

# **BUSINESS SURVEYS AND ECONOMIC ACTIVITY**

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The views expressed in this paper are those of the authors and do not necessarily reflect those of the Reserve Bank of Australia.

## **Abstract**

In this paper we examine the information content of business survey information, focusing in particular on some of the characteristics of the net balance statistic. A number of Australian business surveys are appraised. Four aspects are examined: the extent to which surveys are correlated with economic variables that they are designed to track; advantages in terms of timeliness; the degree to which surveys are forward or backward-looking; and the ability of business surveys to pick turning points. In summary, the business conditions (including sales/output), employment and selling prices components of the business surveys seem to provide the most information, and to a lesser extent the component relating to corporate profitability. Taken together, the surveys can provide useful coincident information on the economy with some advantage in terms of timeliness. The recommended approach to the use of business surveys is to extract common themes and not place too much weight on a single result.

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# **BUSINESS SURVEYS AND ECONOMIC ACTIVITY**

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## **1. Introduction**

Business surveys form part of the broad range of information available on the current state of the economy and its short-term prospects. The information contained in surveys relates to various aspects of a firm's operations, such as sales, profits and selling prices. Survey data are released quite quickly and the forward-looking nature of many of the survey questions suggests that they might be useful in providing information on how various aspects of the economy are expected to evolve. On the other hand, survey responses are generally qualitative, rather than quantitative, therefore making interpretation of the results quite difficult. This is particularly the case if the aggregated results, often summarised as a net balance statistic, are volatile.

This paper seeks to establish how the myriad of information contained in the main national business surveys for Australia might be used in a systematic way. Section 2 discusses the advantages and disadvantages of business survey data, and in the process, outlines how the results are aggregated and the issues associated with interpreting these results. Section 3 details the main private sector business surveys for Australia. Section 4 introduces a number of tests which focus on how well the various business survey measures are correlated with series produced by the Australian Bureau of Statistics (ABS), as well as whether survey measures provide any information over and above that which is provided by past values of important economic variables. The results of these tests are detailed in Section 5. Section 6 examines whether business surveys have been useful in predicting turning points for some of the major economic aggregates. Finally, some broad observations on the Australian surveys are presented in Section 7.

## **2. The Nature and Content of Business Surveys**

Business surveys typically provide qualitative indications from individual companies about a range of questions relating to economic conditions. Firms may be asked to report on how confident they are about the future, as well as on more specific aspects of their business, such as actual and expected sales, profitability, employment and capital expenditure. Quantitative responses (mainly in the form of ranges) are also provided in some surveys, usually relating to areas such as selling prices, input costs and capacity utilisation.

### **2.1 Advantages**

Business surveys potentially provide quite timely information about the current state of the economy, as a number of the survey indicators, such as sales and output, appear to move contemporaneously with economic activity. The survey information has direct parallels in official statistical series but it is released relatively quickly – usually towards the end of the quarter to which the information pertains, or early in the following quarter. In contrast, official data are released with a longer lag because of the large amount of information that has to be collected and collated. National accounts data, for example, are released a little over two months following the end of the quarter.

Survey information can also serve as a cross-check on official statistics, which necessarily tend to be revised as more information becomes available. Moreover, in cases where the survey data are less volatile than the corresponding official data, it may be easier to discern underlying trends from the survey data. This partly accounts for the focus on the Institute of Supply Managers survey in the US (formerly the NAPM survey), the Ifo survey in Germany and the Confederation of British Industry Industrial Trends survey in the UK.<sup>1</sup>

Survey data can also complement official data by filling in gaps in the official statistics. Examples include series on new orders and capacity utilisation. In some cases, business surveys also permit a different perspective on economic data such as a disaggregation by firm size and/or a distinction between domestically-oriented

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<sup>1</sup> For discussion of a number of foreign business surveys see Santero and Westerlund (1996), Cunningham (1997) and Britton, Cutler and Wardlow (1999).

firms and export-oriented firms. Some surveys also provide supplementary information on specific areas, such as factors impinging on sales and profitability, or from time to time, special questions related to topical issues. Over the past few years, for example, questions have been posed to businesses in Australia relating to the Asian financial crisis and the impact on cash flows of the change in taxation arrangements associated with the introduction of the new tax system.

Expectations about important economic variables may also be important if they lead economic developments in a systematic way. For example, expectations of sales and selling prices are likely to affect investment decisions taken by firms. Thus the business surveys are potentially quite useful for judging the outlook for the economy. Combinations of responses may also be enlightening. For example, divergences in responses between actual and expected business conditions (or confidence), or between actual sales and new orders, may provide clues as to whether a movement in inventories is intended or unintended. Survey-based measures of business inflationary expectations may also be used to derive various measures of short-term real interest rates.

## **2.2 Disadvantages**

Nearly all statistical series are surveys insofar as they are based on samples of firms, households or individuals, rather than a complete enumeration. Thus all surveys, including business surveys, are subject to a number of possible sources of error. Sampling error, which arises as a result of the use of a sample rather than a census, is one source of error, though the likelihood of this type of error can be quantified. Moreover, adjustments can be made to results using standard statistical techniques (for example, responses from a particular industry may be weighted by that industry's share in total output). Other sources of error, however, are more subtle and are difficult to quantify. These relate to issues of survey design such as the ordering of survey questions, the medium of interview, the length of time in a survey and the incentives to respond accurately. These factors can introduce a bias to survey results.

In contrast to most official series, business surveys predominantly provide qualitative, rather than quantitative responses to survey questions, so as to make completing the form easier (and faster) for respondents. For example, respondents usually nominate an increase, decrease or unchanged result for a particular variable

(some surveys use up/down or good/poor, while others have gradations within 'increase' and 'decrease'). Even when respondents are asked to provide quantitative responses, this usually takes the form of nominating a given range for a variable, with the collators of the statistics using the midpoint of each range to aggregate responses (for open-ended responses, such as 'greater than 10 per cent' for example, the lower bound is generally used).<sup>2</sup>

Summary statistics are typically used in business surveys to convey the information contained in the qualitative responses. The net balance statistic, which measures the difference between the proportion of firms reporting an improvement in an area and those reporting a deterioration, is the most commonly used statistic.<sup>3</sup> The net balance statistic allows the presentation of a single figure as a summary of responses to each question. Positive balances tend to be associated with growth in the variable of interest, while negative balances tend to be associated with declines in the variable of interest.

The net balance statistic, however, needs to be used carefully as it is not always clear how firms are reporting their individual experiences. Firms reporting an increase in sales, for example, may be referring to either *above-trend* growth in sales, or strictly *positive* growth in sales.<sup>4</sup> If all respondents are reporting relative to an increasing trend over time, then the numbers reporting 'increasing' or 'decreasing' should be roughly equal when growth is around trend. However, if some respondents are reporting relative to zero, then when growth is around trend the share reporting 'increasing' will be greater than the share reporting 'decreasing', suggesting that there may be a positive bias. In order to overcome this type of bias, the simplest adjustment is to refer to the net balance statistic in

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<sup>2</sup> Even in surveys where respondents are asked to nominate single numbers, there is a preference for rounding to numbers such as 0, 5 or 10. This response to uncertainty, and the resultant bunching in the distribution of responses, has important implications for the measurement of central tendency (see Brischetto and de Brouwer (1999)).

<sup>3</sup> A variant on the net balance statistic adds the percentage change answering 'up' to one-half of those saying 'unchanged'. The index is therefore centred around 50, rather than 0. The two approaches are similar in effect, the main difference being the possible range in the net balance statistic and the break-even point.

<sup>4</sup> The degree of imprecision is evident in the large number of respondents who report unchanged conditions. Moreover, the period of comparison is not always clear, with comparisons usually being made with either the previous quarter or the same period a year earlier.



relation to its long-run average. It should be noted, however, that this adjustment implicitly assumes that the bias does not change over time, whereas in practice it may well do.

Reporting of the net balance statistic can also be confusing. Falls in the level of activity are sometimes inferred from negative net balance statistics, whereas negative net balance statistics can be consistent with positive rates of growth, albeit below trend.

The net balance statistic is also potentially misleading in cases where businesses report gradations of increase or decrease. An upgrading of expectations from 'unchanged' to 'moderate increase', for example, will result in a rise in the net balance statistic. In contrast, a similar upgrading from 'moderate increase' to 'large increase' will result in no change in the net balance statistic. Most business surveys employ methods of enumeration to avoid this problem, such as giving different weights to the various categories.

In some cases qualitative results from business surveys are not weighted by the firm's share of output (particularly for results within an industry). This can be misleading if inferences are being drawn about aggregate activity from the survey statistics. Changes in plans of large firms will have a much larger impact on aggregate activity than a similar percentage change of a small firm (this is particularly relevant in industries that are highly concentrated, such as mining and telecommunications).

Business surveys generally provide quantitative ranges for series such as selling prices and capacity utilisation, with respondents being asked to nominate a range for the variable of interest.<sup>5</sup> These ranges, however, have to be chosen carefully. For example, the ranges determined for nominal variables in a high-inflation environment may be too wide in a low-inflation environment, and therefore less informative. They need to be changed over time (and therefore become less comparable over time). In addition, poor selection of ranges can result in increased volatility in a series owing to respondents switching categories frequently. For example, asking businesses about their expectations for inflation and providing

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<sup>5</sup> For a discussion of the relative merits of the various types of quantitative responses, see Curtin (2000).

them with reference bands either side of the midpoint of a central bank's target for inflation, can result in considerable volatility in the aggregate series. Volatility may also result from small changes in the distribution of responses (see Kearns (1998)).

### **3. Business Surveys in Australia**

There are numerous private-sector surveys that focus on the business sector in Australia.<sup>6</sup> The organisations sponsoring these surveys are quite diverse, largely reflecting the various purposes for which the surveys are undertaken. Sponsors include individual firms (both financial and non-financial), industry groups and chambers of commerce. Business surveys can also be differentiated by industry coverage, regional focus and/or firm size. The number of firms surveyed is generally larger for quarterly surveys than for monthly surveys. As a result, the aggregate responses tend to be less volatile in the quarterly surveys. Nevertheless, monthly surveys can provide a useful early signal as to how sentiment is evolving.

The main private sector national business surveys in Australia with a reasonably long history are as follows:

- the Australian Chamber of Commerce and Industry (ACCI) National Survey of Business Expectations (commenced in 1994);<sup>7</sup>
- the ACCI-Westpac Survey of Industrial Trends (1960);
- the Australian Industry Group (AIG) and PricewaterhouseCoopers (PWC) Survey of Australian Manufacturing (1992);
- the Dun & Bradstreet National Business Expectations Survey (1988);
- the National Australia Bank (NAB) Quarterly Business Survey (1989); and

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<sup>6</sup> The Australian Bureau of Statistics also produces a survey of business expectations – Australian Business Expectations (ABS Cat No 5250.0). However, this survey has been discontinued following the release of the results for March quarter 2003.

<sup>7</sup> The ACCI Survey of Investor Confidence is not included as quarterly observations have only been available since September quarter 1997.

- the Yellow Pages Business Index – Small and Medium Enterprises (1993).

Details of the various surveys are shown in Table 1. The surveys are generally conducted by phone, or by the completion of survey forms. Companies tend to be surveyed towards the end of the middle month of the quarter and/or in the first couple of weeks of the third month of the quarter. Business surveys that include more than one industry will often ensure that the number of respondents in each industry is broadly representative of that industry's share in total output. Within individual industries, however, survey responses are not usually weighted by output or employment, though some surveys may use the number of employees as a filter (for example, the NAB survey draws from firms with 40 or more employees).

Areas of focus can vary across surveys (see Table 2). All surveys provide information on sales/output/trading conditions, profitability, employment, capital expenditure and selling prices. There is a survey question relating to input costs in five of the six surveys, while inventories and exports are covered in four of the six surveys. Only three of the six surveys ask a question about confidence. Other questions, such as those relating to capacity utilisation, overtime and new orders, are covered in a small number of surveys.

Questions are not always posed in the same manner (for more details on the main individual survey questions, see Appendix A). For example, in an effort to take account of seasonal fluctuations, respondents may be asked explicitly to exclude normal seasonal changes (ACCI-Westpac, NAB and the Yellow Pages) or make the comparison with the corresponding period 12 months ago (Dun & Bradstreet). A priori, the latter suggests that comparisons with official statistics should be done in year-ended terms. In the case of the ACCI and AIG-PWC surveys, the aggregate results are seasonally adjusted.

There is potential for confusion in some of the surveys. For series such as sales, production and exports, for example, it is not always clear whether real or nominal magnitudes are being referred to (though this distinction becomes less important in a low-inflation environment). Moreover, as stated earlier, firms may be reporting relative to some trend in growth, or relative to zero growth. There are also timing

**Table 1: Private Sector Business Surveys**

	<b>ACCI</b>	<b>ACCI-Westpac</b>	<b>AIG-PWC</b>	<b>Dun &amp; Bradstreet</b>	<b>NAB</b>	<b>Yellow Pages</b>
	National Survey of Business Expectations	Survey of Industrial Trends	Survey of Australian Manufacturing	National Business Expectations Survey	Quarterly Business Survey <sup>(a)</sup>	Small and Medium Business Index <sup>(b)</sup>
Frequency	Quarterly	Quarterly	Quarterly	Quarterly/monthly	Quarterly	Quarterly
Sample size (approx)	1 900–2 500	200	850–900	1 200	900	1 800
Survey coverage	All major sectors	Manufacturing	Manufacturing	Manufacturing, retail and wholesale	All major sectors	Most major sectors
By industry	No	Sub-industry	Sub-industry	Refer above	Yes	Yes
By firm size	Yes	Yes	No	No	Yes	Small and medium-sized enterprises
By state	No	Yes	Yes	No	Yes	Yes
Commenced	November 1994 <sup>(c)</sup>	September 1960 <sup>(d)</sup>	September 1992 <sup>(e)</sup>	March 1988 <sup>(f)</sup>	September 1989	May 1993 <sup>(g)</sup>
Release timing	1–2 months after quarter	Last month of quarter	Last month of quarter	Following month	Month after quarter	Mid-month of quarter

Notes: (a) A monthly survey is also available.

(b) The small business survey was expanded in November 2000 to include medium-sized businesses.

(c) First observation is for the preceding quarter, i.e. September 1994.

(d) Expected profits for the year ahead commenced in June 1988; expected capital expenditure for the year ahead commenced in March 1961; input cost and selling price data commenced in June 1966.

(e) Expected overtime, new orders, profits and stocks commenced in June 1995.

(f) Expected capital expenditure commenced in June 1994.

(g) Expectations data for the year ahead commenced in November 1994; prices data commenced in November 1995.

