Lay people's models of the economy: A study based on surveys of consumer sentiments

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Abstract

The purpose of this paper is to use a large data set comprising individual’s responses to survey questions about future economic conditions, unemployment and prices to explore lay people’s models of the economy and specifically their understanding of the relationship between unemployment and economic activity and also between unemployment and prices. The data is taken from the questionnaires used to form monthly indexes of consumer sentiments in Australia. We ask if the implied bivariate relationships are rational in the sense used by Muth (1961) and if they are consistent with the good-begets-good heuristic proposed by Leiser and Aroch (2009). We also ask if they are consistent with the actual operation of economic – and especially monetary – policy in Australia. We find that the data does provide some support for these hypotheses and for recent work in behavioural macroeconomics utilising the good-begets-good heuristic.

1. Introduction

In 1946 the Survey Research Centre at the University of Michigan commenced regular monthly surveys of US consumers primarily in order to obtain information about likely consumer spending and saving behaviour for forecasting purposes. The survey instrument and the associated indexes of consumer sentiments were developed by George Katona and cover not only individual consumer’s spending intentions but also how they view prospects for a number of macroeconomic variables (especially inflation, unemployment and output) over the near term. Since it was first applied in the USA, Katona’s survey has been adopted by many other advanced economies, including Australia.

While considerable attention has been devoted to aggregating the survey responses into an index of consumer sentiment and also to researching expectations of particular individual variables (inflation expectations especially), little attention has been devoted to exploring the bivariate relationships which are implicit in the respondents’ answers to questions about the behaviour of individual macroeconomic variables. There are three reasons why these relationships, as revealed to us by the

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surveys of consumers, are of interest. First, the democratic or libertarian ideal suggests that we should be interested in lay people’s mental maps or models of the economy; the analysis of individual’s responses to this questionnaire provides one way to obtain this information. Second, it is of interest to know if lay people’s ideas are rational in the ‘Muthian sense’ in which case their expectations, “since they are informed predictions of future events, are essentially the same as the predictions of the relevant economic theory” (Muth, 1961, p. 316). In particular it is of interest to know if lay people’s ideas are consistent with the way the economy, and especially monetary policy, operates. Finally, we need to understand why people not trained in economic theory see things the way they do. This is important for the design of good economic policy, especially if the assumption of rational expectations is dropped as: (a) this means we have to take the heterogeneity of expectations into account when building policy-oriented models, and (b) often policy changes are aimed at changing people’s expectations (this is especially in the case of monetary policy aimed at combating inflation) and this presumes that we have some understanding of what those expectations are and how they are formed. One attempt to explain why people not trained in economic theory see things the way they do is the good-begets-good heuristic posited by Leiser and Aroch (2009) and which we shall discuss in more detail in the next section of the paper. The consumer’s survey responses provide an opportunity to test this hypothesis with a relatively large sample size.

As mentioned above, the survey questionnaires which are used as the basis for the computation of a consumer sentiment index include questions about how individuals view prospects for prices, unemployment and the level of economic activity over the coming year. Since we have access to each individual’s responses to these questions in every month the survey has been operating in Australia, we are in a position to see whether these variables are thought to be related and, if they are, to see if they are thought to be positively or negatively related.

For some time there has been broad agreement amongst economists as to the ‘short-run’ relationship between the three variables for which we have information. Textbooks in macroeconomics, even at the most elementary level, cover two doctrines of relevance to our study. The first, is “Okun’s Law” which states that there is an inverse relationship between changes in unemployment and in the level of economic activity. The second is the “Phillip’s Curve” which states that there is an inverse relationship (or ‘trade-off’) between the rate of unemployment and the rate of inflation in an economy. Since we wish to know if lay people’s ideas are rational in the ‘Muthian sense’ we will test the hypotheses that lay people’s views are consistent with Okun’s Law and the Phillip’s Curve. This means that we will go beyond merely describing the apparent bivariate relationships to perform some basic statistical tests. The survey responses are ordinal and suitable for this purpose. The statistical test adopted in this paper is the well-known Kendall’s tau test which is a common non-parametric measure of association.

