovation.

Non-innovating businesses were far more likely to report *No barriers* to undertaking innovative activity than innovating businesses. *No barriers* to innovation were reported by 48.1% of non-innovating businesses and 26.7% of innovating businesses.

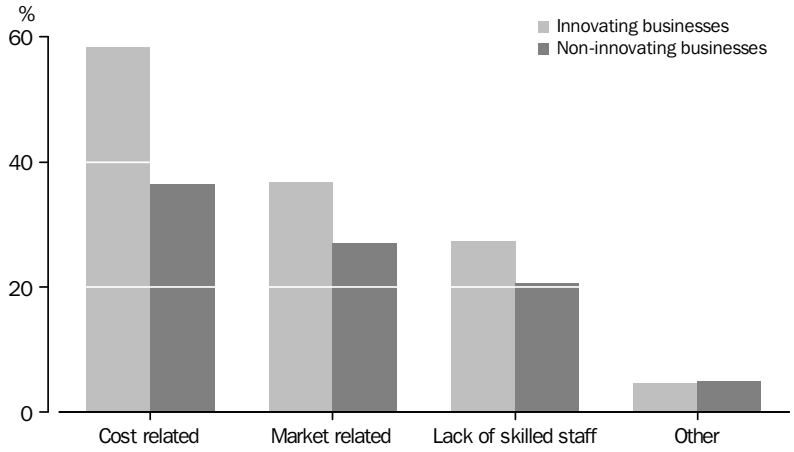
BARRIERS TO INNOVATION *continued*

The most commonly reported barrier to innovation, for both innovating and non-innovating businesses, related to costs. Over half of innovating businesses (58.4%) and over one third of non-innovating businesses (36.5%) cited cost related barriers as a factor hampering innovation. Of the cost related barriers, *Direct costs too high* at 31.6% for innovating businesses and 21.1% for non-innovating businesses was the most significant.

Market related barriers were seen by 36.7% of innovating businesses and 27.0% of non-innovating businesses as hampering innovation. Within market related barriers, 20.0% of innovating businesses and 14.3% of non-innovating businesses reported *Potential market already dominated by established businesses* as the main market related barrier.

Lack of skilled staff was reported as a barrier by 27.2% of innovating businesses and 20.6% of non-innovating businesses.

BARRIERS TO INNOVATION, 2004 AND 2005, by innovator status



DRIVERS OF INNOVATION

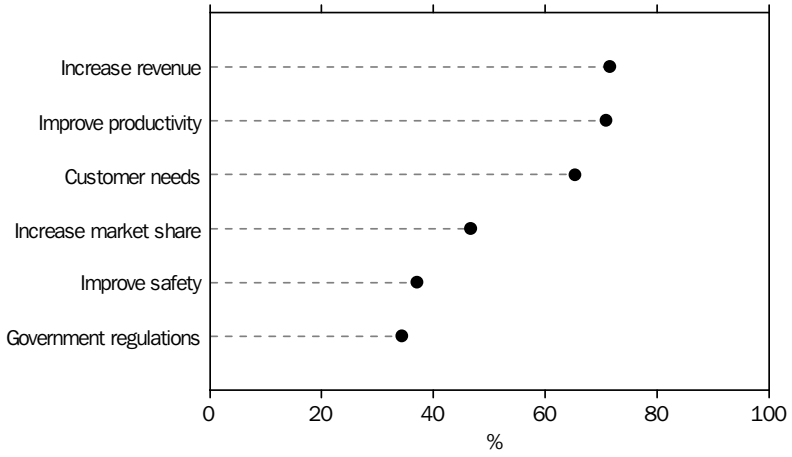
Profit related drivers were the most frequently cited reasons driving innovation, reported by 94.2% of innovating businesses. Market related drivers were reported by 88.9% of innovating businesses, with Legal related drivers being reported by 53.1% of innovating businesses.

Within the broad grouping of Profit related drivers, the highest individual drivers were *Increase revenue* (71.5%) and *Improve productivity* (70.9%). Within Market related drivers the most commonly reported drivers were *Increase responsiveness to customer needs* (65.3%) and *Increase market share* (46.6%), while in Legal related drivers the most frequently cited driver was *Improve safety or working conditions* (37.0%).

These rankings were consistent across all employment ranges, with the exception of Legal related drivers for businesses with 5-19 employees, where *Meet government regulations or standards* (34.7%) was the most frequently reported driver.

DRIVERS OF INNOVATION *continued*

INNOVATING BUSINESSES, SELECTED DRIVERS 2004 AND 2005



COLLABORATION

All businesses were asked to complete the collaboration questions. 26.0% of innovating businesses indicated they were involved in collaboration, compared with 6.4% of non-innovating businesses.

ALL BUSINESSES, COLLABORATION, 2004 AND 2005 (a)(b)

	Innovating businesses	*Non-innovating businesses*	*Total businesses*
	%	%	%
Some collaboration	26.0	6.4	13.2
No form of collaboration	74.0	93.6	86.8

(a) Calendar years.
(b) Proportions are of businesses in each output category.

86.8% of all businesses reported no collaboration for innovative or other purposes. The most commonly reported type of collaboration across all businesses was *Joint marketing or distribution* (7.2%) and *Joint research and development* (3.1%).

COLLABORATION *continued*

ALL BUSINESSES, COLLABORATION, 2004 AND 2005(a), by purpose, by type(b)

	PURPOSE OF COLLABORATION		
	Collaboration for innovative purposes	*Collaboration for other business purposes*	*Collaboration for any purpose*
	%	%	%
Type of collaboration			
Joint marketing or distribution	5.1	2.8	7.2
Joint manufacturing	1.4	0.5	1.7
Joint research and development	2.6	0.6	3.1
Other joint venture	1.7	1.8	2.8
Licensing agreement	1.6	1.0	2.3
Other form of collaboration/alliance	0.6	0.9	1.3
Any collaboration	*9.0*	*5.8*	*13.2*
No collaboration	91.0	94.2	86.8

(a) Calendar years.
(b) Proportions are of businesses in each output category.

The likelihood of an innovating business undertaking any collaboration increased with employment size. *Joint marketing or distribution* was the most frequently reported type of collaboration among innovating businesses employing 5-19 persons (13.1%) and 20-99 persons (17.7%). However, *Joint research and development* was most common in innovating businesses employing 100 or more persons (14.5%).

The types of organisations that innovating businesses collaborated with most frequently, from any location, were *Other parts of a wide enterprise group to which the business belongs* (12.6%), *Clients or customers* (12.0%) and *Suppliers of equipment, materials, components or software* (11.3%). For innovating businesses, the highest reported organisational type from overseas was *Suppliers of equipment, materials, components or software* (3.0%). *Clients or customers* (10.4%) and *Other parts of a wider enterprise group to which the business belongs* (6.4%) were most frequently collaborated with from within same State or Territory and from elsewhere in Australia, respectively.

