Australian Bureau of Statistics

8169.0

Information Paper

Experimental Estimates for Australian Industry adjusted for Off-June Year Reporting

Australia

2008–09 and 2009-10

Information Paper

Experimental Estimates for Australian Industry adjusted for Off-June Year Reporting

Australia

2008–09 and 2009-10

Brian Pink
Australian Statistician

AUSTRALIAN BUREAU OF STATISTICS

EMBARGO: 11.30AM (CANBERRA TIME) WED 30 NOV 2011

ABS Catalogue No. 8169.0

Produced by the Australian Bureau of Statistics

INQUIRIES

- For further information about these and related statistics, contact the National Information and Referral Service on 1300 135 070.

CONTENTS

ABBREVIATIONS

$b	billion (thousand million) dollars
$m	million dollars
ABS	Australian Bureau of Statistics
ABSBR	Australian Bureau of Statistics Business Register
ANZSIC	Australian and New Zealand Standard Industrial Classification
cat. no.	Catalogue number
EAS	Economic Activity Survey
GST	goods and services tax
IVA	industry value added
QBIS	Quarterly Business Indicators Survey
RSE	relative standard error
SESCA	Standard Economic Sector Classification of Australia
SISCA	Standard Institutional Sector Classification of Australia

CHAPTER 1 INTRODUCTION

INTRODUCTION

This information paper explains how businesses reporting data on a non-standard financial year basis can impact on the estimates published in *Australian Industry* (cat. no. 8155.0), and describes an experimental methodology designed to measure the impact of this phenomenon on published data.

The estimates presented in *Australian Industry* (cat. no. 8155.0) are derived from the Economic Activity Survey (EAS), and generally represent the 12 month period ended 30 June. However, where businesses are unable to provide data on this basis, an alternate, or 'off-June' accounting period is used. As a result, in some instances estimates may reflect trading conditions occurring outside of the published reference year.

By its nature, 'off-June reporting' is more prevalent in industries with a high degree of foreign ownership, such as Mining, Manufacturing and Wholesale trade, as many countries have different standard accounting periods to Australia. Some local businesses also report for an 'off-June' year for logistical or operational purposes. Where trading conditions are stable across years, the effect of off-June year reporting is expected to be minimal, but when levels of activity in an industry change quickly, estimates might be more substantially affected. Often, this occurs as a result of price fluctuations or one-off extraordinary events that impact on industry performance.

This paper describes an experimental methodology designed to assess all businesses on the same June year end reporting basis. The methodology uses data collected through the Quarterly Business Indicators Survey (QBIS) to model the impact of off-June year reporting on selected *Australian and New Zealand Standard Industrial Classification 2006* (ANZSIC) industry subdivisions. Using QBIS data, 'off-June year' factors are generated that, when applied to EAS data remove the impact of off-June reporting on estimates. A detailed explanation of the methodology can be found in Chapter 2.

The result is a set of experimental estimates adjusted for off-June year reporting. These experimental estimates, along with the original estimates published in *Australian Industry* (cat. no. 8155.0) are presented by ANZSIC division and subdivision for selected data items in the Appendix of this paper. The data items are wages and salaries, total income, total expenses and Industry Value Added (IVA), presented for the reference years 2008-09 and 2009-10.

Chapter 3 contains a summary of the effects of the off-June adjustments on EAS data. Care should be taken when using these experimental estimates as modelling may introduce an element of error. Information concerning the reliability of estimates is described in Chapter 4.

USER COMMENTS AND FURTHER INFORMATION

The Australian Bureau of Statistics (ABS) is interested in feedback from users of these statistics. Users are invited to contact Annual Integrated Collections at <australian.industry.statistics@abs.gov.au> for comment or to seek clarification on any aspect of this release. Please also note that there are no additional data available by request. The ABS is continuing to evaluate this experimental methodology with a view to possible changes in the future.

RELATED PUBLICATIONS

Other ABS products which may be of interest are listed below, and are available free of charge from the ABS website www.abs.gov.au.

Australian Industry, 2009-10 (cat. no. 8155.0), issued annually

Business Indicators, Jun 2010 (cat. no. 5676.0), issued quarterly

Experimental Estimates for the Manufacturing Industry, 2008-09 (cat. no. 8159.0), issued annually

ACKNOWLEDGEMENT

ABS publications draw extensively on information provided freely by individuals, businesses, governments and other organisations. Their continued cooperation is very much appreciated; without it, the wide range of statistics published by the ABS would not be available. Information received by the ABS is treated in strict confidence as required by the *Census and Statistics Act 1905*.

CHAPTER 2 CONCEPTS AND METHODS

SCOPE AND POPULATION

The estimates presented in this paper are classified by industry, in accordance with the 2006 edition of the *ANZSIC* (cat. no. 1292.0) and by institutional sector, in accordance with the *Standard Institutional Sector of Australia* (SISCA), as detailed in *Standard Economic Sector Classifications of Australia* (SESCA) (cat. no. 1218.0).

The scope of the experimental estimates in this paper is based on the scope of the EAS, with further constraints imposed to match the scope of QBIS. For a detailed explanation of the scope and methodology of these surveys see Explanatory Notes for *Australian Industry* (cat. no. 8155.0) and *Business Indicators* (cat. no. 5676.0). In brief, the scope of the experimental estimates in this paper consists of all business entities on the Australian Bureau of Statistics Business Register (ABSBR) operating in the Australian economy during the reference period, except for:

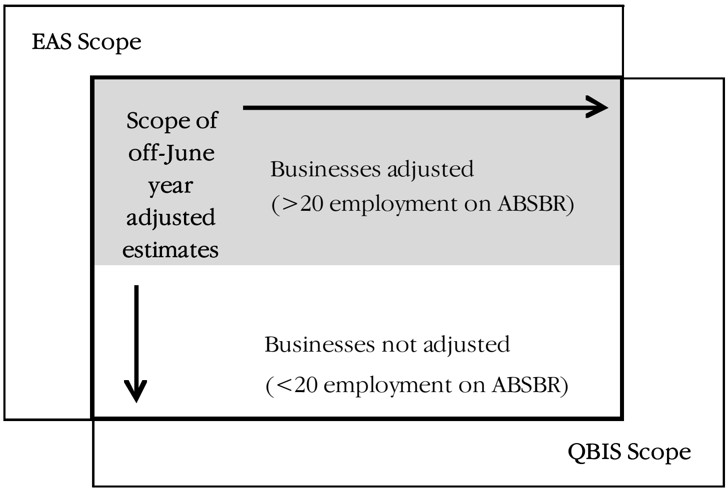
- In most industries, entities classified to SISCA Sector 3 General government. The one industry for which general government units are included is Water supply, sewerage and drainage services (ANZSIC Subdivision 28, within Division D Electricity, gas, water and waste).
- Entities classified to Agriculture, forestry and fishing, Financial and insurance services or Public administration and safety (ANZSIC Divisions A, K and O, respectively)
- Entities classified to Private households employing staff (ANZSIC Subdivision 96, within Division S Other services).

While Education and training and Health care and social assistance (ANZSIC Divisions P and Q, respectively) are conceptually in scope of these analyses, QBIS does not collect information on sales and service income or other expenses for these ANZSIC divisions. Thus no adjustment has been applied to these data items for these industries.

Additionally, entities with an employment size of less than 20 on the ABSBR are within scope of the experimental estimates, but are ineligible for adjustment. Data reported by these businesses still contribute to the estimates, but are not adjusted as part of the process described below. Such conditions of the methodology are explained in Chapter 4. The final scope of off-June adjusted experimental estimates is summarised in Figure 1.

SCOPE AND POPULATION *continued*

FIGURE 1. SCOPE OF THE EXPERIMENTAL ESTIMATES



THE OFF-JUNE REPORTING PROBLEM

The 2009-10 EAS had a reference period ending 30 June 2010; that is, the aim of the EAS was to measure economic activity over the 12 months from 1 July 2009 to 30 June 2010. Analysis of data from EAS shows that the majority of businesses report for this reference period, but for some industries a substantial fraction report for some other reference period. As noted above, 'off-June reporting' is more prevalent in industries with a high degree of foreign ownership, such as MINING, MANUFACTURING and WHOLESALE TRADE, as many countries use different accounting periods to Australia.

Considering the 2009-10 EAS, the 'off-June' reporting periods typically observed were

- reporting period ending 31 December 2009
- reporting period ending 31 March 2010; and
- reporting period ending 30 September 2010

Consequently, where most data reported in *Australian Industry* are for the 12 months ending 30 June, some data can be reported for periods including the previous one or two quarters, or including the succeeding quarter, as demonstrated in Figure 2.

FIGURE 2. THE 2009-10 ECONOMIC ACTIVITY SURVEY REFERENCE PERIOD AND OBSERVED PERIODS OF OFF-JUNE REPORTING

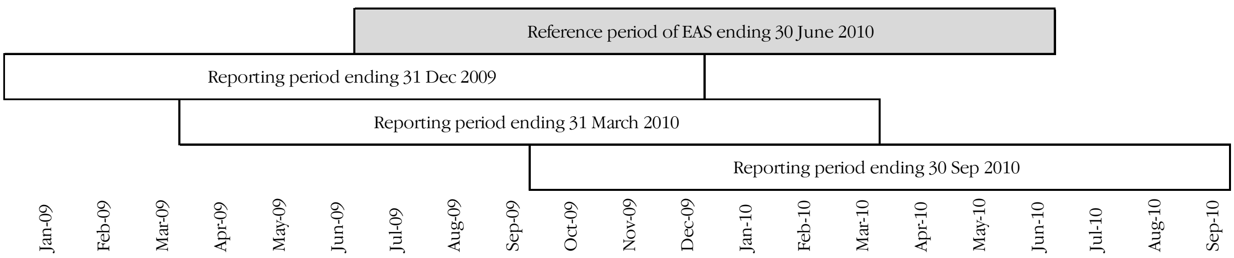


Table 1 gives an estimate of the percentage of the population likely to report on a financial year basis, and their contribution to total industry IVA. The table is exclusive of non-employing entities whose turnover is below the bottom 2.5 percentile of their ANZSIC subdivision. All other businesses with less than 20 employees are included in the June reporting period, because they were ineligible for adjustment. Table 1 therefore

THE OFF-JUNE REPORTING PROBLEM *continued*

represents the off-June reporting businesses which received an adjustment as part of the process described below.

Although businesses reporting for an off-June financial year may be in the minority, their contribution to overall estimates of IVA can be substantial. An example is the MINING industry, with 7% of businesses reporting for a non-standard financial year, contributing 57% of total industry IVA.

TABLE1. PREVALENCE OF OFF-JUNE YEAR REPORTING IN EAS 2009-10, AND THE CONTRIBUTION OF THESE BUSINESSES TO IVA

	ESTIMATE OF % OF POPULATION BY REPORTING PERIOD(a)				ESTIMATE OF % CONTRIBUTION TO IVA BY REPORTING PERIOD(a)			
	Financial year reporters	*Off-June year reporters*			*Financial year reporters*	*Off-June year reporters*		
	JUN	*DEC*	*MAR*	*SEP*	*JUN*	*DEC*	*MAR*	*SEP*
B Mining	93	6	1	0	43	51	6	0
C Manufacturing	99	1	0	0	70	24	3	2
D Electricity, gas, water and waste services	98	1	np	np	82	14	np	np
E Construction	100	0	0	0	91	7	2	0
F Wholesale trade	98	2	0	0	63	23	9	6
G Retail trade	100	0	0	0	96	3	1	0
H Accommodation and food services	99	1	0	0	86	10	1	3
I Transport, postal and warehousing	100	0	0	0	88	10	1	1
J Information media and telecommunications	98	1	0	0	76	10	11	3
L Rental, hiring and real estate services	100	0	0	0	93	5	1	0
M Professional, scientific and technical services	100	0	0	0	83	11	3	3
N Administrative and support services	100	0	0	0	87	11	1	1
P Education and training (private)	92	8	0	0	30	69	0	0
Q Health care and social assistance (private)	np	np	np	np	np	np	np	np
R Arts and recreation services	99	1	0	0	93	5	1	0
S Other services	99	0	0	0	91	7	1	1
Total selected industries	**99**	**1**	**0**	**0**	**79**	**17**	**3**	**1**

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

(a) Includes all businesses in scope of the experimental estimates, except for non-employing entities below a certain turnover threshold. Other businesses with less than 20 employees are included in the JUN category.

