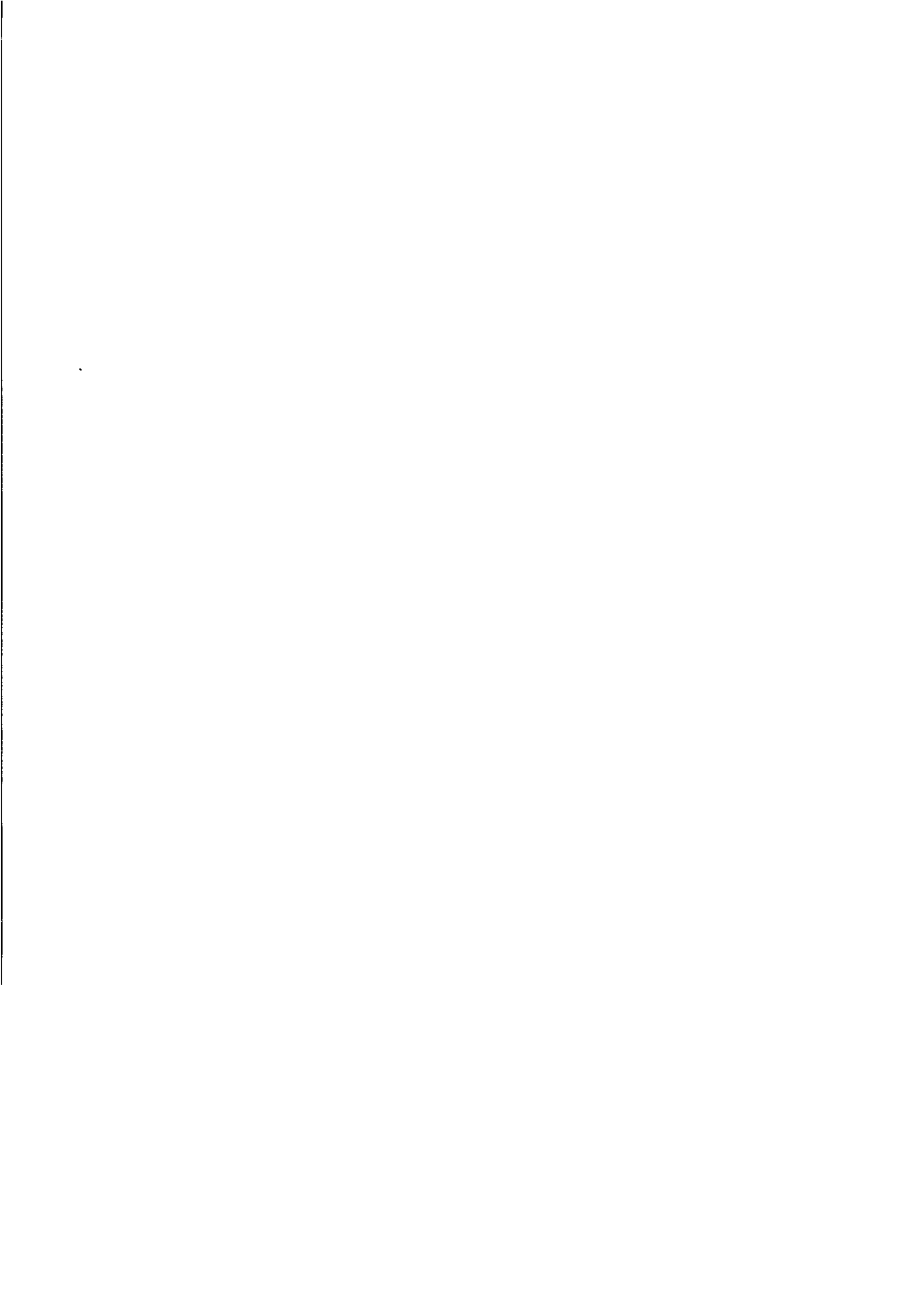


1994

**INNOVATION IN SELECTED  
AUSTRALIAN INDUSTRIES**

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**NEW ISSUE**

**INNOVATION IN  
SELECTED AUSTRALIAN INDUSTRIES  
1994**

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Australian Statistician**

**AUSTRALIAN BUREAU OF STATISTICS**

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### INQUIRIES

- *for further information about the statistics in this publication and the availability of unpublished statistics, contact John Ovington on (06) 252 5189 or Bill Pattinson on (06) 252 5019.*
  - *for information about other statistics and services, please refer to the back page of this publication.*
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## INTRODUCTION