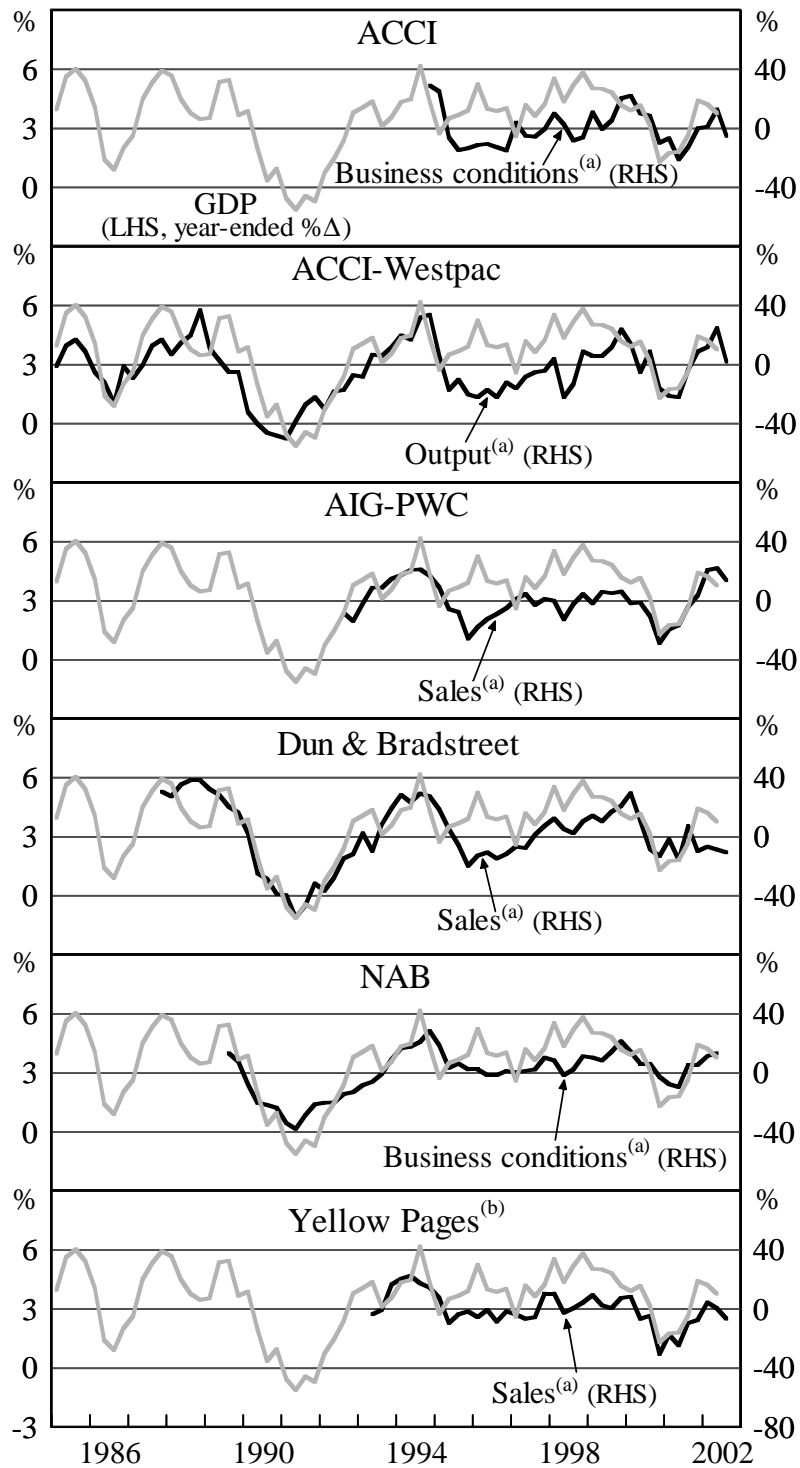
**Table 2: Business Survey Areas of Interest**

	ACCI	ACCI- Westpac	AIG-PWC	Dun & Bradstreet	NAB	Yellow Pages
Confidence		x			x	x
Trading conditions (including sales/output)	x	x	x	x	x	x
Profitability	x	x	x	x	x	x
Capital expenditure	x	x	x	x	x	x
Inventories		x	x	x	x	
Exports	x	x	x		x	
Employment	x	x	x	x	x	x
Input costs	x	x	x		x	x
Selling prices	x	x	x	x	x	x
Capacity utilisation		x	x		x	
Overtime	x	x	x			
New orders		x	x		x	
Deliveries of raw materials			x			

differences between the surveys and comparable official statistics, with most of the ‘actual’ and ‘expected’ results referring to the past three months and the next three months (rather than for the quarter as a whole).

#### **4. What Information do Business Surveys Convey?**

This section examines the usefulness of business surveys in assessing the state and the outlook of the economy. A graphical examination is a useful first step in analysing the relationship between the various business survey indicators and other measures of economic activity. Figure 1 plots the main survey measures of sales/output or business conditions (relative to their long-run average) against year-ended growth in GDP. It shows that the survey indicators provide a reasonable picture of the major cyclical movements in output, particularly those surveys encompassing the early 1990s recession. However, the positive relationship between the level of the net balance statistic and year-ended growth in GDP suggests that there may be a strong backward-looking element to the survey responses, which needs to be taken into account in assessing the usefulness of a particular survey.

**Figure 1: Business Conditions**

- Notes: (a) Deviation from long-run average.  
 (b) Prior to August 2001 data are for small businesses only.

More precise measures of the relationship between business survey indicators and economic variables can be obtained by:

- examining the pair-wise correlation coefficients of the business survey indicators with selected economic variables;
- adding survey information to a simple autoregressive model of an economic variable; and
- performing tests of Granger causality between business survey indicators and the various economic variables.

Correlation coefficients measure the degree of association between two variables. In the work that follows, correlation coefficients are measured over the full history of each series (so as to indicate how well the survey has performed over the life of the series) as well as over a common sample period in order to facilitate comparisons across surveys. The common sample period begins after the early 1990s recession period. Unless stated otherwise, correlations of *expected* business survey indicators and economic variables are undertaken based on the period to which the expectation refers. For example, the observation for the 12 months ahead that was published in the Yellow Pages June 2001 survey would be measured against growth in GDP over the year to June 2002.

The main appeal of correlation coefficients is that they provide a simple rule of thumb for judging the usefulness of a survey variable. However, they have limited predictive ability relative to regression-based techniques. An alternative approach is to add survey information to an autoregressive model of an economic activity variable. This allows us to examine whether the survey outcomes tell us any more about the economic activity variable than lags of the variable itself. To do this, we consider the following autoregressive models:

$$\Delta GDP_{it} = \alpha_{i0} + \sum_{j=1}^4 \alpha_{ij} \Delta GDP_{it-j} + \beta_i BC_{it}^a + u_{it} \quad (1)$$

$$\Delta GDP_{it} = \phi_{i0} + \sum_{j=1}^4 \phi_{ij} \Delta GDP_{it-j} + \varphi_i BC_{it-1}^e + v_{it} \quad (2)$$

where  $\Delta GDP$  refers to the quarterly growth rates of GDP;  $BC$  refers to the level of the net balance (relative to its long-run average);  $i$  refers to the individual survey;  $a$  refers to actual outcomes; and  $e$  refers to expected outcomes. (For illustrative purposes we use GDP and the survey variable, which in this case is ‘business conditions’ – other survey variables are investigated using other economic variables.)

Equation (1) focuses on *actual* business conditions as reported in a survey in the current period, whereas Equation (2) relates to *expectations* held in the previous period for the current period. From a forecasting perspective, both offer advantages in terms of timeliness, particularly the expected variable. The results of the tests are informative in a number of ways. First, a statistically significant survey variable implies that the survey indicator provides information in the estimation of the economic variable in addition to the variable’s own history. Second, the coefficient on the survey variable, if significant, indicates the sensitivity of the quarterly growth rate of the economic variable to a one-unit change in the survey variable (all other variables remaining constant). This is, of course, a minimum test since there may be other variables which perform as good a role as the business sentiment indicator and be just as timely. Roberts and Simon (2001), for example, find that lagged economic indicators (such as changes in GDP, job vacancies and the cash rate) can explain a substantial proportion of the variation in a number of backward and forward-looking sentiment indices.

Another test, which focuses on how forward or backward-looking the survey responses might be, is the Granger causality test. Using the variables outlined above as an example, we begin with a simple two-variable model using six lags. The equations estimated are:

$$\Delta GDP_{it} = \alpha_{i0} + \sum_{j=1}^6 \alpha_{ij} \Delta GDP_{it-j} + \sum_{k=1}^6 \beta_{ik} BC_{it-k} + u_{it} \quad (3)$$

$$BC_{it} = \phi_{i0} + \sum_{j=1}^6 \phi_{ij} \Delta GDP_{it-j} + \sum_{k=1}^6 \phi_{ik} BC_{it-k} + v_{it} \quad (4)$$

The lags of these models are further truncated on the basis of tests of significance, though for each survey the explanators in the two equations are kept identical.



Tests for Granger causality are then undertaken by testing the joint significance of business conditions in Granger-causing GDP (Equation (3)) and also the joint significance of GDP in Granger-causing business conditions (Equation (4)).<sup>8</sup> The results of the tests do not imply any strict causality or determination. In fact, our interpretation of the results is very pragmatic – rejecting the hypothesis that a survey indicator does not Granger-cause an economic variable implies that past values of the survey indicator provide some information which is useful in the estimation of the economic variable in addition to the variable’s own history.

## **5. Results**

The business survey indicators that are examined are confidence, business conditions (sales/output), profitability, capital expenditure, inventories, exports, employment, input costs and selling prices. Correlation coefficients and results from the autoregressive model and Granger causality tests are discussed below.

### **5.1 Confidence**

Of all the concepts that business surveys attempt to measure, ‘confidence’ is perhaps the least well defined. At a theoretical level, confidence does not play a major role in the analysis of economic behaviour, and is perhaps akin to ‘animal spirits’ in the business cycle literature. Three of the six surveys cited above have a forward-looking question relating to confidence, though the period that is being referred to varies from the next quarter (NAB) to the next year (Yellow Pages). On the whole, the responses to the confidence question are considerably more volatile than for responses relating to more measurable concepts, such as sales and output, and may reflect the sensitivity of confidence indicators to news items.

The correlation coefficients listed in Table 3a suggest that confidence, as measured in both the NAB and ACCI-Westpac surveys, is fairly closely correlated with year-ended growth in private final demand and the broader-based measure of industry sales – correlations with year-ended growth in GDP are smaller but still positive. Correlation coefficients over the shorter common sample period (Table 3b) are lower than over the full sample periods, suggesting that the

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<sup>8</sup> The test is a Wald test, evaluated under a  $\chi^2$  distribution.

confidence net balance statistic for the longer-running NAB and ACCI-Westpac surveys has picked up the very large swings in output (such as that associated with the early 1990s recession), though they have not coincided as well with the smaller cyclical swings that have occurred over the past decade. Correlations for the confidence indicator in the Yellow Pages survey are low, though this could relate to the focus of the Yellow Pages survey on small enterprises for most of the period (the survey was expanded to include medium-sized enterprises in November 2000). This survey also asks for a view on business conditions 12 months ahead, rather than the shorter horizons in the other surveys.

Tables 3c and 3d detail the results based on the simple autoregressive model. This tests whether survey measures of confidence explain, at a statistically significant level, private final demand in the period in which the observation was taken, or private final demand in the period to which the survey question specifically refers. For both periods, all survey measures of confidence are significant. The Granger causality tests suggest that there is some information in the business confidence indicators over and above lags of private final demand for the ACCI-Westpac and NAB surveys (Table 3e). Nevertheless, the results also suggest that firms, in formulating an opinion, may be basing that view at least partly on an extrapolation of past trends, such as lags of private final demand (this, of course, may be a reasonable thing to do).

**Table 3a:**  
Correlation coefficients; varying

	<b>GDP</b>			<b>Private final demand</b>	
				<b>Manufacturing</b>	
	Qtly %Δ	6-month %Δ	4qe %Δ		
<b>ACCI-Westpac</b>					
General business situation (next 6 months)	0.39	0.41	0.54	0.72	0.55
<b>NAB</b>					
Business confidence (next quarter)	0.40	0.59	0.54	0.73	0.66
<b>Yellow Pages</b>					
Business conditions (next year)	0.25	-0.02	0.15	0.32	0.04

Notes: See Table 1 for the sectors covered in each survey and the commencement period of each survey.  
(a) From the ABS 'Business Indicators, Australia' release (ABS Cat No 5676.0).

**Table 3b:**  
Correlation coefficients; common

	<b>GDP</b>			<b>Private final demand</b>	
				<b>Manufacturing</b>	
	Qtly %Δ	6-month %Δ	4qe %Δ		
<b>ACCI-Westpac</b>					
General business situation (next 6 months)	0.06	-0.05	0.21	0.54	0.27
<b>NAB</b>					
Business confidence (next quarter)	0.00	0.15	0.25	0.51	0.37
<b>Yellow Pages</b>					
Business conditions (next year)	0.25	-0.02	0.15	0.32	0.04

Notes: See Table 1 for the sectors covered in each survey.  
(a) From the ABS 'Business Indicators, Australia' release (ABS Cat No 5676.0).

<b>Confidence</b>					
sample periods to 2002:Q1					
<b>Industry sales</b>			<b>Industry output</b>	<b>Profits</b>	
Wholesale	Retail	Manufacturing, retail & wholesale	Gross value added	GOS	By industry <sup>(a)</sup>
4qe %Δ					
0.67	0.44	0.70	0.44	0.47	0.76
0.64	0.53	0.74		0.38	
0.30	0.16	0.23		0.21	

<b>Confidence</b>					
sample period (1993:Q2–2002:Q1)					
<b>Industry sales</b>			<b>Industry output</b>	<b>Profits</b>	
Wholesale	Retail	Manufacturing, retail & wholesale	Gross value added	GOS	By industry <sup>(a)</sup>
4qe %Δ					
0.59	0.26	0.54	0.20	0.22	0.66
0.51	0.33	0.55		-0.02	
0.30	0.16	0.23		0.21	

**Table 3c: Confidence**

Significance of survey indicators in explaining private final demand – confidence in current period

	Coefficient	<i>t</i> -statistic	LM(1) <sup>(a)</sup>	LM(1–4) <sup>(a)</sup>
			p-value	
<b>ACCI-Westpac</b>				
General business situation (next 6 months)	0.013	5.41***	0.02	0.09
<b>NAB</b>				
Business confidence (next quarter)	0.050	4.11***	0.46	0.89
<b>Yellow Pages</b>				
Business conditions – expected (next year)	0.040	2.34**	0.92	0.95

Notes: See Table 1 for the commencement period of each survey. \*\*\*, \*\* and \* indicates significance at 1, 5 and 10 per cent levels.

(a) LM(1) and LM(1–4) are tests for serial correlation of order 1 and 1–4.

**Table 3d: Confidence**

Significance of survey indicators in explaining private final demand – confidence in previous period

	Coefficient	<i>t</i> -statistic	LM(1) <sup>(a)</sup>	LM(1–4) <sup>(a)</sup>
			p-value	
<b>ACCI-Westpac</b> 1960:Q4–2002:Q1				
General business situation (next 6 months)	0.016	6.22***	0.99	0.98
<b>NAB</b> 1989:Q4–2002:Q1				
Business confidence (next quarter)	0.052	3.60***	0.55	0.86
<b>Yellow Pages</b> 1993:Q3–2002:Q1				
Business conditions – expected (next year)	0.041	2.31**	0.80	0.70

Notes: \*\*\*, \*\* and \* indicates significance at 1, 5 and 10 per cent levels.

(a) LM(1) and LM(1–4) are tests for serial correlation of order 1 and 1–4.

**Table 3e: Confidence**

Granger causality tests; varying sample periods to 2002:Q1

Dependent variable	Lags		Joint significance <sup>(a)</sup> p-value	Granger cause <sup>(b)</sup>	LM(1) <sup>(c)</sup>	LM(1-4) <sup>(c)</sup>
	PFD	Survey variable			p-value	
<b>ACCI-Westpac</b>						
Private final demand	4	4	0.00	Yes	0.24	0.24
General business situation (next 6 months)	4	4	0.00	Yes	0.16	0.21
<b>NAB</b>						
Private final demand	4	4	0.02	Yes	0.58	0.97
Business confidence (next quarter)	4	4	0.04	Yes	0.26	0.30
<b>Yellow Pages</b>						
Private final demand	4	4	0.27	No	0.33	0.91
Business conditions (next year)	4	4	0.40	No	0.40	0.37

Notes: See Table 1 for the commencement period of each survey.

(a) Using a Wald test of joint significance.

(b) At the 10 per cent level of significance.

(c) LM(1) and LM(1-4) are tests for serial correlation of order 1 and 1-4.

## 5.2 Business Conditions

The term ‘business conditions’, as used in this study, refers to the survey questions relating to the more tangible concepts of output and sales, as well as the less tangible concepts such as business and trading conditions.<sup>9</sup> These aspects of the business surveys receive considerable attention in economic commentaries as, in theory, they most closely approximate aggregate economic measures of demand, such as GDP and industry sales.

Survey respondents are asked to report in both ‘actual’ and ‘expected’ terms. On the whole, the actual series have slightly higher correlation coefficients than the expected series (Tables 4a and 4b). The relative similarity of the correlation results reflects the fact that actual and expected conditions are themselves quite highly correlated (in the case of the NAB and Dun & Bradstreet surveys, for example, the correlation coefficients between actual and expected business conditions are 0.96 and 0.86 respectively). At a practical level, it means that it does not make a lot of difference whether the actual or expected series is used for analytical purposes.

The correlation coefficients suggest that the strongest relationship is between the survey indicators and annual growth in a broad-based measure of industry sales. The correlations with industry value added, which is approximated by industry sales less intermediate consumption, are weaker. A strong positive correlation also exists between the survey indicators and annual growth in private final demand, and to a lesser extent, GDP. The correlations are much higher for year-ended growth than for comparisons over shorter periods, though this probably reflects the higher volatility in the more frequent series. Again, correlations are not as strong over the shorter, common sample period, which does not include the early 1990s recession.

A couple of points are worth noting where comparable data are available at the industry level. Firstly, the observation that the correlation with the broad-based measure of industry sales (such as the manufacturing, retail and wholesale grouping) tends to be higher than with the industry-specific measure of sales,

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<sup>9</sup> The ‘business conditions’ grouping which is used in the NAB survey is a simple average of three net balance indices relating to firms’ trading conditions, profitability and number of employees.

suggests that respondents, at times, might be replying according to the economic conditions of the overall economy rather than to conditions in their own industry. In contrast, the negative correlation coefficients for the mining industry indicate that the output of this sector is not strongly correlated with the domestic economic cycle.

Most of the survey measures of actual business conditions are significant at the 10 per cent level in the autoregressive model of GDP, though fewer surveys meet this hurdle when the survey measures of expected business conditions are employed (Tables 4c and 4d). The Granger causality tests indicate that only in the case of the ACCI-Westpac and Dun & Bradstreet surveys do business conditions Granger-cause GDP while the reverse causality does not apply (Table 4e). For the other surveys, Granger causality is not established in either direction.



