The Effect Of Consumer Sentiment On Consumption: Cross-Sectional Evidence From Elections*

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Abstract

We seek to identify the causal effect of sentiment innovations on consumption. Using unique Australian consumer sentiment survey data we show that, immediately after elections with a change of government, consumers self-identifying as supporters of the winning party report substantially more optimistic beliefs about expected economic conditions than supporters of the losing party. We argue that this variation in beliefs is orthogonal to changes in current fundamentals. We find robust evidence that these shifts in beliefs have a causal effect on spending intentions. Using geographic variation in vote-shares and automobile purchases we also find evidence of an effect on actual spending.

JEL codes: E20, E21

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1 Introduction

Changes in expectations about future economic conditions are thought by many to be an important source of variation in consumer spending. Innovations to consumer sentiment indices may reveal revisions in beliefs about future economic conditions and in turn have a causal effect on consumption. Among economic commentators and political and business leaders it is widely accepted that consumer sentiment measures are both prognostic and causal. Some policymakers have also expressed support for this view (Yellen 2015; Stevens 2011), while Hall (1993) and Blanchard (1993) have argued that an autonomous drop in consumption – foreshadowed in consumer sentiment – was an important contributor to the 1990-91 recession in the United States. Consistent with these views, there is a sizable correlation between consumption growth and consumer sentiment (Figure 1). However, many academic economists remain skeptical about the information contained in consumer sentiment indices. The correlation between sentiment and consumption growth could reflect a common factor, such as changes in current income, that independently influences both sentiment and consumption, rather than sentiment having any causal effect on consumption. Typical of this view, Milton Friedman (1992) argued that “They [consumer confidence indices] are mostly a reflection of what’s going on rather than a cause”.

In general, it is difficult to identify whether innovations to consumer sentiment have a causal effect on consumption because it is challenging to find variation in sentiment that is orthogonal to variation in current economic fundamentals. However, in this paper, we are able to consider cross-sectional variation in sentiment related to individuals’ political partisanship to isolate variation in sentiment that is plausibly orthogonal to changes in current economic fundamentals. We use individual response data from the Australian consumer sentiment survey because it is unique in asking individuals’ about their voting intentions. We document that consumers report substantially higher levels of sentiment when their self-identified political party holds office at a federal level compared to those who support the opposition
party. This can be seen in Figure 2, which shows the consumer sentiment index separately for supporters of the two major political parties in Australia: the Australian Labor Party (ALP) and the Liberal/National Party. Over the period for which we have aggregate-level consumer sentiment data, there were four federal elections which resulted in a change of government: 1983, 1996, 2007 and 2013. These elections are represented by vertical lines in the figure. Strikingly, the difference in sentiment between these two groups of voters is large, the relative change in sentiment occurs precisely at elections, and is sustained for the entire period each political party holds office.

The sharp and discrete change in sentiment at changes of government – which in our sample have not coincided with major economic events – indicates that the variation in sentiment we exploit is unlikely to be related to changes in current or past fundamental drivers of consumption. Furthermore, the timing of the shifts in sentiment at changes of government indicates that the variation reflects partisanship affecting economic beliefs rather than perceptions of current economic conditions affecting partisanship. Thus, we believe these shifts in sentiment around changes of government reflect revisions in beliefs about future economic conditions.

The consumer sentiment index is an average of sub-indexes surveying consumers on their beliefs about prospective changes in both personal and general economic conditions. The most pronounced revision in beliefs at changes of government is to beliefs about general economic conditions, suggesting that expectations about changes in tax and transfer policy following a change in government are not an important source of the difference in sentiment between ALP and Liberal/National voters. Supporting this, we show using individual response data that controlling for observed differences between ALP and Liberal/National party supporters has a negligible effect on the difference between the two groups in beliefs about personal and general economic conditions.

Our identification approach differs from much of the existing literature on consumer sentiment, which has mostly considered time series data and a control variable approach in
seeking to identify whether innovations to sentiment have a causal effect on consumption. Carroll et al. (1994) and Ludvigson (2004) find that after controlling for economic fundamen-
tals – measured by labor income growth, stock prices and short-term interest rates – that
sentiment contains some small but statistically significant independent information about
future consumption growth. But it is unclear what additional information is contained in
consumer sentiment. The incremental predictive power of sentiment could reflect current or
past events embedded in other fundamentals that have not been controlled for, rather than
any independent causal effect of sentiment innovations on spending (Ludvigson 2004). We
believe our identification approach has two important advantages relative to this approach:
first, by using cross-sectional data we remove all aggregate economic shocks that affect both
sentiment and consumption, and; second, by using variation in sentiment caused by changes
in government, rather than the residual-based approach of the time-series literature, we can
be more confident that the variation we use is orthogonal to changes in current economic
fundamentals.

We use two measures of consumer spending to estimate whether the shift in sentiment
between ALP and Liberal/National voters at changes of government has a causal effect
on consumption. The primary measure we use is self-reported spending intentions for a
major household item, which is asked as part of the consumer sentiment survey, allowing
us to match reported sentiment, partisanship and spending intentions at the individual
level. Our second measure of spending exploits geographic variation in vote shares across
postcodes (equivalent to a ZIP code in the U.S.) and new automobile sales to households
as a postcode-level consumption proxy. Auto sales is well-suited for our purposes, being an
important spending decision for most households.

Using the self-reported spending intentions data, we show that consumers report sig-
nificantly more positive spending intentions when the political party they support is in
government. The shift in spending intentions coincides with each of the three changes of
government for which individual response data from the consumer sentiment survey are
available: 1996, 2007 and 2013. To estimate the whether changes in sentiment have a casual
effect on spending intentions, we focus on the period around each change of government
and at the individual level regress reported spending intentions on reported sentiment, using
self-identified partisanship as an instrument for sentiment. This approach uses only vari-
ation in beliefs correlated with political partisanship to identify the effect of sentiment on
spending intentions, which we argue is variation orthogonal to changes in current economic
fundamentals. We find robust evidence that an increase in sentiment causes consumers to
report significantly more positive spending intentions.

Our postcode-level spending measure allows us to assess whether the spending intentions
data map to actual consumption behavior. The new auto purchases data we use span two
changes in government, from the Liberal/National party to the ALP in 2007, and back to the
Liberal/National party in 2013. Consistent with the spending intentions data, we find that
new auto purchases by households increased in ALP postcodes relative to Liberal/National
postcodes following the ALP victory at the 2007 election, and that new auto purchases
by households fell in ALP postcodes relative to Liberal/National postcodes following the
change of government from the ALP to the Liberal/National party at the 2013 election. The
estimated effects are large: moving from a hypothetical postcode with only Liberal/National
voters to a postcode with only ALP voters is estimated to have been associated with an
average 10 percentage point increase in new automobile sales during the period the ALP
held government. This provides, we believe, some of the first evidence matching survey-
based spending intentions data to actual behavior.

Our cross-sectional approach implicitly controls for economy-wide shocks. But partisanship
is correlated with economic variables, and it is possible that economic shocks to specific
occupations or to parts of the income distribution independently influence consumption. To
control for this, we regress postcode-level vote shares on a large set of economic variables and
use only the variation in postcode-level vote shares that cannot be explained by economic
controls as our source of cross-sectional variation. The results are qualitatively similar.
Our paper makes several contributions to the literature. First, our paper provides evidence that consumer sentiment has a causal effect on consumption. The sharp change in sentiment between ALP and Liberal/National voters at elections, which is unlikely to be related to a change in current fundamentals, precedes changes in spending intentions for the two groups. The earlier literature has largely been unable to identify whether the information contained in consumer sentiment mostly proxies current and past fundamentals contained in other macroeconomic series, or contains independent information about future consumption plans.

Second, our results provide a basis for believing that changes in pure sentiment can affect consumption. Disagreement between ALP and Liberal/National voters is evident in expectations for both personal and general economic conditions, which cannot be mutually consistent, implying that, from the point of view of an outside observer, the variation in sentiment we exploit is more likely to be noise than news about fundamentals.\(^1\) Reinforcing this, the political science literature has documented that differences in political affiliations can affect how individuals perceive even past economic events (Bartels 2002). Thus, our results suggest an expansive view of sentiment, providing empirical support for recent theoretical models that highlight a role for non-fundamental drivers of consumption (e.g., Lorenzoni 2009a, and Angeletos and La’O 2013).

Third, by exploiting geographic variation in consumer sentiment and new automobile purchases, we are able to assess whether self-reported spending intentions correlate with actual behavior. Our results provide support for the usefulness of spending intentions elicited from surveys, and more generally speaks to the literature on the generalizability of opinions elicited in survey and experimental settings (e.g., Levitt and List 2007).

Our paper is most similar to contemporaneous work by Mian et al. (2015), who use

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\(^1\) Barsky and Sims (2012) have argued that consumer confidence is likely to reflect information about future productivity rather than “animal spirits”. We do not believe that our results are inconsistent with theirs. They argue that changes in animal spirits cannot lead to long lived changes in consumption because animal spirits do not affect an economy’s productive capacity. Here we have two groups of consumers, so autonomous movements in consumption need not affect the productive capacity of the economy, if the consumption of one group of consumers offsets the other.
United States data to show that consumers report more positive views about government economic policy when the political party they support controls the Presidency. However, they find only suggestive evidence that differences between Democrats and Republicans in views on the success of government policy affects spending intentions and no evidence of a relationship between views about government economic policy and county-level automobile spending. The Australian setting provides three key advantages compared to the United States. Firstly, because the Australian consumer sentiment survey includes a question on voting intentions, we can directly observe political affiliation, rather than needing to impute it based on proxies for partisanship; this enables us to precisely estimate the effect of sentiment on spending intentions. Secondly, we use new automobile sales to households as our spending variable, whereas Mian et al. (2015) use registration data, that also includes sales to business and the government, which adds noise to their measure of observed spending. Thirdly, while voting is voluntary in the United States it is compulsory in Australia, reducing the possibility that local-area partisanship is mis-measured.