To summarise: the aim of the paper is to describe the implied connection in lay people’s minds between (changes in) unemployment & economic activity and also between (changes in) unemployment & prices. To do this we analyse survey data which gives over 200,000 observations of consumer’s views about the expected state of the economy (and specifically future economic conditions, unemployment and prices) covering every month for 17 years. The paper is organised as follows. Section 2 presents a brief review of previous research on lay persons’ understanding of economic relationships. Section 3 gives a brief description of the survey data while Section 4 reports the results. Concluding comments and caveats are in Section 5.

2. Previous work on lay people’s models of the economy

Surprisingly, there has been very little work on lay persons’ understanding of economic relationships. Most authors simply examine lay people’s attitudes or opinions on specific economic outcomes. Subjects studied include inflation (see Leiser and Drori (2005) and Ranyard, Del Missier, Bonini, Duxbury, and Summers (2008) for examples), the global financial crisis (see for example Gangl, Kastlunger, Kirchler, and Voracek (2012), the papers in the 2010 special issue of the Journal of Socio-Economics on ‘The Financial Crisis’ and Christandl (2013)) and policy choices (examples include higher taxes and government expenditure on welfare, see Heinemann and Hennig-Hausen (2012) and Stix (2013)). Occasionally there is a comparison between the responses of lay people and professional economists to survey questions (Blendon et al. (1997) and Caplan (2001)). Compared with our study however these papers do not focus on lay people’s understanding of the bivariate relationship between key macroeconomic variables. Having said that, we are aware of three studies which do seek to uncover the connections lay people see between macroeconomic variables or ideas. One is the paper by Williamson and Wearing (1996). They asked open-ended questions of 95 lay people in an attempt, inter alia, to reveal those economic concepts the respondents saw as linked and the direction and sign of the relationship between them. Each interviewee’s

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2 Essentially this says that if a number of events (or variables) are judged to be either good or bad that any two items within each group will be thought to be positively related with each other while any two items from different groups will be thought to be negatively or inversely related to each other.

3 This is named after the US applied economist Arthur Okun who in 1962 noticed the relationship for US data. Okun was a Yale Professor of Economics who served on the Council of Economic Advisers during the Kennedy and Johnson presidencies.

4 This is named after A.W. (Bill) Phillips, a New Zealander who was Tooke Professor of Economic Science and Statistics at the University of London 1958–1967. Phillips published his first paper on the inverse relationship between inflation and unemployment in 1958. Since then there has been a great deal of work on the nature of the relationship between inflation and unemployment. The hypothesis we consider here (that the two variables are negatively related) is that found in basic economics texts. However, in Section 5 of the paper we will argue that the way monetary policy operates in Australia may provide support for the expectation of a positive relationship between inflation and unemployment.
responses were used to form a highly detailed (and often very complicated) cognitive model of inter-relationships between variables/ideas for that person (examples are presented in the form of diagrams of the respondent’s mental maps\(^5\) in the paper). Unfortunately, due to the open ended nature of the questions and the interests of the authors, no information was reported in the published paper on any perceived bivariate connections including any connections between the three macroeconomic variables of interest here.

Related to the paper by Williamson and Wearing (1996) is the (unpublished) PhD thesis by Williamson (1992). This contains more information of relevance to our study than the journal article mentioned above. Amongst other things, Williamson administered a questionnaire to the 95 subjects which contained explicit questions about the bivariate relationship between a number of variables. Williamson provides information on only one of the bivariate relationships of interest to us, namely the relationship between unemployment and economic growth. A large majority of the respondents saw unemployment and economic growth as negatively related (Williamson, 1992, p. 136), consistent with Okun’s Law and, as we shall see, with the good-begets-good heuristic of Leiser and Aroch (2009).

A second published paper on this topic is that by Leiser and Aroch (2009) who set out to examine lay people’s understanding of the bivariate relationship between various macroeconomic variables. The participants were 42 first-year students in psychology at Ben-Gurion University who responded to a self-paced computer-administered questionnaire in individual booths.\(^6\) The main part of the questionnaire elicited judgments on the causal links between pairs of economic variables. The authors selected 19 economic variables, including: ‘unemployment rate’, ‘economy growth rate’ and ‘rate of inflation’. Each of ‘the questions followed a fixed format: If variable A increases, how will this affect variable B? For example: If the unemployment rate increases, how will this affect the inflation rate?’ (Leiser & Aroch, 2009, p. 374).