The impact of off-June reporting can vary between data items; that is, not only does the incidence and impact of off-June year reporting differ by industry subdivision, it also impacts upon the following data items differently:

- Sales and service income
- Wages and salaries
- Other expenses
- Closing inventories of raw materials
- Opening inventories of raw materials
- Closing inventories of finished goods (including work-in-progress); and
- Opening inventories of finished goods (including work-in-progress)

Consequently, it was necessary to adjust these individual measures to satisfactorily account for each of the different types of off-June reporting within each ANZSIC subdivision.

METHODOLOGY

This paper describes a methodology developed with the aim of measuring and removing the impact of off-June reporting on estimates published in *Australian Industry* (cat. no. 8155.0). The experimental estimates presented in the Appendix of this paper were derived in a two step process. First, for each within scope ANZSIC subdivision, off-June factors were determined for each data item and each of the off-June reporting types. Then, the appropriate off-June factors were applied to data reported by individual EAS businesses within each respective ANZSIC subdivision. This enabled the calculation of new values for these businesses, representing an estimate of how the business would have reported for the standard financial year (that is, 1 July to 30 June). By aggregating these values, new estimates were produced on a standard financial year basis.

Creating off-June year factors

It was necessary to create twenty-one separate factors for each in scope ANZSIC subdivision, as demonstrated in Table 2.

TABLE 2. THE 21 OFF-JUNE YEAR MODELLING FACTORS REQUIRED, FOR EACH ANZSIC SUBDIVISION

	Sales and service income	*Wages and salaries*	*Other expenses*	*Closing inventories of raw materials*	*Opening inventories of raw materials*	*Closing inventories of finished goods*	*Opening inventories of finished goods*
ANZSIC SUBDIVISION	Dec-09	Dec-09	Dec-09	Dec-09	Dec-09	Dec-09	Dec-09
	Mar-10	Mar-10	Mar-10	Mar-10	Mar-10	Mar-10	Mar-10
	Sep-10	Sep-10	Sep-10	Sep-10	Sep-10	Sep-10	Sep-10

The factors were formulated from a subset of businesses sampled in the QBIS. In order to be included in the derivation of the factors, businesses must have met the following criteria:

- For sales and service income, wages and salaries and other expenses factors: Reported a non-zero value for sales and service income, wages and salaries, and other expenses for the seven relevant quarters which cover all possible types of reporting period. For example, for 2009-10 the relevant quarters are March 2009 through September 2010. This condition eliminated businesses which either started up or closed down during the period.
- For inventories factors: Reported a non-zero value for sales and service income and inventories for eight relevant quarters (December 2008 through September 2010). This is because a value for opening inventories was required, which was sourced from the inventories reported in previous quarter.
- Not reported a value for the above items in one quarter greater than 10 times that of an adjacent quarter. This condition eliminated businesses with extreme values.
- Had an employment size of 20 or more. This removed small businesses, whose data are not expected to be impacted by off-June reporting in the EAS.

Sales and service income and other expenses factors were not generated for Education and training and Health care and social assistance (Divisions P and Q respectively), as the information is not collected by QBIS (see Scope and Population above).

Creating off-June year factors continued

For each data item, quarterly QBIS data reported by the subset of businesses established above were summed to give an aggregate value for each in scope ANZSIC subdivision. These aggregate quarterly values were then used to create factors that model the impact of off-June reporting for each of the four data items by each in scope subdivision. To calculate each factor, a ratio of the data reported during the standard financial year and the relevant off-June time-period was generated, by summing data from the four quarters of the standard financial year and dividing this by the summed annualised data from the four quarters of the relevant off-June reporting period, as described by Equation 1.

EQUATION 1. CALCULATING OFF-JUNE FACTORS

$$Off-JuneFactor_{DEC} = \frac{(\underset{\sim}{Q}_{SEP09} + \underset{\sim}{Q}_{DEC09} + \underset{\sim}{Q}_{MAR10} + \underset{\sim}{Q}_{JUN10})}{(\underset{\sim}{Q}_{MAR09} + \underset{\sim}{Q}_{JUN09} + \underset{\sim}{Q}_{SEP09} + \underset{\sim}{Q}_{DEC09})}$$

$$Off-JuneFactor_{MAR} = \frac{(\underset{\sim}{Q}_{SEP09} + \underset{\sim}{Q}_{DEC09} + \underset{\sim}{Q}_{MAR10} + \underset{\sim}{Q}_{JUN10})}{(\underset{\sim}{Q}_{JUN09} + \underset{\sim}{Q}_{SEP09} + \underset{\sim}{Q}_{DEC09} + \underset{\sim}{Q}_{MAR10})}$$

$$Off-JuneFactor_{SEP} = \frac{(\underset{\sim}{Q}_{SEP09} + \underset{\sim}{Q}_{DEC09} + \underset{\sim}{Q}_{MAR10} + \underset{\sim}{Q}_{JUN10})}{(\underset{\sim}{Q}_{DEC09} + \underset{\sim}{Q}_{MAR10} + \underset{\sim}{Q}_{JUN10} + \underset{\sim}{Q}_{SEP10})}$$

where Q is quarterly QBIS data aggregated by industry subdivision for the subset of businesses identified above.

Since inventories are stock variables (that is, represent a quantity existing at a particular point in time) the formulae for deriving inventories factors differed slightly, as described by Equation 2.

EQUATION 2. CALCULATING OFF-JUNE INVENTORIES FACTORS

$$InventoriesFactor_{DEC} = \frac{(\underset{\sim}{Q}\,Inv_{JUN10})}{(OInv_{DEC09})}$$

$$InventoriesFactor_{MAR} = \frac{(\underset{\sim}{Q}\,Inv_{JUN10})}{(\underset{\sim}{Q}\,Inv_{MAR09})}$$

$$InventoriesFactor_{SEP} = \frac{(\underset{\sim}{Q}\,Inv_{JUN10})}{(\underset{\sim}{Q}\,Inv_{SEP09})}$$

Factors were produced for opening and closing inventories, by type of inventory. The types of inventories specified were raw materials inventories and finished goods inventories (including work-in-progress).