This publication presents the results of the second survey by the Australian Bureau of Statistics (ABS) of innovation in Australian industry. This survey was restricted to selected non-manufacturing industries and only collected details of the level and main types of innovations. The main aim of the survey was to assess which industries were most innovative, and hence more appropriate to study in detail.

This survey collected details of innovative activities undertaken by businesses between July 1993 and June 1994. It was based on the definitions and concepts developed jointly by the Organisation for Economic Co-operation and Development (OECD) and Eurostat for collecting innovation data from the Manufacturing Sector. These concepts have been published in *OECD Proposed Guidelines for Collecting and Interpreting Technological Innovation Data* (OECD, Paris, 1992), known as the Oslo Manual.

The Oslo Manual was developed solely for surveys of the Manufacturing Sector and the standard questions asked are relevant only for those types of businesses. The ABS's first survey was restricted to that sector and collected detailed data on the level of innovation, characteristics of the innovating businesses, qualitative aspects of innovative manufacturers and characteristics of their main innovations. These results were published in *Innovation in Australian Manufacturing, 1994* (8116.0). The data in this publication are not strictly comparable to the manufacturing data as the time periods are different. The data for the Manufacturing Sector were collected for the reference period 1 July 1991 to 30 June 1994. The data in this publication were collected for the reference period 1 July 1993 to 30 June 1994.

In the Oslo Manual, technological innovation is defined to '...comprise new products and processes and significant technological changes of products and processes. An innovation has been implemented if it has been introduced on the market (product innovation) or used within a production process (process innovation). Innovations therefore involve a series of scientific, technological, organisational, financial and commercial activities.' As this product/process split did not seem to be appropriate for services businesses, the survey differentiated between the introduction of new or substantially changed goods and new services or substantially changed ways of delivering existing services.

As well as collecting data on technological innovation, the ABS also included questions on non-technological innovation. The results are also presented in this publication.

As the survey was exploratory, only limited data are available for release.

## SUMMARY OF FINDINGS

### INNOVATION

#### IN TOTAL

For all the selected industries surveyed, 21% of businesses undertook one or more innovative activities during the period from July 1993 to June 1994. This can be seen in Table 1.

#### BY INDUSTRY

Within the surveyed industries, shown in Table 1, the Electricity, gas and water supply businesses were the most innovative; 46% of these businesses undertook one or more innovative activities.

The next most innovative industries were the Wholesale trade (34%), Mining (32%), Cultural and recreational services (31%) and Education (26%) industries.

The Finance and insurance industry had the lowest overall level of innovation at 14%, about one third the level for the most innovative industry.

The Service industries in total did not show much difference from the overall total for the selected industries. 21% of businesses in the Service industries undertook one or more innovative activities during the reference period. 14% of businesses undertook non-technological innovation and 12% undertook technological innovation. In terms of technological innovation, 5% of these businesses undertook goods innovation and 9% services innovation.

#### BY TYPE

As can be seen in Table 1, non-technological innovation was the more prevalent type of innovation in the surveyed industries, occurring in 14% of businesses. In contrast, technological innovation occurred in 12% of the surveyed businesses.

Non-technological innovation occurred more frequently than technological innovation in most of the surveyed industries, the exception being the Retail trade, Communication services and Cultural and recreational services industries.

The Electricity, gas and water supply industry was the most innovative industry, having the highest level of non-technological innovation (45%) and a moderately high level of technological innovation (17%).

The Finance and insurance industry recorded the lowest level of non-technological innovation (11%) and also had the second lowest level of technological innovation (7%), resulting in the lowest overall level of innovation.

