Attitude: Does a little thing make a big difference?
An Analysis of the Westpac–Melbourne Institute Consumer Sentiment Index and its Component Indices

Introduction
The purpose of this paper is to evaluate the Westpac-Melbourne Institute consumer sentiment index (CSI) in Australia. The paper will analyse the extent to which separate component indices are indicators of economic growth, consumption expenditure and other economic variables. The current survey consists of five questions posed to consumers for their views on their current and prospective household financial situation; the 12 month and 5 year economic outlook; and current buying conditions for major household items.

The research aims to assess whether consumer sentiment influences economic variables and attempts to identify leading or lagging characteristics. This is important as an understanding of consumers’ expectations and purchasing plans and can provide useful links between future and present economic activity. The paper extends previous research by applying the analysis to the component indices in Australia and including the most recently available economic data—which shows some initial effects of the global financial crisis. The paper provides an insight into the relationship between economic variables and the components of consumer sentiment. It does not intend to provide a detailed econometric analysis, but rather to highlight patterns in the data and significant relationships to further understand linkages between consumer sentiment and economic indicators, especially leading indicator characteristics.

Past research
Analysis of various consumer sentiment indices and the extent to which they are indicators of growth and spending is widely researched. However, few research papers deliver a breakdown of the component indices and their relevant significance. Many studies have also considered international data.

Westpac-Melbourne Institute released a working paper in February 2008 which examined whether the disaggregation of consumer sentiment data improves forecasting ability for GDP and consumption for Australian data. It found that consumer sentiment data increases the accuracy of GDP and consumption forecasts, with certain components of consumer sentiment consistently providing better forecasts than aggregate consumer sentiment data. A Bayesian error correction model was applied to the data.

Another Westpac-Melbourne Institute Working Paper, Loundes and Scutella (2000) also examine the belief that consumers’ opinions and expectations can influence the direction of the economy. Loundes and Scutella (2000) also note that there has been little previous empirical work on Australian consumer sentiment. Their results indicated that consumer sentiment is a useful indicator of total consumption. Chua and Tsiaplias (2008) further the literature by considering whether the sub-components of consumer sentiment improve the capacity to forecast GDP and...
consumption. They find that consumer sentiment data increases the accuracy of GDP and consumption forecasts.

The Reserve Bank produced a discussion paper in November 2001 that considered whether various sentiment indicators can be explained on the basis of commonly available economic data. It also considered the ability of sentiment surveys to forecast major economic indicators. The paper found 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 sentiment indices.

In evaluating confidence indices as indicators of growth and spending, other studies have found significant relationships. A consumer sentiment study of South African data by de Jager (1993) found that consumption tends to recover two quarters after confidence recovers and that there are various economic indicators that are significant to the component indices. McNabb and Taylor (2007) used a dataset on consumer and business confidence indicators across the UK, France, Italy and the Netherlands and considered the extent to which the indicators are linked to GDP and the business cycle. In general they concluded that business confidence indicators are leading indicators and pro-cyclical. There was also some evidence to suggest causality between the indicators and GDP.

This paper will extend current research on consumer sentiment by applying a simple regression analysis to the component indices of consumer sentiment in Australia including the most recent economic data, incorporating the initial effects of the global financial crisis.

The Westpac–Melbourne Institute consumer sentiment index

An understanding of consumers’ expectations and plans provide a useful link between future and present economic activity. Consumer confidence surveys are therefore a useful tool to provide further information on economic activity, as possible indicators of growth and spending, to assist households, businesses, industry and policy-makers in their decision making.

The purpose of the Westpac-Melbourne Institute Consumer Sentiment index publication is to provide an indication of the shifts in consumer sentiment over time. In studies undertaken by Westpac-Melbourne Institute, it has been shown that the consumer sentiment index leads the business cycle by an average of 6 months at troughs and by an average of 11 months at peaks.

The consumer sentiment survey is conducted over a period of approximately four days in the first half of the month. The sample size is approximately 1200 respondents. As the index is usually available three months before the release of official economic indicators, it provides a useful early indication of the direction of economic activity.

Since 1959 consumption has accounted for almost 60 per cent of Australia’s GDP on average. Preliminary graphical analysis shows that consumer sentiment appears to lead GDP growth. As consumption expenditure makes up the largest component of GDP, it is expected that consumer sentiment will show the strongest relationship with this economic variable.

The consumer sentiment index in Australia is comparable to the two consumer surveys in the US. One of the surveys is by Reuters-University of Michigan and the
other by the Conference Board. The Reuters-University of Michigan survey is released two weeks prior to the Conference Board survey and could be regarded as more timely. It is also the more forward-looking of the surveys, with questions covering economic conditions over the next 12 months and over 5 years. The Conference Board only surveys expectations over the next 6 months.