Participants were found to confidently state causal links between variables and to describe a positive or negative relationship between each pair. The authors found (see page 378 of their paper) that the participants saw the rate of economic growth and the rate of unemployment to be negatively related (this is consistent with Okun’s law) and they saw the rate of unemployment and the rate of inflation to be positively related\(^7\) (which is not consistent with most representations of the Phillips’s curve).

Most striking to us is the finding in Leiser and Aroch (2009) that lay people see unemployment and inflation as positively related. The authors have a neat and interesting explanation of the participant’s categorisations into those which are positively related and those which are negatively related by arguing that “When asked: “Does A influence B (and in what direction)?” participants can answer readily on the basis of a simple heuristic, which we dubbed the good-begets-good (GBG) heuristic: If A and B belong to the same pole, an increase in one will also raise the other; if they belong to opposite poles, a rise in one will cause the other to drop”… “Economic events are classified as good or bad, not as neutral components in a causal system … We submit that naïve participants rely on a simple but powerful heuristic: the economic world functions in either a virtuous or a vicious circle. An increase in one good variable will increase the values of other good variables, and decrease those of bad variables. This good-begets-good heuristic settles in most cases how to answer. It is not unrelated to the way economic events are commonly described in popular economic discourse, with strong valuation of every change as either positive or negative” (Leiser & Aroch, 2009, p 378 & p 381).\(^8\) As economists we would express their explanation for the results slightly differently. In the language of economics a ‘good’ is something where more is preferred to less while a ‘bad’ is something where less is preferred to more. It would appear from Table 3 of their paper that ‘goods’ are grouped together and are thought to be positively related to each other while ‘bads’ are grouped together and are thought to be positively related to each other and to be negatively related to ‘goods’. Thus the participants saw economic growth and unemployment to be negatively related (one is a good and one is a bad) while unemployment and inflation are thought to be positively related (both are bads).

In this paper we are (inter alia) interested in whether or not the evidence from surveys of consumer sentiments is consistent with the good-begets-good (GBG) heuristic. Given this hypothesis, we would expect to find a negative association between expectations of economic activity and unemployment while finding a positive association between unemployment and prices. In some ways it is the second of the two relationships which is most interesting from the point of view of testing the GBG heuristic, as the mainstream economist’s Phillips curve would suggest unemployment and inflation are inversely related (contrary to the GBG heuristic) while both the economist’s model and the GBG heuristic would predict a negative association between unemployment and the level of economic activity.

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\(^5\) A model may be thought of as a mental or cognitive map of the world or part of the world. For further discussion see Craik (1943), Johnson-Laird (1989) and Jones, Ross, Lynam, Perez, & Leitch, (2011) and the references cited therein.

\(^6\) A second group of participants was composed of 18 students in their last year of their bachelor’s degree in economics at the same institution. We will focus, as did Leiser and Aroch on the results for the 42 psychology students as they can be regarded as “lay” or, as Leiser and Aroch (2009, p. 373) put it, “economically naïve”.

\(^7\) In their published paper Leiser and Aroch do not give measures of the correlation or any other quantitative measure of association between the variables. However, in a personal communication David Leiser informs us that a large majority (over 4/5) of the 42 respondents saw inflation and unemployment as positively related. In another personal communication David Leiser informs us that in a recent and much larger research project carried out together with Noa de la Vega, 137 out of 180 (that is just over 3/4) respondents saw inflation and unemployment as positively related.

\(^8\) Ziv and Leiser (2013, p. 820) write that: “in studies of naive economic understanding in adults, participants manifest a striking willingness to answer questions about macroeconomic causation, even when their understanding of these matters, as judged by follow-up questions, is very low”.

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Table 1A
Contingency tables (all observations). Responses to questions regarding the change in unemployment and economic activity.