**Table 4a: Business**  
Correlation coefficients;

	GDP			Private final demand	
	Qtly %Δ	6-month %Δ	4qe %Δ	Manufacturing	
<b>ACCI</b>					
Business conditions – actual	0.10	0.27	0.52	0.56	0.48
Business conditions – expected	-0.01	0.17	0.24	0.54	-0.01
<b>ACCI-Westpac</b>					
Output – actual	0.41	0.59	0.70	0.72	0.75
Output – expected	0.28	0.44	0.60	0.69	0.55
<b>AIG-PWC</b>					
Sales – actual	0.23	0.28	0.44	0.54	0.53
Sales – expected	0.03	0.06	0.22	0.38	0.15
<b>Dun &amp; Bradstreet</b>					
Sales – actual	0.47	0.63	0.78	0.78	0.63
Sales – expected	0.41	0.62	0.78	0.84	0.67
<b>NAB</b>					
Business conditions – actual	0.49	0.66	0.82	0.82	0.59
Construction	0.39	0.56	0.78	0.82	0.35
Finance	0.45	0.63	0.78	0.74	0.60
Manufacturing	0.45	0.61	0.75	0.79	0.61
Mining	0.10	0.05	0.17	0.07	-0.15
Retail	0.56	0.70	0.86	0.83	0.59
Recreation	0.38	0.49	0.63	0.59	0.49
Transport	0.52	0.66	0.81	0.82	0.46
Wholesale	0.39	0.56	0.69	0.69	0.57
Business conditions – expected	0.41	0.59	0.78	0.83	0.47
<b>Yellow Pages</b>					
Sales – actual	0.38	0.49	0.54	0.55	0.49
Sales – expected (next quarter)	0.17	0.37	0.39	0.44	0.25
Sales – expected (next year)	0.10	0.40	0.47	0.54	-0.02

Notes: See Table 1 for the sectors covered in each survey and the commencement period of each survey.

(a) From the ABS 'Business Indicators, Australia' release (ABS Cat No 5676.0).

<b>Conditions (Sales/Output)</b>					
varying sample periods to 2002:Q1					
<b>Industry sales</b>			<b>Industry output</b>	<b>Profits</b>	
Wholesale	Retail	Manufacturing, retail & wholesale	Gross value added	GOS	By industry <sup>(a)</sup>
4qe %Δ					
0.75	0.48	0.77		0.15	
0.54	0.28	0.42		0.12	
		0.88	0.67	0.44	0.74
		0.74	0.29	0.40	0.68
		0.67	0.45	0.06	0.62
		0.38	0.25	0.10	0.35
0.85	0.60	0.88		0.41	
0.82	0.55	0.87		0.50	
0.86	0.68	0.88		0.43	
0.81	0.62	0.75	0.61		0.43
0.81	0.54	0.83	0.47		–
0.84	0.67	0.87	0.65		0.63
–0.03	–0.02	–0.08	0.12		0.15
0.84	0.74	0.88	0.64		0.60
0.65	0.51	0.68	0.07		–
0.79	0.59	0.77	0.47		0.35
0.77	0.66	0.82	0.77		0.15
0.87	0.67	0.85		0.41	
0.45	0.42	0.61		0.09	
0.26	0.24	0.32		–0.06	
0.26	0.03	0.16		0.20	

**Table 4b: Business  
Correlation coefficients; common**

	<b>GDP</b>			<b>Private final demand</b>	
	Qtly % $\Delta$	6-month % $\Delta$	4qe % $\Delta$	Manufacturing	
<b>ACCI<sup>(b)</sup></b>					
Business conditions – actual	0.10	0.27	0.52	0.56	0.48
Business conditions – expected	-0.01	0.17	0.24	0.54	-0.01
<b>ACCI-Westpac</b>					
Output – actual	0.08	0.24	0.41	0.45	0.57
Output – expected	-0.24	-0.19	0.02	0.30	0.14
<b>AIG-PWC</b>					
Sales – actual	0.27	0.30	0.44	0.56	0.55
Sales – expected	0.07	0.09	0.22	0.40	0.16
<b>Dun &amp; Bradstreet</b>					
Sales – actual	0.17	0.25	0.43	0.54	0.45
Sales – expected	-0.01	0.22	0.50	0.66	0.41
<b>NAB</b>					
Business conditions – actual	0.16	0.28	0.44	0.62	0.30
Construction	0.13	0.27	0.54	0.74	-0.03
Finance	0.09	0.22	0.37	0.38	0.27
Manufacturing	0.08	0.19	0.32	0.54	0.35
Mining	-0.02	-0.30	-0.44	-0.39	-0.47
Retail	0.37	0.45	0.66	0.70	0.30
Recreation	0.06	0.10	0.10	0.23	0.30
Transport	0.20	0.30	0.45	0.64	0.01
Wholesale	0.04	0.14	0.23	0.33	0.28
Business conditions – expected	-0.02	0.08	0.31	0.63	0.02
<b>Yellow Pages</b>					
Sales – actual	0.39	0.49	0.54	0.55	0.49
Sales – expected (next quarter) <sup>(c)</sup>	0.17	0.37	0.39	0.44	0.25
Sales – expected (next year) <sup>(d)</sup>	0.10	0.40	0.47	0.54	-0.02

Notes: See Table 1 for the sectors covered in each survey.

(a) From the ABS 'Business Indicators, Australia' release (ABS Cat No 5676.0).

(b) Sample period is 1994:Q4–2002:Q1.

(c) Sample period is 1993:Q2–2002:Q1.

(d) Sample period is 1995:Q3–2002:Q1.

<b>Conditions (Sales/Output)</b>					
sample period (1993:Q1–2002:Q1)					
<b>Industry sales</b>			<b>Industry output</b>	<b>Profits</b>	
Wholesale	Retail	Manufacturing, retail & wholesale	Gross value added	GOS	By industry <sup>(a)</sup>
4qe %Δ					
0.75	0.48	0.77		0.15	
0.54	0.28	0.42		0.12	
		0.78	0.45	0.16	0.68
		0.43	0.08	0.18	0.51
		0.67	0.44	0.07	0.64
		0.37	0.25	0.11	0.36
0.75	0.48	0.80		0.09	
0.73	0.35	0.74		0.19	
0.81	0.66	0.81		0.04	
0.71	0.54	0.58	0.49		0.35
0.67	0.34	0.64	-0.03		-
0.76	0.58	0.77	0.28		0.56
-0.50	-0.29	-0.61	0.07		0.03
0.73	0.79	0.80	0.57		0.66
0.41	0.38	0.47	-0.10		-
0.63	0.51	0.54	0.23		0.19
0.61	0.54	0.65	0.51		0.56
0.84	0.66	0.71		0.01	
0.45	0.42	0.61		0.09	
0.26	0.24	0.32		-0.06	
0.26	0.03	0.16		0.20	

**Table 4c: Business Conditions**  
Significance of survey indicators in explaining GDP –  
actual conditions in current period

	Coefficient	<i>t</i> -statistic	LM(1) <sup>(a)</sup>	LM(1–4) <sup>(a)</sup>
			p-value	
<b>ACCI</b>				
Business conditions	0.005	0.53	0.66	0.57
<b>ACCI-Westpac</b>				
Output	0.038	7.65***	0.59	0.32
<b>AIG-PWC</b>				
Sales	0.016	2.02*	0.26	0.48
<b>Dun &amp; Bradstreet</b>				
Sales	0.019	3.42***	0.17	0.10
<b>NAB</b>				
Business conditions	0.034	3.74***	0.03	0.34
<b>Yellow Pages</b>				
Sales	0.027	3.17***	0.33	0.20

Notes: See Table 1 for the commencement period of each survey. \*\*\*, \*\* and \* indicates significance at 1, 5 and 10 per cent levels.

(a) LM(1) and LM(1–4) are tests for serial correlation of order 1 and 1–4.

**Table 4d: Business Conditions**Significance of survey indicators in explaining GDP –  
expectation held in previous period

	Coefficient	<i>t</i> -statistic	LM(1) <sup>(a)</sup>	LM(1–4) <sup>(a)</sup>
			p-value	
<b>ACCI</b>				
1995:Q1–2002:Q1				
Business conditions	0.006	0.56	0.77	0.67
<b>ACCI-Westpac</b>				
1960:Q4–2002:Q1				
Output	0.030	5.64***	0.17	0.10
<b>AIG-PWC</b>				
1992:Q4–2002:Q1				
Sales	0.002	0.14	0.45	0.20
<b>Dun &amp; Bradstreet</b>				
1988:Q2–2002:Q1				
Sales	0.017	2.90***	0.95	0.84
<b>NAB</b>				
1989:Q4–2002:Q1				
Business conditions	0.023	2.31**	0.93	0.99
<b>Yellow Pages</b>				
1993:Q2–2002:Q1				
Sales	0.019	1.76*	0.93	0.61

Notes: \*\*\*, \*\* and \* indicates significance at 1, 5 and 10 per cent levels.  
(a) LM(1) and LM(1–4) are tests for serial correlation of order 1 and 1–4.

**Table 4e: Business Conditions**

Granger causality tests; varying sample periods to 2002:Q1

Dependent variable	Lags		Joint significance <sup>(a)</sup> p-value	Granger cause <sup>(b)</sup>	LM(1) <sup>(c)</sup>	LM(1-4) <sup>(c)</sup>
	GDP	Survey variable			p-value	
<b>ACCI</b>						
GDP	4	4	0.70	No	0.32	0.41
Business conditions – actual	4	4	0.80	No	0.15	0.64
<b>ACCI-Westpac</b>						
GDP	5	5	0.00	Yes	0.73	0.11
Output – actual	5	5	0.57	No	0.73	0.15
<b>AIG-PWC</b>						
GDP	4	6	0.73	No	0.30	0.22
Sales – actual	4	6	0.76	No	0.91	0.18
<b>Dun &amp; Bradstreet</b>						
GDP	5	5	0.03	Yes	0.81	0.85
Sales – actual	5	5	0.40	No	0.49	0.10
<b>NAB</b>						
GDP	3	3	0.44	No	0.33	0.20
Business conditions – actual	3	3	0.24	No	0.16	0.27
<b>Yellow Pages<sup>(d)</sup></b>						
GDP	4	4	0.17	No	0.42	0.42
Sales – actual	4	4	0.86	No	0.22	0.49

Notes: See Table 1 for the commencement period of each survey.

(a) Using a Wald test of joint significance.

(b) At the 10 per cent level of significance.

(c) LM(1) and LM(1-4) are tests for serial correlation of order 1 and 1-4.

(d) We should be cautious in interpreting this result given the low degrees of freedom for this test.

### 5.3 Profitability

Respondents to business surveys are also asked about profitability. Tables 5a and 5b detail correlation coefficients between the survey measure of profitability and two measures of profitability produced by the ABS. The first measure is the national accounts measure of corporate gross operating surplus (GOS). The second measure is company profits before income tax, net interest and depreciation (with a

breakdown also provided by industry).<sup>10</sup> While the latter measure is used to compile the national accounts measure of corporate GOS, there are important differences between the two series. Unlike the company profits measure, the national accounts series for corporate GOS includes profits of companies employing less than 20 people, as well as profits of the agriculture and community service industries. More importantly, the national accounts measure of corporate GOS makes an adjustment for changes in profits attributed to a revaluation of inventories (known as the inventory valuation adjustment) and excludes other valuation adjustments such as those relating to foreign exchange gains or losses and revaluation of assets.

The most notable feature of the results is that, on the whole, the business survey measures of profitability are more closely aligned with company profits than with the national accounts measure of corporate GOS over the common sample period. Thus respondents appear to be responding to surveys in terms of profitability that includes valuation gains and losses. Quarterly correlations are also reasonably positive, notwithstanding the greater volatility in these data compared with year-ended calculations. In terms of the company profits measure, there is not much difference between actual profitability in the current quarter and expected profitability for the next quarter. On the whole, the deterioration in correlation coefficients in the post 1990s recession period is much smaller than for other survey questions. There is a reasonably strong correlation between profits by relevant industry and the manufacturing-based surveys, and the manufacturing and retail components of the NAB survey.

Consistent with the generally positive correlations of the survey-based measures of profitability, the Dun & Bradstreet and NAB survey measures of actual profitability are significant at the 1 per cent level in the autoregressive model of corporate GOS (Table 5c). For expected profitability, the ACCI-Westpac and Dun & Bradstreet survey measures are significant at the 1 per cent level (Table 5d). The Granger causality tests suggest that a number of the business surveys (ACCI, ACCI-Westpac, Dun & Bradstreet and NAB) are forward-looking with survey results Granger-causing company profits (Table 5e).

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<sup>10</sup> This measure is reproduced in the ABS 'Business Indicators, Australia' release (ABS Cat No 5676.0), and is based on the ABS Quarterly Economic Activity Survey (QEAS).



**Table 5a: Profitability**

Correlation coefficients; varying sample periods to 2002:Q1

	Corporate GOS		Company profits – excluding abnormals		Company profits – relevant industry	
	Qtly %Δ	4qe %Δ	Qtly %Δ	4qe %Δ	Qtly %Δ	4qe %Δ
<b>ACCI</b>						
Actual	0.07	0.04	0.43	0.50		
Expected (next quarter)	-0.09	0.45	0.24	0.20		
<b>ACCI-Westpac</b>						
Expected (next year)	0.17	0.33	0.38	0.46	0.37	0.42
<b>AIG-PWC</b>						
Actual	0.18	0.15	0.40	0.40	0.52	0.71
Expected (next quarter)	0.45	0.33	0.40	0.29	0.24	0.37
<b>Dun &amp; Bradstreet</b>						
Actual	0.17	0.49	0.36	0.76	0.35	0.77
Expected (next quarter)	0.13	0.54	0.41	0.80	0.35	0.80
<b>NAB</b>						
Actual	0.22	0.42	0.32	0.64		
Construction			0.20	0.46	-0.01	0.28
Finance			0.42	0.59	-	-
Manufacturing			0.26	0.63	0.22	0.66
Mining			-0.18	-0.05	0.10	0.29
Retail			0.38	0.56	0.21	0.53
Recreation			0.18	0.43	-	-
Transport			0.26	0.48	-0.00	0.28

Wholesale			0.25	0.56	-0.04	0.16
Expected (next quarter)	0.12	0.41	0.23	0.60		
Construction			0.23	0.51	0.09	0.36
Finance			0.26	0.61	-	-
Manufacturing			0.28	0.63	0.17	0.55
Mining			-0.17	-0.10	0.09	0.32
Retail			0.25	0.46	0.09	0.42
Recreation			0.11	0.34	-	-
Transport			0.17	0.48	0.14	0.22
Wholesale			0.20	0.55	-0.11	0.15
Expected (next year)	0.19	0.29	0.36	0.36		
Construction			0.30	0.42	0.21	0.45
Finance			0.35	0.27	-	-
Manufacturing			0.38	0.44	0.38	0.39
Mining			-0.09	-0.46	0.05	-0.21
Retail			0.22	0.30	0.23	0.29
Recreation			0.11	-0.08	-	-
Transport			0.41	0.30	0.17	0.21
Wholesale			0.41	0.30	0.13	-0.06
<b>Yellow Pages</b>						
Actual	0.14	0.10	0.38	0.15		
Expected (next quarter)	0.02	-0.08	0.09	-0.08		
Expected (next year)	-0.10	0.24	-0.21	0.25		

Note: See Table 1 for the sectors covered in each survey and the commencement period of each survey.