As attitudinal surveys should detect early indications of a change in purchase and consumption patterns (de Jager, 1993) the index provides a useful tool for analysis. Katona (1975) as cited in Stuart (1983) argues that consumer spending is partly attributable to their willingness to buy, and therefore their ‘attitudes’ and ‘expectations’. The degree of consumer confidence will therefore determine where disposable income is spent. In the context of the current global financial crisis, changes in consumer sentiment have been watched closely by economists to provide a possible indication of changes in consumption behaviour.

Global financial crisis and recent developments in the CSI

Since September 2008, when the financial crisis intensified, overall economic activity slowed down significantly—globally and in Australia. The outlook for the global economy deteriorated sharply. The IMF cut its forecasts for global growth three times and forecast a global recession for 2009, with a modest recovery in 2010. The weight of the global recession is also impacting on the Australian economy. Australia’s GDP initially contracted by 0.5 per cent in the December quarter 2008, before recovering in the March quarter 2009. Consumer sentiment appears to lead changes in GDP as can be seen in Chart 1.

**Chart 1: Consumer sentiment and gross domestic product**

The government released its 2009–10 Budget on 12 May 2009. It forecast Australia’s real GDP to contract by 0.5 per cent in 2009–10 as a consequence of the global recession, but to recover in 2010–11 to 2.25 per cent growth. The unemployment rate is forecast to rise from 6.0 per cent in 2008–09 to 8.25 per cent in 2009–10 and to 8.5 per cent in 2010–11. Inflation is forecast to moderate over the forecast period
to 1.75 per cent in 2009–10 and to 1.5 per cent in 2010–11. The current account deficit is expected to widen to 5.25 per cent of GDP in 2009–10 and 5.75 per cent of GDP in 2010–11.

The Westpac-Melbourne Institute consumer sentiment index has mostly experienced significant falls in the index since January 2008, with only a few months experiencing monthly increases (month on month changes)—suggesting some leading characteristics for GDP growth. Since January 2008 the largest fall in sentiment occurred in October 2008—falling by 11.0 per cent from an index level of 92.2 in September 2008 to 82.0 in October 2008. An index level of 100 indicates that the balance of confidence or optimism is equally weighted, while an index of greater than 100 indicates that optimists outnumber pessimists. The index remained below 100 from February 2008 to May 2009, partly reflecting consumers concerns over the global economic crisis. However in the past three consecutive months the component consumer sentiment index has risen and stayed above the 100 mark, signifying that optimists outweigh pessimists. The latest figures show that the consumer sentiment index rose by 3.7 per cent in August, following a sharp rise by 9.3 per cent in July. The index is now at 113.4 index points and 31.6 per cent higher than a year ago. (See Chart 2). This research is timely in providing an analysis of the consumer sentiment index in the context of the global financial crisis and its effect on the economy.

**Chart 2: Consumer sentiment index**

![Chart 2: Consumer sentiment index](image)

**Theoretical specification of consumer sentiment**

The current index comprises five indices reflecting respondents’ views about their current and prospective household financial situation; the 12 month and 5 year economic outlook; and current buying conditions for major household items. The
index is calculated as an unweighted average of the five component indices. Each of the component indices are calculated by adding 100 to the net balance of positive and negative responses.

A theoretical specification of consumer sentiment can be represented in the following equation:

Consumer Sentiment Index (CSI) = f(GDP, UE, CPI, i, WAGE, YD, ER), where
GDP = growth in real gross domestic product
UE = unemployed rate
CPI = consumer price index
i = interest rate (cash rate)
WAGE = wage rate
YD = average disposable income
ER = exchange rate

Where CSI = [FIN + HH + FIN12 + ECON12 + ECON] / 5

The following questions are posed to consumers each month:

Q1 Financial Situation [FIN]
First about how people are getting along financially these days? Would you say you and your family are better-off financially or worse-off than you were at this time last year?
1. Better-off
2. Same
3. Worse-off
4. Uncertain/Don’t Know/It depends

Q2 Future Financial Situation [FIN12]
Looking ahead to this time next year. Do you expect you and your family to be better-off financially, or worse-off, or about the same as now?
1. Better-off
2. Same
3. Worse-off
4. Uncertain/Don’t Know/It depends