<table>
<thead>
<tr>
<th>Economic activity</th>
<th>1</th>
<th>0</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unemployment</td>
<td>6888</td>
<td>7694</td>
<td>18423</td>
</tr>
<tr>
<td></td>
<td>25710</td>
<td>27721</td>
<td>42078</td>
</tr>
<tr>
<td></td>
<td>49606</td>
<td>23494</td>
<td>19620</td>
</tr>
</tbody>
</table>

Notes:
1. The qualitative responses to the activity question are recorded as: –1 if economic activity is expected to fall, 0 if it is expected to remain unchanged and +1 if it is expected to rise; while the qualitative responses to the unemployment question are recorded as: –1 if unemployment is expected to fall, 0 if it is expected to remain unchanged and +1 if it is expected to rise.
2. The value of Kendall’s tau-b for the data in Table 1A (unemployment and economic activity) is –0.286 with a p-value of 0.000. This is consistent with Okun’s Law and is also consistent with the results in Williamson (1992) and in Leiser and Aroch (2009) and with the good-begets-good heuristic.

3. The MIAESR survey data

The data come from a survey conducted monthly for the Melbourne Institute of Applied Economic and Social Research (MIAESR) which is part of the University of Melbourne. Survey interviews are conducted by telephone using trained interviewers. The surveys involve either 1200 or 1400 (depending upon the month) adults aged 18 years and over, across Australia. Telephone numbers and the household respondent are selected at random. The survey data commences in January 1995 and ends in December 2011, covering 204 months in total. The respondents are different each month and so while it is possible to look for patterns across individuals in any one month, it is not possible to track an individual’s responses over time. Also, as with the Michigan survey, the questionnaire contains questions designed to elicit information about each individual’s expectations about economic conditions in the 12 months from the date of the survey. The relevant questions and our coding are:

**Economic Activity:** “Thinking of economic conditions in Australia as a whole, during the next 12 months do you expect we’ll have: (1) Good times, (2) Good with qualifications. (3) Some good, some bad. (4) Bad with qualifications. (5) Bad times. (6) Uncertain/Do not Know/It depends”. The responses to this question have been scored [1 10 –1 –1] respectively after deleting those who chose option 6.

**Unemployment:** “Now about people being out of work during the coming 12 months, do you think there'll be: (1) More unemployment. (2) About the same/Some more some less. (3) Less unemployment. (4) Do not Know”. The responses to this question have been scored [1 10 –1 –1] respectively after deleting those who chose option 4.

**Prices:** “Thinking about the prices of things you buy, by this time next year, do you think they’ll have gone: (1) up, (2) down or (3) stayed the same?” (4) Do not Know/Uncertain”. The responses to this question have been scored [1 –10] respectively after deleting those who chose option 4.

Thus, the data set provides direct evidence about the expected movements in the levels of economic activity, unemployment and prices over the coming year. The statistical analysis is undertaken to infer the implied pair-wise correlations from respondents’ answers to the questions about their expected views of the direction of change of each variable.

Notice before we proceed that, unlike the studies mentioned in the literature review (Williamson (1992), Williamson and Wearing (1996) and Leiser and Aroch (2009)), we do not have information on the respondent’s answers to specific questions about their beliefs on the connections between each pair of variables. Instead we are inferring the bivariate connections from the respondent’s answers to quite separate questions involving their perceptions of likely favourable/unfavourable changes for each individual variable. Notice also that our analysis can only cover the cases where the respondents feel they do have a basis to respond as in each month we exclude the Don’t Know/Uncertain responses and focus only on responses we can match across questions.

4. Results and discussion

Since we know the responses given to these questions by each individual in each month the paired responses data can be arranged in the form of 3 × 3 contingency tables with the columns and rows recording the number of +1, 0 and –1 for each of our two-variable combinations. In each case we have discarded the ‘do not knows’ and ‘uncertains’ and have only included responses which can be matched across at least one pair. Since we can match responses for each month over 17 years, we are able to recover the implicit bivariate relationships for 204 months. The number of responses we are able to match for each month has a mean of 1084 and a standard deviation of 77. In most months (185 out of 204) we are able to match more than