2 Consumer Sentiment and Partisanship

2.1 Consumer sentiment

The Westpac-Melbourne Institute Survey of Consumer Sentiment in Australia is modeled on the Thomson Reuters/University of Michigan Survey of Consumers in the United States. However, the Australian survey is unique in asking respondents who they would vote for at a federal election. To measure sentiment, each month respondents are asked about:

(i) their current personal financial situation compared to a year ago;
(ii) the expected change in their personal financial situation over the year ahead;
(iii) the expected change in economic conditions over the year ahead; and
(iv) the expected change in economic conditions over the next five years;

Individual responses for each question are classified as either positive, unchanged / don’t know, or negative. An index for each question is constructed by subtracting the proportion
of negative responses from the proportion of positive responses, and then adding 100. A value of 100 indicates a neutral economic outlook, with the fraction of negative responses equal to the fraction of positive responses. Each question asks about the change rather than the level of economic conditions, and so is a stationary variable; each index has averaged close to 100 since the inception of the survey. The survey is nationally representative and has sample size of about 1,200 each month (compared to 500 for the Michigan Survey of Consumers).²

For each of the four questions outlined above, we construct an index separately for ALP and Liberal/National party voters, and the difference (ALP minus Liberal/National party voter sentiment) is shown in Figure 3. For each question, consumers report more positive responses when the political party they would vote for holds office federally. Notably the relative change in sentiment occurs in the month of an election at which there is a change of government. This change in sentiment in an election month is sharp.³ These large movements in sentiment in the month of a change in government support using partisanship as a way to identify the effect of the sentiment on consumption. We find it hard to think of any changes in current or past consumption fundamentals that could consistently move sentiment by this much in the month of a change of government. We show later that differences in sentiment between these two groups of voters remain even after controlling for differences in the economic and demographic characteristics of voters.

Consumers become more optimistic about both personal and national economic conditions when the political party they support wins office (Figure 3). Conversely opposition party supporters become more pessimistic about both personal and economic conditions. The largest revision in beliefs in the month of a change of government comes from beliefs about future economic conditions in one and five years time. While there is a 2.5 standard

²The aggregate consumer sentiment index is constructed by averaging responses to these four questions as well as responses to a questions asking about whether it is a good time to purchase a major household item. We view this latter question as representing an outcome variable as it measures spending intentions. We discuss the spending intentions question in more detail in Section 4.1.
³Unlike in the US, the government changes hands as soon as the election result is known.
deviation movement on average for the series relating to personal finances in the month of a change of government, the series relating to future economic conditions moves on average by 4.5 standard deviations. Importantly for our purposes, this indicates that government and opposition party supporters disagree in their expectations about both the state of the macroeconomy and their own personal finances. This suggests that the variation in sentiment we use is not primarily being driven by beliefs about how the incoming government will change the income distribution through tax and transfer policies. Rather, there is disagreement about how the government will manage the overall macroeconomy.

As an aside, an entirely separate survey provides corroborating evidence that partisanship affects economic beliefs. A semi-annual Newspoll survey published in The Australian newspaper asks a randomly selected sample of voters whether they expect their standard of living to improve, stay the same, or get worse over the next six months. Figure 5 shows indexes for ALP and Liberal/National party voters, constructed using the same methodology as the consumer sentiment survey. Respondents are substantially more optimistic about their standard of living when the political party they support holds office federally.

As noted, the relative change in beliefs between ALP and Liberal/National party voters in both the consumer sentiment and the Newspoll survey is sharp and occurs precisely when the government changes hands. This is despite the fact that political opinion polling data predicted the changes of governments we observe in our sample well in advance of the election (Figure 6).\(^4\) One possible explanation is that many voters do not pay attention to polling data. Reinforcing this, in a Newspoll survey conducted between just four and six days prior to the 2007 federal election, 45 per cent of Liberal/National party supporters said they believed their party would win the election, despite reliable evidence to the contrary and widespread media coverage of opinion polls leading up to the election. Thus, we would expect to see a response of consumption on or after changes of government, even though the

\(^4\)Our fortnightly political opinion polling data from Newspoll starts in 2006. Pre-election polls also correctly predicted the outcome of the March 1996 election. A Newspoll survey conducted at the start of 1996 indicated that the Liberal/National Party would capture 54 percent of the vote and the ALP would get 46 percent of the vote. The polls numbers remained around these levels until the election.
changes of government are forecastable.

2.2 Partisanship and economic beliefs

The idea that partisanship affects consumers’ beliefs is not unique to the Australian data. A large survey-based political science literature routinely finds that voters are more likely to hold positive views about economic conditions if their partisanship matches that of the President or party in government (e.g., Bartels 2000, Bartels 2002, Evans and Andersen 2006, Gerber and Huber 2009 and Wlezien et al. 1997).

The political science literature provides evidence that partisanship can affect how individuals perceive economic events independently of the effects of government policies targeted to specific groups of voters. Some of the most striking evidence comes from Bartels (2002), who shows how partisanship can affect perceptions of past economic events. In particular Bartels (2002) analyzed responses to the 1988 American Election Studies survey, which asked: “Would you say that compared to 1980, the level of unemployment in the country has gotten better, stayed the same or gotten worse?” A similar question was asked about inflation. A Republican, Ronald Reagan, was the President during this eight-year period, during which the unemployment rate fell by around 1.5 percentage points and inflation fell by close to 10 percentage points. Bartels (2002) found a strong relationship between beliefs about how the economy evolved during Reagan’s Presidency and respondents’ partisanship: only 30 percent of respondents identifying as strong Democrats said that unemployment had improved since 1980, compared with more than 80 percent of strong Republicans. Similarly, despite the large fall in inflation, only about 20 percent of strong Democrats said that inflation was better than in 1980, compared with 70 percent of strong Republicans.

2.3 Conditional consumer sentiment indices

The large movements in consumer sentiment following an election with a change of government indicates that the variation in sentiment we will exploit is unlikely to be related to past or current economic fundamentals. This is further supported by the political science
literature which finds that partisanship affects an individual's outlook for the economy. Here we address the concern that the movement in sentiment observed following a change of government reflects changes to tax and transfer policies made by the incoming government that differentially affect government and opposition party supporters. That is, the government may be expected to enact policies that favor its supporters. Given that policy set by the federal government cannot be targeted to specific individuals, but rather to groups of people (based on for example, their income, age or occupation) we control for observed economic and demographic differences between ALP and Liberal/National party voters. In particular, using information collected from respondents in the consumer sentiment survey, we construct sentiment indexes for ALP and Liberal/National party voters that condition on individual-level economic and demographic characteristics.

We assume that the categorical responses to the consumer sentiment questions (positive, unchanged / don't know, or negative) mask a smooth underlying distribution of consumer sentiment. For each sentiment question, and each survey month, we fit an ordered probit model:

$$s^*_{i,j,t} = X_{i,t} \Gamma_{j,t} + \phi_{j,t} ALP_i + \varepsilon_{i,j,t},$$

(1)

where $s^*_{i,j,t}$ is the latent sentiment of consumer $i$ in response to question $j$ in survey month $t$, $ALP_i$ is a dummy variable if consumer $i$ identifies as an ALP voter, $\phi_{j,t}$ is the coefficient on the ALP dummy variable, and $\varepsilon_{i,j,t}$ is a normally distributed error term. $X_{i,t}$ is a vector of covariates for person $i$, which is discussed in more detail below. $\Gamma_{j,t}$ is the vector of coefficients on those covariates in month $t$. Negative responses are assumed to correspond to levels of the latent sentiment variable below the threshold $\mu_{j,t}^{low}$, positive responses correspond to levels of the latent sentiment variable above the threshold $\mu_{j,t}^{high}$, and unchanged/don't know responses to levels of the latent sentiment variable between these two thresholds. Thus, the probability

5The estimated equation includes dummy variables for consumers who identify as minor party voters, which for brevity are not reported here. Effects are relative to the baseline of a Liberal/National party voter.
that consumer $i$ reports a positive response to question $j$ in survey month $t$ is

$$ p_{i,j,t}^{pos} \equiv Pr\left(s_{i,j,t}^+ > \mu_{j,t}^{high}\right) = Pr\left(\varepsilon_{i,j,t} > \mu_{j,t}^{high} - X_{i,t} \Gamma_{j,t} - \phi_{j,t} ALP_i\right) $$

(2)

and analogously for the other two responses. The thresholds $\mu_{j,t}^{low}$ and $\mu_{j,t}^{high}$ and the coefficients $\phi_{j,t}$ and $\Gamma_{j,t}$ are jointly estimated using maximum likelihood, under the identification constraints that the error term, $\varepsilon_{i,j,t}$, has unit variance and the regression omits a constant term. Observations are weighted by their sampling frequency, $\omega_i$.