Q3 Future Economic Conditions [ECON12]
Thinking of economic conditions in Australia as a whole. During the next 12 months, do you expect we’ll have good times financially, or bad times, or what?
1. Good times
2. Good with qualifications
3. Some good, some bad
4. Bad with qualifications
5. Bad times
6. Uncertain/Don’t Know/It depends

Q4 Five-Year Economic Forecast [ECON]
Looking ahead, what would you say is more likely? That in Australia as a whole, we’ll have continuous good times during the next five years or so, or we’ll have some bad times—or what?
1. Continuous good times
2. Good with qualifications
3. Some good, some bad
4. Some bad with qualifications
5. Some bad times
6. Uncertain/Don’t Know/It depends

Q5 Consumer Buying Intentions [HH]
Next, about the major things people buy for their homes. Speaking generally, do you think now is a good time or a bad time, for people to buy major household items?
1. Good
2. Some good, some bad
3. Bad
4. Don’t know/Uncertain

As surveys of consumer attitudes are often used to draw associations between attitudes and intentions to purchase (Leone, 1983), each of these indicators should in theory reflect an aspect of confidence and according to sentiment hypotheses may have an influence on economic variables.

The following statistics have been chosen to test and compare the consumer sentiment component indices and their relationship with economic variables.

To measure family finances compared with a year ago [FIN]:
- Percentage changes in private consumption expenditure – seasonally adjusted at annual rates (CON)
- Percentage change in average weekly earnings – at annual rates – as a measure of wage rates (AWE)
- Percentage changes in disposable income – seasonally adjusted at annual rates (YD)
- Percentage changes in the consumer price index (CPI)
- Percentage changes in variable mortgage lending rates on housing loans – at annual rates as a measure of interest rate changes (MR)
- Percentage changes in the price return on the all ordinaries index at an annual rate (AO)
- Percentage changes in output prices of petroleum and coal products at annual rates (measure of petrol price changes) (PET)

To measure family finances for the next 12 months [FIN12]:
- Percentage changes in private consumption expenditure – seasonally adjusted at annual rates (CON)
- Percentage change in average weekly earnings – at annual rates – as a measure of wage rates (AWE)
- Percentage changes in disposable income – seasonally adjusted at annual rates (YD)
- Percentage changes in the consumer price index (CPI)
- Percentage changes in variable mortgage lending rates on housing loans – at annual rates as a measure of interest rate changes (MR)
- Percentage changes in the price return on the all ordinaries index at an annual rate (AO)
- Percentage changes in output prices of petroleum and coal products at annual rates (measure of petrol price changes) (PET)

To measure time to buy major household items [HH]:
- Percentage changes in private consumption expenditure – seasonally adjusted at annual rates (CON)
- Percentage change in average weekly earnings – at annual rates – as a measure of wage rates (AWE)
- Percentage changes in disposable income – seasonally adjusted at annual rates (YD)
Percentage changes in the price return on the all ordinaries index at an annual rate (AO)
- Percentage changes in output prices of petroleum and coal products at annual rates (measure of petrol price changes) (PET)
- Percentage changes in the price index of established homes, weighted average of all capital cities (HOUSE)

To measure economic conditions for the next 12 months [ECON12]:
- Percentage increase in gross domestic product in chain volume measures – seasonally adjusted at annual rates (GDP)
- Percentage changes in the unemployment rate – seasonally adjusted at annual rates (UE)
- Percentage changes in the consumer price index (CPI)
- Percentage changes in the US/AU spot exchange rate at annual rates (ER)

To measure economic conditions for the next 5 years [ECON]:
- Percentage increase in gross domestic product in chain volume measures – seasonally adjusted at annual rates (GDP)
- Percentage changes in the unemployment rate – seasonally adjusted at annual rates (UE)
- Percentage changes in the consumer price index (CPI)
- Percentage changes in the US/AU spot exchange rate at annual rates (ER)

Expected signs and relationships

Wage rate (AWE)
Average weekly earnings are an indicator of a family’s main source of income. If earnings increase in the current period, then finances compared to a year ago will be more positive. Therefore an increase in AWE will lead to respondents being more positive in response to the FIN question, they are more likely to feel better about their financial circumstances currently (compared to a year ago) and also about the future prospects (financial situation in 12 months time). The expected sign is therefore positive. Similarly, increased earnings would create a positive picture for economic conditions both in 12 months and 5 years time (ECON and ECON12 indicators).

Disposable income (YD)
Disposable income measures a person’s spending or consumption capacity. Therefore if disposable income were to increase, this would have a positive impact on family finances compared to a year ago as consumers now have more money at hand to spend or save, which also affects their decisions to buy household goods (HH). The expected sign is therefore positive. This same theory is applicable to the other consumer sentiment indices because when consumers feel more confident about their own wealth they are more likely to feel confident about the future prospects for the economy (ECON and ECON12).