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9 This is the most problematic of the three questions given the focus of our research. Strictly speaking the question is asking about prices (i.e. the price level) rather than inflation (i.e. the rate of change in the price level). However we note that a recent survey of perceptions and expectations of price changes and inflation concluded that: “The main insight from the review is that while consumers may have a limited ability to store and recall specific prices and even succumb to a number of biases in the way in which they form perceptions and expectations of global price changes, they do seem to have some feel for, and ability to judge and forecast, inflation” (Ranyard et al., 2008 p. 397).
out our statistical tests using data for each individual month over our sample period. To avoid spurious correlations which are purely the result of the aggregation of the data over such a long time period, information sets are available to the respondents. Hence, to obtain a better understanding about the relationships and to better perceive the noise and measurement error inherent in such data, to conduct formal tests of our hypotheses. Given the ordinal nature of the data, we use Kendall’s tau-b as our measure of the association between each pair of variables. Values of tau-b may range from −1 if there is a perfect negative association (i.e. all pairs lie along the minor SW-NE diagonal of the table) to +1 where there is a perfect positive association (i.e. all pairs lie along the major NW-SE diagonal of the table).11

As mentioned, Table 1A refers to paired answers to questions about the level of activity (Y) and unemployment (U) and it is clear that there is not a perfect correlation (whether positive or negative) between the two as many responses lie off the diagonals. However, roughly twice as many respondents lie in cells along the minor (SW-NE) diagonal than lie in cells along the major (NW-SE) diagonal. Along the minor diagonal are the respondents who, when they expected economic activity to rise, expected unemployment to fall and vice versa.

Contingency Table 1B refers to paired answers to questions about prices (P) and unemployment (U). Looking at this contingency table it is again clear that there is not a perfect correlation (whether positive or negative) between the two variables as, once again, we see that many responses lie off the diagonals. However, over twice as many respondents lie in cells along the major (NW-SE) diagonal than lie in cells along the minor (SW-NE) diagonal. The major diagonal shows the number of respondents who, when they expected a fall in unemployment, also expected a fall in prices and vice versa.

While inspection of contingency tables is suggestive of the presence and direction of relationships it is necessary, given the noise and measurement error inherent in such data, to conduct formal tests of our hypotheses. Given the ordinal nature of the data, we use Kendall’s tau-b as our measure of the association between each pair of variables. Values of tau-b may range from −1 where there is a perfect negative association (i.e. all pairs lie along the minor SW-NE diagonal of the table) to +1 where there is a perfect positive association (i.e. all pairs lie along the main NW-SE diagonal of the table).11 However, aggregating data from all months over the whole of the period 1995–2011 cannot be particularly informative about the presence or absence of bivariate relationships as it brings together individual’s expectations formed at very different times, and especially at very different stages of the business cycle (including the period of the global financial crisis) when very different information sets are available to the respondents. Hence, to obtain a better understanding about the relationships (and to better avoid spurious correlations which are purely the result of the aggregation of the data over such a long time period) we carried out our statistical tests using data for each individual month over our sample period.

The values of tau-b and their 95% confidence intervals for every month of the survey are displayed as a time series in Figs. 1 and 2.12 Fig. 1 shows the values for the expected change in unemployment and activity while Fig. 2 shows the values for the expected change in unemployment and prices. The plots of the correlation coefficients over time show that lay people’s perceptions of the relationships have been relatively stable except for the period 2007–2010 (this is the period leading into the global financial crisis (GFC) and the years when it had the greatest impact upon the Australian economy).13

As mentioned, Fig. 1 assesses the association between the responses to the question dealing with unemployment expectations and the responses to the question dealing with expectations of the level of economic activity. In every month we have a significant and negative relationship between the two, indicating that those who responded by saying that economic activity would fall (rise) tended to also respond by saying that unemployment would rise (fall). So for all 204 months in 2007 and 2008, which were periods of global financial crisis.

### Table 1B

Contingency tables (all observations). Responses to questions regarding the change in unemployment and prices.

<table>
<thead>
<tr>
<th></th>
<th>Prices</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Unemployment</td>
<td>−1</td>
<td>1183</td>
<td>4873</td>
</tr>
<tr>
<td></td>
<td>0</td>
<td>2127</td>
<td>13163</td>
</tr>
<tr>
<td></td>
<td>+1</td>
<td>2834</td>
<td>9933</td>
</tr>
</tbody>
</table>

Notes:
1. The qualitative responses to the price question are recorded as: −1 if the price level is expected to fall, 0 if it is expected to remain unchanged and +1 if it is predicted to rise.
2. The value of Kendall’s tau-b for the data in Table 1B (unemployment and inflation) is +0.040 with a p-value of 0.000. This is consistent with the economist’s Phillips curve but, although the correlation is very low (it is positive and significantly different from zero) consistent with Leiser and Aroch (2009) good-begets-good heuristic.