**Table 5b: Profitability**

Correlation coefficients; common sample period (1994:Q4–2002:Q1)

	Corporate GOS		Company profits – excluding abnormals		Company profits – relevant industry	
	Qtly %Δ	4qe %Δ	Qtly %Δ	4qe %Δ	Qtly %Δ	4qe %Δ
<b>ACCI</b>						
Actual	0.02	0.00	0.39	0.47		
Expected (next quarter)	–0.09	0.20	0.24	0.45		
<b>ACCI-Westpac</b>						
Expected (next year)	–0.07	0.04	0.22	0.23	0.04	0.26
<b>AIG-PWC</b>						
Actual	0.25	0.09	0.41	0.36	0.54	0.65
Expected (next quarter) <sup>(a)</sup>	0.45	0.33	0.40	0.29	0.24	0.37
<b>Dun &amp; Bradstreet</b>						
Actual	0.04	0.11	0.34	0.71	0.31	0.77
Expected (next quarter)	–0.13	0.23	0.30	0.72	0.15	0.77
<b>NAB</b>						
Actual	0.14	0.11	0.37	0.48		
Construction			0.37	0.48	–0.11	0.20
Finance			0.42	0.47	–	–
Manufacturing			0.24	0.44	0.19	0.61
Mining			–0.24	–0.38	–0.15	–0.05
Retail			0.39	0.38	0.22	0.63
Recreation			–0.03	0.12	–	–
Transport			0.40	0.20	0.02	0.36

Wholesale			0.29	0.35	0.01	0.46
Expected (next quarter)	-0.06	0.13	0.28	0.49		
Construction			0.41	0.59	0.09	0.32
Finance			0.14	0.51	-	-
Manufacturing			0.31	0.51	0.10	0.58
Mining			-0.16	-0.40	-0.17	0.01
Retail			0.29	0.22	0.00	0.52
Recreation			-0.05	0.01	-	-
Transport			0.27	0.35	0.06	0.10
Wholesale			0.09	0.34	0.16	0.63
Expected (next year)	-0.06	0.00	0.12	0.07		
Construction			0.13	0.41	0.28	0.34
Finance			0.13	0.02	-	-
Manufacturing			0.21	0.19	0.10	0.23
Mining			-0.14	-0.58	-0.02	-0.32
Retail			0.16	0.02	0.25	-0.03
Recreation			-0.08	-0.21	-	-
Transport			0.19	-0.03	0.23	-0.05
Wholesale			0.27	0.16	0.28	0.02
<b>Yellow Pages</b>						
Actual	0.14	0.07	0.39	0.06		
Expected (next quarter)	-0.05	-0.14	-0.02	-0.20		
Expected (next year) <sup>(a)</sup>	-0.10	0.24	-0.21	0.25		

Notes: See Table 1 for the sectors covered in each survey.

(a) Sample period is 1995:Q3–2002:Q1.

**Table 5c: Profitability**

Significance of survey indicators in explaining company profits<sup>(a)</sup> –  
actual profits in current period

	Coefficient	<i>t</i> -statistic	LM(1) <sup>(b)</sup>	LM(1–4) <sup>(b)</sup>
			p-value	
<b>ACCI</b>				
Current quarter	0.18	2.11**	0.15	0.48
<b>AIG-PWC</b>				
Current quarter	0.15	2.37**	0.95	0.81
<b>Dun &amp; Bradstreet</b>				
Current quarter	0.17	4.44***	0.33	0.84
<b>NAB</b>				
Current quarter	0.17	3.28***	0.93	0.25
<b>Yellow Pages</b>				
Current quarter	0.12	1.79*	0.60	0.81

Notes: See Table 1 for the commencement period of each survey. \*\*\*, \*\* and \* indicates significance at 1, 5 and 10 per cent levels.

(a) Company profits – excluding abnormals.

(b) LM(1) and LM(1–4) are tests for serial correlation of order 1 and 1–4.

**Table 5d: Profitability**

Significance of survey indicators in explaining company profits<sup>(a)</sup> –  
expectation held in previous period

	Coefficient	<i>t</i> -statistic	LM(1) <sup>(b)</sup>	LM(1–4) <sup>(b)</sup>
			p-value	
<b>ACCI</b>				
1994:Q4–2002:Q1				
Next quarter	0.08	0.55	0.31	0.54
<b>ACCI-Westpac</b>				
1988:Q3–2002:Q1				
Next year	0.12	3.04***	0.74	0.96
<b>AIG-PWC</b>				
1995:Q3–2002:Q1				
Next quarter	0.26	2.44**	0.96	0.20
<b>Dun &amp; Bradstreet</b>				
1988:Q2–2002:Q1				
Next quarter	0.21	4.93***	0.46	0.79
<b>NAB</b>				
1989:Q3–2002:Q1				
Next quarter	0.12	2.33**	0.97	0.19
<b>Yellow Pages</b>				
1993:Q2–2002:Q1				
Next quarter	0.01	0.14	0.69	0.54

Notes: \*\*\*, \*\* and \* indicates significance at 1, 5 and 10 per cent levels.

(a) Company profits – excluding abnormals.

(b) LM(1) and LM(1–4) are tests for serial correlation of order 1 and 1–4.

**Table 5e: Profitability**

Granger causality tests; varying sample periods to 2002:Q1

Dependent variable	Lags		Joint significance <sup>(b)</sup> p-value	Granger cause <sup>(c)</sup>	LM(1) <sup>(d)</sup>	LM(1-4) <sup>(d)</sup>
	CP <sup>(a)</sup>	Survey variable			p-value	
<b>ACCI</b>						
Company profits	4	4	0.02	Yes	0.69	0.27
Profitability – actual	4	4	0.56	No	0.13	0.32
<b>ACCI-Westpac</b>						
Company profits	4	4	0.06	Yes	0.90	0.86
Profitability – expected (next year)	4	4	0.14	No	0.82	0.77
<b>AIG-PWC</b>						
Company profits	5	5	0.42	No	0.46	0.61
Profitability – actual	5	5	0.17	No	0.83	0.89
<b>Dun &amp; Bradstreet</b>						
Company profits	4	4	0.00	Yes	0.53	0.64
Profitability – actual	4	4	0.38	No	0.39	0.93
<b>NAB</b>						
Company profits	5	5	0.03	Yes	0.15	0.40
Profitability – actual	5	5	0.15	No	0.55	0.32
<b>Yellow Pages</b>						
Company profits	4	4	0.51	No	0.98	0.96
Profitability – actual	4	4	0.01	Yes	0.22	0.13

Notes: See Table 1 for the commencement period of each survey.

(a) Company profits – excluding abnormals.

(b) Using a Wald test of joint significance.

(c) At the 10 per cent level of significance.

(d) LM(1) and LM(1-4) are tests for serial correlation of order 1 and 1-4.

## 5.4 Capital Expenditure

Business capital expenditure is a relatively volatile component of the expenditure side of the national accounts. Therefore, business surveys are potentially quite useful in forecasting actual outcomes. Some business surveys examine total business capital expenditure, whereas others divide it into capital expenditure on machinery and equipment (around 50 per cent of business investment as recorded in the national accounts), and capital expenditure on buildings and structures (around 25 per cent of total business investment).<sup>11</sup> The surveys provide actual and expected readings for capital expenditure, with the exception of the ACCI-Westpac and NAB surveys which only provide expected data.

Tables 6a and 6b detail correlation coefficients for the various business survey measures of capital expenditure with the national accounts measure of business investment (where applicable, business investment is split into machinery and equipment investment, and buildings and structures investment), as well as the ABS capital expenditure (Capex) survey measure of business investment (which also provides a breakdown by industry). The machinery and equipment component of the latter survey feeds into the national accounts measure of business investment in machinery and equipment. The national accounts measure of buildings and structures investment is derived from surveys other than Capex (such as the ABS Building Activity Survey and the Engineering Construction Survey).

The results for capital expenditure are mixed, though a number of points stand out. Firstly, survey measures of capital expenditure are more closely aligned with the national accounts measures of investment than the Capex measure over the common sample period, though they don't appear to offer much assistance in forecasting quarterly movements in investment. Secondly, the correlation coefficients for the expectations components of the business surveys are reasonably high, perhaps reflecting the long gestation periods normally associated with capital expenditure plans. More importantly, however, those surveys that look at investment plans over the year ahead (ACCI-Westpac and NAB) appear to be providing some additional information as the survey responses are significant in the autoregressive model (Table 6d) and are forward-looking (Table 6e).

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<sup>11</sup> Investment in livestock and intangible fixed assets accounts for the remainder.



**Table 6a: Capital**  
Correlation coefficients; varying

	New business investment (national accounts)					
	Total		Buildings and structures		Machinery and equipment	
	Qtly %Δ	4qe %Δ	Qtly %Δ	4qe %Δ	Qtly %Δ	4qe %Δ
<b>ACCI</b>						
Buildings – actual			0.11	0.08		
Equipment – actual					0.06	0.44
Buildings – expected (next quarter)			0.05	0.18		
Equipment – expected (next quarter)					0.18	0.45
<b>ACCI-Westpac</b>						
Buildings – expected (next year)				0.36		
Equipment – expected (next year)						0.16
<b>AIG-PWC</b>						
Actual	0.23	0.42				
Expected (next quarter)	0.24	0.56				
<b>Dun &amp; Bradstreet</b>						
Actual	0.28	0.66				
Expected (next quarter)	0.10	0.57				
<b>NAB<sup>(a)</sup></b>						
Equipment – expected (next year)	0.56	0.74			0.37	0.55
Construction	0.44	0.59			0.23	0.34
Finance	0.56	0.80			0.36	0.62
Manufacturing	0.47	0.65			0.31	0.51
Mining	0.06	0.14			-0.06	0.05
Retail	0.53	0.73			0.35	0.54
Recreation	0.51	0.58			0.41	0.41
Transport	0.47	0.60			0.29	0.42
Wholesale	0.51	0.68			0.34	0.50
<b>Yellow Pages</b>						
Actual	0.05	0.24				
Expected (next quarter)	0.07	0.14				
Expected (next year)	0.22	0.27				

Notes: See Table 1 for the sectors covered in each survey and the commencement period of each survey.

(a) Sample period for industry variables is 1989:Q4–2000:Q2.

**Expenditure**

sample periods to 2002:Q1

<b>Capital expenditure survey</b>							
<b>Total</b>		<b>Buildings and structures</b>		<b>Machinery and equipment</b>		<b>Total capital expenditure by relevant industry</b>	
Qtly %Δ	4qe %Δ	Qtly %Δ	4qe %Δ	Qtly %Δ	4qe %Δ	Qtly %Δ	4qe %Δ
		-0.06	-0.18				
				0.08	0.38		
		0.18	0.03				
				0.13	0.39		
			0.35			0.19	0.34
					0.34	0.33	0.49
0.21	0.41					0.29	0.57
0.22	0.50					0.35	0.76
0.16	0.51					0.01	0.49
0.19	0.44					0.08	0.44
0.44	0.65			0.41	0.54		
0.23	0.38			0.18	0.25	-0.06	-0.01
0.36	0.61			0.35	0.53	0.18	0.48
0.31	0.66			0.32	0.53	0.18	0.49
0.09	0.08			0.09	0.22	0.09	0.14
0.40	0.63			0.37	0.50	0.04	0.05
0.48	0.59			0.41	0.47	0.27	0.49
0.36	0.52			0.32	0.45	0.02	0.29
0.33	0.57			0.30	0.40	0.08	0.02
0.15	0.07						
-0.00	-0.05						
0.05	-0.01						

**Table 6b: Capital**  
Correlation coefficients; common

	New business investment (national accounts)					
	Total		Buildings and structures		Machinery and equipment	
	Qtly %Δ	4qe %Δ	Qtly %Δ	4qe %Δ	Qtly %Δ	4qe %Δ
<b>ACCI</b>						
Buildings – actual			0.11	0.08		
Equipment – actual					-0.02	0.38
Buildings – expected (next quarter)			0.05	0.17		
Equipment – expected (next quarter)					0.18	0.45
<b>ACCI-Westpac</b>						
Buildings – expected (next year)				-0.45		
Equipment – expected (next year)						0.12
<b>AIG-PWC</b>						
Actual	0.22	0.52				
Expected (next quarter)	0.12	0.54				
<b>Dun &amp; Bradstreet</b>						
Actual	0.20	0.62				
Expected (next quarter)	0.04	0.53				
<b>NAB<sup>(a)</sup></b>						
Equipment – expected (next year)	0.42	0.64			0.31	0.47
Construction	0.12	-0.18			0.08	-0.36
Finance	0.12	0.34			0.03	0.24
Manufacturing	0.14	0.44			0.04	0.30
Mining	0.29	0.34			0.15	0.23
Retail	0.36	0.36			0.19	0.22
Recreation	0.35	0.44			0.37	0.27
Transport	0.14	0.23			0.26	0.38
Wholesale	0.16	0.21			0.17	0.04
<b>Yellow Pages</b>						
Actual	-0.03	0.20				
Expected (next quarter)	-0.00	0.13				
Expected (next year) <sup>(b)</sup>	0.22	0.43				

Notes: See Table 1 for the sectors covered in each survey.

(a) Sample period for industry variables is 1989:Q4–2000:Q2.

(b) Sample period is 1995:Q3–2002:Q1.

**Expenditure**

sample period (1994:Q4–2002:Q1)

<b>Capital expenditure survey</b>							
<b>Total</b>		<b>Buildings and structures</b>		<b>Machinery and equipment</b>		<b>Total capital expenditure by relevant industry</b>	
Qtly %Δ	4qe %Δ	Qtly %Δ	4qe %Δ	Qtly %Δ	4qe %Δ	Qtly %Δ	4qe %Δ
		-0.06	-0.18				
				0.00	0.30		
		0.18	0.03				
				0.13	0.39		
			0.04			-0.05	-0.15
					0.23	0.18	0.24
0.07	0.35					0.16	0.60
0.09	0.43					0.24	0.74
0.05	0.42					-0.11	0.49
0.14	0.39					0.00	0.50
0.34	0.52			0.31	0.39		
-0.02	-0.29			-0.06	-0.46	-0.25	0.17
0.03	0.15			0.00	0.10	-0.10	-0.49
-0.03	0.42			0.00	0.24	-0.08	0.37
0.15	0.06			0.20	0.35	0.17	0.42
0.14	0.30			0.16	0.11	0.06	0.32
0.43	0.49			0.39	0.32	0.09	0.49
-0.04	0.20			0.29	0.35	-0.22	0.08
0.07	0.21			0.06	-0.08	0.07	-0.53
0.05	-0.06						
-0.07	-0.10						
0.05	0.18						

**Table 6c: Capital Expenditure**

Significance of survey indicators in explaining new business investment<sup>(a)</sup> – actual capital expenditure in current period

	Coefficient	<i>t</i> -statistic	LM(1) <sup>(b)</sup>	LM(1–4) <sup>(b)</sup>
			p-value	
<b>ACCI</b>				
Buildings (current quarter)	0.15	0.41	0.21	0.15
Equipment (current quarter)	0.32	1.45	0.10	0.28
<b>AIG-PWC</b>				
Current quarter	0.14	1.49	0.52	0.16
<b>Dun &amp; Bradstreet</b>				
Current quarter	0.08	0.95	0.48	0.50
<b>Yellow Pages</b>				
Current quarter	0.09	0.79	0.26	0.80

Notes: See Table 1 for the commencement period of each survey.

(a) Total, machinery and equipment, and buildings and structures investment used where appropriate.

(b) LM(1) and LM(1–4) are tests for serial correlation of order 1 and 1–4.

At the industry level, the AIG-PWC survey has a relatively high positive correlation with business investment by manufacturers, while the Dun & Bradstreet survey has a similar relationship with the industries that it covers, viz manufacturing, retail and wholesale. The NAB survey has also performed reasonably well in tracking expenditure plans of the recreation, mining and manufacturing industries. Outside of these industries, however, the correlations are low, and in a number of cases, even negative. The low correlations for the Yellow Pages survey probably reflect the coverage of the survey – small and medium-sized enterprises. Moreover, some capital items are more likely to be treated as intermediate consumption, rather than as business investment (such as computers).

**Table 6d: Capital Expenditure**Significance of survey indicators in explaining new business investment<sup>(a)</sup> –  
expectation held in previous period

	Coefficient	<i>t</i> -statistic	LM(1) <sup>(b)</sup>	LM(1–4) <sup>(b)</sup>
			p-value	
<b>ACCI</b>				
1994:Q4–2002:Q1				
Buildings (next quarter)	–0.02	–0.06	0.22	0.54
Equipment (next quarter)	0.30	1.67	0.10	0.20
<b>ACCI-Westpac</b>				
1961:Q2–2002:Q1				
Buildings (next year)	0.12	3.11***	0.82	0.33
Equipment (next year)	0.18	4.99***	0.60	0.02
<b>AIG-PWC</b>				
1993:Q1–2002:Q1				
Next quarter	0.13	1.10	0.33	0.64
<b>Dun &amp; Bradstreet</b>				
1994:Q3–2002:Q1				
Next quarter	–0.02	–0.27	0.86	0.30
<b>NAB</b>				
1989:Q4–2002:Q1				
Next year	0.30	4.13***	0.03	0.13
<b>Yellow Pages</b>				
1993:Q2–2002:Q1				
Next quarter	0.06	0.52	0.60	0.89

Notes: \*\*\*, \*\* and \* indicates significance at 1, 5 and 10 per cent levels.

(a) Total, machinery and equipment, and buildings and structures investment used where appropriate.

(b) LM(1) and LM(1–4) are tests for serial correlation of order 1 and 1–4.