Consumer price index (CPI)
An increase in inflation implies a general increase in the level of prices. Due to the relative price elasticities of goods within the consumer basket, the effect of inflation is not distributed evenly. For some, spending on general goods and services will be
considered more expensive and consumers may restrict their consumption habits. However, the overall effect on consumption expenditure will depend on the relative strength of this restriction. The expected sign is therefore positive or negative for all component indices.

**Interest rate (MR)**
The interest rate (mortgage rate) is a measure of consumers’ potential wealth and therefore their ability to spend more money. If mortgage rates increase then disposable incomes fall and financial situations worsen. However an increase in the interest rate can also lead to an increase in income for particular consumers, such as pensioners. Therefore the sign may be positive or negative for all component questions, depending on the relative strength of the relationship for different consumers.

**Share prices (AO)**
Share prices are a measure of consumers’ investments and potential to increase their disposable income and wealth. Therefore if share price returns increase, financial situations are likely to improve. The expected sign is therefore positive. Consumers will also feel more confident about future economic conditions and are more likely to consider it a good time to purchase major household goods.

**Petrol prices (PET)**
Petrol takes up a proportion of consumers’ disposable income and is a necessary good. Demand for petrol is inelastic and as prices rise, consumers are still likely to purchase the good. Therefore when petrol prices increase, disposable income falls and financial situations worsen. Therefore the expected sign is negative. Consumers are also less likely to feel confident about future economic conditions when petrol prices are rising.

**Exchange rates (ER)**
From a consumers’ perspective, increases in the exchange rate provide increased choice of purchases from overseas markets (and imports) and therefore better ‘value for money’. Therefore rises in exchange rates would be expected to contribute to improved confidence in financial situations, ability to purchase household goods and the general economic outlook. The expected sign is therefore positive for all component indices.

**House prices (HOUSE)**
House prices are a measure of wealth. If prices increase, the value of investments and therefore wealth also increase. This is likely to contribute to higher expectations about future financial conditions as well as conditions compared to a year ago. Increases in house prices also lead to a higher level of income and therefore likelihood to spend on household goods. The expected sign is therefore positive. Expectations about future economic conditions are also likely to improve with house prices.

**Unemployment rate (UE)**
Increasing unemployment is an indicator of higher likelihood of job loss and income, which reduces consumers’ confidence in their financial situations as well as economic conditions. Therefore the expected sign is negative.
**Gross domestic product (GDP)**

Changes in gross domestic product (GDP) reflect economic growth and increases in the standard of living across the country. Therefore when GDP increases this flows on to improved economic conditions in the future, better financial positions due to the high level of economic activity (and less likelihood of loss of jobs and incomes) and therefore spending abilities. The expected sign is therefore positive. As GDP increases consumers become more confident overall.

**Consumption expenditure (CON)**

As consumption expenditure makes up a large percentage of GDP a similar effect on consumer confidence is expected. Increased confidence about financial situations and economic conditions will all lead to higher expenditures. The expected sign is therefore positive.

**Empirical estimation and results**

This paper applies simple regression techniques to assess relationships and to identify patterns within each of the questions that make up the consumer sentiment index. Consumer confidence data is well known to be highly correlated and this is reflected in the relatively low Durbin Watson (DW) statistics found for most of the regressions run, this is particularly the case when disaggregating the sentiment index into its components. Relatively low DW statistics are therefore expected for the simple regressions for this research. Income and intention are often highly correlated and the use of aggregate data on a time series basis can result in serial correlation (Leone, 1983). The period of evaluation is from the June quarter 1980 through to the March quarter 2009.

As the purpose of this paper is to provide a preliminary analysis of the component indices of consumer sentiment in Australia further statistical tests and more complicated regression functions have not been performed. The main analysis therefore focuses on simple statistical interpretations of the t statistics, p values, R² and DW. This simple approach provides a picture of the underlying relationships in the component indices and contributes to a further understanding of sentiment and consumer behaviour.

Numerous regressions were run and those that presented significant relationships between the component indices and the economic variables tested are presented below. With the exception of average weekly earnings (AWE) and the consumer price index (CPI), all other variables (annual growth rates) were stationary and therefore inputted directly into the regressions. The AWE and CPI variables were non-stationary and required first differencing to transform them. For each component index the economic variables identified above were tested for up to four leads and lags. However, limited significant results were found for the lagged economic variables for each index. The most significant results for each index are discussed below.