IDEAS, KNOWLEDGE AND ABILITIES

The most reported source of ideas or information for innovative activity was *Internal sources* (75.8%). This included ideas or information sourced from Within the business or Other parts of a wider enterprise group to which the business belongs.

Market sources of ideas or information were reported by 69.6% of innovating businesses. Clients or customers, consultants and competitors along with Suppliers of equipment, materials, components or software were included in *Market sources*.

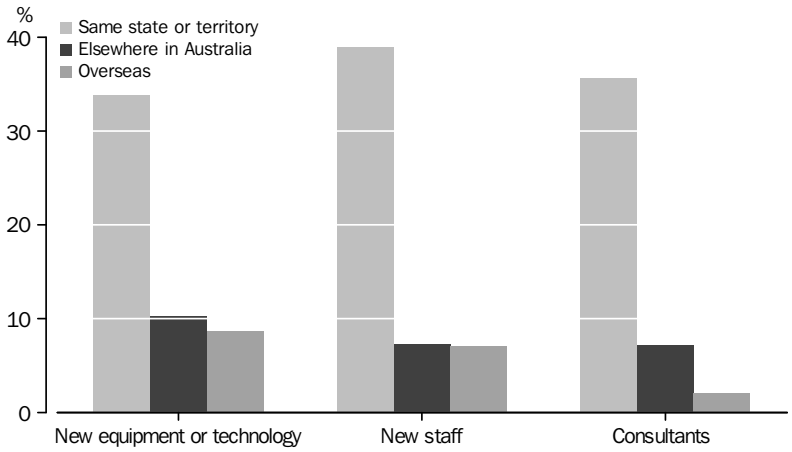
Institutional sources (7.7%) were least used by innovating businesses as a source of ideas or information. *Institutional sources* included Universities or other higher education institutions, Government agencies, Private non-profit research institutions and Commercial laboratories.

43.6% of innovating businesses sourced their ideas and information for innovative activity from *Other sources*, including professional conferences, meetings, fairs and exhibitions, along with web sites and journals.

IDEAS, KNOWLEDGE AND ABILITIES *continued*

A significant proportion of innovating businesses either *Acquired new equipment or technology for producing the business's goods or services* (46.5%), *Employed new skilled staff* (45.2%), or *Used consultants (or other paid advisors)* (40.6%) as a method of acquiring knowledge or abilities. All of these methods were most often sourced from within the same State or Territory.

INNOVATING BUSINESSES, SELECTED METHODS USED TO ACQUIRE KNOWLEDGE OR ABILITIES, 2004 AND 2005, by location of source



For innovating businesses, the most commonly used method of acquiring knowledge or abilities from any higher education or research institutions, at 10.4%, was *Employed new graduate(s)*.

SKILLS AND CAPABILITIES

General business skills were the most common skills and capabilities sought by innovating businesses across all employment sizes.

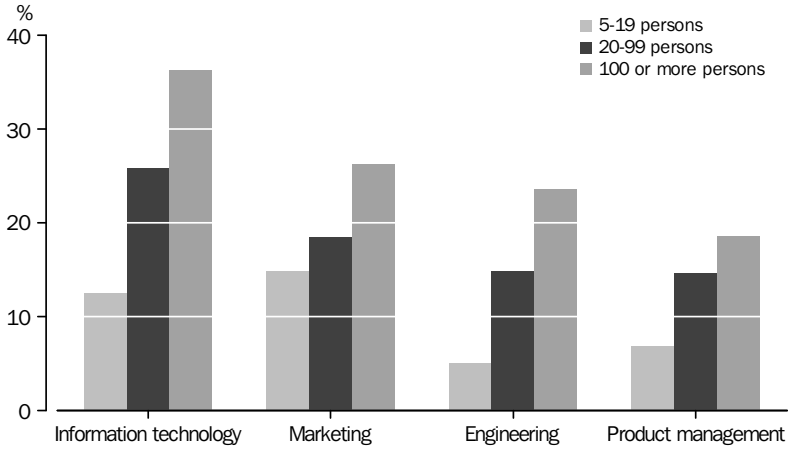
In innovating businesses with 20-99 persons and 100 or more persons, the three leading skills sought for innovative activity were *Information Technology* (25.8% and 36.3% respectively), *Marketing* (18.5% and 26.2% respectively), and *Engineering* (14.9% and 23.6% respectively).

By contrast, innovating businesses with 5-19 persons *General Business* (16.7%), *Marketing* (14.9%) and *Information Technology* (12.5%) were the skills most frequently sought.

In most cases demand for skilled staff increased with the size of the innovating business.

SKILLS AND CAPABILITIES *continued*

INNOVATING BUSINESSES, SELECTED SKILLS AND CAPABILITIES SOUGHT, 2004 AND 2005, by employment size



Businesses employing 100 or more persons, most frequently recruited *People already within the business* to undertake innovative activity.

For recruitment sources outside of the business, innovating businesses with 20-99 persons and 100 or more persons reported *Businesses in Australia* (36.1% and 44.4% respectively) and *Overseas businesses* (5.4% and 21.0% respectively). *Businesses in Australia* (20.6%) and *Australian universities* (3.4%) were significant recruitment sources for innovating businesses employing 5-19 persons.

INTELLECTUAL PROPERTY PROTECTION METHODS

Just under three quarters (73.0%) of innovating businesses reported that they had *No formal methods in use* to protect their intellectual property. *Copyright or trademark* was the most common formal method reported by innovating businesses (20.3%). *Patents* were the second most common formal method used by 7.3% of innovating businesses.

The use of formal methods ranged from 21.6% for innovating businesses which employed 5-19 persons to 41.8% for innovating businesses which employed 100 or more persons.

The majority of innovating businesses (68.5%) reported *No informal methods in use*. The most commonly used informal method of intellectual property protection was *Secrecy (including electronic protection methods)*, reported by 23.2% of innovating businesses.

The use of *Secrecy (including electronic protection methods)*, and *Complexity of product design* increased with innovating business size. However, *Making frequent and rapid changes to the good or service* and *Other informal methods* (8.6% and 2.9% respectively) were most commonly reported by innovating businesses employing 20-99 persons.

DEGREE OF NOVELTY

Introduction of goods or services that were *New to the world* was reported by 7.7% of innovating businesses. Less than 1% of innovating businesses reported introducing new operational or organisational/managerial processes that were *New to the world*. New goods or services *New to Australia* were introduced by 15.2% of innovating businesses while 74.0% of innovators introduced new goods and services *New to the business*.

DEGREE OF NOVELTY *continued*

Development within *The business or a related company* was reported most often for both new goods or services (74.7%), new operational processes (65.8%) and new organisational/managerial processes (75.9%). Proportions of innovating businesses who developed new goods, services or processes in co-operation with other businesses or institutions ranged from 18.7% to 25.6%. Smaller proportions reported new goods, services or processes developed by *Other business(es) or institution(s)* (ranging from 8.8% to 12.9%).