**Table 6e: Capital Expenditure**

Granger causality tests; varying sample periods to 2002:Q1

Dependent variable	Lags		Joint significance <sup>(b)</sup> p-value	Granger cause <sup>(c)</sup>	LM(1) <sup>(d)</sup>	LM(1-4) <sup>(d)</sup>
	NBI <sup>(a)</sup>	Survey variable			p-value	p-value
<b>ACCI</b>						
1994:Q3–2002:Q1						
NBI	4	2	0.32	No	0.23	0.58
Capex – actual (buildings)	4	2	0.04	Yes	0.55	0.37
NBI	4	3	0.38	No	0.67	0.10
Capex – actual (equipment)	4	3	0.27	No	0.49	0.11
<b>ACCI-Westpac</b>						
1961:Q2–2002:Q1						
NBI	4	4	0.01	Yes	0.74	0.93
Capex – expected (buildings)	4	4	0.45	No	0.27	0.28
NBI	4	4	0.00	Yes	0.89	0.31
Capex – expected (equipment)	4	4	0.76	No	0.27	0.44
<b>AIG-PWC</b>						
1992:Q3–2002:Q1						
NBI	4	4	0.58	No	0.32	0.51
Capex – actual	4	4	0.15	No	0.70	0.14
<b>Dun &amp; Bradstreet</b>						
1994:Q2–2002:Q1						
NBI	4	4	0.26	No	0.37	0.17
Capex – actual	4	4	0.43	No	0.57	0.32
<b>NAB</b>						
1989:Q4–2002:Q1						
NBI	5	5	0.00	Yes	0.77	0.35
Capex – expected (next year)	5	5	0.32	No	0.28	0.23
<b>Yellow Pages</b>						
1993:Q3–2002:Q1						
NBI	4	4	0.02	Yes	0.90	0.12
Capex – actual	4	4	0.21	No	0.25	0.52

Notes: (a) New business investment (national accounts).

(b) Using a Wald test of joint significance.

(c) At the 10 per cent level of significance.

(d) LM(1) and LM(1-4) are tests for serial correlation of order 1 and 1-4.

## 5.5 Inventories

Four of the surveys ask businesses about the level of inventories. The Dun & Bradstreet and NAB surveys ask respondents about changes in total inventories (i.e., both raw materials and finished goods); the ACCI-Westpac survey seeks separate responses for stocks of raw materials and stocks of finished products; and the AIG-PWC survey asks manufacturers about stocks of finished products only.

Tables 7a and 7b detail correlation coefficients between the various survey measures and inventories as measured in the national accounts and in the ABS Quarterly Economic Activity Survey (QEAS).<sup>12</sup> Both the national accounts and QEAS survey measures of inventories include stocks of final goods, work-in-progress and raw materials (and therefore should be tracked more closely by the Dun & Bradstreet and NAB surveys). The QEAS survey forms the basis of the national accounts estimate of the change in inventories (and also provides a breakdown by industry), though it excludes inventories of the transport and construction industries.

Over the full sample period, the correlation coefficients for both the quarterly and year-ended measures of inventories are not that dissimilar. This is also true over the shorter, common sample period, though it is noticeable that the correlations are less positive. On the whole, the Dun & Bradstreet survey is providing the best guide to inventories, with this survey measure significant in the autoregressive model (Tables 7c and 7d) and forward-looking as measured in the Granger causality test (Table 7e). This may reflect the fact that the industries covered by the Dun & Bradstreet survey – manufacturing, wholesale and retail – account for a large share of total inventories.

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<sup>12</sup> Results from this survey are reproduced in the ABS ‘Business Indicators, Australia’ release (ABS Cat No 5676.0).



**Table 7a: Stocks**

Correlation coefficients; varying sample periods to 2002:Q1

	<b>Private non-farm inventories</b>		<b>Inventories – total selected industries</b>		<b>Stocks in relevant industry</b>	
	Qtly %Δ	4qe %Δ	Qtly %Δ	4qe %Δ	Qtly %Δ	4qe %Δ
<b>ACCI-Westpac</b>						
Raw materials – actual	0.48	0.47	0.41	0.56	0.35	0.42
Raw materials – expected (next quarter)	0.40	0.26	0.34	0.38	0.24	0.22
Finished products – actual	0.42	0.54	0.39	0.48	0.29	0.29
Finished products – expected (next quarter)	0.37	0.26	0.28	0.34	0.22	0.16
<b>AIG-PWC</b>						
Finished products – actual	0.11	0.25	0.11	0.24	-0.05	-0.00
Finished products – expected (next quarter)	-0.14	0.14	-0.16	0.02	-0.15	-0.09
<b>Dun &amp; Bradstreet</b>						
Actual	0.46	0.53	0.50	0.71	0.49	0.68
Expected (next quarter)	0.42	0.36	0.52	0.64	0.53	0.65
<b>NAB</b>						
Actual	0.31	0.31	0.52	0.69		
Expected (next quarter)	0.21	0.10	0.45	0.49		

Note: See Table 1 for the sectors covered in each survey and the commencement period of each survey.

**Table 7b: Stocks**

Correlation coefficients; common sample period (1993:Q4–2002:Q1)

	<b>Private non-farm inventories</b>		<b>Inventories – total selected industries</b>		<b>Stocks in relevant industry</b>	
	Qtly %Δ	4qe %Δ	Qtly %Δ	4qe %Δ	Qtly %Δ	4qe %Δ
<b>ACCI-Westpac</b>						
Raw materials – actual	0.15	0.16	0.19	0.26	0.15	0.10
Raw materials – expected (next quarter)	0.35	0.44	0.33	0.45	–0.02	–0.04
Finished products – actual	0.18	0.40	0.22	0.26	–0.07	–0.13
Finished products – expected (next quarter)	0.25	0.33	0.11	0.35	0.03	–0.16
<b>AIG-PWC</b>						
Finished products – actual	0.15	0.07	0.03	0.03	–0.01	–0.13
Finished products – expected (next quarter) <sup>(a)</sup>	–0.14	0.14	–0.16	0.02	–0.15	–0.09
<b>Dun &amp; Bradstreet</b>						
Actual	0.06	0.24	0.16	0.41	0.21	0.44
Expected (next quarter)	–0.03	0.08	0.04	0.21	–0.07	–0.38
<b>NAB</b>						
Actual	0.01	0.10	0.04	0.16		
Expected (next quarter)	0.05	–0.03	0.06	–0.01		

Notes: See Table 1 for the sectors covered in each survey.

(a) Sample period is 1995:Q3–2002:Q1.

**Table 7c: Stocks**

Significance of survey indicators in explaining private non-farm inventories – actual stocks in current period

	Coefficient	<i>t</i> -statistic	LM(1) <sup>(a)</sup>	LM(1–4) <sup>(a)</sup>
			p-value	
<b>ACCI-Westpac<sup>(b)</sup></b>				
Finished products (current quarter)	0.026	1.91*	0.17	0.34
<b>AIG-PWC</b>				
Current quarter	0.035	0.63	0.96	0.57
<b>Dun &amp; Bradstreet</b>				
Current quarter	0.028	2.74***	0.18	0.09
<b>NAB</b>				
Current quarter	0.031	1.52	0.40	0.07

Notes: See Table 1 for the commencement period of each survey. \*\*\*, \*\* and \* indicates significance at 1, 5 and 10 per cent levels.

(a) LM(1) and LM(1–4) are tests for serial correlation of order 1 and 1–4.

(b) Sample period is 1974:Q4–2002:Q1.

**Table 7d: Stocks**

Significance of survey indicators in explaining private non-farm inventories – expectation held in previous period

	Coefficient	<i>t</i> -statistic	LM(1) <sup>(a)</sup>	LM(1–4) <sup>(a)</sup>
			p-value	
<b>ACCI-Westpac</b> 1974:Q4–2002:Q1				
Finished products (next quarter)	0.037	3.17***	0.98	0.95
<b>AIG-PWC</b> 1995:Q3–2002:Q1				
Next quarter	–0.024	–0.54	0.38	0.83
<b>Dun &amp; Bradstreet</b> 1988:Q2–2002:Q1				
Next quarter	0.032	2.63**	0.59	0.28
<b>NAB</b> 1989:Q3–2002:Q1				
Next quarter	0.029	1.30	0.44	0.05

Notes: \*\*\*, \*\* and \* indicates significance at 1, 5 and 10 per cent levels.

(a) LM(1) and LM(1–4) are tests for serial correlation of order 1 and 1–4.

**Table 7e: Stocks**

Granger causality tests; varying sample periods to 2002:Q1

Dependent variable	Lags		Joint significance <sup>(b)</sup> p-value	Granger cause <sup>(c)</sup>	LM(1) <sup>(d)</sup>	LM(1-4) <sup>(d)</sup>
	PNFI <sup>(a)</sup>	Survey variable			p-value	
<b>ACCI-Westpac</b>						
PNFI	4	4	0.93	No	0.44	0.65
Finished products – actual	4	4	0.00	Yes	0.30	0.33
<b>AIG-PWC</b>						
PNFI	4	4	0.83	No	0.91	0.84
Stocks – actual	4	4	0.84	No	0.56	0.72
<b>Dun &amp; Bradstreet</b>						
PNFI	5	5	0.02	Yes	0.47	0.35
Stocks – actual	5	5	0.28	No	0.64	0.36
<b>NAB</b>						
PNFI	4	4	0.13	No	0.35	0.39
Stocks – actual	4	4	0.34	No	0.49	0.28

Notes: See Table 1 for the commencement period of each survey.

(a) Private non-farm inventories (national accounts).

(b) Using a Wald test of joint significance.

(c) At the 10 per cent level of significance.

(d) LM(1) and LM(1-4) are tests for serial correlation of order 1 and 1-4.

## 5.6 Exports

Four of the business surveys report on exports – the one small difference amongst the surveys being that the ACCI-Westpac reports on export deliveries, whereas the others report on export sales. Correlation coefficients between the survey measures and total export volumes are shown in Tables 8a and 8b. Export volumes are also split into non-rural export volumes, resource exports and manufactured exports.

Correlations over the common sample period are strongest between the survey measures and year-ended growth in manufactured exports. In contrast to many of the other survey questions, however, the performance of the surveys following the early 1990s recession has improved. Results from the autoregressive model (Tables 8c and 8d) and Granger causality tests (Table 8e) were generally inconclusive.

**Table 8a: Exports**

Correlation coefficients; varying sample periods to 2002:Q1

	<b>Total exports</b>		<b>Non-rural exports</b>		<b>Resource exports</b>		<b>Manufactured exports</b>	
	Qtly %Δ	4qe %Δ	Qtly %Δ	4qe %Δ	Qtly %Δ	4qe %Δ	Qtly %Δ	4qe %Δ
<b>ACCI</b>								
Actual	0.23	0.47	0.24	0.45	0.12	-0.03	0.31	0.60
Expected (next quarter)	0.25	0.46	0.03	0.32	0.09	0.15	-0.03	0.42
<b>ACCI-Westpac</b>								
Actual	0.09	0.15					0.07	0.38
Expected (next quarter)	0.03	0.17					0.20	0.42
<b>AIG-PWC</b>								
Actual	-0.01	0.03					0.09	0.08
Expected (next quarter)	0.17	0.43					0.25	0.54
<b>NAB</b>								
Actual	0.06	0.31	0.09	0.32	0.05	-0.19	0.03	0.26
Expected (next quarter)	-0.15	0.20	-0.04	0.25	-0.01	-0.19	-0.11	0.25

Note: See Table 1 for the sectors covered in each survey and the commencement period of each survey.

**Table 8b: Exports**

Correlation coefficients; common sample period (1992:Q4–2002:Q1)

	<b>Total exports</b>		<b>Non-rural exports</b>		<b>Resource exports</b>		<b>Manufactured exports</b>	
	Qtly %Δ	4qe %Δ	Qtly %Δ	4qe %Δ	Qtly %Δ	4qe %Δ	Qtly %Δ	4qe %Δ
<b>ACCI<sup>(a)</sup></b>								
Actual	0.23	0.47	0.24	0.45	0.12	-0.03	0.31	0.60
Expected (next quarter)	0.25	0.46	0.03	0.32	0.09	0.15	-0.03	0.42
<b>ACCI-Westpac</b>								
Actual	0.12	0.49					-0.04	0.42
Expected (next quarter)	-0.13	0.45					0.15	0.59
<b>AIG-PWC</b>								
Actual	-0.01	0.03					0.10	0.08
Expected (next quarter)	0.17	0.43					0.25	0.54
<b>NAB</b>								
Actual	0.14	0.52	0.17	0.60	0.06	-0.12	0.19	0.65
Expected (next quarter)	-0.11	0.39	0.01	0.49	-0.02	-0.10	0.03	0.57

Notes: See Table 1 for the sectors covered in each survey.

(a) Sample period is 1994:Q3–2002:Q1.

**Table 8c: Exports**

Significance of survey indicators in explaining total non-rural exports – actual exports in current period

	Coefficient	<i>t</i> -statistic	LM(1) <sup>(a)</sup>	LM(1–4) <sup>(a)</sup>
			p-value	
<b>ACCI</b>				
Current quarter	0.101	1.86*	0.26	0.58
<b>ACCI-Westpac</b>				
Current quarter	0.012	0.32	0.65	0.06
<b>AIG-PWC</b>				
Current quarter	0.017	0.60	0.52	0.65
<b>NAB</b>				
Current quarter	0.017	0.52	0.54	0.96

Notes: See Table 1 for the commencement period of each survey. \*\*\*, \*\* and \* indicates significance at 1, 5 and 10 per cent levels.

(a) LM(1) and LM(1–4) are tests for serial correlation of order 1 and 1–4.

**Table 8d: Exports**

Significance of survey indicators in explaining total non-rural exports – expectation held in previous period

	Coefficient	<i>t</i> -statistic	LM(1) <sup>(a)</sup>	LM(1–4) <sup>(a)</sup>
			p-value	
<b>ACCI</b> 1994:Q4–2002:Q1				
Next quarter	0.002	0.04	0.46	0.38
<b>ACCI-Westpac</b> 1960:Q4–2002:Q1				
Next quarter	0.015	0.40	0.60	0.70
<b>AIG-PWC</b> 1992:Q4–2002:Q1				
Next quarter	0.087	1.37	0.00	0.06
<b>NAB</b> 1989:Q3–2002:Q1				
Next quarter	–0.015	–0.41	0.76	0.86

Note: (a) LM(1) and LM(1–4) are tests for serial correlation of order 1 and 1–4.

**Table 8e: Exports**

Granger causality tests; varying sample periods to 2002:Q1

Dependent variable	Lags		Joint significance <sup>(b)</sup> p-value	Granger cause <sup>(c)</sup>	LM(1) <sup>(d)</sup>	LM(1-4) <sup>(d)</sup>
	TNRE <sup>(a)</sup>	Survey variable			p-value	
<b>ACCI</b>						
TNRE	3	3	0.55	No	0.94	0.64
Exports – actual	3	3	0.74	No	0.32	0.21
<b>ACCI-Westpac</b>						
TNRE	4	4	0.67	No	0.75	0.86
Exports – actual	4	4	0.46	No	0.75	0.44
<b>AIG-PWC</b>						
TNRE	4	4	0.88	No	0.53	0.76
Exports – actual	4	4	0.46	No	0.50	0.47
<b>NAB</b>						
TNRE	4	3	0.79	No	0.64	0.61
Exports – actual	4	3	0.02	Yes	0.24	0.83

Notes: See Table 1 for the commencement period of each survey.

(a) Total non-rural exports (balance of payments).

(b) Using a Wald test of joint significance.

(c) At the 10 per cent level of significance.

(d) LM(1) and LM(1-4) are tests for serial correlation of order 1 and 1-4.

## 5.7 Employment

All surveys have a question on employment. Two of the surveys (ACCI-Westpac and Dun & Bradstreet) refer specifically to employee numbers, while the remainder refer to 'employment' (with respondents possibly referring to either numbers or hours worked). Tables 9a and 9b list correlation coefficients between the survey measures of employment and the ABS measure of the number of employed and full-time equivalent employment (which takes into account hours worked). Correlation coefficients for employment by industry are also listed.