**The financial situation compared to a year ago**

The financial situation compared to a year ago correlated best with current disposable income and future consumer prices, mortgage rates and consumption expenditure.
It would be expected that when comparing current financial situations consumers would be influenced by their most recent experiences. Disposable income was found to be significant at one to two lagged quarters, reinforcing the coincident nature of the FIN indicator—consumers are basing their answers on their immediate present and a small amount of time before and after (see table 1). The leading nature of the component index can be seen in Chart 3.

**Chart 3: The financial situation compared to a year ago and disposable income**

![Chart 3: The financial situation compared to a year ago and disposable income](chart3.png)

**Table 1**

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>Independent variable</th>
<th>t</th>
<th>p</th>
<th>R²</th>
<th>DW</th>
</tr>
</thead>
<tbody>
<tr>
<td>FIN</td>
<td>YD</td>
<td>7.17</td>
<td>0.00</td>
<td>0.37</td>
<td>0.50</td>
</tr>
<tr>
<td></td>
<td>YD(1)</td>
<td>6.09</td>
<td>0.00</td>
<td>0.29</td>
<td>0.62</td>
</tr>
<tr>
<td></td>
<td>YD(2)</td>
<td>5.45</td>
<td>0.00</td>
<td>0.25</td>
<td>0.54</td>
</tr>
<tr>
<td></td>
<td>YD(3)</td>
<td>4.79</td>
<td>0.00</td>
<td>0.21</td>
<td>0.43</td>
</tr>
<tr>
<td></td>
<td>YD(4)</td>
<td>3.55</td>
<td>0.00</td>
<td>0.12</td>
<td>0.41</td>
</tr>
</tbody>
</table>

The results showed that the FIN indicator effects changes in consumer prices in two to three quarters time. The CPI is demand driven and therefore consumers’ confidence in their wealth (financial) positions will effectively bid up prices however, with a lagged effect. (See table 2).

**Table 2**

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>Independent variable</th>
<th>t</th>
<th>p</th>
<th>R²</th>
<th>DW</th>
</tr>
</thead>
<tbody>
<tr>
<td>FIN</td>
<td>CPI(1)</td>
<td>2.70</td>
<td>0.01</td>
<td>0.06</td>
<td>0.48</td>
</tr>
<tr>
<td></td>
<td>CPI(2)</td>
<td>4.24</td>
<td>0.00</td>
<td>0.14</td>
<td>0.55</td>
</tr>
<tr>
<td></td>
<td>CPI(3)</td>
<td>4.17</td>
<td>0.00</td>
<td>0.14</td>
<td>0.62</td>
</tr>
<tr>
<td></td>
<td>CPI(4)</td>
<td>3.51</td>
<td>0.00</td>
<td>0.10</td>
<td>0.52</td>
</tr>
</tbody>
</table>
The same can be said about the result for consumption expenditure, which shows that FIN is the best indicator of changes in consumption if lagged by two quarters (see table 3). This can be explained by the cumulative effect of consumers’ behaviour and that the better they ‘feel’ about their financial circumstance the more likely they are to consume goods and services. In answering this survey question consumers may also view their answers with this in mind, ‘if this situation were to continue…’, and therefore be slightly forward looking. Chart 4 highlights the relationship between FIN and consumption.

**Chart 4: The financial situation compared to a year ago and private consumption expenditure**

The regression results for mortgage rates are more difficult to interpret. The sign of the coefficient is positive, suggesting that when consumers ‘feel better’ about their current situations this drives up mortgage rates in the future. However another interpretation is that the wealth effect for consumers is outweighing the effect of rising interest rates and subsequent availability of income. While a larger proportion of income may be going to mortgage loans as rates rise, consumers may perceive that the value of their house still outweighs this effect. (See table 4).

**Table 3**

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>Independent variable</th>
<th>$t$ value</th>
<th>$p$ value</th>
<th>$R^2$</th>
<th>DW</th>
</tr>
</thead>
<tbody>
<tr>
<td>FIN</td>
<td>CON</td>
<td>6.10</td>
<td>0.00</td>
<td>0.25</td>
<td>0.53</td>
</tr>
<tr>
<td></td>
<td>CON(1)</td>
<td>7.36</td>
<td>0.00</td>
<td>0.33</td>
<td>0.60</td>
</tr>
<tr>
<td></td>
<td>CON(2)</td>
<td>7.46</td>
<td>0.00</td>
<td>0.34</td>
<td>0.66</td>
</tr>
<tr>
<td></td>
<td>CON(3)</td>
<td>6.78</td>
<td>0.00</td>
<td>0.29</td>
<td>0.54</td>
</tr>
<tr>
<td></td>
<td>CON(4)</td>
<td>4.90</td>
<td>0.00</td>
<td>0.18</td>
<td>0.52</td>
</tr>
</tbody>
</table>
The financial situation in 12 months

The expected financial situation of consumers correlates best with future disposable income (three quarters hence) and private consumption expenditure (three quarters hence). This can be explained by the fact that consumers are forward looking and look ahead to assess their disposable incomes as a measure of their financial positions. The results suggest consumers look ahead by about three quarters to make decisions on how confident they are about future financial situations. Chart 5 illustrates the relationship between future finances and disposable income. (See table 5).