We are interested in the effect of partisanship on consumer attitudes. The estimated average difference in the probability of reporting a positive response to question $j$ in month $t$ between an otherwise similar ALP voter and a Liberal/National party voter is

$$ \Delta \bar{p}_{j,t}^{pos} = \frac{1}{N} \sum_{i=1}^{N} \omega_i \left[ \hat{p}_{i,j,t}^{pos}(ALP_i = 1) - \hat{p}_{i,j,t}^{pos}(ALP_i = 0) \right] $$

(3)

and similarly for negative responses,

$$ \Delta \bar{p}_{j,t}^{neg} = \frac{1}{N} \sum_{i=1}^{N} \omega_i \left[ \hat{p}_{i,j,t}^{neg}(ALP_i = 1) - \hat{p}_{i,j,t}^{neg}(ALP_i = 0) \right] $$

(4)

Subtracting Equation (4) from Equation (3), and rearranging gives:

$$ \Delta \bar{p}_{j,t}^{pos} - \Delta \bar{p}_{j,t}^{neg} = \frac{1}{N} \sum_{i=1}^{N} \omega_i \left[ \hat{p}_{i,j,t}^{pos}(ALP_i = 1) - \hat{p}_{i,j,t}^{neg}(ALP_i = 1) \right] $$

$$ - \frac{1}{N} \sum_{i=1}^{N} \omega_i \left[ \hat{p}_{i,j,t}^{pos}(ALP_i = 0) - \hat{p}_{i,j,t}^{neg}(ALP_i = 0) \right] $$

(5)

The first term on the right-hand side of Equation (5) is the probability for an ALP voter of reporting a positive response less the probability of reporting a negative response; the second term is the same for Liberal/National party voters. Each term mirrors the published sentiment indices, which are constructed by subtracting the fraction of negative responses from positive responses. Thus, estimates of Equation (5) provide conditional analogues to the raw sentiment indices.

The covariates used in Equation (1) are an individual’s age, income, gender, occupa-
tion, education, home ownership status and whether they live in a metropolitan or non-
metropolitan area. The consumer sentiment survey categorizes income to be within a $10,000
bucket starting from $20,000 up to $100,000. All incomes above $100,000 are placed into
one category and all incomes less than or equal to $20,000 are placed into another category.
Income dummy variables, in these ranges, are included in Equation (1). This allows for the
effect of income on sentiment to differ non-linearly by income category.

The conditional estimates for each expectations question in the sentiment survey are
shown in Figure 4 and are similar to the unconditional estimates, shown in Figure 3. No-
tably, the sharp relative movement in sentiment following an election with a change of
government remains even after for controlling for demographic differences between ALP and
Liberal/National party voters. Supporters of each party continue to disagree on both ex-
pectations of their own personal economic conditions and future macroeconomic conditions.
This provides evidence that shifts in sentiment are unlikely to be driven by expected changes
in tax or transfer policy, which are likely to be related to observable differences between vot-
ers.

3 Data

We study the effect of consumer sentiment on consumption using individual- and postcode-
level consumption data. On an individual level, we match reported spending intentions
to reported economic beliefs. We follow a growing literature in using spending intentions
from survey data to understand consumption behaviour (see for example Bachmann et al.
for the effect of the 2003 US tax rebate). Our study is novel in providing corroborating
evidence using actual spending data at a postcode level, the most disaggregated level at
which a consumption proxy is available. We measure consumption using the number of new
automobile purchases in a postcode and match this to postcode-level data on partisanship.
3.1 Individual level data

We proxy consumption on an individual level using spending intentions data from the consumer sentiment survey. In particular, we use the response to the question on whether it is a good time to purchase a major household item. Responses are classified as positive, unchanged / don’t know, or negative. Using other questions in the survey, we can match an individual’s stated spending intentions to their sentiment, political preferences and a range of economic and demographic characteristics. The data are available on a monthly basis and span the changes of government in March 1996, November 2007 and September 2013.

3.2 Postcode level data

3.2.1 Vote shares

Australia has a parliamentary political system, with either the ALP or the Liberal/National party holding government since World War II. Voting is compulsory, with failure to vote resulting in a fine. This has ensured turnout above 93 percent at each election in the post-War period. This is important because it minimizes the possibility of mismeasurement of local-area partisanship, which would arise with voluntary voting if those who choose to vote are different than those who do not. By contrast, turnout in the US has varied between 49 and 63 per cent since 1960.6

We measure partisanship on a postcode level as the fraction of votes going to the ALP in a federal election using the Australian Electoral Commission’s two-party preferred measure.7

There are currently 150 federal electorates (equivalent to US Congressional districts) in Aus-

6Data on Australian voter turnout is sourced from the Australian Electoral Commission. US data is from the International Institute for Democracy and Electoral Assistance.
7Voters are required to order each candidate in their political division from most to least preferred. Candidates with the least number of first-preference votes are successively eliminated until two candidates remain. Votes for eliminated candidates are transferred to the next most preferred candidate indicated on each ballot. Thus the winning candidate in each political division captures at least 50 per cent of the vote. Their share of votes is the two-party preferred (TPP) vote share, our measure of partisanship. In all but a handful of electorates (3 in the 2007 election and 10 at the 2013 election), the two candidates remaining at the end of the count are from the ALP or the Liberal/National party. For the few electorates where an independent or minor party either won or came second, we use a TPP measure constructed such that the top two candidates are from each of the major parties. Excluding these electorates does not change our results.
tralia, with electorate boundaries set by an independent non-partisan commission. Voting occurs at more than 8,000 polling places. We aggregate these polling place results to the 2,738 postcodes in Australia.

### 3.2.2 Consumption

We use the number of new automobile purchases as our postcode-level consumption measure. We think that automobile purchases are a good proxy for consumption because they represent an important spending decision for households. Between 1995 and 2013 the consumer sentiment survey included a question asking whether it is a good time to buy an automobile. Using the methodology outlined in Section 2.3, we construct the difference in responses between ALP and Liberal/National voters to this question conditional on an individual’s economic and demographic characteristics. There is a very close relationship between attitudes toward buying an automobile and self-reported spending intentions for a major household item, indicating that new automobile sales is a good measure of consumption to map to sentiment (Figure 7).

New automobile sales data are sourced from VFACTS. These are administrative data covering the universe of new automobile sales. The data record the postcode of the owner, not the location of the dealership where the automobile was purchased. One benefit of the VFACTS sales data is disaggregation by buyer type. We use only new automobile sales to households (and exclude sales to businesses and governments) because this maps most closely to the survey of consumer sentiment.\(^8\) The data span the November 2007 and the September 2013 changes in government.

To control for differences in population growth across postcodes we measure new automobile sales in per capita terms. Population data is sourced from the five-yearly Socio-Economic Indexes for Areas Census. We linearly interpolate the data to get population estimates between Census dates.\(^9\)

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\(^8\)Sales to businesses and governments account for around 55 per cent of total annual new automobile sales.

\(^9\)For the period after 2011, the most recent Census, we assume postcode-level population growth continues at its rate over the period 2006-11.
3.2.3 Control variables

The federal government’s tax and transfer policies could differentially affect different groups of voters. We use a range of postcode-level variables to control for these differences. We obtain average taxable income data, from the Australian Taxation Office. The Census provides a range of postcode-level economic variables every five years: the share of people with a college education, average age, the unemployment rate, the share of people who rent, and the share of employed people in white-collar professions. We also collect postcode-level information on the share of employment by industry. Industries are grouped according to the NAICS classification. Information is also collected on the geographic location of a postcode. Postcodes are classified - in increasing order of remoteness - as being in either a major city, inner regional, outer regional, remote or very remote. These data are sourced from the Australian Statistical Geography Standard. Throughout the paper, we exclude postcodes in the Australian Capital Territory (ACT), where the federal public service is located. Changes of government may have an immediate effect on the incomes of federal public servants, through hiring or redundancies. Hence, consumption for those people can be affected by other channels rather than via sentiment effects.

3.2.4 Summary statistics

The top and bottom panels of Table 1 report postcode-level summary statistics by population-weighted quintiles of ALP vote share at the 2007 and 2013 federal elections. Demographic and employment-by-industry data reported in Table 1 are sourced from the Census closest in time to each election: the 2006 Census for the 2007 election and the 2011 Census for the 2013 election.

Our analysis is able to exploit large differences in vote shares across postcodes, with the fifth quintile having a 36 percentage point higher ALP vote share at the 2007 and 2013 elections than the first quintile.\footnote{These postcode level vote shares are persistent through time; the correlation between the vote share in the 2007 and 2013 elections is 0.95.} Income is decreasing in ALP vote share, and so is the mean
level of new automobile purchases. Postcodes with a higher ALP vote share also tend to have a lower share of white-collar employment, a higher unemployment rate, and a higher share of renters. However, differences in educational attainment and average age are relatively minor. By industry, the main differences are the relatively high share of manufacturing employment and low share of agricultural employment in high ALP vote share postcodes. By geographic location, 88 percent of postcodes in the top quintile are in metropolitan areas, compared with 50 percent of postcodes in the bottom quintile.

4 Consumer sentiment and consumption

4.1 Spending intentions

Individual response data from the consumer sentiment survey allow us to map an individual’s sentiment to their spending intentions. We exploit the variation in sentiment related to an individual’s political preferences to see if people that reported positive sentiment were more likely to report positive spending intentions.