The factors generated give an indication of the variability in trading conditions between off-June reporting periods and the standard Australian financial year. A factor of 1 indicates no variability, implying there is no effect of off-June reporting on estimates published in *Australian Industry* (cat. no. 8155.0). Conversely, the further a factor lies from 1, the greater the impact of off-June reporting on industry estimates.

Where there were five or less contributing QBIS businesses in an ANZSIC subdivision, it was considered that data was of insufficient quality to model accurately.

An example of the calculation of factors for Subdivision 14, WOOD PRODUCT MANUFACTURING is provided below. Quarterly sales and service income estimates derived from in-scope QBIS data (see Table 3) were utilised to produce 'off-June' factors (see Equation 3) to be applied to EAS estimates of sales and service income.

Creating off-June year factors continued

TABLE 3. CALCULATING FACTORS - EXAMPLE: SALES OF GOODS AND SERVICES, SUBDIVISION 14 WOOD PRODUCT MANUFACTURING

Quarter	*Sales and service income estimates derived from in scope QBIS data*(a) $m
Mar-09	777
Jun-09	825
Sep-09	909
Dec-09	894
Mar-10	858
Jun-10	968
Sep-10	1 009

(a) Due to the scoping criteria listed above, these estimates represent a subset of the QBIS data, and so the estimates given here differ from those published in *Business Indicators* (cat. no. 5676.0).

EQUATION 3. CALCULATING FACTORS - EXAMPLE: Sales of goods and services, Subdivision 14 Wood product manufacturing

$$Off-JuneFactor_{DEC} = \frac{(909+894+858+968)}{(777+825+909+894)}$$

$$= \frac{(3,629)}{(3,405)}$$

$$= 1.066$$

$$Off-JuneFactor_{MAR} = \frac{(909+894+858+968)}{(825+909+894+858)}$$

$$= \frac{(3,629)}{(3,486)}$$

$$= 1.041$$

$$Off-JuneFactor_{SEP} = \frac{(909+894+858+968)}{(894+858+968+1,009)}$$

$$= \frac{(3,629)}{(3,729)}$$

$$= 0.973$$

Applying factors to EAS Data

Once the off-June year factors were established for each subdivision, they were applied to selected data items from the EAS. The adjusted items are shown in Table 4, as well as the factors which were used to adjust them. Note that not all components of the published items have been adjusted, due to a lack of available QBIS data from which to create factors.

TABLE 4. QBIS FACTORS AND ADJUSTED EAS DATA ITEMS

Published data item	Adjusted components of published data items	QBIS factor used	Industries adjusted
Wages and salaries	Wages and salaries	Wages and salaries	All selected industries(b)
Total income	Sales and service income	Sales and service income	All selected industries(b) except Divisions P and Q
Total expenses	Wages and salaries Employer contributions into superannuation Worker's compensation premiums Fringe benefits tax Payroll tax	Wages and salaries	All selected industries(b)
	Purchases of materials Purchases of finished goods Other intermediate input expenses	Other expenses	All selected industries(b) except Divisions P and Q
Industry value added(a)	Wages and salaries Employer contributions into superannuation Worker's compensation premiums Fringe benefits tax Payroll tax	Wages and salaries(a)	All selected industries(b)
	Sales and service income	Sales and service Income	All selected industries(b) except Divisions P and Q
	Purchases of materials Purchases of finished goods Other intermediate input expenses	Other expenses	
	Opening inventories - finished goods Opening inventories - work-in-progress	Opening inventories - finished goods plus work-in-progress	Divisions B, C, F, G, H
	Closing inventories - finished goods Closing inventories - work-in-progress	Closing inventories - finished goods plus work-in-progress	
	Opening inventories - raw materials	Opening inventories - raw materials	
	Closing inventories - raw materials	Closing inventories - raw materials	

(a) Labour costs are a component of IVA for non-market producers only. See Glossary for more information.
(b) Excludes Division A Agriculture, Forestry and Fishing, K Financial and Insurance Services and O Public Administration and Safety. Population' for more details.

Applying factors to EAS Data continued

Businesses were identified as either 'on-June reporters' or one of the three types of 'off-June reporters' described above based on the reporting period they indicated on the EAS form. Factors were only applied to in scope businesses eligible for selection in EAS with an employment size of at least 20. For 2009-10, the following four categories were created:

- December year end reporting businesses: Businesses which reported data for the 12 months ended November or December 2009, or January 2010. Reported EAS data was adjusted using the December off-June factors.
- March year end reporting businesses: Businesses which reported data for the 12 months ended February, March or April 2010. Reported EAS data was adjusted using the March off-June factors.

Applying factors to EAS Data continued

- June year end reporting businesses: Businesses which reported data for the 12 months ended May, June or July 2010. The vast majority of businesses fall into this category, and their data are not adjusted.
- September year end reporting businesses: Businesses which reported data for the 12 months ended August or September 2010. Reported EAS data was adjusted using the September off-June factors.

Calculating off-June year adjusted estimates

Following the application of off-June year factors to EAS data reported by off-June year businesses, estimates were recalculated using the standard EAS methodology described in Technical Note 1 of *Australian Industry* (cat. no. 8155.0). Estimates were generated for the four published data items wages and salaries, total income, total expenses and IVA, for all in scope ANZSIC divisions and subdivisions.

CHAPTER 3 SUMMARY OF RESULTS

TOTAL SELECTED INDUSTRIES

For Total selected industries in 2009–10, applying off-June year adjustments resulted in an $8.1b (1%) increase in the estimate for IVA. Similarly, estimates of total income and total expenses increased by $14.0b (0.6%) and $11.6b (0.5%) respectively, and the off-June year adjusted estimate of wages and salaries was $1.0b (0.2%) higher than the original estimate.