FINANCIAL INDICATORS

Businesses were asked questions related to their income from sales of new goods or services and expenditure on innovation for their most recent financial year ended on or before 30 September 2005. 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 innovating were those that undertook innovation in the two calendar years to December 2005, whereas expenditure data were collected for the 2004–05 financial year.

Income from sales of new goods and services

The introduction of new or significantly improved goods or services had a greater impact on the income from sales of goods or services for innovating businesses with 5-19 persons than for innovating businesses with 100 or more persons employed. For businesses with 5-19 persons, 8.8% of total income from sales of goods or services was generated by the introduction of new or significantly improved goods or services. This equates to more than double the proportion (4.1%), of total income from sales of goods or services generated by the introduction of new or significantly improved goods or services for businesses with 100 or more persons employed.

Expenditure on innovation related activities

Businesses employing 5-19 persons reported the highest (2.5%) proportion of total expenditure related to the development, introduction and implementation of goods and services. Businesses employing 100 or more persons reported a slightly higher (1.3%) proportion of expenditure related to the development, introduction or implementation of operational processes compared with businesses in the other employment size categories.

Research and Experimental Development

Expenditure on research and experimental development (R&D) included in this publication is sourced from the ABS collection "*Research and Experimental Development - Business, Australia, 2004-05*" (cat no 8104.0), see Explanatory Notes paragraph 16 for more information. The 2005 Innovation Survey asked all businesses to indicate if they had performed Research and experimental development in-house or had acquired any research and experimental development from other businesses or organisations.

11.9% of all businesses reported some expenditure on R&D; 11.4% reported expenditure on R&D performed by the business and 2.6% of businesses reported expenditure on acquisition of R&D from other businesses or organisations. Over a quarter of innovating businesses reported expenditure related to the performance of R&D by the business.

Type of innovation related expenditure

Businesses were asked to indicate which types of expenditure related to innovative activity they had made during 2004-05. The highest reported category was *Acquisition of machinery and equipment specifically purchased to develop, introduce or implement new goods, services or processes* (39.9%). Other categories where a high proportion of innovating businesses recorded expenditure was *Training related to new goods, services or processes* (38.8%) and *Marketing activities aimed at market introduction of new goods or services* (35.2%).

The proportion of innovating businesses that reported expenditure on each type of innovative activity generally increased with business size.

Source of funds for expenditure on innovation related activities

The vast majority of innovating businesses used *Internal sources* (90.0%) as a source of funds for expenditure on innovation. *Borrowings* were used by 33.8% of innovating businesses, with 2.7% accessing the *Federal government* as a source of funds for innovative activity.

With respect to employment size, the highest proportion of innovating businesses reporting sources of funds in any category was in the 100 or more persons size range, with the exception of *External equity (venture capital),* where businesses employing 20-99 persons had the highest proportion (2.0%).

2.1 BUSINESS OWNERSHIP, AT DECEMBER 2005(a), by length of current ownership(b)

	Proportion of total businesses at December 2005	*Proportion of businesses innovating during 2004 and 2005*(c)
	%	%
Length of current ownership		
Less than 1 year	6.3	^37.3
1 year to less than 4 years	17.1	38.4
4 years to less than 9 years	20.6	37.4
9 years or more	55.9	32.6
Total	(d)**100.0**	**34.9**

^ 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 business used in the Innovation Survey.

(b) Proportions are of businesses in each output category.

(c) Refers to businesses which undertook any innovative activity during calendar years 2004 and 2005.

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

2.2 BUSINESS OWNERSHIP, AT DECEMBER 2005(a), by type of ownership(b)

	Proportion of total businesses at December 2005	*Proportion of businesses innovating during 2004 and 2005*(c)
	%	%
Degree of ownership		
Wholly Australian owned	94.4	33.6
Greater than 0% and less than 10%	0.6	*41.7
Greater than or equal to 10% and less than or equal to 50%	0.8	^58.9
Greater than 50%	4.2	^58.5
Total	(d)**100.0**	**34.9**

^ 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) See Explanatory Notes paragraphs 4-10 for the scope, coverage and definition of business used in the Innovation survey.

(b) Proportions are of businesses in each output category.

(c) Refers to businesses which undertook any innovative activity during calendar years 2004 and 2005.

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

2.3 BARRIERS TO INNOVATION, 2004 AND 2005(a), by innovation status(b)(c)

	Innovating businesses	*Non-Innovating businesses*	*Total businesses*
	%	%	%
Barriers			
Cost related barriers			
Excessive economic risk perceived by the business	19.0	11.5	14.1
Excessive economic risk perceived by financiers	5.0	2.9	3.6
Direct costs too high	31.6	21.1	24.8
Cost or availability of finance	15.8	7.8	10.6
Government regulations or standards	22.5	17.2	19.0
Any cost related barriers	*58.4*	*36.5*	*44.1*
Market related barriers			
Potential market already dominated by established business	20.0	14.3	16.3
Lack of customer demand for new goods or services	10.0	12.0	11.3
Unable to appropriate benefits from intellectual property	3.6	2.3	2.8
Inability to secure strategic partnerships	4.8	2.0	3.0
Market too small or unknown	11.6	5.8	7.8
Lack of information on technologies	2.5	1.8	2.1
Any market related barriers	*36.7*	*27.0*	*30.4*
Lack of skilled staff	27.2	20.6	22.9
Other barriers	4.6	4.9	4.8
No barriers to innovation	26.7	48.1	40.7

(a) Calendar years.

(b) Businesses could identify more than one barrier.

(c) Proportions are of businesses in each output category.

2.4 INNOVATING BUSINESSES, DRIVERS OF INNOVATION, 2004 AND 2005(a), by employment size(b)(c)

	EMPLOYMENT SIZE			
	5-19 persons	*20-99 persons*	*100 or more persons*	*Total*
	%	%	%	%
Drivers				
Profit related drivers				
Improve productivity	70.7	72.6	^64.7	70.9
Increase revenue	71.6	70.3	77.0	71.5
Reduce costs	51.7	58.4	^57.2	54.2
Any profit related drivers	*95.6*	*91.3*	*94.8*	*94.2*
Market related drivers				
Be at the cutting edge of the industry	32.8	41.4	46.4	36.4
Increase responsiveness to customer needs	62.7	69.0	73.0	65.3
Increase market share	40.7	57.4	^51.6	46.6
Establish a new market	25.8	32.5	33.1	28.4
Exploit new ways to manage this business's supply chain	17.7	23.7	^34.0	20.6
Increase export opportunities	8.1	9.6	10.7	8.7
High degree of price competition in this business's product markets	26.5	31.5	27.6	28.1
Any market related drivers	*86.8*	*92.8*	*91.1*	*88.9*
Legal related drivers				
Be environmentally responsible	17.6	19.6	26.6	18.8
Improve safety or working conditions	33.0	44.8	37.3	37.0
Meet government regulations or standards	34.7	34.8	29.8	34.4
Any legal related drivers	*51.5*	*55.8*	*56.0*	*53.1*
Other drivers	6.1	5.1	7.1	5.8

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

(a) Calendar years.