In panel (a) of Figure 8 we show the difference in stated spending intentions between ALP and Liberal/National party voters. Consumers report higher spending intentions when their political party holds government at the federal level, with statistical tests finding a break in the mean level of the series following an election that results in a change in government (see Table A1 in the Online Appendix for Bai and Perron (1998) multiple break test results).\footnote{The 1996 election was held on 2 March. The consumer sentiment survey is conducted at the end of each month and can continue into the start of the following month. This is why the break in the spending intentions series for the 1996 election occurs in February 1996.}

This finding also carries through when we construct conditional spending intentions indices for ALP and Liberal/National party voters using the methodology outlined in Section 2.3. In particular, panel (b) of Figure 8 shows that differences in spending intentions between ALP and Liberal/National party voters remain after controlling for an individual’s economic and demographic characteristics. A Bai and Perron (1998) multiple break point test run on the conditional spending intentions index confirms a break in the index at each change of
Comparing responses in the consumer sentiment survey to questions about economic conditions (Figure 3) and spending intentions (Figure 8), suggests a positive relationship between sentiment and spending intentions. Consumers report both a more positive economic outlook and positive spending intentions when their political party is in power.

To formally test if higher sentiment causes higher spending intentions, we estimate the following regression on the individual response consumer sentiment survey data:

\[
\text{spend}_{i,t} = \delta_t + \phi \text{expect}_{i,t} + \sum_j \gamma_j X_{ji,t} + \epsilon_{it} \tag{6}
\]

where \(\text{spend}_{i,t}\) is the reported spending intention of individual \(i\) in month \(t\) and \(\text{expect}_{i,t}\) is an individual’s reported expectations of future economic conditions, \(X_{ji,t}\) is the full set of economic and demographic control variables for person \(i\) listed in Section 2.3 and \(\delta_t\) is a survey month dummy. We measure \(\text{expect}_{i,t}\) using either of two questions in the consumer sentiment survey asking individuals about their expectations of macroeconomic conditions over the next one and five years. These questions capture an individual’s beliefs about macroeconomic conditions faced by all consumers, and so abstract from beliefs about how government policy affects the distribution of income.

The difficulty in estimating Equation (6) is that while \(\text{expect}_{i,t}\) captures sentiment shocks, it also captures shocks to fundamental factors that could jointly influence consumption and macroeconomic expectations. We therefore need an instrument that is correlated with “sentiment” but not the fundamental macroeconomic shock. Our instrument is an individual’s partisanship. Specifically, we instrument \(\text{expect}_{i,t}\) with a dummy variable that is equal to one if a survey respondent’s voting intention matches the political party in office and is zero otherwise. We believe that political preferences are a valid instrument given that it is difficult to think of any fundamental factor that could consistently shift expectations of future macroeconomic conditions for both ALP and Liberal/National party voters this sharply in the month of a change of government.
Our identification assumption is strongest in the period around which there has been a change in government. Hence, we estimate Equation (6), with $expect_{i,t}$ instrumented with partisanship, over the period one year before and after an election with a change in government. Note that Equation (6) is estimated separately for expectations of economic conditions in one and five years time. We code the answers to the spending intentions and expectations of future economic conditions questions as follows: positive responses take on a value of 3, unchanged or don’t know responses take on a value of 2 and negative responses take on a value of 1. A linear probability model is estimated for both the first stage and second stage regressions.\footnote{We choose to estimate the first stage equation using a linear probability model, rather than an ordered probit because, with instrumental variables, OLS estimates of the first stage produce consistent estimates. First stage estimates using an ordered probit model only produce consistent estimates under restrictive conditions. We also grouped responses to the spending intentions questions into two categories (one category for positive spending intentions and another category for unchanged and negative spending intentions) and estimated the second stage using a probit model and the first stage as a linear probability model. The results were similar to those reported in the text.} Although the relationship between sentiment and spending intentions may not be linear as assumed in the second stage regression here, we are simply interested in identifying whether a casual channel from sentiment to spending intentions exist, and so we use a linear probability model for simplicity.

Results from three elections - 1996, 2007 and 2013 - are shown in Table 2. In the first stage, we find that consumers are more positive about future economic conditions in both one and five years time when their partisanship matches that of the federal government. Because each regression uses only one instrument, we report t-statistics rather than F-statistics, which would yield equivalent p-values. The precision of the first stage results indicate that our instrument is strong, with each instrument having a t-statistic in excess of 15 in the first stage regressions.

For each election, we find that an improvement in an individual’s expectations of future economic conditions, both in one and five years time, has a statistically significant positive effect on that individual’s spending intentions. This provides evidence that changes in sentiment can have a causal effect on stated spending intentions on an individual consumer
4.2 Consumption data

We have shown that an improvement in expected future macroeconomic conditions has a causal effect on spending intentions. Here we look to see if automobile consumption data support the results from the spending intentions data.

4.2.1 Without controls

We would like to know if differences in self-reported spending intentions between ALP and Liberal/National party voters are reflected in differences in observed new automobile sales. ALP voters became substantially more optimistic about economic conditions than Liberal/National party voters when the ALP won government at the 2007 election. If the opinions expressed in the sentiment survey are indicative of actual consumption behaviour we would expect to see a relative increase in new automobile sales in ALP-leaning postcodes. Conversely, we would expect to see a relative increase in new automobile sales in Liberal/National-leaning postcodes following the 2013 election when the Liberals/Nationals won government.

To see if self-reported spending intentions are informative about actual consumption, we estimate the following regression from the March quarter 2004 to the June quarter 2015:

\[
\log (mv_{it}) = \alpha_i + \sum_{j=-T_0}^{T_1} \delta_j d_t + \sum_{j=-T_0, j\neq T_0}^{T_1} \beta_j (d_t \times ALP^\tau_i) + \epsilon_{it}, \tag{7}
\]

where \(mv_{it}\) is per capita new automobile sales in postcode \(i\) in quarter \(t\), \(\alpha_i\) is a postcode-specific fixed effect, \(d_t\) is an indicator variable taking the value unity in year-quarter \(t\) and zero otherwise, \(ALP^\tau_i\) is the ALP vote share in postcode \(i\) for an election held at time \(\tau\), and \(\epsilon_{it}\) is an error term.\(^{13}\) The coefficients \(\delta_j\) are quarterly fixed effects, capturing all variation

\(^{13}\)The use of a log transformation for the dependent variable results in the exclusion of observations with zero automobile sales in a given quarter. Based on the regression weights, which are equal to the average number of automobile sales over the two years prior to a change of government, the postcodes that contain a zero observation in any given quarter account for less than 1.5 percent of new automobile sales over the weighting period. As an alternative, we have estimated Equation (7) with the level of per capita new automobile sales as the dependent variable, which does not result in the exclusion of any data. The results are very similar,
in new automobile sales that is common across postcodes, such as seasonality, changes in new automobile prices, and aggregate economic shocks. The coefficients of interest are \( \beta_j \), indicating the relationship in quarter \( t \) between the ALP vote share and per capita new automobile sales. The omitted category in the regression is the quarter in which the election is held, so all estimated \( \beta_j \)-coefficients are relative to that period. Note we estimate Equation (7) separately for the 2007 and 2013 elections. We use weighted least-squares, with weights equal to the average number of new automobile sales over the two years prior to the change of government at time \( \tau \).\(^{14}\) Standard errors are clustered at the electorate level.

Results are shown in Figure 9. The top panel presents the \( \beta \)-coefficient estimates together with two standard error confidence bands, using vote shares for the 2007 federal election. The bottom panel reports analogous results using vote share data from the 2013 election. The coefficient estimates indicate the log change in the quarterly level of new automobile sales, relative to the quarter in which the election was held, when moving from a hypothetical postcode with only Liberal/National voters to one with only ALP voters.

Shortly after the ALP won government at the 2007 federal election, the estimated \( \beta \)-coefficients show an increase in the level of new automobile sales in ALP-leaning postcodes relative to Liberal/National party leaning postcodes. In the two years following the 2007 election, the \( \beta \)-coefficients average to about 0.1. This indicates that going from a postcode with no ALP voters to a postcode where everyone votes for the ALP increases per capita automobile sales by about 10 per cent. The estimated \( \beta \)-coefficients line up well with spending intentions data from the consumer sentiment survey: the largest difference in the average level of new automobile sales between ALP and Liberal/National postcodes occurred around 2012, consistent with the timing of the largest difference between ALP and Liberal/National voters in spending intentions for a major household item from the consumer sentiment survey.

Turning to the 2013 election, we find evidence of lower per capita automobile sales in ALP leaning postcodes following the Liberal/National Party election victory. While, the fall

\(^{14}\)Using population weights instead does not materially change our results.
in the estimated $\beta$-coefficients start prior to the 2013 election, consistent with the spending intentions data, an average of the $\beta$-coefficients indicates a 7 percentage point lower level of new automobile purchases by ALP voters relative to Liberal/National party voters in the two years after the ALP’s loss of government compared to the ALP’s last two years in office. Wald tests confirm a statistically significant difference in the estimated $\beta$-coefficients two years before and after the 2013 election.\textsuperscript{15}

4.2.2 With controls

An incoming government could enact tax and transfer policies that favors its supporters. This could have a direct effect on consumption by changing the distribution of income, implying that government policy, rather than sentiment, could be responsible for changes in automobile consumption. Policy set by the federal government cannot be targeted to specific individuals, but rather to particular groups of people based on observable characteristics. Table 1 shows that partisanship is correlated with a range of economic indicators. While our identification approach uses partisanship as a source of variation in economic perceptions, there would ideally also be no difference in how government policy affects ALP and Liberal/National party voters. Here we employ three approaches to control for differences between ALP and Liberal/National party voters. In the first approach, we construct a measure of pure partisanship by isolating variation in the ALP vote share at each election that is uncorrelated with observable economic differences between ALP and Liberal/National party voters. We then use this variation as our source of identification. The second approach allows for time-varying economic shocks correlated with the level of income. The third approach employs difference-in-difference regressions, allowing for differences in income growth across postcodes.