In 2008–09, for Total selected industries, off-June adjustments decreased the original estimate of IVA by $2.3b. Estimates of total income and total expenses decreased by $16.2b and $17.8b respectively, and the off-June year adjusted estimate of wages and salaries increased by $1.5b.

In both years, differences between off-June adjusted estimates and original estimates for wages and salaries were minor, generally tending to increase slightly. In both 2008–09 and 2009–10, the largest adjustments were to Mining ($0.4b and $0.5b respectively) and Education and training ($0.2b and $0.3b respectively). This is consistent with these two industries exhibiting the greatest percentage of units reporting for an off-June year (see Table 1).

Differences between original and off-June adjusted total income estimates in 2009–10 were driven by increases in Mining ($6.5b) and Wholesale trade ($3.1b). In 2008–09, differences between original and off-June adjusted total income estimates were primarily a result of decreases in Manufacturing ($8.4b) and Wholesale trade ($7.8b). These movements likely reflect the subdued performance of the above industries during 2009, as a result of the global financial crisis and softening commodity prices during this period.Total income estimates for Education and training and Health care and social assistance remained unchanged, as off-June adjustment factors were not able to be generated for this data item for these industries (see 'Scope and Population' in Chapter 2).

Differences between original and off-June adjusted total expenses estimates in 2009–10 were driven by increases in Wholesale trade ($4.8b) and Mining ($3.1b), while original and off-June adjusted estimates of total expenses in 2008–09 differed mainly due to decreases in Wholesale trade ($10.6b) and Manufacturing ($7.9b).

The increases in off-June adjusted IVA estimates in 2009–10 were primarily a result of increases in Mining ($4.0b) and Manufacturing ($2.4b). In 2008–09, although alterations to the IVA estimate were relatively small overall, differences were almost entirely driven by a decrease in Manufacturing ($2.5b).

These findings demonstrate that changes in the key estimates of IVA, total income and total expenses were mostly attributable to substantial movements in the Mining, Manufacturing and Wholesale trade industries. As demonstrated in Table 1, the off-June reporting businesses in these industries make a substantial contribution to estimates of

TOTAL SELECTED INDUSTRIES *continued*

IVA, and the extent of variation between original and off-June adjusted estimates indicates that these industries were influenced by fluctuations in trading conditions over time. Conversely, although off-June reporting businesses also made a significant contribution to estimates of IVA in Education and training (Table 1), off-June adjusted estimates differ only marginally from original values, indicating that this industry experienced minimal variation in trading conditions over time.

In general, the results presented above were in line with initial expectations, and provide an estimate of the extent of variation caused by the issue of off-June reporting in EAS.

CHAPTER 4 RELIABILITY OF THE EXPERIMENTAL ESTIMATES

DATA QUALITY

When interpreting the experimental estimates in this publication, it is important to take into account factors that may affect the reliability of the experimental estimates. The quality of the experimental estimates can be limited by:

- the validity of the assumptions underpinning the modelling
- the accuracy of the data used in the production of experimental estimates

The methodology used here is also limited by necessary restrictions in the scope of the industries adjusted. Off-June adjustments have not been applied to Agriculture, forestry and fishing and Public administration and safety (ANZSIC Divisions A and O respectively) as QBIS does not collect information from these industries and factors were not able to be produced. Data collected in EAS suggest that the effect of off-June reporting is minor in these industries. Financial and insurance services (ANZSIC Division K) has also been excluded as it is not collected by the EAS.

ASSUMPTIONS UNDERPINNING THE MODEL

The modelling methodology used to create the experimental estimates presented in this publication is based on the following assumptions:

- it is valid to only adjust the data reported by businesses with an employment size of 20 or more for off-June reporting. Smaller businesses were excluded as they are not expected to face the same trading conditions as the large businesses from which off-June modelling factors have been derived, and are relatively minor contributors to the off-June reporting problem.
- businesses with an employment size of 20 or more, that report for a given off-June financial period and are within the same ANZSIC subdivision face similar trading conditions throughout the year, justifying the use of adjustment factors for each data item that have been derived at the subdivision level.
- the relationship between EAS data items and QBIS data items is meaningful and consistent. In assessing this it is important to note that:
  - There are some scope differences between the businesses included in each survey, the largest of these being that government owned or controlled Public Non-Financial Corporations are excluded from QBIS but included in EAS.
  - QBIS and EAS both take their frame from the ABSBR, which is updated quarterly. This leads to minor differences in the businesses available for survey selection between EAS and QBIS, because the September, December and March quarterly frames used for QBIS differ from the annual frame used by EAS.
  - Some data item concepts vary slightly between QBIS and EAS, although every effort has been made to create factors from QBIS data items that are correlated with the items they are used to adjust in EAS.
  - There are some minor differences in the way data are processed between EAS and QBIS.
- the QBIS data used to produce off-June adjustment factors is of high quality.
- the industry coding on the ABSBR is accurate.

SAMPLING ERROR

Both the EAS and QBIS use a sample of businesses, rather than a full enumeration (that is, a census), and are thus subject to sampling error. The resultant estimates are likely to differ from those that would have been produced had data been obtained from every business.

One measure of sampling error is the standard error, which indicates the extent to which an estimate might have varied by chance because only a sample of businesses was included. 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 a census were conducted, and about nineteen chances in twenty (i.e. a confidence interval of 95%) that the difference will be less than two standard errors. Sampling error can also be measured by the relative standard error (RSE) which is obtained by expressing the standard error as a percentage of the estimate to which it refers. RSEs for the four published data items are shown in Table 5 below.