(b) Businesses could identify more than one driver.

(c) Proportions are of innovating businesses in each output category.

2.5 INNOVATING BUSINESSES, COLLABORATION, 2004 AND 2005(a), by employment size(b)(c)

	EMPLOYMENT SIZE			
	5-19 persons	*20-99 persons*	*100 or more persons*	*Total*
	%	%	%	%
Type of collaboration for any purpose				
Joint marketing or distribution	13.1	17.7	12.8	14.5
Joint manufacturing	3.7	5.4	4.4	4.2
Joint research and development	6.4	8.0	14.5	7.4
Other joint venture	6.6	3.2	8.0	5.7
Licensing agreement	5.7	2.7	4.7	4.7
Other form of collaboration/alliance	1.5	1.4	4.5	1.7
Any collaboration	*24.9*	*26.8*	*33.0*	*26.0*
No collaboration for any purposes	75.1	73.2	67.0	74.0

(a) Calendar years.
(b) Businesses could identify more than one type of collaboration.
(c) Proportions are of innovating businesses in each output category.

2.6 INNOVATING BUSINESSES, COLLABORATION 2004 AND 2005(a), by location, by type of organisation(b)(c)

	LOCATION OF ORGANISATION			
	From within same state or territory	*From elsewhere in Australia*	*From overseas*	*Any location*
	%	%	%	%
Type of organisation collaborated with				
Other parts of a wide enterprise group to which the business belongs	8.2	6.4	2.6	12.6
Market organisations				
Clients or customers	10.4	5.0	2.1	12.0
Suppliers of equipment, materials, components or software	8.8	5.0	3.0	11.3
Consultants	5.6	3.2	1.3	7.5
Competitors and other businesses from the same industry	7.7	2.9	1.3	9.2
Any market organisations	*18.3*	*8.9*	*5.3*	*21.4*
Institutional organisations				
Universities or other higher education institutions	2.0	0.7	0.1	2.3
Government agencies	3.2	0.6	0.2	3.3
Private non-profit research institutions	0.5	0.3	0.1	0.6
Commercial laboratories/research and development enterprises	1.4	0.4	0.3	1.6
Any institutional organisations	*4.5*	*1.5*	*0.4*	*4.9*
Other types of organisations	1.2	0.1	0.1	1.4

(a) Calendar years.
(b) Businesses could identify more than one location or one type of organisation.
(c) Proportions are of businesses in each output category.

2.7 INNOVATING BUSINESSES, SOURCES OF IDEAS AND INFORMATION, 2004 AND 2005(a), by employment size(b)(c)

	EMPLOYMENT SIZE			
	5-19 persons	*20-99 persons*	*100 or more persons*	***Total***
	%	%	%	%
Sources of ideas or information for innovative activity				
Internal sources	72.2	80.8	87.3	**75.8**
Market sources	67.3	74.4	^ 67.6	**69.6**
Institutional sources	7.6	6.2	16.2	**7.7**
Other sources	43.6	44.0	^ 42.4	**43.6**

^ estimate has a relative standard error of 10% to less than 25% and should be used with caution
(a) Calendar years.
(b) Businesses could identify more than one source of idea or information.
(c) Proportions are of businesses in each output category.

2.8 INNOVATING BUSINESSES, METHODS USED TO ACQUIRE KNOWLEDGE OR ABILITIES, 2004 AND 2005(a), by location of source(b)(c)

	LOCATION OF SOURCE			
	From within same state or territory	*From elsewhere in Australia*	*From overseas*	***Any location***
	%	%	%	%
Method used to acquire knowledge or abilities				
Employed new skilled staff	39.0	7.3	7.1	**45.2**
Interchanged staff with another business	5.2	2.1	1.2	**7.4**
Used consultants (or other paid advisors)	35.7	7.2	2.0	**40.6**
Acquired new equipment or technology for producing this business's goods or services	33.9	10.3	8.7	**46.5**
Merger/takeover with/of another business (in whole or part)	3.9	0.9	0.2	**4.7**
Other methods to acquire knowledge and abilities	6.0	1.1	0.7	**7.2**

(a) Calendar years.
(b) Businesses could identify more than one location or method.
(c) Proportions are of innovating businesses in each output category.

2.9 INNOVATING BUSINESSES, METHODS USED TO ACQUIRE KNOWLEDGE OR ABILITIES, 2004 AND 2005(a), by location of institution(b)(c)

	LOCATION OF INSTITUTION(b)		
	From Australian higher education or research institutions	*From overseas higher education or research institutions*	***Any higher education or research institutions***
	%	%	%
Method used to acquire knowledge or abilities from higher education or research institutions			
Employed new graduate(s)	10.0	0.6	**10.4**
Employed academic or research staff	2.7	0.7	**3.1**
Used research results published by these institutions	2.9	1.4	**3.8**
Used research facilities of these institutions	1.6	0.2	**1.6**
Used patents, designs, or other intellectual property rights from these institutions	1.7	0.3	**2.0**
Used consultants from these institutions	5.7	0.7	**5.9**
Contracted out research and development to these institutions	1.6	0.2	**1.6**
Other methods to acquire knowledge or abilities from institutions	2.3	0.3	**2.4**

(a) Calendar years.
(b) Businesses could identify more than one institution or method.
(c) Proportions are of innovating businesses in each output category.

2.10 INNOVATING BUSINESSES, STAFF SKILLS AND CAPABILITIES SOUGHT, 2004 AND 2005(a), by employment size(b)(c)

	EMPLOYMENT SIZE			
	5-19 persons	*20-99 persons*	*100 or more persons*	***Total***
	%	%	%	%
Skills sought for innovative activity				
Engineering	5.1	14.9	23.6	**9.3**
Scientific	1.1	3.3	7.7	**2.2**
Marketing	14.9	18.5	26.2	**16.7**
Information Technology	12.5	25.8	36.3	**18.2**
Product management	6.9	14.6	18.6	**10.1**
General business	16.7	30.5	^ 41.2	**22.6**
Other	5.4	5.5	5.1	**5.4**

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

(a) Calendar years.

(b) Businesses could identify more than one skill sought.

(c) Proportions are of innovating businesses in each output category.