\textit{Pure partisanship}

\textsuperscript{15}The $p$-value associated with the null hypothesis that the $\beta$-coefficients are the same before and after an election is 0.06.
To construct a measure of pure partisanship, we separately regress the ALP vote share at the 2007 and 2013 elections on a wide range of economic variables, and take the residual series. The regression includes the full set of demographic and industry variables reported in Table 1, as well as controls for the geographic characteristics of a postcode.\textsuperscript{16} (Regression results are reported in Table A2 in the Online Appendix). The control variables absorb between 55 and 60 per cent of the postcode-level variation in vote shares.

We then re-estimate Equation (7) replacing the observed ALP vote share variable with our measure of pure partisanship:

\[
\log (mv_{it}) = \alpha_i + \sum_{j=-T_0}^{T_1} \delta_j d_t + \sum_{j=-T_0, j\neq T_0}^{T_1} \beta_j (d_t \times \xi_i^\tau) + \epsilon_{it},
\]

where $\xi_i^\tau$ is the residual for postcode $i$ from a regression of the ALP vote for the election held at date $\tau$ on the set of control variables described above. To allow for the use of a generated regressor, standard errors are constructed using 1000 bootstrap replications, with resampling conducted at the electorate level.

Results using this residual variation in the ALP vote share for both the 2007 and 2013 elections show a qualitatively similar profile to that from Equation (7) without controls (compare Figures 9 and 10). We again find little evidence of a pre-trend before the 2007 election. Following the ALP’s victory at the 2007 election we estimate that a positive ALP vote share residual is associated with a higher level of new automobile purchases. Also consistent with the consumer sentiment survey, this pattern reverses around the time of the 2013 election, at which the Liberal/National party formed government. The change in new automobile purchases is more pronounced than in the regression without controls. Although the downward trend in new automobile purchases began about 18 months prior to the 2013 election, it does line up with the timing of the downward trend in the difference between ALP and Liberal/National voters on whether it is a good time to buy a major household item in the consumer sentiment survey, which is also plotted in Figure 10.

\textsuperscript{16}For the 2007 election, we use 2006/07 mean taxable income, and for the 2013 election we use 2012/13 data.
Because the control variables absorb over half the variation in the ALP vote share across postcodes, the standard errors around our estimates are now larger. But we nonetheless believe that the point estimates are informative, particularly given that they follow a broadly similar pattern to the point estimates from the regression without controls. These results provide further evidence that consumers’ stated spending intentions in the sentiment survey correlate with observed behaviour.

Time-varying shocks correlated with income

To control for time-varying shocks to different parts of the income distribution we group postcodes into population-weighted terciles based on the average taxable income in each postcode in the year prior to the 2007 and 2013 elections. A tercile dummy variable interacted with year-quarter dummy variables is then added to Equation (7). Specifically, we estimate:

\[
\log(m_{it}) = \alpha_i + \sum_{j=-T_0}^{T_1} \delta_j d_t + \sum_{j=-T_0, j \neq T_0}^{T_1} \beta_j (d_t \times ALP_{i}^\tau) + \sum_{k=1}^{2} \sum_{j=-T_0}^{T_1} \gamma_j(d_t \times TER_{ik}) + \epsilon_{it}, \tag{9}
\]

where \(TER_{ik}\) is a dummy variable that is equal to one if postcode \(i\) is in tercile \(k \in \{1, 2\}\), where the top income tercile is the omitted category. This flexible specification controls for time-varying shocks to each income tercile and allows us to be agnostic as to the source of the shock.

Results for Equation (9) are shown in Figure 11. The estimated \(\beta\)-coefficients are similar to those from Equation (7) without controls, suggesting that our earlier results were not primarily driven by shocks to different parts of the income distribution (compare Figure 9 with Figure 11). Again, even after controlling for shocks to each tercile, we find that the pattern of the estimated \(\beta\)-coefficients lines up well with the difference in spending intentions between ALP and Liberal/National Party voters in the consumer sentiment survey.

\[\text{Difference-in-difference regressions}\]
To this point, we have relied upon point-in-time data, mostly from the 2006 and 2011 Census. This approach controls for differential income shocks correlated with observable economic characteristics. We now adopt a difference-in-difference framework, which allows us to control for changes in postcode-level incomes over time. Here we argue that if different groups of voters experience different shocks then this should be reflected in their incomes.

We estimate the following difference-in-difference regression at an annual frequency:

$$\Delta^h \log (mv_{i,t+h}) = \alpha + \beta_h ALP^2007_i + \sum \gamma_j X_{ij,h} + \phi_h \Delta^h \log (inc_{i,t+h}) + \varepsilon_{i,h}$$

(10)

where $\Delta^h \log (mv_{i,t+h})$ is the percent change in per capita automobile purchases in postcode $i$ between 2007 and year 2007+$h$, where $h = \{1, 2, ... 6\}$. Control variables include postcode-level growth in taxable income, $\Delta^h \log (inc_{i,t+h})$, and the full set of control variables $X_{i,j}$ listed in Table 1. Due to the limited availability of data following the 2013 election, we can only estimate Equation (10) for the 2007 election. As before, we use the average number of new automobile purchases over the two years before the 2007 election as regression weights.

We estimate Equation (10) separately over six different time horizons: 2007 to 2008 ($h = 1$), 2007 to 2009 ($h = 2$), and so on, until the period 2007 to 2013 ($h = 6$). Figure 12 shows estimates of $\beta_h$ in the presence and absence of the control variables (left- and right-hand panels, respectively). Figure 12 can be interpreted as follows: the first data point at 2008 shows the effect on growth in new automobile sales from 2007 to 2008 when moving from a postcode with no ALP voters to one with only ALP voters. The second data point for 2009 shows this same effect, but for automobile sales over a two year window from 2007 to 2009, and so on. The size of these estimated effects are non-trivial: going from a hypothetical postcode with only Liberal/National party voters to another postcode with only ALP voters is estimated to have increased per capita new automobile purchases by around 10 percent two years after the 2007 election, even after we control for changes in income.

Because our identification strategy relies on variation in the ALP vote share across postcodes, we would expect the effect of partisanship on automobile sales to be more pronounced
in the postcodes that have either a high fraction of ALP or Liberal/National voters. We would like to see if just using these “extreme” postcodes makes a material difference to our results. The bottom panels of Figure 12 report estimates for Equation (10) restricting the estimation sample to postcodes in the top and bottom quintiles of ALP vote share at the 2007 federal election. The results are similar in this subset of postcodes, suggesting that most of our identification comes from postcodes at the extremes of partisanship.

Because we cannot directly map an individual’s partisanship to their consumption, the postcode level data used in this section necessarily leads to more noisy estimates of the relationship between partisanship and consumption than the individual level spending intentions data. Automobile purchases are also lumpy, implying that purchases may not move discretely at elections. Despite this, we still find evidence that differences in consumer sentiment between ALP and Liberal/National party voters are reflected in differences in new automobile sales around changes of government. The profile of the estimated effect of the ALP vote share on per capita car sales in Figures 9, 10 and 11 lines up well with the difference in spending intentions between ALP and Liberal/National party voters for a major household item in the consumer sentiment survey shown in Figure 8. Hence we believe these results are supportive of our conclusions from using individual consumer level spending intentions data.

5 Discussion

In terms of the what the variation in sentiment we use represents, we believe that it is more likely to represent pure sentiment shocks resulting from partisanship than unbiased expectations about changes in future incomes. Firstly, the shift in sentiment between ALP and Liberal/National party voters occurs immediately following a change of government. These movements in sentiment are sharp and of a similar magnitude to that observed during recessions. Consumers are more optimistic about both personal and national economic conditions when the political party they support holds office, suggesting that beliefs about changes in
the income distribution are not the source of variation in sentiment. This interpretation is consistent with the political science literature, which finds that partisanship affects an individual’s assessment of past and future macroeconomic conditions.

Secondly, we make use of an extensive set of controls to account for the fact that partisanship is correlated with economic variables. These controls allow us to separate out the effect of economic policies targeted to specific demographic groups from their “perceived fundamentals.” After controlling for economic and demographic characteristics, we still find a positive relationship between sentiment and our measures of consumption. We believe that this provides support for the notion that sentiment indices contain meaningful independent information about future consumption, as argued by Hall (1993) and Blanchard (1993).

Our paper is most similar to Gerber and Huber (2009) and Mian et al. (2015), who both use cross-sectional county-level data to identify a relationship between partisanship and consumption following U.S. presidential elections. Gerber and Huber (2009) find evidence that consumption increases by more in counties that voted for the incoming president. In contrast, Mian et al. (2015) report no statistically significant effect. These differences in results partly reflect how each set of authors measure consumption. Gerber and Huber (2009) use county-level sales tax revenue data, which is problematic because consumers may shop in one county but live in another. Mian et al. (2015) use data similar to ours including self-reported spending intentions from the Michigan consumer sentiment survey and new automobile registrations.