TABLE 5. RELATIVE STANDARD ERRORS

	Wages and salaries	*Total expenses*	*Total income*	*Industry value added*
	%	%	%	%
Industry Division				
Mining	1.3	0.9	0.5	0.9
Manufacturing	0.6	0.4	0.5	1.0
Electricity, gas, water and waste services	0.5	0.5	0.4	0.7
Construction	2.0	2.0	1.8	3.5
Wholesale trade	2.7	2.4	2.3	2.9
Retail trade	1.8	1.7	1.6	2.9
Accommodation and food services	2.1	1.9	1.7	2.3
Transport, postal and warehousing	1.2	1.1	1.1	1.8
Information media and telecommunications	1.1	0.9	0.8	0.9
Rental, hiring and real estate services	2.9	3.1	2.5	2.9
Professional, scientific and technical services	1.9	2.7	2.2	2.8
Administrative and support services	2.0	3.0	5.2	2.4
Education and training	1.4	2.1	2.9	2.4
Health care and social assistance	1.6	1.2	1.1	1.3
Arts and recreation services	2.9	1.9	1.6	3.0
Other services	2.3	2.2	2.7	3.9
Total selected industries(a)	**0.5**	**0.6**	**0.6**	**0.6**

(a) Excludes Division A Agriculture, Forestry and Fishing, K Financial and Insurance Services and O Public Administration and safety

NON-SAMPLING ERROR

There are a range of other potential errors that are not caused by sampling and can occur in any statistical collection. Non-sampling error may be due to inadequacies in available sources from which the ABSBR was compiled, imperfections in reporting by providers, the modelling of QBIS data, as well as errors made in collection of the data such as in recording, coding and processing data. Although it is not possible to quantify non-sampling error, every effort is made to reduce it to a minimum. Survey collection forms are designed to be easy to complete, and efficient and effective operating procedures and systems are used to compile the statistics. The ABS compares data from different ABS and non-ABS sources to ensure consistency and coherence.

A1.1 OFF-JUNE ADJUSTED ESTIMATES BY INDUSTRY DIVISION

	WAGES AND SALARIES		TOTAL INCOME		TOTAL EXPENSES		INDUSTRY VALUE ADDED	
	Original *$m*	*Off-June adjusted* *$m*	*Original* *$m*	*Off-June adjusted* *$m*	*Original* *$m*	*Off-June adjusted* *$m*	*Original* *$m*	*Off-June adjusted* *$m*
MINING								
2008–2009	16 055	16 425	184 179	184 102	123 175	123 989	106 911	106 702
2009–2010	16 751	17 210	168 887	175 343	118 740	121 827	87 807	91 812
MANUFACTURING								
2008–2009	52 402	52 521	415 866	407 464	389 202	381 319	103 925	101 377
2009–2010	51 853	51 612	389 980	391 400	363 547	364 348	96 809	99 163
ELECTRICITY, GAS, WATER AND WASTE SERVICES								
2008–2009	8 561	8 582	86 316	86 532	76 333	76 331	29 235	29 477
2009–2010	9 079	9 083	92 267	92 444	82 340	82 422	32 088	32 187
CONSTRUCTION(a)								
2008–2009	40 849	41 111	264 953	265 758	240 499	241 082	78 899	79 425
2009–2010	42 918	42 950	280 802	280 957	254 002	254 275	83 822	83 741
WHOLESALE TRADE								
2008–2009	29 628	29 811	411 107	403 265	397 563	386 987	56 071	55 520
2009–2010	30 181	30 306	410 808	413 902	394 859	399 661	55 246	56 078
RETAIL TRADE								
2008–2009	34 067	34 104	345 930	345 740	328 631	328 273	60 325	60 425
2009–2010	35 035	35 055	358 214	358 719	341 939	342 502	63 641	63 674
ACCOMMODATION AND FOOD SERVICES								
2008–2009	17 221	17 212	69 756	69 805	63 249	63 274	29 798	29 798
2009–2010	17 543	17 552	72 662	72 657	65 515	65 511	31 044	31 077
TRANSPORT, POSTAL AND WAREHOUSING(a)								
2008–2009	25 677	25 544	129 970	129 468	118 517	118 051	49 448	49 253
2009–2010	26 846	26 852	131 775	131 985	121 426	121 527	52 260	52 376
INFORMATION MEDIA AND TELECOMMUNICATIONS (a)								
2008–2009	11 683	11 744	67 367	67 646	61 702	61 954	33 944	34 043
2009–2010	11 641	11 623	73 977	74 338	62 854	63 017	35 029	35 208

(a) No adjustment has been applied to inventories due to lack of available QBIS data

A1.1 OFF-JUNE ADJUSTED ESTIMATES BY INDUSTRY DIVISION *continued*

	WAGES AND SALARIES		TOTAL INCOME		TOTAL EXPENSES		INDUSTRY VALUE ADDED	
	Original *$m*	*Off-June adjusted* *$m*	*Original* *$m*	*Off-June adjusted* *$m*	*Original* *$m*	*Off-June adjusted* *$m*	*Original* *$m*	*Off-June adjusted* *$m*
RENTAL, HIRING AND REAL ESTATE SERVICES(a)								
2008–2009	11 220	11 188	86 912	86 695	73 485	73 355	47 744	47 620
2009–2010	10 923	10 934	97 469	97 626	72 801	72 962	49 475	49 484
PROFESSIONAL, SCIENTIFIC AND TECHNICAL SERVICES(a)								
2008–2009	52 047	52 293	186 463	186 247	149 741	149 444	81 587	81 952
2009–2010	53 176	53 277	180 409	181 818	148 577	149 768	83 895	84 236
ADMINISTRATIVE AND SUPPORT SERVICES(a)								
2008–2009	26 609	26 584	61 530	61 334	58 702	58 587	37 140	37 032
2009–2010	28 675	28 803	64 905	65 025	61 561	61 672	38 656	38 811
EDUCATION AND TRAINING(a)(b)								
2008–2009	12 086	12 257	24 744	24 744	22 446	22 638	15 865	15 867
2009–2010	13 136	13 444	27 330	27 330	24 063	24 410	16 631	16 634
HEALTH CARE AND SOCIAL ASSISTANCE(a)(b)								
2008–2009	28 740	28 812	78 465	78 465	66 372	66 453	46 505	46 516
2009–2010	31 741	31 766	82 028	82 028	70 084	70 113	48 642	48 644
ARTS AND RECREATION SERVICES(a)								
2008–2009	4 593	4 597	28 093	28 038	24 049	24 021	9 441	9 443
2009–2010	5 014	5 006	29 738	29 652	25 467	25 375	10 016	10 016
OTHER SERVICES(a)								
2008–2009	13 617	13 722	52 813	52 921	46 713	46 854	22 900	23 031
2009–2010	14 097	14 114	54 807	54 790	47 043	46 996	23 100	23 120
TOTAL SELECTED INDUSTRIES(c)								
2008–2009	385 055	386 507	2 494 464	2 478 224	2 240 379	2 222 612	809 738	807 481
2009–2010	398 609	399 587	2 516 058	2 530 014	2 254 818	2 266 386	808 161	816 261