Chart 5: The financial situation in 12 months and disposable income

The results for consumption expenditure can be explained through the concept that deterioration in consumers’ outlook for financial conditions in the next 12 months
will affect consumption expenditure in three quarters time, which is indicated in Chart 6. (See table 6).

**Chart 6: The financial situation in 12 months and private consumption expenditure**

![Chart 6: The financial situation in 12 months and private consumption expenditure](chart)

**Table 6**

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>Independent variable</th>
<th>p</th>
<th>t value</th>
<th>R²</th>
<th>DW</th>
</tr>
</thead>
<tbody>
<tr>
<td>FIN12</td>
<td>CON</td>
<td>0.02</td>
<td>2.46</td>
<td>0.05</td>
<td>0.91</td>
</tr>
<tr>
<td></td>
<td>CON(1)</td>
<td>0.00</td>
<td>3.64</td>
<td>0.11</td>
<td>0.98</td>
</tr>
<tr>
<td></td>
<td>CON(2)</td>
<td>0.00</td>
<td>4.76</td>
<td>0.17</td>
<td>1.07</td>
</tr>
<tr>
<td></td>
<td>CON(3)</td>
<td>0.00</td>
<td>5.35</td>
<td>0.21</td>
<td>1.08</td>
</tr>
<tr>
<td></td>
<td>CON(4)</td>
<td>0.00</td>
<td>4.74</td>
<td>0.17</td>
<td>1.08</td>
</tr>
</tbody>
</table>

Mortgage rate changes also presented significant results for the FIN12 indicator, however the sign of the coefficient was not as expected. As discussed for the previous index, this could be due to the wealth effect overcoming income effects, or could also be related to perceived ‘good’ financial situations now leading to increased mortgage rates in four quarters time as a result of increased consumption activity. Extensive experimentation with changes in average weekly earnings, share prices, petrol prices and the consumer price index as determinants of FIN12 all proved insignificant. (See table 7).

**Table 7**

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>Independent variable</th>
<th>p</th>
<th>t value</th>
<th>R²</th>
<th>DW</th>
</tr>
</thead>
<tbody>
<tr>
<td>FIN12</td>
<td>MR(3)</td>
<td>0.00</td>
<td>2.91</td>
<td>0.07</td>
<td>0.87</td>
</tr>
<tr>
<td></td>
<td>MR(4)</td>
<td>0.00</td>
<td>3.43</td>
<td>0.10</td>
<td>0.92</td>
</tr>
</tbody>
</table>

**The economic situation in 5 years**

ECON is the best (leading) indicator of growth in gross domestic product if lagged by two to three quarters. As expected the ECON indicator is also significant with respect...
to growth in the unemployment rate. About three quarters after a deterioration in expectations about the future economic situation, the unemployment rate will increase. (See table 8 and Chart 7).

Chart 7: Economic situation in 5 years and change in gross domestic product

Table 8

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>Independent variable</th>
<th>t</th>
<th>p value</th>
<th>$R^2$</th>
<th>DW</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECON</td>
<td>GDP</td>
<td>2.39</td>
<td>0.02</td>
<td>0.05</td>
<td>0.40</td>
</tr>
<tr>
<td></td>
<td>GDP(1)</td>
<td>2.93</td>
<td>0.00</td>
<td>0.07</td>
<td>0.46</td>
</tr>
<tr>
<td></td>
<td>GDP(2)</td>
<td>3.69</td>
<td>0.00</td>
<td>0.11</td>
<td>0.46</td>
</tr>
<tr>
<td></td>
<td>GDP(3)</td>
<td>3.81</td>
<td>0.00</td>
<td>0.12</td>
<td>0.47</td>
</tr>
<tr>
<td></td>
<td>GDP(4)</td>
<td>3.31</td>
<td>0.00</td>
<td>0.09</td>
<td>0.47</td>
</tr>
</tbody>
</table>

Results for changes in private consumption expenditure were also significant with respect to ECON. When consumers are feeling positive about future economic conditions they are more likely to feel confident about their wealth positions and spending is likely to increase. The results show that ECON has a lagged effect of about three to four quarters on consumption. The overall explanatory power, as measured by the coefficient of determination, was highest for the relationship between ECON and UE. (See tables 9 and 10).