Communication services (21%), Cultural and recreational services (19%) and Wholesale trade (18%) were the industries with the most technological innovation. Transport and storage (7%) and Finance and insurance (7%) were the least technologically innovative industries.

Service innovation was the most prevalent type of technological innovation in the surveyed industries, occurring in 9% of businesses. In contrast, goods innovation occurred less frequently, in 5% of the surveyed businesses.

# 1

## PROPORTION OF BUSINESSES UNDERTAKING INNOVATIVE ACTIVITIES, JUNE 1994<sup>1</sup>

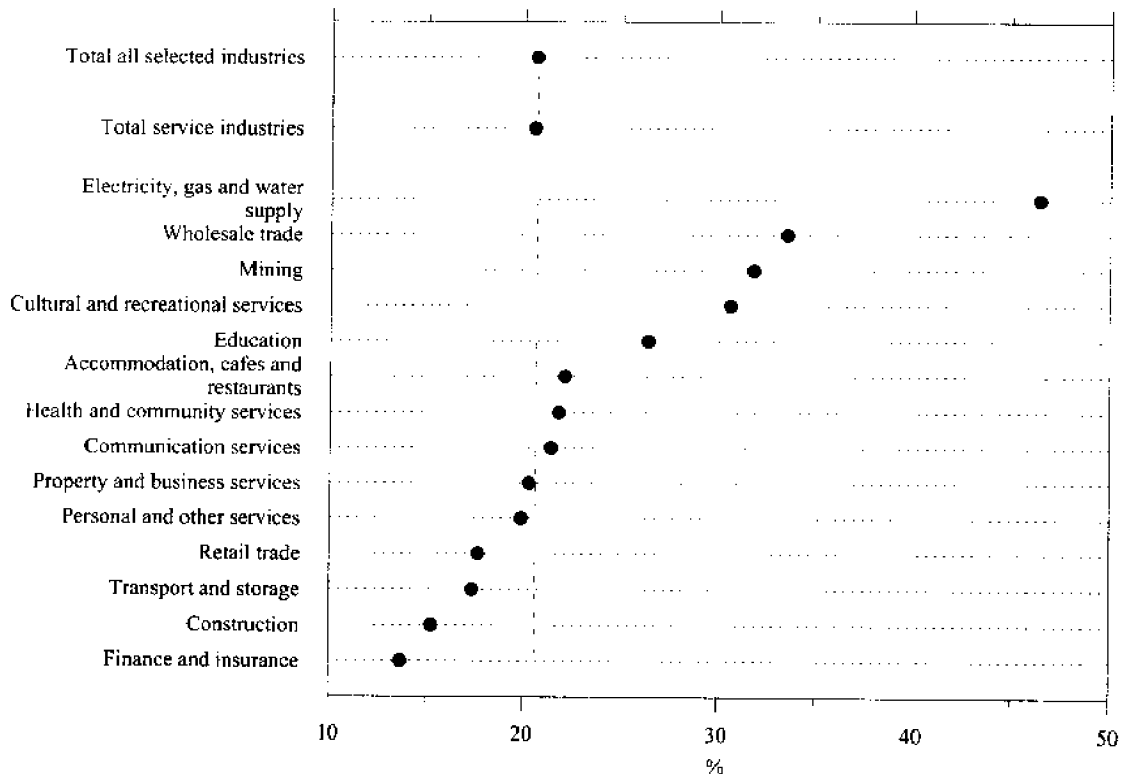
Selected industries <sup>2</sup>	Innovation type				
	Goods %	Services %	Technological <sup>3</sup> %	Non- technological %	One or more %
B Mining	8.4	2.0	9.7	28.5	31.8
D Electricity, gas and water supply	3.1	16.0	17.2	45.4	46.4
E Construction	3.5	5.5	7.9	10.8	15.3
F Wholesale trade	13.2	8.7	18.0	25.9	33.5
G Retail trade	6.7	10.4	12.8	7.2	17.7
H Accommodation, cafes and restaurants	9.0	7.3	10.6	15.9	22.1
I Transport and storage	3.2	6.4	6.5	12.9	17.4
J Communication services	0.4	20.6	20.9	18.2	21.4
K Finance and insurance	0.5	6.8	7.0	11.0	13.7
L Property and business services	3.6	8.5	11.4	14.6	20.3
N Education	0.2	16.9	17.0	23.1	26.4
O Health and community services	4.2	9.8	10.4	16.4	21.8
P Cultural and recreational services	3.8	19.0	19.9	17.6	30.6
Q Personal and other services	3.7	6.2	9.2	15.4	19.9
<b>Total all selected industries</b>	<b>5.4</b>	<b>8.7</b>	<b>11.5</b>	<b>14.0</b>	<b>20.6</b>