(a) No adjustment has been applied to inventories due to lack of available QBIS data
(b) No adjustment has been applied to sales and service income due to a lack of available QBIS data
(c) Excludes Division A Agriculture, Forestry and Fishing, K Financial and Insurance Services and O Public Administration and Safety

GLOSSARY

ABSBR The Australian Bureau of Statistics Business Register. This contains a list of all businesses in Australia, sourced from the Australian Taxation Office. Most entities are represented by an Australian Business Number. This is suitable for ABS statistical needs when the business is simple in structure, however more significant and diverse businesses are profiled directly by the ABS.

Business A business is generally considered to be a person, partnership, or corporation engaged in commercial activity.

Capital work done for own use Capitalised work done by the employees or proprietors of a business in manufacturing, constructing, installing or repairing assets, in mineral and petroleum exploration activities, and the in-house development of computer software, for use by the business or for rental or lease. This work is valued at the capitalised costs of the materials and the wages and salaries involved.

Closing inventories The value of all inventories of finished goods (including inventories for resale), work-in-progress (less progress payments billed), raw materials, fuels and containers at the end of the reporting period.

Depreciation and amortisation Depreciation/amortisation allowed on tangible and intangible assets. Includes, for lessees only, depreciation/amortisation in respect of finance leases.

Employer contributions into superannuation Includes all employer contributions to superannuation funds (including the employer productivity contribution) and provisions for employer contributions to superannuation funds. Also includes expenses relating to employer funded defined benefit schemes. Employee contributions and salary sacrifice contributions are excluded.

Industry division The structure of ANZSIC comprises four levels, ranging from industry division (broadest level) to industry class (finest level). The main purpose of the industry division level is to provide a limited number of categories which give a broad overall picture of the economy. There are 19 divisions within ANZSIC, each identified by an alphabetical letter, that is, 'A' for Agriculture, forestry and fishing, 'B' for Mining, 'C' for Manufacturing, etc.

Industry subdivision This is the broadest level category within each industry division of ANZSIC and is identified by a two-digit code, e.g. Industry Subdivision 14 for Wood product manufacturing. Industry subdivisions are built up from industry groups which, in turn, are built up from industry classes.

Industry value added (IVA) IVA represents the value added by an industry to the intermediate inputs used by the industry. IVA is the measure of the contribution by businesses, in the selected industry, to gross domestic product.

The derivation of IVA for individual businesses depends on whether they are classified as market or non-market producers. Non-market producers are those institutions which provide goods or services either free or at prices that are not economically significant. In other words, their prices are not significantly influenced by the amounts that producers are willing to supply, nor the amounts that users are willing to pay to purchase the goods or services being provided. Conversely, market producers provide goods and services at prices that are economically significant.

For market producers, the derivation of IVA is as follows:

Sales and service income

plus Funding from federal, state and/or local government for operational costs

Industry value added (IVA) *continued*

plus Capital work done for own use

plus Closing inventories

less Opening inventories

less Purchases of goods and materials

less Other intermediate expenses (for details, see the entry for total expenses)

equals IVA

It should be noted that wage and salary expenses and most other labour costs are not taken into account in the calculation of IVA for market producers, nor are interest expenses, depreciation and a number of lesser expenses (see the entry for total expenses for further details). On the income side, IVA only includes sales and service income and government funding for operational costs.

As a principle, the output of non-market production is valued at cost, including intermediate input expenses. As shown in the above derivation, purchases and other intermediate input expenses are deducted from output in order to arrive at IVA.

Accordingly, the derivation of IVA for non-market producers can be described as follows:

Selected labour costs

plus Depreciation and amortisation

equals IVA

Estimates of industry value added are obtained by summing the contributions of businesses classified to that industry, both market and (if any) non-market producers. Market producers predominate in most industries.

Industry value added is related to, but different from, the national accounting variable gross value added. For national accounts purposes, gross value added is calculated by adjusting industry value added to include General Government units and also to account for some other effects.

Off-June reporting

In annual surveys, businesses are asked to report their operations for the standard financial year. In Australia, this is July 1st to June 30th, however the standard financial year differs between countries. Off-June reporting occurs when a business is unable to report for the standard financial year, and instead supplies information for a different, 'off-June' year. Many off-June reporters are companies which are based overseas, while some Australian businesses are off-June reporters for other reasons. For example, most schools report for a calendar year (1st January to 31st December) in order to align with the school year.

Opening inventories

The value of all inventories of finished goods (including inventories for resale), work-in-progress (less progress payments billed), raw materials, fuels and containers at the beginning of the reporting period.

Other expenses

In the QBIS collection, refers to all expenses other than selected labour costs (see the entry for Total Expenses), interest, depreciation and amortisation, capital repayments, costs associated with the transfer of real estate, dividends, donations, export freight charges, extraordinary losses, foreign exchange losses, goods and services tax (GST), excise and duties payable to governments, income tax and other direct taxes, losses on asset sales, and unrealised gains/losses from revaluations of assets. The major items that are included are intermediate input expenses (defined in the entry for Total expenses).

Payroll tax

A tax levied by state and territory governments on the amount of wages and salaries paid by a business. Excludes pay-as-you-go withholding tax.

Purchases of goods and materials

Purchases of materials, components, containers, packaging materials, fuels, electricity and water, and purchases of finished goods for resale. Also includes capitalised purchases.

Reference period

For each collection year, businesses are asked to report data for the year ended 30 June. However, if a business has a different financial year, it is asked to report for a 12 month period which ends between 1 October of the previous year and 30 September of the current year. This period is then used as a substitute for the financial year ended 30 June. For example, for the 2009–10 collection, a business may have reported data for the year ended 31 December 2009.