**Table 9a: Employment**  
Correlation coefficients; varying sample periods to 2002:Q1

	Total employment		Total full-time equivalent employment		Total employment in relevant industry	
	Qtly %Δ	4qe %Δ	Qtly %Δ	4qe %Δ	Qtly %Δ	4qe %Δ
<b>ACCI</b>						
Actual	0.48	0.32	0.48	0.29		
Expected (next quarter)	0.51	0.24	0.49	0.26		
<b>ACCI-Westpac</b>						
Actual	0.75	0.74	0.78	0.75	0.36	0.64
Expected (next quarter)	0.67	0.65	0.69	0.68	0.35	0.62
<b>AIG-PWC</b>						
Actual	0.57	0.25	0.51	0.23	0.17	0.32
Expected (next quarter)	0.44	0.41	0.44	0.40	0.15	0.46
<b>Dun &amp; Bradstreet</b>						
Actual	0.80	0.84	0.79	0.85	0.54	0.87
Expected (next quarter)	0.78	0.77	0.80	0.77	0.55	0.83
<b>NAB</b>						
Actual	0.76	0.70	0.78	0.71		
Construction	0.66	0.64			0.42	0.61
Finance	0.63	0.52			0.43	0.43
Manufacturing	0.75	0.68			0.33	0.65
Mining	0.22	0.47			0.03	0.36
Retail	0.72	0.56			0.32	0.54
Recreation	0.56	0.51			0.02	0.08

Transport	0.74	0.76			0.02	0.29
Wholesale	0.67	0.69			0.07	0.06
Expected (next quarter)	0.75	0.74	0.76	0.73		
Construction	0.70	0.70			0.45	0.61
Finance	0.71	0.64			0.34	0.44
Manufacturing	0.75	0.68			0.31	0.60
Mining	0.16	0.40			0.03	0.19
Retail	0.65	0.47			0.19	0.50
Recreation	0.56	0.63			-0.04	0.10
Transport	0.71	0.75			0.03	0.32
Wholesale	0.62	0.61			0.13	0.05
Expected (next year)	0.78	0.81	0.78	0.81		
Construction	0.73	0.83			0.46	0.57
Finance	0.73	0.71			0.43	0.57
Manufacturing	0.69	0.74			0.36	0.45
Mining	0.30	0.13			0.07	-0.09
Retail	0.62	0.74			0.30	0.36
Recreation	0.59	0.58			-0.08	0.08
Transport	0.68	0.67			0.08	0.38
Wholesale	0.67	0.66			0.06	0.18
<b>Yellow Pages</b>						
Actual	0.17	0.17	0.16	0.17		
Expected (next quarter)	0.35	0.30	0.35	0.33		
Expected (next year)	0.18	0.35	0.21	0.44		

Note: See Table 1 for the sectors covered in each survey and the commencement period of each survey.

**Table 9b: Employment**

Correlation coefficients; common sample period (1994:Q4–2002:Q1)

	Total employment		Total full-time equivalent employment		Total employment in relevant industry	
	Qtly %Δ	4qe %Δ	Qtly %Δ	4qe %Δ	Qtly %Δ	4qe %Δ
<b>ACCI</b>						
Actual	0.41	0.25	0.41	0.23		
Expected (next quarter)	0.51	0.24	0.49	0.26		
<b>ACCI-Westpac</b>						
Actual	0.65	0.55	0.62	0.43	0.05	0.09
Expected (next quarter)	0.58	0.45	0.53	0.36	0.02	0.13
<b>AIG-PWC</b>						
Actual	0.49	0.17	0.40	0.06	0.03	0.18
Expected (next quarter)	0.23	0.35	0.31	0.30	0.08	0.40
<b>Dun &amp; Bradstreet</b>						
Actual	0.51	0.41	0.47	0.41	0.17	0.26
Expected (next quarter)	0.57	0.55	0.61	0.55	0.10	0.40
<b>NAB</b>						
Actual	0.51	0.50	0.51	0.47		
Construction	0.31	0.12			0.32	0.37
Finance	0.40	0.36			0.35	0.31
Manufacturing	0.38	0.35			0.05	0.28
Mining	-0.22	-0.01			0.15	0.36
Retail	0.53	0.43			0.07	0.48
Recreation	0.22	0.33			-0.06	0.14
Transport	0.49	0.52			-0.12	0.07

Wholesale	0.29	0.61			0.09	-0.01
Expected (next quarter)	0.49	0.43	0.53	0.39		
Construction	0.42	0.25			0.40	0.33
Finance	0.52	0.20			0.14	0.06
Manufacturing	0.47	0.34			0.07	0.24
Mining	-0.27	-0.25			0.12	0.16
Retail	0.46	0.20			-0.02	0.40
Recreation	0.22	0.46			-0.01	0.18
Transport	0.44	0.54			-0.07	0.01
Wholesale	0.30	0.31			0.26	0.09
Expected (next year)	0.46	0.72	0.46	0.73		
Construction	0.31	0.73			0.41	0.47
Finance	0.36	0.49			0.31	0.61
Manufacturing	0.34	0.58			0.11	0.29
Mining	-0.22	-0.25			0.13	0.05
Retail	0.24	0.54			0.05	0.00
Recreation	0.28	0.44			-0.06	0.23
Transport	0.32	0.44			0.02	0.04
Wholesale	0.36	0.50			0.17	0.15
<b>Yellow Pages</b>						
Actual	0.03	0.03	0.13	0.07		
Expected (next quarter)	0.27	0.32	0.29	0.32		
Expected (next year) <sup>(a)</sup>	0.18	0.35	0.21	0.44		

Notes: See Table 1 for the sectors covered in each survey.

(a) Sample period is 1995:Q3–2002:Q1.

<b>Table 9c: Employment</b>				
Significance of survey indicators in explaining total employment – actual employment in current period				
	<b>Coefficient</b>	<b><i>t</i>-statistic</b>	<b>LM(1)<sup>(a)</sup></b>	<b>LM(1–4)<sup>(a)</sup></b>
			p-value	
<b>ACCI</b>				
Current quarter	0.021	2.34**	0.19	0.13
<b>ACCI-Westpac<sup>(b)</sup></b>				
Current quarter	0.020	6.79***	0.21	0.53
<b>AIG-PWC</b>				
Current quarter	0.026	4.00***	0.18	0.48
<b>Dun &amp; Bradstreet</b>				
Current quarter	0.030	5.76***	0.28	0.15
<b>NAB</b>				
Current quarter	0.023	4.83***	0.16	0.11
<b>Yellow Pages</b>				
Current quarter	0.006	0.29	0.91	0.62

Notes: See Table 1 for the commencement period of each survey. \*\*\*, \*\* and \* indicates significance at 1, 5 and 10 per cent levels.  
(a) LM(1) and LM(1–4) are tests for serial correlation of order 1 and 1–4.  
(b) Sample period is 1978:Q4–2002:Q1.

The correlation coefficients are generally quite high, with the coefficients being similar for the number of employed and full-time equivalents. In contrast to other economic variables measured in surveys, the correlations for quarterly growth are stronger than for year-ended growth. Employment expectations for the most part also tend to be just as good as the actual outcomes. This is important, as the actual survey measures, which are compiled on a quarterly basis, do not have any advantage, in terms of timeliness, over the monthly labour force survey data. High correlation coefficients for expected quarterly growth in the next quarter are evident in most of the surveys, with the possible exception of the AIG-PWC and Yellow Pages surveys, suggesting that most of the surveys are useful in predicting employment growth in the next quarter. There is a modest deterioration in performance over the common sample period. Specific industry data appear to be of limited use.

**Table 9d: Employment**Significance of survey indicators in explaining total employment –  
expectation held in previous period

	Coefficient	<i>t</i> -statistic	LM(1) <sup>(a)</sup>	LM(1–4) <sup>(a)</sup>
			p-value	
<b>ACCI</b> 1994:Q4–2002:Q1				
Next quarter	0.025	2.79**	0.89	0.58
<b>ACCI-Westpac</b> 1978:Q4–2002:Q1				
Next quarter	0.018	4.99***	0.88	0.79
<b>AIG-PWC</b> 1992:Q4–2002:Q1				
Next quarter	0.021	1.61	0.33	0.13
<b>Dun &amp; Bradstreet</b> 1988:Q2–2002:Q1				
Next quarter	0.031	4.43***	0.76	0.25
<b>NAB</b> 1989:Q3–2002:Q1				
Next quarter	0.026	4.30***	0.03	0.10
<b>Yellow Pages</b> 1993:Q3–2002:Q1				
Next quarter	0.033	1.64	0.94	0.18

Notes: \*\*\*, \*\* and \* indicates significance at 1, 5 and 10 per cent levels.

(a) LM(1) and LM(1–4) are tests for serial correlation of order 1 and 1–4.

Consistent with the high positive correlation coefficients, the business survey measures are significant in the autoregressive model (Tables 9c and 9d), with the exception of the Yellow Pages survey. Tests of Granger causality for employment were also quite positive (Table 9e), with the ACCI, ACCI-Westpac and Dun & Bradstreet surveys being forward-looking. The strong numbers overall probably reflect the fact that employment is a variable that the survey respondents have a strong influence over. Moreover, growth in employment generally lags growth in output.

**Table 9e: Employment**

Granger causality tests; varying sample periods to 2002:Q1

Dependent variable	Lags		Joint significance <sup>(a)</sup> p-value	Granger cause <sup>(b)</sup>	LM(1) <sup>(c)</sup>	LM(1-4) <sup>(c)</sup>
	Total employment	Survey variable			p-value	
<b>ACCI</b>						
Total employment	3	3	0.03	Yes	0.84	0.26
Employment – actual	3	3	0.93	No	0.34	0.75
<b>ACCI-Westpac</b>						
Total employment	4	4	0.00	Yes	0.16	0.69
Employment – actual	4	4	0.34	No	0.92	0.21
<b>AIG-PWC</b>						
Total employment	3	3	0.00	Yes	0.65	0.23
Employment – actual	3	3	0.01	Yes	0.69	0.33
<b>Dun &amp; Bradstreet</b>						
Total employment	4	4	0.00	Yes	0.52	0.34
Employment – actual	4	4	0.59	No	0.88	0.27
<b>NAB</b>						
Total employment	4	3	0.00	Yes	0.20	0.24
Employment – actual	4	3	0.02	Yes	0.59	0.35
<b>Yellow Pages</b>						
Total employment	5	5	0.32	No	0.55	0.55
Employment – actual	5	5	0.10	No	0.23	0.54

Notes: See Table 1 for the commencement period of each survey.

(a) Using a Wald test of joint significance.

(b) At the 10 per cent level of significance.

(c) LM(1) and LM(1-4) are tests for serial correlation of order 1 and 1-4.

## 5.8 Input Costs

A number of input costs are covered in the various business surveys. Most of the surveys cover labour costs such as wages, while some also cover non-wage labour costs and the cost of raw materials. The surveys report on both actual outcomes and expectations for the next quarter.

The results vary quite markedly across surveys, as well as across the variable being measured. The strongest results are for the ACCI-Westpac survey with a positive association evident between the survey's unit cost measure (for both actual and expected) and the ABS measure of Average Weekly Ordinary Time Earnings (AWOTE). This result is confirmed in the autoregressive model and the survey measure appears to be forward-looking as measured by the test of Granger causality. (This may reflect, to some extent, the long sample period, which includes large swings in wages growth.) Strong results were also recorded for the raw material cost component of the AIG-PWC survey and the ABS measure of manufacturing input prices, for both quarterly and year-ended growth. There also appears to be some information in the purchase cost and overhead components of the NAB survey when measured against the ABS measures of manufacturing input prices and non-wage labour costs respectively.



**Table 10a: Input**  
Correlation coefficients; varying

	Average weekly earnings		Private AWOTE	
	Qtly %Δ	4qe %Δ	Qtly %Δ	4qe %Δ
<b>ACCI</b>				
Wages – actual	–0.01	–0.38	0.06	–0.07
Wages – expected (next quarter)	0.02	–0.22	0.32	0.15
Non-wage labour costs – actual				
Non-wage labour costs – expected (next quarter)				
<b>ACCI-Westpac</b>				
Unit costs – actual	0.66	0.81	0.58	0.83
Unit costs – expected (next quarter)	0.63	0.79	0.55	0.80
<b>AIG-PWC</b>				
Wages – actual	–0.01	0.04	0.15	0.32
Wages – expected (next quarter)	0.03	0.21	0.39	0.66
Raw material costs – actual				
Raw material costs – expected (next quarter)				
<b>NAB</b>				
Labour costs – actual	0.30	0.39	0.31	0.50
Labour costs – expected (next quarter)	0.25	0.53	0.34	0.65
Purchase costs – actual				
Purchase costs – expected (next quarter)				
Overheads – actual				
Overheads – expected (next quarter)				
<b>Yellow Pages</b>				
Wages – actual	–0.41	–0.52	–0.28	–0.26
Wages – expected (next quarter)	–0.17	–0.34	–0.09	–0.10
Wages – expected (next year)	–0.25	–0.59	–0.15	–0.51

Note: See Table 1 for the sectors covered in each survey and the commencement period of each survey.



**Table 10b: Input**  
Correlation coefficients; common

	Average weekly earnings		Private AWOTE	
	Qtly %Δ	4qe %Δ	Qtly %Δ	4qe %Δ
<b>ACCI</b>				
Wages – actual	-0.03	-0.38	0.07	-0.04
Wages – expected (next quarter)	0.02	-0.22	0.32	0.15
Non-wage labour costs – actual				
Non-wage labour costs – expected (next quarter)				
<b>ACCI-Westpac</b>				
Unit costs – actual	0.21	0.58	0.40	0.74
Unit costs – expected (next quarter)	0.17	0.46	0.35	0.69
<b>AIG-PWC</b>				
Wages – actual	-0.11	-0.14	0.01	-0.03
Wages – expected (next quarter)	0.05	0.17	0.40	0.61
Raw material costs – actual				
Raw material costs – expected (next quarter)				
<b>NAB</b>				
Labour costs – actual	-0.04	-0.09	0.13	0.16
Labour costs – expected (next quarter)	-0.15	-0.10	0.08	0.15
Purchase costs – actual				
Purchase costs – expected (next quarter)				
Overheads – actual				
Overheads – expected (next quarter)				
<b>Yellow Pages</b>				
Wages – actual	-0.38	-0.68	-0.26	-0.48
Wages – expected (next quarter)	-0.25	-0.39	-0.09	-0.15
Wages – expected (next year) <sup>(a)</sup>	-0.25	-0.53	-0.15	-0.24

Notes: See Table 1 for the sectors covered in each survey.

(a) Sample period is 1995:Q3–2002:Q1.

<b>Costs</b>					
sample period (1994:Q4–2002:Q1)					
<b>Private AWOTE – manufacturing</b>		<b>Manufacturing input prices</b>		<b>Non-wage labour costs</b>	
Qtly %Δ	4qe %Δ	Qtly %Δ	4qe %Δ	Qtly %Δ	4qe %Δ
				-0.01	-0.06
				0.24	0.15
0.04	0.09	0.51	0.78	0.13	0.12
-0.09	0.02	0.37	0.67	0.19	0.16
-0.13	0.31				
0.14	0.22				
		0.67	0.83		
		0.29	0.75		
		0.44	0.57		
		0.26	0.37		
				0.32	0.57
				0.45	0.56

**Table 10c: Input Costs**Significance of survey indicators in explaining input costs<sup>(a)</sup> –  
actual input costs in current period

	Coefficient	<i>t</i> -statistic	LM(1) <sup>(b)</sup>	LM(1–4) <sup>(b)</sup>
			p-value	
<i>Wages</i>				
<b>ACCI</b>				
Wages	0.006	0.32	0.61	0.87
<b>ACCI-Westpac</b>				
Unit costs	0.028	4.42***	0.71	0.49
<b>AIG-PWC</b>				
Wages	0.020	1.01	0.57	0.49
<b>NAB</b>				
Labour costs	0.670	2.01*	0.57	0.85
<b>Yellow Pages</b>				
Wages	-0.039	-1.66	0.83	0.42
<i>Purchase costs</i>				
<b>AIG-PWC</b>				
Raw material costs	0.064	3.50***	0.54	0.19

Notes: See Table 1 for the commencement period of each survey. \*\*\*, \*\* and \* indicates significance at 1, 5 and 10 per cent levels.

(a) Private average weekly ordinary time earnings (wages) and manufacturing input prices (purchase costs).

(b) LM(1) and LM(1–4) are tests for serial correlation of order 1 and 1–4.

**Table 10d: Input Costs**Significance of survey indicators in explaining input costs<sup>(a)</sup> –  
expectation held in previous period

	Coefficient	<i>t</i> -statistic	LM(1) <sup>(b)</sup>	LM(1–4) <sup>(b)</sup>
			p-value	
<i>Wages</i>				
<b>ACCI</b>				
1994:Q4–2002:Q1				
Wages (next quarter)	0.028	2.22***	0.07	0.10
<b>ACCI-Westpac</b>				
1966:Q3–2002:Q1				
Unit costs (next quarter)	0.023	3.68***	0.57	0.36
<b>AIG-PWC</b>				
1993:Q1–2002:Q1				
Wages (next quarter)	0.051	2.29**	0.56	0.72
<b>NAB</b>				
1989:Q3–2002:Q1				
Labour costs (next quarter)	0.600	1.74*	0.09	0.49
<b>Yellow Pages</b>				
1993:Q2–2002:Q1				
Wages (next quarter)	–0.015	–0.56	0.47	0.32
<i>Purchase costs</i>				
<b>AIG-PWC</b>				
1993:Q1–2002:Q1				
Raw material costs (next quarter)	0.019	0.56	0.34	0.61

Notes: \*\*\*, \*\* and \* indicates significance at 1, 5 and 10 per cent levels.

(a) Private average weekly ordinary time earnings (wages) and manufacturing input prices (purchase costs).

(b) LM(1) and LM(1–4) are tests for serial correlation of order 1 and 1–4.