This leads to the question of why we find that changes in sentiment affect consumption while Mian et al. (2015) do not. We believe that our data allows us to better measure sentiment, partisanship and consumption at a disaggregated level. In an online appendix we provide a reconciliation between our results and those from Mian et al. (2015). To summarize, Mian et al. (2015) have to impute an individual’s partisanship based on the county where they live. Imputing partisanship in our data based on an individual’s postcode, rather than using their stated voting intention, results in no longer being able to see the effect of
an election on consumer’s self-reported spending intentions. Secondly, Mian et al. (2015) measure automobile sales using registration data which includes sales to businesses and governments as well as households. Using our data, we find that the inclusion of business and government automobile sales makes it more difficult to see a positive relationship between the ALP vote share and automobile sales. Lastly, since voting is compulsory in Australia, we have a better measure of local area partisanship.

6 Implications for macroeconomic models

To this point we have taken the innovations to consumer sentiment at elections as given, and sought to identify the effect of these innovations on individual consumer’s spending intentions and postcode-level new automobile purchases. Here we discuss whether this variation could reflect mechanisms identified by existing macro models.

The sharp changes in sentiment at changes of government represents variation plausibly unrelated to changes in current economic conditions, suggesting that changes of government may act as news shocks (Beaudry and Portier 2006). Barsky and Sims (2012, p. 1371) have argued that “fundamental news is the main driving force behind the observed relationship between confidence and subsequent economic activity.”

We are skeptical about the news contained in sentiment innovations at changes of government. Changes of government could lead to systematic changes in the income distribution, benefiting supporters at the expense of opponents, but consumers disagree on both expectations of personal and general economic conditions. Supporters of the winning party expect both their own and national economic conditions to substantially improve, while supporters of the losing party expect the opposite. Any news-based explanation would have to reconcile these conflicting beliefs about national economic conditions. We also find it difficult to think of systematic changes in government economic policy that could cause the magnitude of revisions to beliefs about personal economic conditions that we see in the sentiment survey at changes of government. Furthermore, controlling for a wide range of economic and
demographic groupings to which economic policy could be targeted does little to reduce the difference in sentiment between supporters and opponents of the government.

Another possibility is that the variation in sentiment we use represents noise shocks, which Barsky and Sims (2012, p. 1345) define to be “…optimism or pessimism that, while not ex-ante irrational, is erroneous from the point of view of an outside observer with knowledge of the shocks.” Lorenzoni (2009b) develops a model in which noise shocks cause consumers to temporarily over or underestimate the economy’s productive capacity, generating aggregate demand like features. Consumers receive a noisy signal about innovations to aggregate productivity, but learning is sluggish because idiosyncratic supply shocks and dispersed information create a high degree of uncertainty about current productivity. In our setting, there appears to be particularly slow learning, with sentiment responding predictably at each change of government, and disagreement between supporters of the government and opposition party persisting for the entire term each party holds office. This suggests voters hold strong priors about the superiority of their party’s economic management, and face strong frictions filtering the contribution of their party’s economic policy from other influences on economic outcomes. The evidence from Bartels (2002), discussed earlier, indicates that there are even substantial frictions limiting learning by voters about past economic conditions.

In a departure from the news-noise view of business cycles, there is a literature looking at how agents can co-ordinate on market equilibria. Matsusaka and Sbordone (1995) find that a model with strategic complementarities can lead to multiple equilibria with sentiment influencing which equilibrium is reached. Angeletos and La’O (2013) develop a unique-equilibrium model in which aggregate fundamentals and preferences are known by all agents to be unchanging but sentiment shocks can nonetheless cause variation in aggregate demand. Sentiment shocks generate correlation in higher-order beliefs, such that optimism (pessimism) is justified by signals that others are also optimistic (pessimistic). The variation in sentiment at elections that we document could be a result of higher-order belief dynamics along the
lines of Angeletos and La’O (2013), but this is necessarily speculative because only first-order beliefs are observable. Furthermore, there is nothing in the theory proposed by Angeletos and La’O (2013) that would generate strong positive within-group correlation in beliefs and strong negative between-group correlation in beliefs, as we document by partisanship.

Considering these possibilities, we view the partisan variation in sentiment to most likely represent noise. But we remain surprised that barriers to learning are sufficiently strong for these difference in beliefs to be so persistent and predictable. While difficult to rationalize from a theoretical point of view, it is these features of the sentiment data that are so useful from an econometric identification point of view.

7 Conclusion

We use novel variation in consumer sentiment associated with political preferences to investigate whether innovations to consumer sentiment have a causal effect on consumption. Consumers are substantially more optimistic about economic conditions when the party they support is in government. The difference in sentiment between supporters of the two parties is large and the relative change occurs immediately following an election at which there is a change of government.

To see if the beliefs captured in sentiment surveys affect consumption, we match individual consumers’ expectations of future economic conditions from the consumer sentiment survey to their spending intentions. We find that consumers who have a more positive economic outlook report more positive spending intentions. We validate these results using postcode level automobile consumption data. In particular, following an election with a change of government, automobile purchases increase by relatively more in postcodes with a greater share of voters for the winning party.

We believe that our results have important implications. Firstly, our results indicate that consumer sentiment has a causal effect on spending intentions. Given our extensive use of controls, and the large movement in sentiment we observe at elections, we believe that the
variation in sentiment we identify represents pure sentiment shocks rather than unbiased expectations about changes in future incomes. This suggests that consumer sentiment can contain important information not captured by other macroeconomic indicators. From a policy makers perspective, divergences between consumer sentiment and the level of economic activity implied by macroeconomic data may contain important information about future consumption. Secondly, we have found that spending intentions elicited in sentiment surveys correlate well with actual consumption. Since individual level consumption data is difficult to obtain, our results provide support for researchers using spending intentions to study consumption behavior.

References


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<td>68,424</td>
<td>77,614</td>
<td>70,192</td>
<td>67,501</td>
<td>65,831</td>
<td>60,969</td>
</tr>
<tr>
<td>Age</td>
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<td>39</td>
<td>38</td>
<td>38</td>
<td>37</td>
<td>36</td>
</tr>
<tr>
<td>Share with college education</td>
<td>16.5</td>
<td>16.8</td>
<td>16.0</td>
<td>16.3</td>
<td>16.9</td>
<td>16.6</td>
</tr>
<tr>
<td>Share renting their home</td>
<td>30.1</td>
<td>26.4</td>
<td>29.1</td>
<td>29.2</td>
<td>30.7</td>
<td>35.4</td>
</tr>
<tr>
<td>Unemployment rate</td>
<td>5.8</td>
<td>4.7</td>
<td>5.5</td>
<td>5.5</td>
<td>5.8</td>
<td>7.4</td>
</tr>
<tr>
<td>Share with white collar job</td>
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<td>39.2</td>
<td>34.0</td>
<td>33.3</td>
<td>32.7</td>
<td>30.0</td>
</tr>
<tr>
<td>Industry shares:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agriculture</td>
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<td>7.6</td>
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<td>1.6</td>
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<td>0.6</td>
</tr>
<tr>
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<td>12.7</td>
<td>12.2</td>
<td>11.0</td>
<td>9.6</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>9.5</td>
<td>7.7</td>
<td>8.6</td>
<td>9.1</td>
<td>9.9</td>
<td>12.3</td>
</tr>
<tr>
<td>Retail &amp; wholesale trade</td>
<td>20.1</td>
<td>18.8</td>
<td>19.7</td>
<td>20.1</td>
<td>20.6</td>
<td>21.4</td>
</tr>
<tr>
<td>Services</td>
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<td>17.4</td>
<td>17.2</td>
<td>17.2</td>
<td>17.8</td>
<td>18.0</td>
</tr>
<tr>
<td>Health &amp; education</td>
<td>20.1</td>
<td>20.0</td>
<td>20.7</td>
<td>20.7</td>
<td>20.2</td>
<td>19.0</td>
</tr>
<tr>
<td>Arts &amp; accommodation</td>
<td>8.2</td>
<td>7.6</td>
<td>8.4</td>
<td>8.2</td>
<td>8.0</td>
<td>8.7</td>
</tr>
<tr>
<td>Public sector</td>
<td>6.6</td>
<td>5.5</td>
<td>6.3</td>
<td>6.9</td>
<td>7.7</td>
<td>6.4</td>
</tr>
<tr>
<td>Other</td>
<td>3.9</td>
<td>3.7</td>
<td>3.9</td>
<td>4.0</td>
<td>3.9</td>
<td>3.9</td>
</tr>
</tbody>
</table>

Notes: This table reports population-weighted means for each variable by quintile of the ALP vote share and for the total population. Postcode characteristics data are taken from the Census that is the closest in time to the change in government: the 2006 Census for the 2007 federal election and the 2011 Census for the 2013 federal election; income data are taxable income for the 2006/07 and 2012/13 financial years; automobiles data are total per capita purchases for 2007 and 2013. Postcodes in the Australian Capital Territory are excluded.
Table 2: Beliefs About General Economic Conditions and Spending Intentions

### Second stage: \( spend_{it} = \delta_{t} + \sum_{j} \gamma_{j} X_{ij,t} + \phi \text{expect}_{it} + \varepsilon_{it} \)