1000 responses. The months with the smallest number of matches are February 1996 when we can match only 895 of the 1200 responses and November 2007 when we can match only 918 of the 1200 responses. These two months coincided with federal elections in Australia and are the only election dates in our sample period which saw a change in government (all other months in which election campaigns were occurring show no reduction in the number of responses which can be matched – that is, no increase in the number of ‘do not knows’ or ‘uncertain’ responses).

To assist the reader to understand what follows, we show in Tables 1A and 1B the contingency table for all of the observations in our data set taken together.10

Contingency Table 1A refers to paired answers to questions about the level of activity (Y) and unemployment (U) and it is clear that there is not a perfect correlation (whether positive or negative) between the two as many responses lie off the diagonals. However, roughly twice as many respondents lie in cells along the minor (SW-NE) diagonal than lie in cells along the major (NW-SE) diagonal. Along the minor diagonal are the respondents who, when they expected economic activity to rise, expected unemployment to fall and vice versa.

Contingency Table 1B refers to paired answers to questions about prices (P) and unemployment (U). Looking at this contingency table it is again clear that there is not a perfect correlation (whether positive or negative) between the two as many responses lie off the diagonals. However, over twice as many respondents lie in cells along the major (NW-SE) diagonal than lie in cells along the minor (SW-NE) diagonal. The major diagonal shows the number of respondents who, when they expected a fall in unemployment, also expected a fall in prices and vice versa.

While inspection of contingency tables is suggestive of the presence and direction of relationships it is necessary, given the noise and measurement error inherent in such data, to conduct formal tests of our hypotheses. Given the ordinal nature of the data, we use Kendall’s tau-b as our measure of the association between each pair of variables. Values of tau-b may range from −1 where there is a perfect negative association (i.e. all pairs lie along the minor SW-NE diagonal of the table) to +1 where there is a perfect positive association (i.e. all pairs lie along the main NW-SE diagonal of the table).11 However, aggregating data from all months over the whole of the period 1995–2011 cannot be particularly informative about the presence or absence of bivariate relationships as it brings together individual’s expectations formed at very different times, and especially at very different stages of the business cycle (including the period of the global financial crisis) when very different information sets are available to the respondents. Hence, to obtain a better understanding about the relationships (and to better avoid spurious correlations which are purely the result of the aggregation of the data over such a long time period) we carried out our statistical tests using data for each individual month over our sample period.

The values of tau-b and their 95% confidence intervals for every month of the survey are displayed as a time series in Figs. 1 and 2.12 Fig. 1 shows the values for the expected change in unemployment and activity while Fig. 2 shows the values for the expected change in unemployment and prices. The plots of the correlation coefficients over time show that lay people’s perceptions of the relationships have been relatively stable except for the period 2007–2010 (this is the period leading into the global financial crisis (GFC) and the years when it had the greatest impact upon the Australian economy).13

As mentioned, Fig. 1 assesses the association between the responses to the question dealing with unemployment expectations and the responses to the question dealing with expectations of the level of economic activity. In every month we have a significant and negative relationship between the two, indicating that those who responded by saying that economic activity would fall (rise) tended to also respond by saying that unemployment would rise (fall). So for all 204 months in

10 The total number of paired responses we can match for each pair of questions over the whole of the sample period is 221,234.
11 The test is a non-parametric test and, under the null hypothesis of independence of X and Y, the sampling distribution for large samples is commonly approximated as a normal distribution with mean zero and variance \( \frac{2n^2 + 3n + 1}{9n(n - 1)} \), where n is the number of (pairs of) observations i.e. the number of individuals whose responses may be matched across each pair of questions.
12 An Excel file with the values of the tau-b’s and their standard errors for each month is available upon request from the authors.
13 Compared with the USA and Europe the Global Financial Crisis had only a minor impact on the Australian economy. The aggregate (seasonally adjusted) unemployment rate peaked at 5.9% in June 2009 after which it began to fall slowly. This value of 5.9% is low compared with the peak unemployment rate in the previous recession (the early 90s) where it reached a peak of 11.2% in December 1992. In short, while the Australian economy experienced a brief period of recession, in no way could the term ‘great recession’ be used to describe the Australian experience.
our sample period the results are consistent with lay people operating 'as if' (to use Milton Friedman’s evocative phrase) they are familiar with Okun’s Law. The results for this pair of variables are also consistent in every month with Leiser and Aroch’s good-begets-good heuristic.