**Table 10e: Input Costs**

Granger causality tests; varying sample periods to 2002:Q1

Dependent variable	Lags		Joint significance <sup>(b)</sup> p-value	Granger cause <sup>(c)</sup>	LM(1) <sup>(d)</sup>	LM(1-4) <sup>(d)</sup>
	AWOTE/ MIP <sup>(a)</sup>	Survey variable			p-value	
<i>Wages</i>						
<b>ACCI</b>						
1994:Q3–2002:Q1						
AWOTE	4	4	0.00	Yes	0.45	0.46
Wages – actual	4	4	0.06	Yes	0.37	0.22
<b>ACCI-Westpac</b>						
1966:Q2–2002:Q1						
AWOTE	4	4	0.03	Yes	0.30	0.11
Unit costs – actual	4	4	0.25	No	0.97	0.49
<b>AIG-PWC</b>						
1992:Q3–2002:Q1						
AWOTE	3	3	0.85	No	0.66	0.32
Wages – actual	3	3	0.86	No	0.18	0.34
<b>NAB</b>						
1989:Q3–2002:Q1						
AWOTE	3	5	0.38	No	0.12	0.25
Labour costs – actual	3	5	0.55	No	0.31	0.15
<b>Yellow Pages</b>						
1993:Q1–2002:Q1						
AWOTE	4	4	0.89	No	0.44	0.88
Wages – actual	4	4	0.16	No	0.99	0.86
<i>Purchase costs</i>						
<b>AIG-PWC</b>						
1992:Q3–2002:Q1						
MIP	4	4	0.01	Yes	0.97	0.87
Raw material costs – actual	4	4	0.85	No	0.83	0.20

Notes: (a) Private average weekly ordinary time earnings; manufacturing input prices.

(b) Using a Wald test of joint significance.

(c) At the 10 per cent level of significance.

(d) LM(1) and LM(1-4) are tests for serial correlation of order 1 and 1-4.

## 5.9 Selling Prices

Correlation coefficients of the various survey measures of selling prices (referred to as ‘final prices’ in the NAB survey and ‘prices charged’ in the Yellow Pages survey) with the consumer price index (CPI), the weighted median CPI and manufacturing output prices are shown in Tables 11a and 11b. With the exception of the ACCI National Survey of Business Expectations, correlation coefficients are quite positive for both quarterly and year-ended growth rates over both the full and common sample periods. The correlations are stronger for the CPI than for the weighted median CPI. For those surveys focusing on the manufacturing sector, the actual quarterly outcomes are highly correlated with the ABS manufacturing output price series, particularly the ACCI-Westpac series. In terms of expected quarterly growth rates, most surveys appear to be useful. These results are consistent with the results for the autoregressive model, suggesting that the selling price component of business surveys is providing information about current inflation in addition to information provided by lags of inflation. A number of the survey measures of selling prices are also shown to Granger-cause the CPI (Table 11e).



**Table 11a: Selling Prices**  
Correlation coefficients; varying sample periods to 2002:Q1

	CPI		Weighted median CPI		Manufacturing output prices	
	Qtly %Δ	4qe %Δ	Qtly %Δ	4qe %Δ	Qtly %Δ	4qe %Δ
<b>ACCI</b>						
Selling prices – actual	0.15	0.03	-0.19	-0.21		
Selling prices – expected (next quarter)	0.51	0.30	0.29	0.06		
<b>ACCI-Westpac</b>						
Selling prices – actual	0.75	0.83	0.80	0.81	0.77	0.85
Selling prices – expected (next quarter)	0.74	0.86	0.80	0.83	0.71	0.85
<b>AIG-PWC</b>						
Selling prices – actual	0.64	0.77	0.34	0.46	0.23	0.54
Selling prices – expected (next quarter)	0.46	0.77	0.26	0.49	0.11	0.55
<b>Dun &amp; Bradstreet</b>						
Selling prices – actual	0.65	0.80	0.63	0.77	0.49	0.74
Selling prices – expected (next quarter)	0.72	0.76	0.66	0.69	0.45	0.75
<b>NAB</b>						
Final prices – actual	0.65	0.78	0.46	0.53		
Construction	0.25	0.20	0.11	0.04		
Finance	0.48	0.36	0.38	0.19		
Manufacturing	0.62	0.80	0.45	0.60		
Mining	0.54	0.62	0.33	0.34		
Retail	0.45	0.66	0.32	0.46		
Recreation	0.50	0.62	0.41	0.47		
Transport	0.53	0.76	0.43	0.65		

Wholesale	0.28	0.27	0.09	0.05		
Final prices – expected (next quarter)	0.58	0.75	0.53	0.57		
Construction	0.40	0.21	0.35	0.07		
Finance	0.62	0.37	0.50	0.19		
Manufacturing	0.54	0.77	0.50	0.63		
Mining	0.33	0.44	0.24	0.24		
Retail	0.32	0.61	0.35	0.52		
Recreation	0.35	0.47	0.33	0.37		
Transport	0.37	0.65	0.39	0.61		
Wholesale	0.29	0.41	0.25	0.23		
<b>Yellow Pages</b>						
Prices charged – actual	0.59	0.40	0.48	0.41	0.45	0.65
Prices charged – expected (next quarter)	0.32	0.34	0.17	0.28	0.44	0.68
Prices charged – expected (next year)	0.28	0.81	0.07	0.79	0.49	0.63

Note: See Table 1 for the sectors covered in each survey and the commencement period of each survey.

**Table 11b: Selling Prices**  
Correlation coefficients; common sample period (1994:Q4–2002:Q1)

	CPI		Weighted median CPI		Manufacturing output prices	
	Qtly %Δ	4qe %Δ	Qtly %Δ	4qe %Δ	Qtly %Δ	4qe %Δ
<b>ACCI</b>						
Selling prices – actual	0.15	0.04	–0.19	–0.21		
Selling prices – expected (next quarter)	0.51	0.30	0.29	0.06		
<b>ACCI-Westpac</b>						
Selling prices – actual	0.66	0.72	0.48	0.59	0.49	0.69
Selling prices – expected (next quarter)	0.50	0.63	0.33	0.41	0.23	0.64
<b>AIG-PWC</b>						
Selling prices – actual	0.67	0.80	0.36	0.49	0.25	0.61
Selling prices – expected (next quarter)	0.51	0.79	0.24	0.46	0.10	0.60
<b>Dun &amp; Bradstreet</b>						
Selling prices – actual	0.43	0.49	0.18	0.27	0.27	0.51
Selling prices – expected (next quarter)	0.66	0.53	0.43	0.23	0.27	0.64
<b>NAB</b>						
Final prices – actual	0.56	0.72	0.29	0.33		
Construction	–0.07	–0.23	–0.10	–0.30		
Finance	0.74	0.54	0.57	0.36		
Manufacturing	0.52	0.69	0.21	0.31		
Mining	0.47	0.73	0.23	0.34		
Retail	0.33	0.69	0.17	0.40		
Recreation	0.24	0.31	0.15	0.01		
Transport	0.17	0.56	0.08	0.42		

Wholesale	0.39	0.52	0.18	0.23		
Final prices – expected (next quarter)	0.55	0.58	0.34	0.18		
Construction	0.23	-0.16	0.29	-0.24		
Finance	0.77	0.41	0.64	0.22		
Manufacturing	0.54	0.63	0.29	0.24		
Mining	0.27	0.49	0.17	0.18		
Retail	0.30	0.59	0.19	0.34		
Recreation	0.20	0.17	0.11	-0.12		
Transport	0.15	0.40	0.07	0.17		
Wholesale	0.41	0.43	0.19	0.06		
<b>Yellow Pages</b>						
Prices charged – actual	0.59	0.40	0.48	0.41	0.45	0.65
Prices charged – expected (next quarter)	0.32	0.34	0.17	0.28	0.44	0.68
Prices charged – expected (next year)	0.28	0.81	0.07	0.79	0.49	0.63

Note: See Table 1 for the sectors covered in each survey.

**Table 11c: Selling prices**

Significance of survey indicators in explaining the CPI –  
actual selling prices in current period

	Coefficient	<i>t</i> -statistic	LM(1) <sup>(a)</sup>	LM(1–4) <sup>(a)</sup>
			p-value	
<b>ACCI</b>				
Selling prices	0.013	0.54	0.01	0.01
<b>ACCI-Westpac</b>				
Selling prices	0.025	6.02***	0.90	0.33
<b>AIG-PWC</b>				
Selling prices	0.070	4.32***	0.48	0.84
<b>Dun &amp; Bradstreet</b>				
Selling prices	0.025	3.74***	0.45	0.34
<b>NAB</b>				
Final prices	1.960	4.49***	0.98	0.62
<b>Yellow Pages</b>				
Prices charged	0.053	3.28***	0.00	0.01

Notes: See Table 1 for the commencement period of each survey. \*\*\*, \*\* and \* indicates significance at 1, 5 and 10 per cent levels.

(a) LM(1) and LM(1–4) are tests for serial correlation of order 1 and 1–4.

**Table 11d: Selling Prices**Significance of survey indicators in explaining the CPI –  
expectation held in previous period

	Coefficient	<i>t</i> -statistic	LM(1) <sup>(a)</sup>	LM(1–4) <sup>(a)</sup>
			p-value	
<b>ACCI</b>				
1994:Q4–2002:Q1				
Selling prices (next quarter)	0.071	3.63***	0.92	0.18
<b>ACCI-Westpac</b>				
1966:Q3–2002:Q1				
Selling prices (next quarter)	0.027	4.85***	0.40	0.50
<b>AIG-PWC</b>				
1993:Q1–2002:Q1				
Selling prices (next quarter)	0.036	2.15**	0.10	0.40
<b>Dun &amp; Bradstreet</b>				
1988:Q2–2002:Q1				
Selling prices (next quarter)	0.040	5.30***	0.51	0.80
<b>NAB</b>				
1989:Q4–2002:Q1				
Final prices (next quarter)	1.660	3.31***	0.01	0.04
<b>Yellow Pages</b>				
1995:Q4–2002:Q1				
Prices charged (next quarter)	0.028	1.25	0.00	0.00

Notes: \*\*\*, \*\* and \* indicates significance at 1, 5 and 10 per cent levels.

(a) LM(1) and LM(1–4) are tests for serial correlation of order 1 and 1–4.

**Table 11e: Selling Prices**

Granger causality tests; varying sample periods to 2002:Q1

Dependent variable	Lags		Joint significance <sup>(a)</sup> p-value	Granger cause <sup>(b)</sup>	LM(1) <sup>(c)</sup>	LM(1-4) <sup>(c)</sup>
	CPI	Survey variable			p-value	
<b>ACCI</b>						
1994:Q3–2002:Q1						
CPI	4	4	0.01	Yes	0.75	0.50
Selling prices – actual	4	4	0.05	Yes	0.28	0.44
<b>ACCI-Westpac</b>						
1966:Q2–2002:Q1						
CPI	4	4	0.00	Yes	0.17	0.58
Selling prices – actual	4	4	0.10	No	0.39	0.86
<b>AIG-PWC</b>						
1992:Q3–2002:Q1						
CPI	4	4	0.22	No	0.55	0.96
Selling prices – actual	4	4	0.32	No	0.67	0.90
<b>Dun &amp; Bradstreet</b>						
1988:Q1–2002:Q1						
CPI	3	3	0.00	Yes	0.65	0.84
Selling prices – actual	3	3	0.00	Yes	0.67	0.18
<b>NAB</b>						
1989:Q3–2002:Q1						
CPI	3	3	0.12	No	0.34	0.83
Final prices – actual	3	3	0.20	No	0.67	0.89
<b>Yellow Pages</b>						
1995:Q3–2002:Q1						
CPI	5	6	0.06	Yes	0.21	0.11
Prices charged – actual	5	6	0.42	No	0.37	0.35

Notes: (a) Using a Wald test of joint significance.

(b) At the 10 per cent level of significance.

(c) LM(1) and LM(1-4) are tests for serial correlation of order 1 and 1-4.

## **6. Turning Points**

One of the difficulties in using tools such as correlation analysis, the autoregressive model and Granger causality tests, is that they do not necessarily tell us anything about the accuracy of business surveys in predicting turning points in the economic cycle. This is particularly important for some of the more aggregated economic activity indicators such as those relating to business conditions (including sales/output), employment and selling prices. A simple test of the ability of business surveys to pick turning points is to examine visually whether a turning point in an economic variable is coincident with, or has been led by, a sharp movement in a business survey indicator. Where a significant movement in a business survey indicator has routinely led a turning point, the information is particularly useful. Even in cases where the business survey indicator is a coincident indicator, the information is beneficial because of the timeliness of some of the business survey indicators. (As noted earlier, this is particularly the case for GDP, which can lag the surveys by up to two months.) Nevertheless, any assessments are highly judgmental because of the quarterly volatility in both the survey and statistical measures.

### **6.1 Business Conditions**

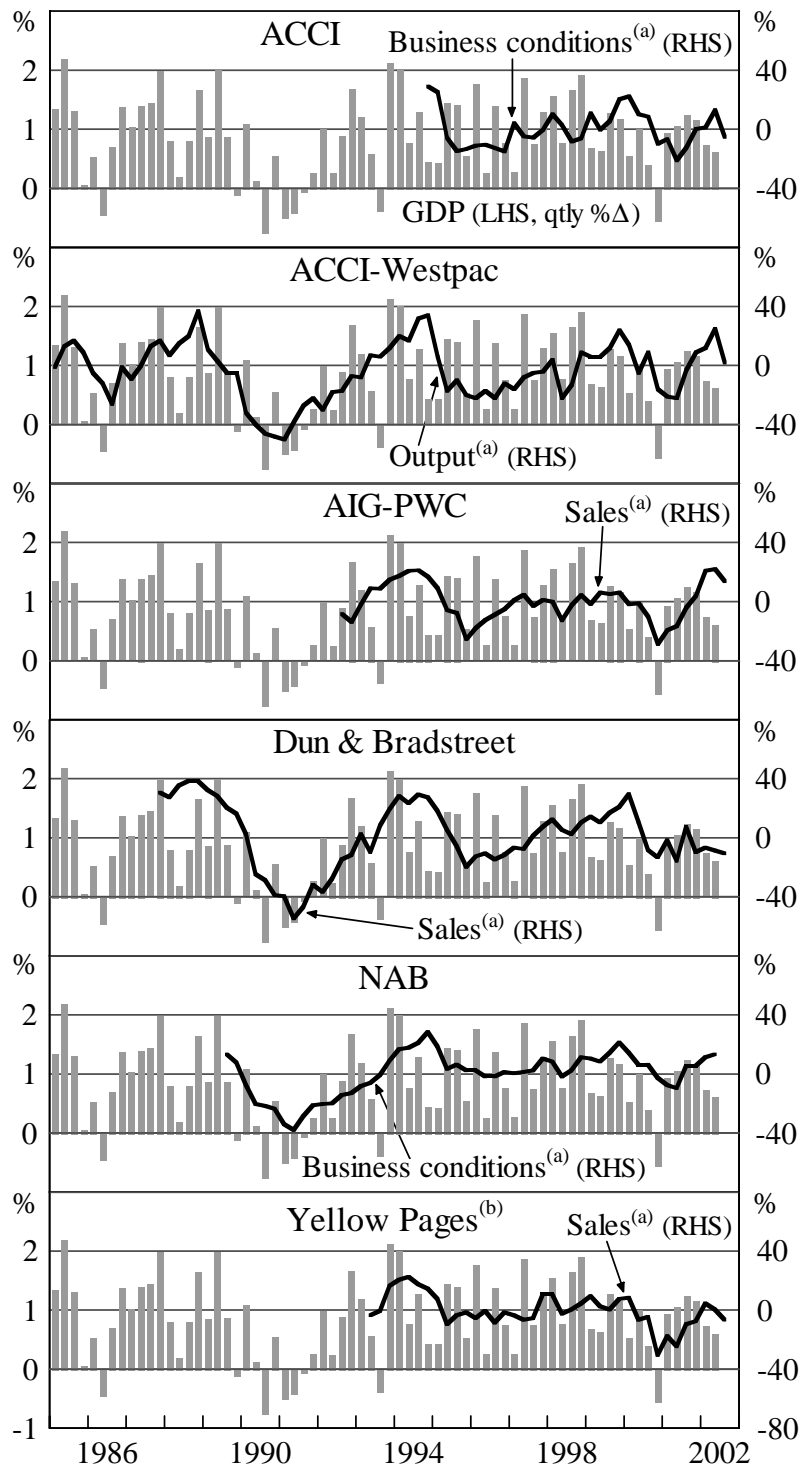
The various business survey indicators of business conditions are plotted against quarterly growth in GDP in Figure 2.<sup>13</sup> The positioning of the axes is intentional, as a long-run average reading of zero for the business surveys has tended to equate with trend quarterly growth in GDP of just under 1 per cent.