Table 9

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>Independent variable</th>
<th>t</th>
<th>p value</th>
<th>$R^2$</th>
<th>DW</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECON</td>
<td>CON(2)</td>
<td>2.74</td>
<td>0.01</td>
<td>0.06</td>
<td>0.45</td>
</tr>
<tr>
<td></td>
<td>CON(3)</td>
<td>3.69</td>
<td>0.00</td>
<td>0.11</td>
<td>0.45</td>
</tr>
<tr>
<td></td>
<td>CON(4)</td>
<td>3.62</td>
<td>0.00</td>
<td>0.11</td>
<td>0.49</td>
</tr>
</tbody>
</table>
The economic situation in 12 months

The results for economic conditions in 12 months time were very similar to the ECON indicator with gross domestic product, consumption expenditure, and the unemployment rate all producing significant results. The signs of these three coefficients were as expected, however ECON12 proved to be a good leading indicator of these variables at different lags to ECON.

ECON12 leads growth in gross domestic product by one to two quarters and consumption expenditure by three quarters. The economic situation in 12 months also proved to be a good indicator of unemployment changes in lagged by two to three quarters. (See tables 11, 12 and 13). Chart 8 indicates that the ECON12 index displays leading characteristics.

Chart 8: Economic situation in 12 months and change in gross domestic product

Table 11

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>Independent variable</th>
<th>t</th>
<th>p value</th>
<th>R²</th>
<th>DW</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECON12</td>
<td>GDP</td>
<td>5.63</td>
<td>0.00</td>
<td>0.22</td>
<td>0.60</td>
</tr>
<tr>
<td>GDP(1)</td>
<td>6.60</td>
<td>0.00</td>
<td>0.28</td>
<td>0.70</td>
<td></td>
</tr>
<tr>
<td>GDP(2)</td>
<td>6.55</td>
<td>0.00</td>
<td>0.28</td>
<td>0.66</td>
<td></td>
</tr>
<tr>
<td>GDP(3)</td>
<td>5.28</td>
<td>0.00</td>
<td>0.20</td>
<td>0.62</td>
<td></td>
</tr>
<tr>
<td>GDP(4)</td>
<td>3.64</td>
<td>0.00</td>
<td>0.11</td>
<td>0.56</td>
<td></td>
</tr>
</tbody>
</table>
Significant results were found for changes in the exchange rate and the consumer price index (both of which produced insignificant results for the economic situation in 5 years). Consumers’ confidence in the economic outlook for the next twelve months would spur on spending activity leading to an overall increase in consumption across the economy, having a flow on effect to prices. The results suggest this indicator is a leading indicator of changes in consumer prices if lagged by four quarters. (See table 14).

The interpretation of ECON12 as an indicator of changes in the exchange rate is slightly more difficult to interpret. The regression results were highest for the same quarter, even though the question is posed with respect to future conditions. The sign of the coefficient was negative and not as expected. (See table 15).

The time to buy household goods
The time to buy indicator for consumers suggests that it can be used to predict future patterns in private consumption expenditure with a three to four quarter lag. The coefficient signs for all economic variables were as expected. This relationship is
also reflected in the R² values. The leading nature of the HH index is distinctly noticeable as seen in Chart 9. (See table 16).

**Chart 9: The time to buy household goods and private consumption expenditure**

![Chart showing time to buy household goods and private consumption expenditure](chart9.png)

Table 16

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>Independent variable</th>
<th>t</th>
<th>p value</th>
<th>R²</th>
<th>DW</th>
</tr>
</thead>
<tbody>
<tr>
<td>HH</td>
<td>CON</td>
<td>2.04</td>
<td>0.04</td>
<td>0.04</td>
<td>0.54</td>
</tr>
<tr>
<td></td>
<td>CON(1)</td>
<td>3.72</td>
<td>0.00</td>
<td>0.11</td>
<td>0.58</td>
</tr>
<tr>
<td></td>
<td>CON(2)</td>
<td>5.19</td>
<td>0.00</td>
<td>0.20</td>
<td>0.64</td>
</tr>
<tr>
<td></td>
<td>CON(3)</td>
<td>5.84</td>
<td>0.00</td>
<td>0.24</td>
<td>0.73</td>
</tr>
<tr>
<td></td>
<td>CON(4)</td>
<td>5.80</td>
<td>0.00</td>
<td>0.24</td>
<td>0.73</td>
</tr>
</tbody>
</table>