<table>
<thead>
<tr>
<th></th>
<th>1996 Election</th>
<th>2007 Election</th>
<th>2013 Election</th>
</tr>
</thead>
<tbody>
<tr>
<td>\text{expect}: next year</td>
<td>0.360***</td>
<td>0.302***</td>
<td>0.435***</td>
</tr>
<tr>
<td></td>
<td>(0.031)</td>
<td>(0.061)</td>
<td>(0.061)</td>
</tr>
<tr>
<td>\text{expect}: 5 years</td>
<td>0.524***</td>
<td>0.329***</td>
<td>0.511***</td>
</tr>
<tr>
<td></td>
<td>(0.047)</td>
<td>(0.062)</td>
<td>(0.077)</td>
</tr>
<tr>
<td>Controls</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Observations</td>
<td>22,650</td>
<td>21,954</td>
<td>24,985</td>
</tr>
</tbody>
</table>

### First stage: \( \text{expect}_{it} = \delta_{t} + \sum_{j} \gamma_{j} X_{ij,t} + \lambda \text{support}_{it} + \varepsilon_{it} \)

<table>
<thead>
<tr>
<th></th>
<th>1996 Election</th>
<th>2007 Election</th>
<th>2013 Election</th>
</tr>
</thead>
<tbody>
<tr>
<td>\text{expect}: next year</td>
<td>0.437***</td>
<td>0.307***</td>
<td>0.237***</td>
</tr>
<tr>
<td></td>
<td>(0.013)</td>
<td>(0.014)</td>
<td>(0.013)</td>
</tr>
<tr>
<td>\text{expect}: 5 years</td>
<td>0.242***</td>
<td>0.304***</td>
<td>0.252***</td>
</tr>
<tr>
<td></td>
<td>(0.014)</td>
<td>(0.017)</td>
<td>(0.016)</td>
</tr>
<tr>
<td>\text{support}</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Controls</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Observations</td>
<td>22,650</td>
<td>21,954</td>
<td>24,985</td>
</tr>
</tbody>
</table>

Notes: Each regression uses individual response data pooled over the period one year before and after each election with a change in government: March 1996, November 2007 and September 2013. The variable ‘\text{expect}: next year’ is beliefs about the ‘expected change in general economic conditions over the next year’, with responses coded as 1 (worse), 2 (unchanged), and 3 (better); ‘\text{expect}: 5 years’ is responses to the analogous question about economic conditions over the next 5 years; \text{support} takes the value unity if a survey respondent’s self-identified voting intention matches the political party in office and zero otherwise; \text{spend} is responses to the question ‘do you think now is a good time to buy a major household item’ with responses coded as 1 (bad time), 2 (neither good/nor bad), and 3 (good time). The set of controls \( X_{ij,t} \) includes: gender, age, occupation, education, home ownership, income, metro/non-metro, plus a constant; \( \delta_{t} \) is a survey/month fixed effect. The categorical variables \text{expect} and \text{spend} are treated as linear variables; the first-stage is estimated using OLS and the second-stage is estimated using Two-Stage Least Squares. Robust standard errors have been used; ***, ** and * represent statistical significance at the 1, 5 and 10 percent levels, respectively.

Summary: In the first stage we use self-identified partisanship as an instrument for consumer expectations about the change in general economic conditions; the second-stage regression estimates indicate that holding more optimistic beliefs about general economic conditions causes consumers to report higher spending intentions.
Figure 1: Consumer Sentiment and Consumption Growth

Notes: The figure shows year-ended growth in household final consumption expenditure, sourced from the national accounts, and the aggregate Westpac-Melbourne Institute consumer sentiment index.

Summary: There is a high correlation between sentiment and consumption growth.

Figure 2: Consumer Sentiment Index

Notes: The left panel shows the consumer sentiment index by consumers’ self-identified voting intention; the right panel shows the difference between the two series in the left panel: ALP minus Liberal/National party voters. Vertical lines show dates when government changed hands.

Summary: Sentiment is substantially higher when a consumer’s self-identified political party holds government.
Notes: The consumer sentiment survey contains four questions asking about economic beliefs. For each question a separate index is constructed for self-identified ALP and Liberal/National voters; each panel shows the difference between these index levels, ALP minus Liberal/National voters. The survey questions are: (a) change in personal financial situation compared to a year ago; (b) expected change in personal financial situation over the next year; (c) expected change in general economic conditions over the next year; (d) expected change in general economic conditions over the next five years. Responses to each question are either positive, unchanged/don’t know, or negative. Vertical lines show dates when government changed hands.

Summary: Consumers have more optimistic beliefs about personal and general economic conditions when the political party they support holds government.
Figure 4: Economic Belief Components of Consumer Sentiment Survey: Conditional Indices
ALP minus Liberal/National Voters

Notes: Responses to each question are either positive, unchanged/don’t know, or negative. (See notes to Figure 3 for details on each question.) For each question and each survey month an ordered probit model is fitted; the set of included variables are: gender, age, occupation, education, home ownership, income, metro/non-metro and voting intention. For each month, the estimated average marginal effect of reporting a positive response is calculated for an ALP voter relative to a Liberal/National party voter; the same is done for negative responses. The lines reported in each figure are the difference (positive minus negative) between these two estimated average marginal effects, providing an econometric analogue to the unconditional means shown in Figure 3. Dashed lines are two standard error bands. Vertical lines show dates when government changed hands.

Summary: After controlling for individual level characteristics, consumers have more optimistic beliefs about personal and general economic conditions when the political party they support holds government.
Figure 5: News poll: Expected Change in Standard of Living

(a) By Voting Intention

(b) ALP Minus Liberal/National Voters

Notes: News poll surveys consumers on their expected change in standard of living over the next six months; responses are improve, no change/uncertain, or get worse. An index is constructed by subtracting the fraction reporting a negative response from the fraction reporting a positive response. The left panel shows the index level by consumers’ voting intention. The right panel shows the difference between the two series in the left panel: ALP minus Liberal/National party voters. Vertical lines show dates when government changed hands. The survey has been conducted in June and December each year since 2000.

Summary: The News poll survey, entirely separate from the consumer sentiment survey, shows that consumers are more optimistic about their standard of living when the political party they support holds government.

Figure 6: Political Opinion Polling: News poll Two-Party Preferred Vote Shares

Notes: The figure shows ALP (red) and Liberal/National party (blue) Two-Party Preferred vote shares from the generally fortnightly News poll survey. Vertical lines indicate elections at which there was a change of government. Circles indicate actual vote shares at the November 2007, September 2010, and September 2013 elections.

Summary: The Liberal/National party trailed in the News poll survey for over a year before losing the 2007 election; polling before the 2013 change of government was more mixed.
Figure 7: Spending Intentions: Good Time to Buy a Car: Conditional ALP Minus Liberal/National Voters

Notes: The figure shows the effect of changes of government on spending intentions for automobiles. The index is constructed from individual response data and conditions on respondents’ economic and demographic characteristics (see notes to Figure 4 for details). Consumers were asked whether ‘now is a good time to buy a car’, and responses classified as either good, neutral, or bad. The automobiles question was asked on a quarterly basis from 1995-2006, then monthly until January 2014, when it was discontinued. We show the index on a quarterly basis, together with the analogous index of spending intentions on a major household item.

Summary: Consumers are more likely to report that now is a good time to buy a car if the political party they support holds government, conditional on individual-level characteristics.

Figure 8: Spending Intentions: Good Time to Buy A Major Household Item
ALP Minus Liberal/National Voters

(a) Unconditional

(b) Conditional

Notes: The figure shows the effect of changes of government on spending intentions for a major household item. Consumers were asked whether ‘now is a good time to buy a major household item’, and responses classified as either good, neutral, or bad. A separate index is constructed for ALP and Liberal/National voters as one hundred plus the share of positive responses less the share of negative response. The left panel shows the difference between these two indices, ALP minus Liberal/National voters. The right panel shows the conditional analogue; see notes to Figure 4 for details.

Summary: Consumers are more likely to report that now is a good time to buy a major household item if the political party they support holds government.
Figure 9: Partisanship and Automobile Purchases: Coefficient on ALP Vote Share

(a) 2007 Election Vote Shares

(b) 2013 Election Vote Shares

Notes: The top panel shows coefficient estimates $\beta_j$ for Equation (7) using vote share data from the 2007 federal election; the omitted category is the December quarter 2007, when the ALP won government. The bottom panel reports coefficient estimates $\beta_j$ using vote share data from the 2013 federal election; the omitted category is the September quarter 2013, when the Liberal/National party won government. Standard errors are clustered by federal electorates.

Summary: Automobile sales were higher in ALP-leaning postcodes relative to Liberal/National leaning postcodes when the ALP held office between November 2007 and September 2013.
Figure 10: Partisanship and Automobile Purchases: Coefficient on Unexplained Variation in ALP Vote Share

(a) 2007 Election Vote Shares

Notes: The figures show coefficient estimates $\beta_j$ for Equation (8). The top panel reports the coefficients $\beta_j$ using vote shares from the 2007 federal election, and the omitted category is the December quarter 2007, when the ALP won government. The bottom panel reports the coefficients $\beta_j$ using vote shares from the 2013 federal election, and the omitted category is the September quarter 2013, when the Liberal/National party won government. Dashed lines show 95 per cent confidence bands calculated from 1000 bootstrap replications; resampling was conducted at the federal electorate level. The Good Time to Buy series is the difference between ALP and Liberal/National party voters in self-reported spending intentions for a major household item.