2.11 INNOVATING BUSINESSES, SOURCES OF RECRUITMENT, 2004 AND 2005(a), by employment size(b)(c)

	EMPLOYMENT SIZE			
	5-19 persons	*20-99 persons*	*100 or more persons*	*Total*
	%	%	%	%
Where businesses recruited people for innovative activity				
People already within this business	24.7	36.4	63.4	30.7
People outside this business from:				
Businesses in Australia	20.6	36.1	44.4	26.9
Overseas businesses	2.2	5.4	^ 21.0	4.3
Australian universities	3.4	2.3	3.9	3.1
Overseas universities	—	—	0.6	0.1
Australian public sector research agencies	0.1	0.2	1.8	0.2
Other Australian public sector agencies	1.4	0.5	1.4	1.1
Total people outside business	*25.2*	*39.6*	*56.0*	*31.6*
Elsewhere	0.9	1.4	1.7	1.1
Businesses that recruited people from anywhere for innovative activity	38.2	59.7	76.5	47.4
Businesses that did not recruit people for innovative activity	61.8	40.3	23.5	52.6

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

— nil or rounded to zero (including null cells)

(a) Calendar years.

(b) Businesses could identify more than one source of recruitment.

(c) Proportions are of innovating businesses in each output category.

2.12 INNOVATING BUSINESSES, INTELLECTUAL PROPERTY PROTECTION METHODS, 2004 AND 2005(a), by employment size(b)(c)

	EMPLOYMENT SIZE			
	5-19 persons	*20-99 persons*	*100 or more persons*	*Total*
	%	%	%	%
Formal methods				
Patents	4.6	9.8	21.6	7.3
Registration of design	2.9	3.6	15.0	3.9
Copyright or trademark	17.8	23.6	29.4	20.3
Other formal methods	2.8	4.0	4.1	3.3
Any formal methods	*21.6*	*35.0*	^ *41.8*	*27.1*
No formal methods used	78.4	65.0	^ 58.2	73.0
Informal methods				
Secrecy (including electronic protection methods)	19.7	27.3	36.6	23.2
Complexity of product design	6.1	10.8	18.1	8.3
Making frequent and rapid changes to the good or service	4.3	8.6	4.0	5.6
Other informal methods	2.2	2.9	1.6	2.4
Any informal methods	*26.8*	*38.6*	*44.3*	*31.6*
No informal methods used	73.2	61.5	55.8	68.5

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

(a) Calendar years.

(b) Businesses could identify more than one method of protection for intellectual property.

(c) Proportions are of innovating businesses in each output category.

2.13 INNOVATING BUSINESSES, CHARACTERISTICS OF NEW GOODS, SERVICES OR PROCESSES, 2004 AND 2005(a), by innovation type(b)(c)(d)

	PROPORTION OF BUSINESSES THAT INTRODUCED OR IMPLEMENTED		
	New goods or services	*New operational processes*	*New organisational/managerial processes*
	%	%	%
Degree of novelty of the new goods or services or processes developed			
New to the business only	74.0	87.4	93.9
New to the industry	20.0	10.8	5.5
New to Australia	15.2	3.6	0.8
New to the world	7.7	0.8	0.3
Where the new goods or services or processes were developed			
Within the business or related company	74.7	65.8	75.9
In co-operation with other businesses or institutions	21.8	25.6	18.7
By other businesses or institutions	10.4	12.9	8.8

(a) Calendar years.
(b) Excludes innovating businesses that only reported innovative activity not yet complete or abandoned.
(c) Businesses could provide more than one answer to each question. A ranking of importance was not asked.
(d) Proportions are of innovating businesses in each output category.

2.14 INNOVATING BUSINESSES, SELECTED FINANCIAL INDICATORS, 2004-05(a), by employment size

	EMPLOYMENT SIZE			
	5-19 persons	*20-99 persons*	*100 or more persons*	***Total***
	%	%	%	%
Income(b)				
Proportion of income from sales of goods or services that resulted from the introduction of new or significantly improved goods or services(c)	8.8	4.9	4.1	**4.5**
Expenditure(b)(c)				
Proportion of total expenditure related to the development, introduction or implementation of:				
Any new or significantly improved goods and services	2.5	1.6	1.8	**1.8**
Any new or significantly improved operational processes	1.0	1.0	1.3	**1.3**
Any new or significantly improved organisational/managerial processes	0.9	0.5	0.6	**0.6**
Any innovative activity	4.4	3.1	3.7	**3.7**

(a) Data relates to the most recent financial year ended on or before 30 September 2005.
(b) Proportions are of income from sales of goods or services and total expenditure reported by innovating businesses in each output category.
(c) Includes expenditure from all innovation-active businesses.

2.15 RESEARCH AND EXPERIMENTAL DEVELOPMENT, 2004-05(a), by innovator status(b)(c)(d)

	Innovating businesses	*Non innovating businesses*	***All businesses***
	%	%	%
Proportion of businesses which reported expenditure relating to			
Performing research and experimental development	26.0	3.5	**11.4**
Acquiring research and experimental development from other companies or research institutions	5.3	1.1	**2.6**
Proportion of businesses which reported any expenditure on research and experimental development	27.1	3.7	**11.9**

(a) Data relates to the most recent financial year ended on or before 30 September 2005.
(b) Businesses could report one or both types of expenditure.
(c) Proportions are of businesses in each output category.
(d) See Explanatory Notes paragraph 15.

2.16 INNOVATING BUSINESSES, TYPE OF INNOVATION RELATED EXPENDITURE, 2004-05(a), by employment size(b)

	EMPLOYMENT SIZE			
	5-19 persons	*20-99 persons*	*100 or more persons*	***Total***
	%	%	%	%
PROPORTION OF INNOVATING BUSINESSES THAT REPORTED EXPENDITURE ON:				
Acquisition of machinery and equipment specifically purchased to develop, introduce or implement new goods, services or processes	35.6	47.4	^ 45.8	**39.9**
Acquisition of licences, rights, patents, and other intellectual property	9.3	17.4	18.5	**12.4**
New design work	11.4	20.3	23.9	**15.0**
Training related to new goods, services or processes	32.5	48.7	^ 52.5	**38.8**
Marketing activities aimed at market introduction of new goods or services	32.1	40.3	^ 40.2	**35.2**
Other activities related to the development, introduction or implementation of any new or significantly improved				
Goods or services	14.5	22.3	26.7	**17.7**
Operational processes	20.4	24.8	34.1	**22.6**
Organisational/managerial processes	29.7	35.0	42.1	**32.1**

^ estimate has a relative standard error of 10% to less than 25% and should be used with caution
(a) Businesses were asked to indicate which activity they had any expenditure for during the financial year ended on or before 30 September 2005. Businesses were not asked to report actual expenditure for each item.
(b) Proportions are of innovating businesses in each output category.