Fig. 2 assesses the association between the responses to the question dealing with prices and the responses to the question dealing with unemployment. The value of tau-b is significantly different from zero and positive in just over 60% of the months (127 of the 204), indicating that in a majority of months, individuals who are saying that prices would rise (fall) tended to also say that unemployment would also rise (fall). So for a majority of months the implied positive relationship between the two is not consistent with lay people operating ‘as if’ they are familiar with the economists (short-run) Phillip’s Curve relation but is consistent with the results in Leiser and Aroch (2009) and with their good-begets-good heuristic.

The correlations reveal that the onset of the Global Financial Crisis in late 2007 was associated with a change in perceptions. There was an especially marked increase in the strength of the implied negative relationship between unemployment and the level of economic activity. Inspection of the raw data showed that at this time there was an increase in the number of individual respondents who were expecting both a fall in the level of economic activity and a rise in unemployment. Turning to the relationship between inflation and unemployment we see that there was a noticeable change in the relationship between

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14 See Friedman (1953), especially pp. 18–22.
15 The value of tau-b is not both significantly different from zero and negative in any of the monthly surveys.
16 Prior to this date there was much uncertainty as to the effect of overseas events on the Australian economy and we think this explains the weakening of the association between the level of activity and unemployment in late 2007 and early 2008.
these two variables at the time of the Global Financial Crisis. Inspection of the raw data showed that over this period there was an increase in the number of respondents who were expecting both a fall in prices and a rise in unemployment.

How do we explain these results? The Global Financial Crisis triggered by problems in the US financial system (and especially associated with the bankruptcy of Lehman Brothers in September 2008) affected Australia directly, initially through liquidity problems and subsequently via a fall in exports. While awareness of the crisis and its likely consequences were building up for more than a year prior to the collapse of Lehman Brothers, a number of things were happening in late 2008 to markedly increase concern amongst the population. During these months, a number of reports and events heightened awareness of economic conditions and increased considerably the concern amongst the populace. Economic circumstances were noticeably deteriorating with unemployment rising and job vacancies collapsing, and in the last quarter of 2008 the economy was experiencing negative growth in GDP for the first time in many years. House prices and stock prices were also falling at that time. Much attention was given to these phenomena in the media and there was much speculation as to the likelihood of further deterioration in the economy and especially in household incomes. A number of policy initiatives were also implemented in late 2008 and early 2009 (for example, a government stimulus package which included one-off cash payments to seniors, carers and families; dramatic cuts in interest rates; a guarantee of all deposits in Australian banks; a ban on short-selling in the Australian share market and a time-limited cash grant to first home buyers), all of which had the effect of limiting the depths of the recession but which also served to reinforce the (by now, widespread) notion that the economy was in crisis.

In relation to all of the results for the period of the Global Financial Crisis, extreme pessimism may have been the dominant sentiment, where pessimism takes the form of “deterioration of economic conditions”. In other words, a pessimistic mind-set prevailed where the level of economic activity, prices and employment were expected to fall (and thus unemployment expected to rise). This is borne out by the data in Table 2 which shows the percentage of all respondents in each year who are predicting particular outcomes: (a) that economic conditions will deteriorate, (b) that unemployment will rise and (c) that prices will rise. A comparison of the entries for 2007 with 2008 and especially 2009 is striking. What this seems to indicate is that in times of crisis households are more influenced by media treatment and by recent outcomes and, in this particular case, ‘pessimism’ seems to be the dominant sentiment affecting all responses.

5. Conclusions and caveats

There are two important caveats to our results. First, the question related to prices asks if prices will be different next year than they are now. Strictly speaking, this is different to asking specifically about the rate of inflation. Secondly, unlike the

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Table 2
The percentage of all respondents in each year who are predicting particular outcomes: (a) that economic conditions will deteriorate, (b) that unemployment will rise and (c) that prices will rise.