Future disposable income (lag of 4 quarters) and future house prices (lags of 2 to 3 quarters) also presented the most significant results for the HH indicator. This result is consistent with the theory that consumers’ intentions to purchase household goods are dependent on their relative view of their own wealth. The result of the YD regression means that consumers must be forward looking when regarding their purchases and consider their disposable income in one year time (4 quarters ahead). (See table 17 and Chart 10).
House prices are a measure of consumers’ relative wealth and if prices increase then they see themselves as ‘wealthier’ and more likely to be in a position to spend on household goods. The results show that intentions to purchase household goods are dependent on how much house prices will change in two to three quarters time. (See table 18).

Table 18

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>Independent variable</th>
<th>t</th>
<th>p value</th>
<th>R²</th>
<th>DW</th>
</tr>
</thead>
<tbody>
<tr>
<td>HH</td>
<td>HOUSE(1)</td>
<td>1.97</td>
<td>0.06</td>
<td>0.14</td>
<td>0.72</td>
</tr>
<tr>
<td></td>
<td>HOUSE(2)</td>
<td>2.80</td>
<td>0.01</td>
<td>0.25</td>
<td>0.71</td>
</tr>
<tr>
<td></td>
<td>HOUSE(3)</td>
<td>2.53</td>
<td>0.00</td>
<td>0.22</td>
<td>0.89</td>
</tr>
<tr>
<td></td>
<td>HOUSE(4)</td>
<td>1.75</td>
<td>0.09</td>
<td>0.12</td>
<td>1.16</td>
</tr>
</tbody>
</table>

Consumer sentiment and growth cycles

The notion that consumer sentiment indices are more useful as leading indicators of economic variables during ‘bust’ periods as opposed to ‘booms’ is widely discussed. Many studies have compared confidence indices to business cycles to determine the significance of the relationship. McNabb and Taylor (2007) found that in general confidence properties across four European countries showed leading indicator
behaviour, are pro-cyclical, and explain a large percentage of the variance of GDP decompositions. Santero and Westerlund (1996) examined the usefulness of consumer and business surveys in assessing the cyclical position of the economy and found that sentiment measures provide valuable information for his assessment, however, the relationship varies significantly across countries.

Preliminary testing in this study comparing a period of relative slow economic growth in Australia (downturn experienced during 1980–1993) and a subsequent period of rising growth (upturn experienced 1994–2008) showed only minor change to the results. Initial testing was done for the variables expected to show the strongest relationship; private consumption expenditure for the two financial situation indices and household goods; and gross domestic product changes for the economic situation indices.

The most notable result was a general increase in the DW statistics for each regression. The most significant result was found for the HH sub-index in the time period 1994Q1:2009Q1. The results showed significantly improved DW and for $R^2$ statistics (see Table 19), suggesting that during periods of sustained economic growth consumers’ confidence about purchasing household goods is more likely to translate into private consumption expenditure. (See table 19).

Table 19

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>Independent variable</th>
<th>1994Q1:2009Q1</th>
<th>1980Q2:2009Q1</th>
</tr>
</thead>
<tbody>
<tr>
<td>HH</td>
<td>CON</td>
<td>R² 0.16</td>
<td>DW 0.91</td>
</tr>
<tr>
<td></td>
<td>CON(1)</td>
<td>R² 0.25</td>
<td>DW 1.17</td>
</tr>
<tr>
<td></td>
<td>CON(2)</td>
<td>R² 0.39</td>
<td>DW 1.24</td>
</tr>
<tr>
<td></td>
<td>CON(3)</td>
<td>R² 0.32</td>
<td>DW 1.33</td>
</tr>
<tr>
<td></td>
<td>CON(4)</td>
<td>R² 0.15</td>
<td>DW 1.42</td>
</tr>
</tbody>
</table>

**Conclusion**

The results presented here indicate that the component indices of the consumer sentiment index in Australia provide useful indicators of economic variables. The component indices mostly display leading characteristics. To some extent these results are consistent with previous consumer confidence research in that understanding consumers’ expectations is a viable tool for assessing future economic activity.

The simple regression analysis applied in this paper will be a useful base for extensions on the statistical analysis, further research into business cycles, or application to other economic variables. Further research would also benefit from multivariate analysis to draw out more information about the relative relationships.

The paper extends previous research by applying the analysis to the $component$ indices in Australia and including the most recently available economic data—which has shown some initial effects of the global financial crisis.
References