2.17 INNOVATING BUSINESSES, SOURCES OF FUNDS FOR INNOVATION RELATED EXPENDITURE, 2004-05(a), by employment size(b)

	EMPLOYMENT SIZE			
	5-19 persons	*20-99 persons*	*100 or more persons*	*Total*
	%	%	%	%
Source of funds				
Internal sources	88.3	92.0	93.8	90.0
Market Sources				
External equity (venture capital)	1.1	2.0	1.3	1.4
External equity (other)	1.4	1.3	1.8	1.4
Borrowings	32.7	^ 34.9	37.0	33.8
Any market sources	*34.9*	^ *37.1*	*38.5*	*35.9*
Government Sources				
Federal	2.7	2.3	5.7	2.7
State or local	0.9	2.0	3.0	1.4
Any government sources	*3.1*	*4.0*	*7.6*	*3.7*
Other	1.2	0.3	1.3	0.9

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

(a) Businesses were asked to indicate sources of funds for any innovation related expenditure during the financial year ended on or before 30 September 2005. Businesses were not asked to report actual amount of funds received.

(b) Proportions are of innovating businesses in each output category.

EXPLANATORY NOTES

INTRODUCTION

1 This publication, *Innovation in Australian Business, 2005*, presents results from the 2005 Innovation Survey. This 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 was the two year calendar period 2004 and 2005. Financial data relates to the most recent financial year ended on or before 30 September 2005.

SCOPE AND COVERAGE

4 The scope of the 2005 Innovation Survey was all businesses in Australia with employment recorded on the ABS Business Register of 5 or more 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 2005 Innovation Survey, like most ABS economic collections, was taken from the ABS Business Register. The register provides a list of employing businesses, primarily based on registrations to the Australian Taxation Office's (ATO) Pay As You Go Withholding (PAYGW) scheme. The frame is updated quarterly to take account of new businesses, businesses which have ceased employing, changes in employment levels, changes in industry and other general business changes. 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 removed from the frame. The estimates in this publication include an allowance for the time it takes a newly registered business to get on to the survey frame.

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.

SURVEY METHODOLOGY

10 The 2005 Innovation Survey was conducted by mail. It was based on a random sample of approximately 6,800 businesses which was stratified by industry, state/territory and number of employees. All businesses with 200 or more employees were included in the sample with the exception of MANUFACTURING industries, where all businesses with 500 or more employees were included in the sample.

DEFINING INNOVATION

11 The 2005 Innovation Survey draws on the conceptual definitions and guidelines included in the '*Oslo Manual, Guidelines for Collecting and Interpreting Innovation Data*' (Third Edition, 2005). This manual provides a framework for the collection of innovation statistics and specifies the definitions of innovating businesses and innovation-active businesses that are used by the ABS. For the 2005 Innovation Survey, the status of innovation was extended to include innovative activity that was abandoned during the reference period or was incomplete at the end of the reference period.

12 The '*Oslo Manual, Guidelines for Collecting and Interpreting Innovation Data*' (Third Edition, 2005) extends the type of innovative activity to include *marketing methods*. There was insufficient time before the conduct of the 2005 Innovation Survey to incorporate the collection of this type of innovation; this will be included in the future.

COMPARABILITY OF BUSINESS COUNTS

13 Estimates of the number of businesses operating in Australia can be derived from a number of sources within the ABS. They may relate to a particular point in time or may be presented as an average annual figure. However, these estimates will not always show the same results. Variations will occur because of differing data sources, differing scope and coverage definitions between surveys, as well as variations due to sampling and non-sampling error. More information about business counts can be found in the information paper *A Statistical View of Counts of Businesses in Australia* (cat. no. 8162.0).

14 The Innovation Survey was not designed to provide high quality estimates of numbers of businesses for any of the output classifications (for example, state or territory or industry) and the number of businesses in this publication are only included to provide contextual information for the user. A more robust source of counts of Australian businesses is available from *Australian Bureau of Statistics Business Register, Counts of Businesses* (cat. no. 8161.9.55.001).

RESEARCH AND EXPERIMENTAL DEVELOPMENT (R&D)

15 The proportions of businesses reporting expenditure on R&D presented in this publication are based on answers to basic indicator questions in the 2005 Innovation Survey questionnaire. Users should not compare the estimates included for these items with results from the ABS Survey of Research and Experimental Development - Business. The R&D survey uses the concepts in the publication *Proposed Standard Practice for Surveys of Research and Experimental Development ('Frascati Manual'), 2002* OECD, Paris, 2003 to compile R&D statistics; and has different scope, processes and procedures to the 2005 Innovation Survey.

16 Estimates of expenditure on research and experimental development used in this publication are derived from data collected from businesses in the ABS R&D survey in respect of the year ended June 2005. For more information about these data, please refer to *Research and Experimental Development, Businesses, 2004-05* (cat. no. 8104.0). Adjustments have been made for differences in scope between the 2005 Innovation Survey and the R&D survey. A split between expenditure by innovating businesses and non-innovating businesses cannot be provided.

REVISIONS TO 2003 ESTIMATES OF EXPENDITURE ON INNOVATION

17 For the 2003 Innovation Survey, there were problems with the collection of expenditure related to innovation. This was particularly noticeable in the number of innovating businesses who, although they did incur this type of expenditure, were unable to provide these estimates. There was also a relatively low response rate of 82%. The 2003 Innovation Survey was the first to be conducted for several years and there was insufficient information to determine similarity or difference between respondents and non-respondents. At the time, the imputation method utilised was the most suitable in the context of the available information.

18 Quality assurance of the 2005 Innovation Survey at the unit record level identified significant differences between the data reported for 2005 and that imputed for 2003 for both total businesses expenditure and that related to innovative activity. It was not possible to obtain revised estimates for 2003 from respondents. A decision was made to improve the quality of 2003 estimate by revising imputation for total business and innovation related expenditure to get more accurate estimates for 2003. This was done using information available from the 2005 survey and other areas of the ABS for the total business expenditure item. For some of the non-responding units in 2003, information about their innovator status was known. These revisions were confined to completely enumerated units in the 2003 Innovation Survey.

19 Revising imputation for 2003 has resulted in a revised estimate of $21,897.7m for expenditure on innovation by innovating businesses only. This estimate has a relative standard error (RSE) of $1,788.5m. The ABS considers a 95% confidence interval of$18,320.6m to $25,474.7m to be appropriate for this revised estimate. Users are urged

REVISIONS TO 2003 ESTIMATES OF EXPENDITURE ON INNOVATION *continued*

to use caution when making comparisons or assessments of movement between the 2003 and 2005 estimates.

OUTPUT CLASSIFICATIONS

20 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.

MORE DETAILED INNOVATION DATA

21 As indicated on page 2, this publication contains only summary data from the 2005 Innovation Survey. Data at least equivalent to that included in the 2003 issue of this publication will be released in spreadsheet format available free of charge from the ABS web site. These spreadsheets will include detailed (including some cross-classified) industry, state and employment data by topic as well as accompanying summary commentary. The following sets out the schedule for release of these detailed data:

- 7 December 2006 - Innovation indicators, financial indicators and selected innovation indicators based on European Union (EU) Community Innovation Survey scope.
- 19 January 2007 - Detailed data for Skills and capabilities, Collaboration and Barriers. International comparisons for Australia, the European Union and New Zealand.
- 16 February 2007 - Detailed data for Drivers, Source of ideas and Methods for acquiring knowledge and Intellectual Property.