<table>
<thead>
<tr>
<th>Year</th>
<th>Say there will be bad economic conditions in the coming 12 months</th>
<th>Say there will be more unemployment in the coming 12 months</th>
<th>Say that the prices of things they buy will be higher next year</th>
</tr>
</thead>
<tbody>
<tr>
<td>1995</td>
<td>43</td>
<td>36</td>
<td>91</td>
</tr>
<tr>
<td>1996</td>
<td>39</td>
<td>47</td>
<td>86</td>
</tr>
<tr>
<td>1997</td>
<td>43</td>
<td>49</td>
<td>82</td>
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<tr>
<td>1998</td>
<td>50</td>
<td>50</td>
<td>81</td>
</tr>
<tr>
<td>1999</td>
<td>31</td>
<td>36</td>
<td>82</td>
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<tr>
<td>2000</td>
<td>44</td>
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<tr>
<td>2001</td>
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<td>58</td>
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<tr>
<td>2002</td>
<td>36</td>
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<td>87</td>
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<tr>
<td>2003</td>
<td>33</td>
<td>38</td>
<td>85</td>
</tr>
<tr>
<td>2004</td>
<td>24</td>
<td>29</td>
<td>85</td>
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<td>2005</td>
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<td>2006</td>
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<td>65</td>
<td>76</td>
</tr>
<tr>
<td>2010</td>
<td>25</td>
<td>28</td>
<td>85</td>
</tr>
<tr>
<td>2011</td>
<td>40</td>
<td>41</td>
<td>84</td>
</tr>
</tbody>
</table>

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17 David Leiser has pointed out to us that it may well be that the correlations between inflation and unemployment, are both driven by their negative correlation with the general sentiment towards the economy rather than pair-wise correlations between the two. We test for this by examining the extent to which the value of Tau-b is correlated with the overall index of consumer sentiment over our sample period. The correlation is not significantly different from zero ($p$ value = 0.334) for the twelve years prior to the Global Financial Crisis (which includes the ‘boom’ years prior to the GFC) but there is a significant and positive correlation ($p$ value = 0.030) between the two over the period of the Global Financial Crisis. We take this to indicate that a common factor (general sentiment) is relevant to extreme circumstances (as in the Global Financial Crisis and thus our emphasis on ‘pessimism’ as the driving force in that period) but that it may not be the relevant explanation away from the extremes. However, it is difficult to make a definitive statement about the role of a common factor such as general sentiment as our sample period includes only one boom (the years preceding the GFC) and one recession. Ideally the hypothesis should be tested on a much longer run of data which includes a number of recessions, recovery episodes and booms.
studies reported in Williamson (1992), Williamson and Wearing (1996) and Leiser and Aroch (2009), we do not have direct evidence of the connections between variables. Instead, we are inferring bivariate relationships from respondents’ answers to separate questions about their expectations of any change in each variable. Having said that, the benefit of the approach adopted here is that we can work with sample sizes far larger than is found elsewhere in the literature on this topic.

The good-begets-good heuristic of Leiser and Aroch (2009) receives support. The most striking result in this regard is the strong correlation between responses to the survey question dealing with perceptions of unemployment and the responses to the question dealing with expectations of ‘future economic conditions’. Also, the association between prices and unemployment expectations is positive and is consistent with the good-begets-good heuristic for the majority of months in our sample period. The results for ‘strict’ Muthian rationality are mixed. Okun’s law receives unambiguous support whereas the postulated short-run Phillips relation is decisively rejected. However, it may be argued that a positive association between prices and unemployment is consistent with the actual operation of the economy given the exercise of monetary policy in the form of inflation targeting by the Reserve Bank of Australia (Australia’s central bank) since the early 1990s. It is well known that high inflation leads to a policy response in the form of higher interest rates to curb spending which may then dampen growth in employment. In such a world it would be rational to think that higher prices would be associated with higher unemployment. Our work thus suggests that there is a need for further research with different data sets.

Acknowledgements

The authors would like to thank David Leiser, Alex Wearing and an anonymous reviewer for their very helpful comments and advice. The usual caveat applies.

References


18 Although the presence (and sign) of the relationship between unemployment and prices (inflation) seems to be time and circumstance dependent, suggesting that there is a need for further research with different data sets.