Sales and service income

Includes:

Sales of goods

- whether or not produced by the business (including goods produced for the business on a commission basis). Includes export sales, sales or transfers to related businesses or to overseas branches of the business, progress payments relating to long term contracts if they are billed in the period, delivery charges not separately invoiced to customers, sales of goods produced by the business from crude materials purchased, and income from 'specific' rates (e.g. water, sewerage, irrigation and drainage rates). Excludes excise and duties received on behalf of the government (e.g. the petroleum production excise duty), sales of assets, natural resource royalties income, interest income, and delivery charges separately invoiced to customers. Exports are valued free on board, i.e. export freight charges are excluded.

Income from services

- includes income from consulting services, repair, maintenance and service income and fees, contract, subcontract and commission income, management fees/charges from related and unrelated businesses, installation charges, delivery charges separately invoiced to customers and royalties from intellectual property (e.g. patents and copyrights) and natural resource royalties income. Excludes interest income, and delivery charges not separately invoiced to customers.

Rent, leasing and hiring income

- derived from the ownership of land, dwellings, buildings and other structures, motor vehicles, plant, machinery and other equipment. Excludes royalties from mineral leases, income from finance leases and payments received under hire purchase arrangements.

These are valued net of discounts given and exclusive of goods and services tax (GST). Extraordinary items are also excluded.

The above definitions are equivalent for both EAS and QBIS, with the exception that natural resource royalties income is not included as part of sales and service income for the QBIS collection.

Standard Institutional Sector Classification of Australia (SISCA)

The SISCA is the central classification among ABS Standard Economic Sector Classifications. It is based on the System of National Accounts 2008 (SNA08) institutional sector classification, and comprises the sectors: Non-financial corporations, Financial corporations, General government, Households, Not-for-profit institutions serving households, and Rest of the world (which includes only non-resident units, these being excluded from all other sectors). For more information, please refer to the Standard Economic Sector Classifications of Australia (SESCA) (cat. no. 1218.0).

Total expenses

For the purposes of calculating economic and accounting variables, expenses incurred by businesses are divided into several categories. However, some expenses are excluded entirely from all such calculations: excluded are capital repayments, costs associated with the transfer of real estate, dividends, donations, export freight charges, extraordinary losses, foreign exchange losses, goods and services tax (GST), excise and duties payable to governments, income tax and other direct taxes, losses on asset sales, and unrealised gains/losses from revaluations of assets.

Those expenses used for calculations are categorised as follows:

Intermediate input expenses

Total expenses *continued*

This category covers the major expenses incurred by businesses in producing and distributing goods and services (except labour costs), and comprises two sub-categories of operating expenses:

(i) Purchases of goods, materials and services used in production, which include:
- purchases of materials, components, containers and packaging materials, electricity, fuels and water
- purchases of goods for resale (without any further processing or assembly)
- capitalised purchases of materials
- freight and cartage expenses.

(ii) Other intermediate input expenses

Expenses related to the sale of goods and administrative expenses, which include:
- management fees/charges paid to related and unrelated businesses
- bank charges other than interest
- audit and other accounting expenses
- legal fees
- advertising expenses
- postal and telecommunication expenses
- office supplies and printing expenses
- travelling, accommodation and entertainment expenses
- staff training
- payments for royalties from intellectual property (e.g. patents and copyrights)
- payments to employment agencies for staff.

Also included are 30% of the value of insurance premiums (except workers' compensation and compulsory third party motor vehicle insurance premiums). This represents the service charge component of insurance premiums, and is derived as premiums paid less expected claims incurred, which on average is estimated to be 30% of premiums paid.

Excluded from intermediate input expenses are selected labour costs and selected other operating expenses, as follows.

Selected labour costs
- wages and salaries (including provisions for employee entitlements, salary sacrificed earnings, share based payments and stock options)
- employer contributions into superannuation
- workers' compensation premiums/costs.

Selected other operating expenses

Some expenses are excluded from the calculation of intermediate input expenses and selected labour costs, but are included in the calculation of total expenses. These include:
- depreciation and amortisation
- interest expenses
- computer software expenses not capitalised by businesses
- land tax and land rates
- mineral/petroleum exploration expenses not capitalised by businesses
- other expenses not capitalised by businesses
- payroll tax and fringe benefits tax
- natural resource royalties expenses
- bad and doubtful debts.

Also included are the remaining 70% of insurance premiums (except workers' compensation and compulsory third party motor vehicle insurance premiums).

Total income

Comprises sales and service income, government funding, interest income and other income.

Total selected industries TOTAL SELECTED INDUSTRIES comprises data for all ANZSIC divisions, excluding ANZSIC Division A AGRICULTURE, FORESTRY AND FISHING, Division K FINANCIAL AND INSURANCE SERVICES and Division O PUBLIC ADMINISTRATION AND SAFETY. For a detailed discussion of the scope and coverage of the estimates, see Chapter 2 - Scope and Population. Units classified to the GENERAL GOVERNMENT or REST OF THE WORLD institutional sectors are excluded from the scope of estimates for most industries that comprise TOTAL SELECTED INDUSTRIES. This limits coverage to private sector entities and government-owned or controlled Public non-financial corporations.

Wages and salaries The gross wages and salaries (including capitalised wages and salaries) of all employees of the business. The item includes severance, termination and redundancy payments, salaries and fees of directors and executives, retainers and commissions of persons who received a retainer, bonuses, and annual and other types of leave. Provision expenses for employee entitlements (e.g. provisions for annual leave and leave bonus, long service leave, sick leave, and severance, termination and redundancy payments) are also included, as are salary sacrificed earnings and remuneration of employees in the form of share based payments and stock options.

Payments related to self-employed persons such as consultants, contractors and persons paid solely by commission without a retainer are excluded. The drawings of working proprietors and partners are also excluded.

Workers' compensation premiums/costs Workers' compensation is a compulsory insurance cover to be taken out by all employers, except for self-insured workers, according to legislative schemes to cover employees suffering injury or disease in the course of or arising out of employment.

FOR MORE INFORMATION . . .

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

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 website. 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 statistics on the ABS website can be downloaded free of charge.

WEB ADDRESS www.abs.gov.au