<sup>1</sup> Relates to innovation undertaken during the period July 1993 to June 1994.

<sup>2</sup> Excludes Divisions (A) Agriculture, forestry and fishing, (C) Manufacturing and (M) Government, administration and defence.

<sup>3</sup> Those businesses which undertook goods and/or services innovation during the period July 1993 to June 1994.

**CHART 1 PROPORTION OF BUSINESSES UNDERTAKING ONE OR MORE INNOVATIVE ACTIVITIES, JUNE 1994**





**INNOVATIVE ACTIVITIES  
BY EMPLOYMENT**

**BY SIZE OF BUSINESS**

The extent of innovation, shown in Table 2, ranged from 17% for businesses with employment of less than 5, to 86% for businesses with employment of 1,000 or more.

**BY TYPE OF INNOVATION**

As can be seen in Table 2, technological innovation occurred in only 10% of businesses with employment of less than 5. In contrast, the level of technological innovation increased to 40% of businesses with employment of 1,000 or more.

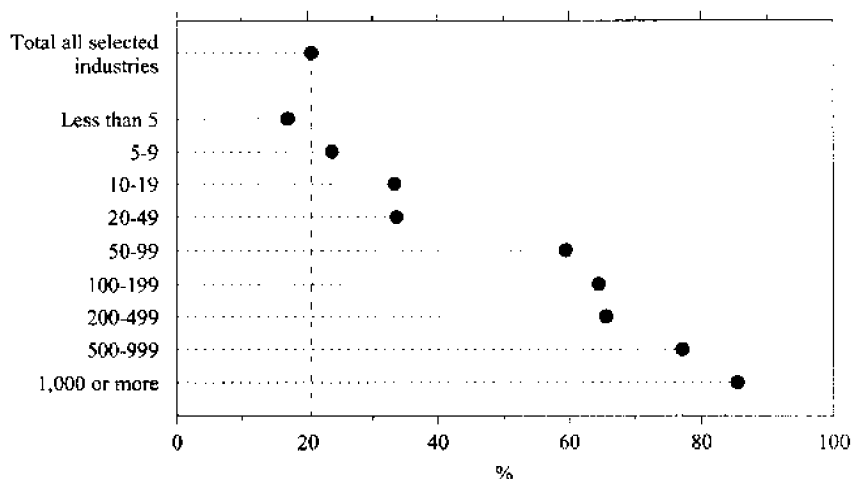
Non-technological innovation was also generally more prevalent in larger businesses. Businesses which undertook non-technological innovation ranged from 10% of businesses with employment of less than 5, to 81% of businesses with employment of 1,000 or more.

In all business employment size groups, non-technological innovation was more prevalent than technological innovation. Generally as the employment size of the business increased the level of service innovation increased, from 8% for businesses with employment of less than 5, to 33% for businesses with employment of 1,000 or more. However the same trend did not occur for goods innovation: the lowest level of innovation (4%) occurred in the employment size 20-49, the highest in businesses with employment of 1,000 or more (20%).

**BY INDUSTRY AND SIZE OF BUSINESS**

When industry and size details are cross classified, as they are in Table 3, some interesting details emerge. For example, in the Retail industry, for the smallest employment category (less than 5 employees) technological innovation was far more prevalent than non-technological innovation. However, for Retail businesses employing between 5 and 20 employees the level of technological and non-technological innovation was similar. Above employment size of 20, non-technological innovation was more prevalent.