22 Key indicator results from the Australian Innovation Survey and the EU and New Zealand Innovation surveys were compared in the 2003 Innovation Survey publication. While New Zealand has released results from its 2005 Innovation Survey, results from the EU Community Innovation Survey IV for all the member countries were not available at the time of release. International comparative datasets will be released when all of the EU data is available. This information is expected to be released via the ABS web site on 19 January 2007.

RELATED PUBLICATIONS

23 In addition to the previous issue of this publication, other ABS publications relating to innovation in business in Australia are listed below:

- *Patterns of Innovation in Australian Business, 2003,* (cat. no. 8163.0)
- *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, 2004–05,* (cat. no. 8104.0)

ABS WEB SITE

24 Other information relating to innovation in business can be found on the ABS web site <www.abs.gov.au>; see the Innovation, Science and Technology Home page under Themes/Industry.

DATA AVAILABLE ON REQUEST

25 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

26 Estimates of proportions shown in the tables are rounded to one tenth of a percentage point.

27 Where figures have been rounded, discrepancies may occur between the sum of the component items and the total. In addition, percentages have been calculated using the unrounded figures.

CHANGES TO THE COLLECTION OF INNOVATION STATISTICS

28 The collection of all business characteristics data by the ABS has been reviewed and a new strategy has been adopted. These types of data have generally been collected through a number of surveys which included the Innovation Survey. Due to the differences in scope and content definition, data produced from the range of characteristics surveys were not directly comparable and minimally integrated. A new integrated Business Characteristics Survey (BCS) will be introduced from the 2005-06 reference year.

29 The BCS will collect an extensive range of characteristics data using integrated concepts and best practice methodology. It will provide greater flexibility in measurement of a range of business characteristics and more comprehensive integration of these types of data for analysis of interrelationships between business characteristics and economic outcomes, for example, productivity. While population and cross sectional estimates will continue to be available, a longitudinal dataset for these data will be created and updated annually. This micro level data will be available in the form of a confidentialised unit record file - the ABS Confidentialised Unit Record File: Business Longitudinal Database and in the associated analytical paper A Profile of Australian Businesses: Some initial findings from the Business Longitudinal Database.

30 Impacts on innovation statistics resulting from the introduction of the BCS, include:

- change to a single, financial year reference period
- annual key innovation activity measures (including the ability to compile estimates for multiple reference years, e.g. single, two or three year periods)
- predominantly biennial release characteristics of innovation outputs (some topics will be collected annually, e.g. barriers), these will have a single, financial year reference period

COMMENTS

31 The ABS welcomes comment and suggestions from users regarding the new Business Characteristics Survey, specifically the collection of data relating to innovation in Australian business. 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
OECD	Organisation for Economic Co-operation and Development
PAYGW	pay-as-you-go withholding
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

APPENDIX

COMPARABILITY WITH THE 2003 INNOVATION SURVEY

SUMMARY OF CHANGES AND IMPACTS ON COMPARABILITY

1 As a result of the review of the 2003 Innovation Survey, changes were made to survey scope, content and procedures to improve quality and coherence of survey outputs. The main changes were:

- a change to a two year reference period for all innovative activity and characteristics data;
- the extension of the status of innovation to include innovative activity commenced but not yet complete or abandoned during the reference period;
- the specification of reference period for items where reference period was omitted in the 2003 Innovation Survey;
- a change to how innovation-related financial indicators were collected in order to alleviate reporting and quality problems identified in the 2003 Innovation Survey;
- the overall change in structure of the survey questionnaire to facilitate easier reporting and assist in improving response rates and data quality;
- more effective procedures to improve the response rate overall; and
- the implementation of more comprehensive quality assurance processes including historical comparison to 2003 key indicators at both micro and macro level.

CHANGE IN REFERENCE PERIOD

2 The 2003 Innovation Survey had a three calendar year reference period for innovation activity and characteristics topics. This was changed to a two calendar year reference period for the 2005 survey. The change in reference period is part of the staged implementation of the Business Characteristics Survey (BCS), see Explanatory Notes paragraphs 28-30.

3 To enable comparisons between both cycles of Innovation Survey outputs, data for key indicators from the 2003 survey have been modelled to reflect a two year reference period. These key indicators are the total proportion of innovating businesses, and the component proportions of businesses with goods and service, operational process and organisational/managerial process innovation.

4 Modelling rather than revising 2003 survey data was undertaken because year of innovative activity was not collected separately for the 2001 and 2002 calendar years in the 2003 survey. More information about the methodology used to model 2003 data is available from the contact shown on the front of this publication.

5 In the 2003 survey questionnaire, there were inconsistencies with reference period specification in a majority of characteristics questions and these were not able to be rectified. As a result the ability to measure any movement in results for characteristics data between the two surveys is restricted.

6 Financial data are not affected as the reference period for these data in both surveys is a single financial year (i.e. nominally 2002-03 and 2004-05).

EXTENSION OF SCOPE OF INNOVATIVE ACTIVITY

7 For the 2005 Innovation Survey, the scope of innovative activity was extended to include work that started but was not yet complete or was abandoned during the reference period. This is consistent with the '*Oslo Manual, Guidelines for Collecting and Interpreting Innovation Data*' (Third Edition, 2005) and what is being done internationally. Innovation related to *marketing methods* was not included at this stage; this was predominantly due to the lack of time to adequately test this more significant change. Some element of marketing is already considered to be included in the

EXTENSION OF SCOPE OF INNOVATIVE ACTIVITY *continued*

estimates. Many of the changes identified in the '*Oslo Manual, Guidelines for Collecting and Interpreting Innovation Data*' (Third Edition, 2005) will be introduced for the 2005-06 BCS where the core innovation questions will cover all types and states of innovative activity.

8 The impact on the overall rate of innovation of this change in scope can be seen in the difference between the proportion of innovating businesses and innovation-active businesses. While 12.2% of businesses reported starting but not yet completing or abandoning innovative activity during the reference period, they only contribute 1.4 percentage points to the estimate of innovation-active businesses.

9 There was no attempt to ask businesses to exclude this type of innovative activity in the innovation characteristics questions.

10 The extension of scope had a minor impact on the estimate of innovation expenditure. Businesses that only reported starting but not yet completing or abandoning innovative activity during the reference period accounted for $103 million of the total innovation expenditure of $30,582.9 million (or approximately 0.3%). For businesses that reported implementing or introducing new goods, services or process as well as innovative activity started but not yet complete or abandoned, It is not possible to quantify the amount of innovation expenditure that was solely for the latter two activities.

TECHNICAL NOTE

DATA QUALITY

INTRODUCTION

1 When interpreting the results of a survey it is important to take into account factors that may affect the reliability of the estimates. Estimates in this publication are subject to both non-sampling and sampling errors.