The ACCI-Westpac is the only surviving business survey from the late 1985/86 slowdown period. In terms of tracking overall activity, the ACCI-Westpac survey measure was, at best, a coincident indicator as the economy slowed and probably lagged the recovery by a quarter. This is somewhat surprising as the slowdown in output of the manufacturing sector (to which the survey applies) began a quarter earlier than for the overall economy and recovered a quarter earlier as well.

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<sup>13</sup> A further note of caution is warranted as the ABS series are based on the latest available data rather than the data that were available at the time.



**Figure 2: Business Conditions**

- Notes: (a) Net balance; deviation from long-run average.  
 (b) Prior to August 2001 data are for small businesses only.

The three surveys reporting around the time of the early 1990s recession were coincident indicators of the slowdown. In a couple of instances (Dun & Bradstreet and ACCI-Westpac), sentiment was turning down by the second half of 1989, but this was from well above long-run average levels. The Dun & Bradstreet 'expected output' series (not shown on Figure 2) showed a clear one quarter lead of the comparable actual series through this period, though this leading relationship appears to have diminished over time. The ACCI-Westpac survey also provided some advance warning of the depth of the recession that was to come, though this probably reflected the focus of this survey on the manufacturing sector – manufacturing output fell by just under 4 per cent in the year to June 1990, whereas GDP rose by nearly 2 per cent over the same period. Most surveys picked up the improvement in sentiment through 1991, though the indices were still well below long-run average levels suggesting that growth in sales/output was still weak.

All surveys recorded a strong rebound in conditions from well below long-run average levels to well above long-run average levels over the three years from early 1991 to early 1994. However, the surveys (with the possible exception of NAB) appear to have provided a false signal in 1995 when they turned negative but growth in output remained around trend.

Another possibly false signal was around the time of the Asian financial crisis when there was a marked deterioration in business sentiment over what, in the event, turned out to be a period of above-trend growth. The fall in sentiment was particularly noticeable for those firms exposed to the external sector, such as some parts of the manufacturing sector. Sharp falls in business conditions to below long-run average levels were recorded in the ACCI-Westpac and AIG-PWC surveys of manufacturers. In the event, however, growth in manufacturing output slowed only modestly to around 3½ per cent (this compares with growth in GDP (excluding manufacturing) of around 4½ per cent).

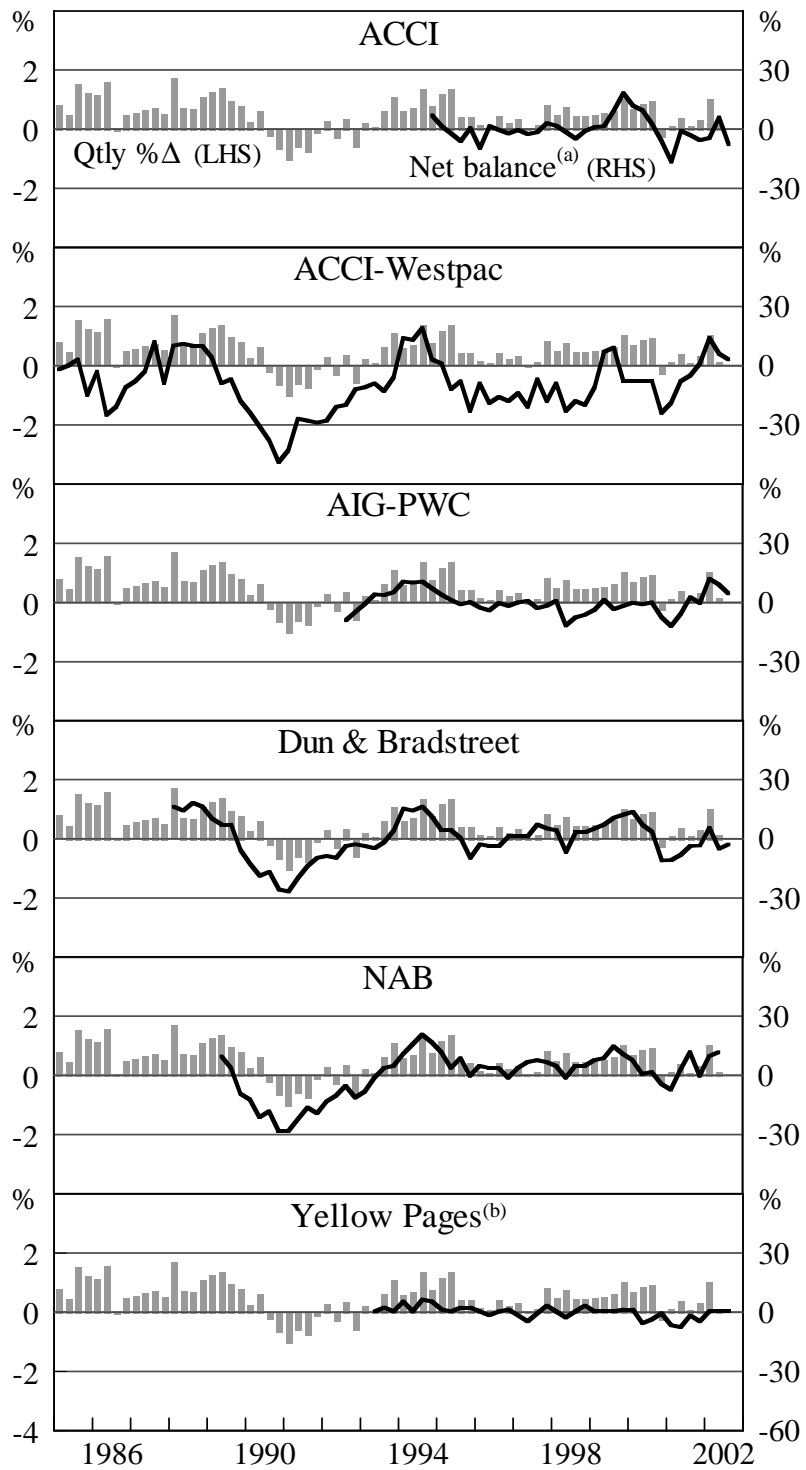
Over the course of 2000, the survey indices of business conditions declined, suggesting some slowing in the rate of growth of the economy, albeit back towards rates of growth experienced in the mid 1990s. The fall, however, was from high levels, possibly reflecting a simple reversal of the ebullient expectations built up over the course of 1999, and it wasn't until the December quarter that most of the indices fell to below long-run average levels. The exceptions were the actual sales

index in the Yellow Pages survey of small business, which fell below its long-run average in the June quarter 2000, and the AIG-PWC survey of manufacturing which dipped briefly below its long-run average level in March quarter 2000 and again in September quarter 2000. The recovery in sentiment appears to have lagged growth in output. In fact, much of the rebound in business conditions coincided with the release of stronger-than-expected GDP data for March 2001 quarter in June.

## **6.2 Employment**

The survey measures of expected employment in the next quarter are plotted against the quarterly percentage change in the ABS measure of employment in Figure 3. The survey measures are plotted with respect to the quarter in which the observation was made, rather than the quarter to which the observation refers. The employment indicators have probably done better than the business conditions indicators in picking turning points. As noted earlier, this may reflect firms knowing more about their own prospective hiring intentions, since they are the ones taking the decisions, than they do about future sales. It may also reflect the fact that changes in employment tend to lag changes in output. Accordingly, changes in employment are easier to predict.

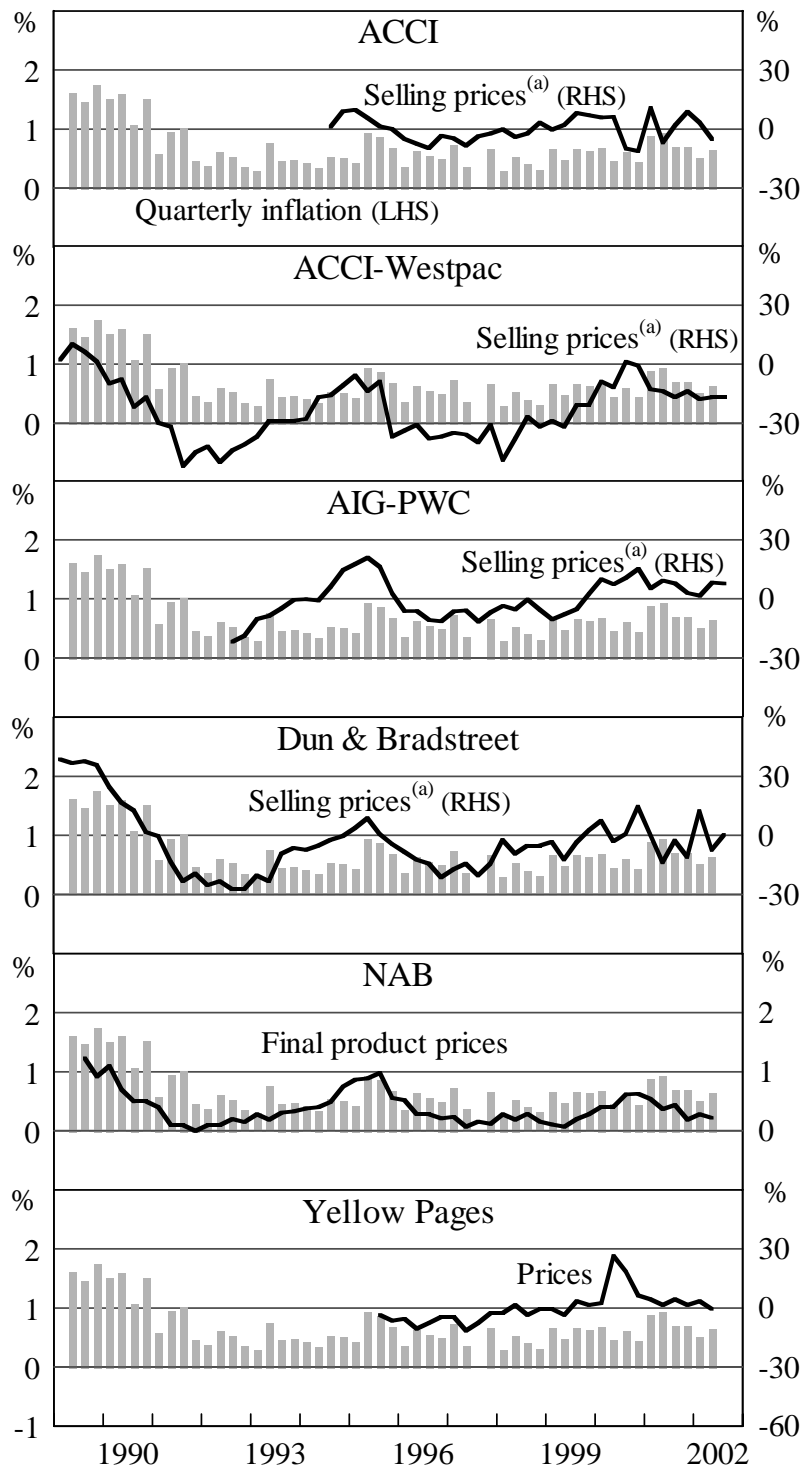
The employment shakeout in the early 1990s recession was well telegraphed by most of the surveys, with negative net balances being recorded by most of the surveys in the second half of 1989. The return to consistently positive growth was also matched by a strong recovery in hiring intentions. Most of the surveys appear to have anticipated the acceleration in employment growth that occurred in late 1997 to early 1998 and again towards the end of 1999, with net balances for most of the surveys moving higher in the middle of 1997 and 1999 respectively. In contrast, the weakness in the job market in late 2000 seems to have come as a surprise. Employment was very weak in December quarter 2000. However, this only coincided with weakness in business expectations for March quarter 2001.

**Figure 3: Employment**

- Notes: (a) Deviation from long-run average.  
 (b) Prior to August 2001 data are for small businesses only.

### **6.3 Selling Prices**

The survey measures for selling prices also appear to be picking up some price pressures in advance of the official statistics. Figure 4 shows the various business survey measures of selling prices plotted against weighted median inflation (excluding the effect of tax changes around the time of the introduction of the GST in September quarter 2000). The two periods of a noticeable acceleration in price pressures in the inflation-targeting period – early 1995 and in the second half of 2000 – have been picked up in virtually all of the surveys. Strength in output growth over these periods would have been a factor for survey respondents, but it may also reflect survey respondents picking up some of the movement in the exchange rate, which eventually flows through to consumer prices – large depreciations were experienced in 1992/93 and over the second half of 1997 and 1998.

**Figure 4: Selling Prices**

Note: (a) Net balance; deviation from long-run average.

## 7. Conclusion

Business surveys provide a potentially useful source of information about the economy. They benefit from being released well ahead of comparable official statistics. In some cases they fill in gaps in the official statistics and may provide a different perspective on an issue. Some of the questions posed are forward-looking, and quite often they provide supplementary information on areas of special interest. However, care needs to be taken in using the information in business surveys. They are subject to a number of possible sources of measurement error. Moreover, much of the information is qualitative and therefore needs to be summarised in the form of a net balance statistic, which can be difficult to interpret.

Looking at the performance of the various Australian business survey indicators over the past decade or so, a few observations can be made:

- in terms of information on the current state of the economy, business survey series such as business conditions (including sales/output), employment and selling prices, provide some information about developments in important macroeconomic variables. Timeliness is the obvious advantage, but some of the surveys also appear to be forward-looking;
- the profits component of surveys also performs relatively well in a number of the surveys, in particular for quarterly movements in profits, though they track the company profits measure of corporate profitability better than the national accounts measure of gross operating surplus;
- the results for capital expenditure are mixed. The surveys do not appear to offer much in the way of forecasting quarterly movements in business investment, though the two surveys looking at expectations over the year ahead (ACCI-Westpac and NAB) perform reasonably well; and
- generally speaking, the stocks and export components of the business surveys do not offer much, though there are some isolated exceptions such as the Dun & Bradstreet survey for stocks.

In terms of turning points, the business conditions component of business surveys has probably been a coincident indicator of turning points – and therefore has a timing advantage over official statistics – though they have provided a false signal on occasion. This component has identified periods when the economy is going into, and exiting from, major economic downturns such as the early 1990s recessions, but has been less successful at identifying turning points associated with smaller cyclical variations. In contrast, the employment and selling prices components of business surveys have been useful leading indicators of turning points in comparable official statistics, though to some extent this may reflect the lagging relationship that these indicators have with other important macroeconomic variables, such as growth in output.

Given the variability across the survey components, and even between the different surveys, the recommended approach is to focus on a range of surveys. Common themes can then be extracted and light shed on certain sectors, or aspects of the economy, where timely official data are not available. This can then be compared with other partial indicators of the economy such as growth in credit, share prices and corporate profitability. This approach also ensures that too much weight is not placed on a single result.



## Appendix A: Selected Survey Questions

**Table A1: Selected Survey Questions**

Survey	Question	Applies to:	Responses (reference period)	Comment
ACCI	Please indicate how your own business has performed over the last three months relative to the previous three months	Sales/revenue, export sales, average wages, other labour costs, average selling prices, profitability, employment levels, overtime, capital expenditure	Up, same, down (last three months, next three months)	The results are seasonally adjusted and de-trended by ACCI
ACCI-Westpac	Excluding normal seasonal changes, what has been your company's experience over the past three months and what do you expect during the next three months	Numbers employed, overtime worked, new orders, output, average costs per unit of output, average selling prices, export deliveries, stock of raw materials, stocks of finished goods	Up, same, down (past three months, next three months)	
AIG-PWC	Please indicate the changes your company experienced in respect of...	Production levels, sales levels, employment levels, overtime, wages, new orders, exports, profits, selling prices, stocks, deliveries of raw materials	Up significantly, up moderately, no change, down moderately, down significantly (last three months, next three months)	National results for the net balance statistic are seasonally adjusted by AIG-PWC
Dun & Bradstreet	Respondents are asked what they expect compared with the same quarter a year ago.	Sales, profits, employees, capital investment, inventories and selling prices	Increase, no change, decrease (actual – previous quarter, expected – quarter ahead)	Since the middle of 1999 different businesses have been surveyed in each month of the quarter, with the results aggregated for the

quarter; prior to 1999, one quarterly survey was undertaken in the third month of each quarter

NAB	Excluding normal seasonal changes, what is your opinion of your company's...	Trading performance (e.g. turnover, gross earnings), profitability	Very poor, poor, satisfactory, good, very good (changes in the last three months, changes in the next three months)
	Excluding normal seasonal changes, what changes has your company experienced in the following...	Number of employees, forward orders, stock, export sales	Very poor, poor, satisfactory, good, very good (conditions in the last three months, conditions in the next three months)
Yellow Pages	Thinking about the (reference period), excluding normal seasonal factors, have you experienced/do you expect...	Value of sales, employment, wages bill, prices, capital expenditure, profitability	Increase, no change, decrease (last three months, next three months)

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