**CHART 2 PROPORTION OF BUSINESSES UNDERTAKING ONE OR MORE INNOVATIVE ACTIVITIES BY EMPLOYMENT, JUNE 1994**



## 2

**PROPORTION OF BUSINESSES UNDERTAKING INNOVATIVE ACTIVITIES, BY EMPLOYMENT, JUNE 1994<sup>1</sup>**

Employment	Innovation type				
	Goods	Services	Technological <sup>2</sup>	Non-technological	One or more
	%	%	%	%	%
Less than 5	4.2	7.7	10.0	10.1	17.0
5-9	8.1	9.1	13.0	16.6	23.8
10-19	10.0	14.8	18.7	29.2	33.3
20-49	3.9	10.0	13.5	30.6	33.6
50-99	8.8	21.5	25.7	50.5	59.4
100-199	12.7	19.7	27.6	61.1	64.4
200-499	8.6	21.7	26.4	61.3	65.6
500-999	14.3	26.3	31.5	72.9	77.1
1,000 or more	19.8	33.1	40.0	80.7	85.5
<b>Total all selected industries</b>	<b>5.4</b>	<b>8.7</b>	<b>11.5</b>	<b>14.0</b>	<b>20.6</b>

<sup>1</sup> Relates to innovation undertaken during the period July 1993 to June 1994.

<sup>2</sup> Those businesses which undertook goods and/or services innovation during the period July 1993 to June 1994.

## 3

**INNOVATIVE STATUS, BY INDUSTRY<sup>1</sup> AND EMPLOYMENT, JUNE 1994<sup>2</sup>**

Selected industries	Employment size									
	<5		5-9		10-19		20-99		>100	
	Tech-nolo-gical	Non-tech-nolo-gical	Tech-nolo-gical	Non-tech-nolo-gical	Tech-nolo-gical	Non-tech-nolo-gical	Tech-nolo-gical	Non-tech-nolo-gical	Tech-nolo-gical	Non-tech-nolo-gical
	%	%	%	%	%	%	%	%	%	%
B Mining	8	22	7	21	18	39	14	50	10	68
D Electricity, gas and water supply	22	39	-	22	-	50	22	64	30	86
E Construction	8	7	6	22	15	37	6	43	22	69
F Wholesale trade	16	25	18	21	29	26	20	45	38	64
G Retail trade	11	1	13	12	38	38	16	41	24	64
H Accommodation, cafes and restaurants	11	16	5	10	33	33	13	24	19	54
I Transport and storage	4	8	13	18	1	37	19	19	21	80
J Communication services	17	17	50	25	-	-	55	45	61	100
K Finance and insurance	5	8	18	20	17	34	34	45	30	69
L Property and business services	12	12	9	16	7	28	15	36	30	73
N Education	9	16	42	42	3	4	13	34	28	43
O Health and community services	7	14	20	21	5	14	14	32	35	57
P Cultural and recreational services	12	10	40	26	16	33	17	25	25	47
Q Personal and other services	9	12	12	28	-	10	24	29	43	63
<b>Total all selected industries</b>	<b>10</b>	<b>10</b>	<b>13</b>	<b>17</b>	<b>19</b>	<b>29</b>	<b>16</b>	<b>35</b>	<b>29</b>	<b>64</b>

<sup>1</sup> Excludes Divisions (A) Agriculture, forestry and fishing, (C) Manufacturing and (M) Government, administration and defence.

<sup>2</sup> Relates to innovation undertaken during the period July 1993 to June 1994.

<sup>3</sup> Those businesses which undertook goods and/or services innovation during the period July 1993 to June 1994.