NON-SAMPLING ERRORS

2 Non-sampling errors may arise as a result of errors in the reporting, recording or processing of the data and can occur even if there is a complete enumeration of the population. These errors can be introduced through inadequacies in the questionnaire, treatment of non-response, inaccurate reporting by respondents, errors in the application of survey procedures, incorrect recording of answers and errors in data capture and processing.

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

4 There continues to be problems with the collection of innovation specific financial items (income from sales of new goods or services and expenditure on innovative activity). Businesses do not generally keep their records on a basis that allows for easy extraction of these data, therefore, they generally report estimates only. Furthermore, businesses could report either dollars or percentages for these items.

5 The Innovation survey is dynamic in nature and the concepts measured are subject to evolution and refinement over time. As noted in the Appendix, improvements have been made to the questionnaire and survey procedures, however it is not possible to measure the impact of all of these changes on data quality.

6 The 2005 Innovation Survey had a response rate of approximately 93%; this was above the target response rate and substantially higher than the response rate of 82% achieved for the 2003 Innovation Survey.

SAMPLING ERROR

7 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.

8 .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 innovation-active businesses was 34.9%. The standard error of this estimate was 1.3%. There would be about two chances in three that a full enumeration would have given a figure in the range 33.6% to 36.2%, and about nineteen chances in twenty that it would be in the ranges 32.3% to 37.5%. Detailed standard errors are available on request.

SAMPLING ERROR *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 To annotate proportion estimates a value of 50% has been used in the calculation of RSE rather than the estimated proportion from the survey data. This avoids inconsistencies between the way very low and very high proportions are annotated. Relative standard errors for estimates in this publication have been calculated using the actual standard error and the survey estimate (referred to as x) in the following manner:

RSE%(x) = (SE(x)*100)/50

11 Using the previous example, the standard error for the estimated proportion of total innovation-active businesses was 1.3%. Multiplied by 100 and then divided by 50 gives an RSE calculated on this basis of 2.6%. It is these figures that appear in the table appended to this chapter.

12 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.

13 For estimates of proportion the symbol '^' means that the estimate from full enumeration could lie more than a decile away so the estimate should be used with caution. For example a proportion estimate of 30% annotated with '^' means the full enumeration value could lie beyond the range 20% to 40%. The symbol '*' means the estimate from full enumeration could lie more than a quartile away and is subject to sampling variability too high for most practical purposes. A proportion estimate of 30% annotated with '*' means the full enumeration value could lie beyond the range 5% to 55%. Proportion estimates annotated with the symbol '**' have a sampling error that causes the estimates to be considered too unreliable for general use.

RELATIVE STANDARD ERRORS, 2004 AND 2005(a), by innovation type(b)

		BUSINESSES WHICH INTRODUCED OR IMPLEMENTED					
	Total number of businesses at 31 December 2005	*Any new or significantly improved goods or services*	*Any new or significantly improved operational processes*	*Any new or significantly improved organisational/ managerial processes*	*Any new goods, services or processes*	*Proportion of businesses which started but did not yet complete or abandoned any innovative activity*	*Proportion of businesses innovating*
	%	%	%	%	%	%	%
Employment size							
5–19 persons	1.6	2.3	2.3	2.5	3.2	2.0	3.3
20–99 persons	4.7	5.1	5.2	5.0	5.4	4.2	5.4
100 or more persons	8.8	6.5	7.5	9.2	9.2	4.9	8.6
Income size							
Less than $1m	3.0	3.3	3.4	3.5	4.3	2.9	4.3
$1m-Less than $5m	3.4	3.7	3.4	4.0	4.3	2.8	4.5
$5m or more	4.6	4.6	4.9	5.4	5.4	3.2	5.2
State/territory							
New South Wales	1.0	4.0	3.5	4.0	4.8	3.0	4.9
Victoria	1.5	3.7	3.8	4.7	4.9	3.5	4.9
Queensland	0.9	4.6	4.9	5.5	6.0	2.7	6.0
South Australia	2.1	8.3	10.4	11.4	11.5	10.2	11.4
Western Australia	1.7	8.6	8.1	9.4	9.4	6.4	9.4
Tasmania	4.0	14.5	11.2	12.0	17.0	9.3	17.1
Northern Territory	4.5	11.4	16.8	18.1	18.8	3.8	18.7
Australian Capital Territory	0.7	9.9	10.0	12.5	11.2	5.5	11.2
Region							
Capital cities	2.1	2.5	2.4	2.3	2.9	2.2	3.0
Other areas	4.9	4.2	4.2	4.5	4.9	3.1	5.1
Industry							
Mining	2.1	6.1	6.6	8.6	9.3	6.5	9.5
Manufacturing	0.7	2.3	2.7	2.4	2.8	2.5	2.9
Electricity, gas and water	2.4	7.1	5.6	6.7	7.4	7.0	8.2
Construction	1.5	5.3	6.7	6.7	7.5	4.3	7.5
Wholesale trade	2.0	7.2	6.6	8.2	8.7	5.7	8.3
Retail trade	1.8	6.2	6.0	6.5	8.1	3.9	8.3
Accommodation, cafes and restaurants	1.8	6.7	7.0	6.7	7.1	4.9	7.1
Transport and storage	2.1	5.7	6.3	6.8	7.3	4.4	7.3
Communication services	1.5	7.1	5.9	7.2	7.3	5.9	7.1
Finance and insurance	4.4	4.8	5.4	6.3	6.6	4.4	6.6
Property and business services	1.2	4.4	4.7	5.4	5.6	3.9	5.5
Cultural and recreational services	2.0	5.3	6.0	6.6	6.9	6.0	7.3
Total	**0.6**	**2.0**	**2.0**	**2.2**	**2.6**	**1.7**	**2.6**

(a) Calendar years.

(b) Calculated using methodology described in paragraphs 9-13 in this chapter.

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 expenses 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 2005. Businesses with a different financial year were asked to report for a 12 month period which ended between 1 October 2004 and 30 September 2005.
Innovation	The process of developing, introducing and implementing a new or significantly improved good or service or a new or significantly improved process.
Innovation-active	A businesses which, in the reference period, undertook any innovative activity irrespective of whether that activity has been abandoned, not yet completed or implemented or introduced.
Innovating business	A business which, in the reference period, introduced any new or significantly improved good or service and/or implemented any new or significantly improved operational and/or organisational/managerial process.
Innovative activity	Innovative activity includes any work that was intended to result in the introduction or implementation of new or significantly improved goods, services or processes.
Intellectual property	Refers to the ownership of ideas and control over the tangible or virtual representation of those ideas.
New good or service	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. 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.
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

New operational process *continued*	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. Businesses were asked to include significant improvements to existing operational processes.
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 reference period, did not undertake any innovative activity.
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.

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

2815800001052
ISSN 1448 5206

RRP $28.00