## EXPLANATORY NOTES

- DESCRIPTION**
- 1** This publication presents statistics from a survey of innovation undertaken for selected Australian industries. Information was collected in respect of businesses' innovative activities during the period 1 July 1993 to 30 June 1994.
- SURVEY METHODOLOGY**
- 2** Approximately 6,700 management units in Australian industry were sampled. The sample was taken from the Australian Bureau of Statistics' Business Register. The survey was conducted by mailed questionnaires and a 94% response rate was obtained.
- SCOPE AND COVERAGE**
- 3** The survey included businesses of all sizes operating in the selected industries. Most industries were included, the exceptions being Agriculture, forestry and fishing, Government administration and defence and Education, regardless of whether those businesses had undertaken innovative activities during the period.
- STATISTICAL UNIT**
- 4** The business unit from which the information was collected and published is the management unit, which is the highest-level accounting unit within a business, having regard to industry homogeneity. In nearly all cases it coincides with the legal entity owning the business (i.e. company, partnership, trust, sole operator, etc.). In the case of large diversified businesses, however, there may be more than one management unit, each coinciding with a 'division' or 'line of business'. A division or line of business is separately identified where separate and comprehensive accounts are maintained.
- CLASSIFICATION BY INDUSTRY**
- 5** The statistics in this publication are classified by industry in accordance with the 1993 edition of the *Australian and New Zealand Standard Industrial Classification (1292.0)*. Each business unit is classified to a single industry. The industry allocated is the one which provides the main source of income for the management unit irrespective of whether a range of activities or a single activity is undertaken by the unit.
- SURVEY ERROR**
- 6** The extent to which survey error affects the results of the survey is unknown. This is the first time the survey has been conducted, and it involved new concepts. This is expected to contribute to the survey error in a small way. However, a comprehensive process of pilot testing and consultation with respondents was conducted to minimise this specific source of survey error.
- 7** As 94% of the businesses completed forms, non-response bias can be expected to be small.
- SAMPLING ERROR**
- 8** A measure of the reliability of sample estimates is given by the standard error, which indicates the extent to which estimates might have varied by chance because only a sample of businesses was included.
- 9** There are about two chances in three that a sample estimate will differ by less than one standard error from the figure that would have been obtained if all units had been included in the survey, and approximately nineteen chances in twenty that the difference will be less than two standard errors.

**STANDARD ERRORS ASSOCIATED WITH THE PROPORTION OF BUSINESSES UNDERTAKING  
INNOVATIVE ACTIVITIES<sup>1</sup>, JUNE 1994**

Selected industries <sup>2</sup>		Standard errors (percentage points)		
		Technological innovation <sup>3</sup>	Non-technological innovation	One or more innovations
B	Mining	3.6	7.2	7.5
D	Electricity, gas and water supply	9.1	12.0	12.0
E	Construction	3.0	2.2	3.2
F	Wholesale trade	3.9	4.3	4.7
G	Retail trade	4.7	1.8	4.9
H	Accommodation, cafes and restaurants	5.3	6.5	7.5
I	Transport and storage	2.6	3.4	4.0
J	Communication services	14.1	13.9	14.1
K	Finance and insurance	1.5	3.6	3.7
L	Property and business services	3.3	3.5	4.0
N	Education	6.1	6.6	6.8
O	Health and community services	2.9	3.4	4.1
P	Cultural and recreational services	6.8	6.4	7.6
Q	Personal and other services	2.7	3.2	3.5
<b>Total all selected industries</b>		<b>1.4</b>	<b>1.2</b>	<b>1.7</b>

<sup>1</sup> Relates to innovation undertaken during the period July 1993 to June 1994.

<sup>2</sup> Excludes Divisions (A) Agriculture, forestry and fishing, (C) Manufacturing and (M) Government, administration and defence.

<sup>3</sup> Those businesses which undertook goods and/or services innovation during the period July 1993 to June 1994.

**10** The standard errors are high due to the relatively small sample that was selected, particularly in the businesses of smaller employment size.

**11** Standard errors for other estimates presented in this publication are not provided here but can be made available on request.

**RELATED STATISTICS**

**12** Other statistics relevant to innovation are contained in the following publications:

- *Innovation in Industry, 1993-94, March 1995* (8117.0)
- *Innovation in Australian Manufacturing, 1994, August 1995* (8116.0)
- *Manufacturing Technology Statistics, Australia, 31 December 1991* (8123.0)
- *Mining Technology Statistics, Australia, 30 June 1991* (8413.0)
- *Research and Experimental Development, Business Enterprises (Inter Year Survey), Australia, 1993-94* (8114.0)

**COMMENTS**

**13** Comments on the statistics presented in this publication and suggestions for further improvement would be most welcome and should be forwarded to:

The Director  
Small Business and Science and Technology Section  
Australian Bureau of Statistics  
PO Box 10  
Belconnen ACT 2616



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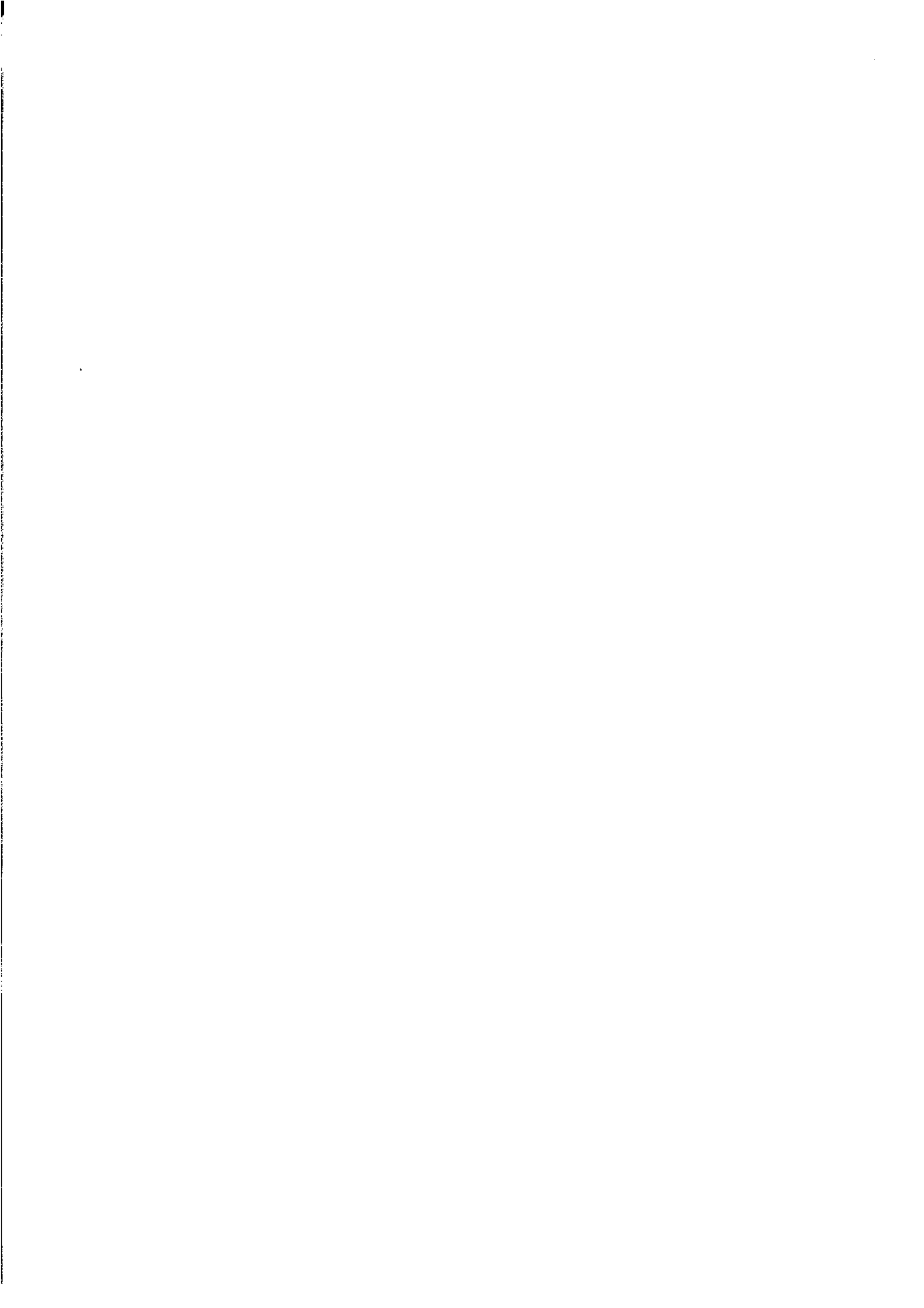
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