Summary: Controlling for observable differences in characteristics of postcodes, automobile sales were higher in ALP-leaning postcodes relative to Liberal/National leaning postcodes when the ALP held office between November 2007 and September 2013.
Notes: The top panel shows coefficient estimates $\beta_j$ for Equation (9), where we control for time-varying shocks to income terciles, using vote share data from the 2007 federal election; the omitted category is the December quarter 2007, when the ALP won government. The bottom panel reports coefficient estimates $\beta_j$ using vote share data from the 2013 federal election; the omitted category is the September quarter 2013, when the Liberal/National party won government. Standard errors are clustered by federal electorates.

Summary: After controlling for time-varying shocks to income terciles, automobile sales were higher in ALP-leaning postcodes relative to Liberal/National leaning postcodes when the ALP held office between November 2007 and September 2013.
Figure 12: Partisanship and Automobile Sales: Difference-in-Difference Regressions
Coefficient on ALP Vote Share at 2007 Election

Notes: Each panel reports coefficient estimates $\beta_h$ for Equation (10); each coefficient $\beta_h$ is from a separate regression. The first panel reports coefficients $\beta_h$ from a regression including no controls; the second panel includes the full set of controls listed in Table 1; the third and fourth panels repeat the first two panels restricting the data sample to postcodes in the top and bottom population-weighted quintiles of ALP vote share at the 2007 federal election. Summary: Controlling for income growth and other observable differences in characteristics of postcodes, automobile sales were higher in ALP-leaning postcodes relative to Liberal/National leaning postcodes when the ALP held office between November 2007 and September 2013.
A Online Appendix

A.1 Reconciliation with Mian et al. (2015)

Our paper is most closely related to Mian et al. (2015), who use U.S. data to investigate whether changes in county-level consumption following a presidential election, that results in a change in party that holds the presidency, are related to county-level voting outcomes. While we find that an increase in sentiment leads to higher consumer spending, they find no statistically significant relationship between sentiment regarding government economic policy and consumer spending. We offer a few explanations as to why our results differ to theirs.

Firstly, the Australian consumer sentiment survey asks respondents about their voting intentions. In contrast, Mian et al. (2015) have to impute an individual’s partisanship based on the county where they live. To see the effect of imputing partisanship, using our data we impute an individual’s partisanship based on their postcode. In particular, we re-compute conditional consumer sentiment indices using the same methodology outlined in Section 2.3, but instead of using an individual’s self-reported voting intention we use the postcode-level ALP vote share in their postcode of residence at the 2007 election. Comparing the results in Figure A1 where partisanship is imputed to that in Figures 4 and 8 of our paper, where we observe partisanship, we can see that imputing partisanship introduces noise into the data. Nonetheless, these estimates do suggest that ALP voters became more pessimistic about the national economy (sub-indices $d$ and $e$ in Figure A1) following changes in government. But the effect of partisanship on spending intentions is too small to detect when voting intention is imputed from postcode-level vote shares. These results using the imputed measure of partisanship mirror the findings of Mian et al. (2015) for the US, and so provide a reconciliation between our findings.

In terms of how automobiles are measured, because we are interested in the effect of con-
sumer sentiment on household consumption, we use automobile sales to households. Mian et al. (2015) use registration data which includes automobile sales to businesses and governments in addition to households. To see the effect of using total automobile sales data we re-estimate Equation (7) from our paper using Australian automobile registration data. The data are sourced from the Australian Bureau of Statistics and are available on an annual basis. Figure A2 shows the effect of an increase in the ALP vote share on automobile sales. It now becomes unclear whether changes in sentiment affect consumption, with the estimated coefficients having a saw-toothed pattern around the 2007 election.

Finally, voting in Australia is compulsory. In contrast, voting in the US is voluntary. This can lead to selection issues. For example, it is well known that voter turnout can be affected by opinion polls. This leads to measurement error which can downwardly bias the estimated effect of partisanship on consumption.

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17The VFAC'Ts data used in the main body of the paper contain only sales of automobiles to households. Here we use annual data from the Australian Bureau of Statistics because it contains automobiles purchased by households, businesses and the government.

18Mian et al. (2015) also use credit card data in their analysis. Unfortunately we do not have access to credit card data.
Table A1: Bai and Perron (1998) Break Test Results: Spending Intentions: ALP minus Lib/Nat Voters

<table>
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<tr>
<th>Double maximum test</th>
<th>Information criteria</th>
<th>Sequential test</th>
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<tr>
<td></td>
<td></td>
<td>3 breaks</td>
<td>4 breaks</td>
<td>5 breaks</td>
</tr>
<tr>
<td></td>
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<td>4 breaks</td>
<td>4 breaks</td>
<td>5 breaks</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>government</td>
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<tr>
<td><strong>Unconditional spending intentions</strong></td>
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<td></td>
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<tr>
<td>UD-Max</td>
<td>BIC</td>
<td>SupF(2</td>
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<td>81.08***</td>
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<td>Mar-08</td>
<td>Dec-07</td>
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<tr>
<td>LWZ</td>
<td>SupF(3</td>
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<td>Oct-13</td>
<td>Apr-10</td>
</tr>
<tr>
<td>4 breaks</td>
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<td></td>
<td>Sep-13</td>
</tr>
<tr>
<td></td>
<td></td>
<td>74.53***</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>SupF(4</td>
<td>3)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>33.62***</td>
<td></td>
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</tr>
<tr>
<td></td>
<td></td>
<td>SupF(5</td>
<td>4)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>5.16</td>
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<td></td>
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<td><strong>Conditional spending intentions</strong></td>
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<td></td>
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<tr>
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<td>BIC</td>
<td>SupF(2</td>
<td>1)</td>
<td>Apr-96</td>
</tr>
<tr>
<td>86.26***</td>
<td>5 breaks</td>
<td>126.90***</td>
<td>Dec-08</td>
<td>Nov-07</td>
</tr>
<tr>
<td>LWZ</td>
<td>SupF(3</td>
<td>2)</td>
<td>Oct-13</td>
<td>Apr-10</td>
</tr>
<tr>
<td>3 breaks</td>
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<td>59.70***</td>
<td>Oct-13</td>
<td>Dec-07</td>
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<td></td>
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<td>SupF(4</td>
<td>3)</td>
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<td></td>
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<td>33.92***</td>
<td></td>
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<td></td>
<td></td>
<td>SupF(5</td>
<td>4)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>5.18</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes: This table reports tests for a break in the difference between the mean level of spending intentions for ALP and Liberal/National voters. The double maximum test is for an unspecified number of breaks against the null of zero breaks. The UD-Max test statistics evaluate an F-statistic for 1–5 breaks, with the breakpoints selected by global minimization of the sum of squared residuals. The UD-Max statistic weights the five F-statistics equally. The LWZ statistic is a modified Schwarz criterion. The SupF($i+1|i$) test is for $i+1$ breaks against the null of $i$ breaks. The sequential test selects the number of breaks stepwise from zero breaks using the SupF test assuming a 5 percent significance level. The break dates are those identified by minimizing the sum of squared errors conditional on the number of breaks. ***, ** and * represent statistical significance at the 1, 5 and 10 percent levels, respectively.

Summary: There is statistically significant evidence of a break in relative spending intentions for ALP and Liberal/National voters at changes of government.
### Table A2: ALP Vote Share Regressions

<table>
<thead>
<tr>
<th></th>
<th>ALP vote share: 2007</th>
<th>ALP vote share: 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Log taxable income</td>
<td>-19.22***</td>
<td>-24.32***</td>
</tr>
<tr>
<td></td>
<td>(4.68)</td>
<td>(5.04)</td>
</tr>
<tr>
<td>Bachelor’s degree or higher: per cent</td>
<td>1.17***</td>
<td>1.12***</td>
</tr>
<tr>
<td></td>
<td>(0.22)</td>
<td>(0.20)</td>
</tr>
<tr>
<td>Average age: years</td>
<td>-0.20*</td>
<td>-0.24**</td>
</tr>
<tr>
<td></td>
<td>(0.11)</td>
<td>(0.12)</td>
</tr>
<tr>
<td>Unemployment rate: per cent</td>
<td>1.73***</td>
<td>1.05***</td>
</tr>
<tr>
<td></td>
<td>(0.21)</td>
<td>(0.25)</td>
</tr>
<tr>
<td>Share of renters: per cent</td>
<td>0.00</td>
<td>-0.02</td>
</tr>
<tr>
<td></td>
<td>(0.05)</td>
<td>(0.06)</td>
</tr>
<tr>
<td>White-collar profession: per cent</td>
<td>-0.80***</td>
<td>-0.74***</td>
</tr>
<tr>
<td></td>
<td>(0.16)</td>
<td>(0.19)</td>
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<tr>
<td>Industry of employment: per cent</td>
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</tr>
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<td>-0.64***</td>
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<td>(0.14)</td>
<td>(0.13)</td>
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<td>Mining &amp; construction</td>
<td>-0.39***</td>
<td>-0.38***</td>
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<tr>
<td></td>
<td>(0.13)</td>
<td>(0.16)</td>
</tr>
<tr>
<td>Retail &amp; wholesale trade</td>
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</tr>
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<td></td>
<td>(0.17)</td>
<td>(0.20)</td>
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<td>Services</td>
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<td>-0.53***</td>
</tr>
<tr>
<td></td>
<td>(0.19)</td>
<td>(0.19)</td>
</tr>
<tr>
<td>Health and education</td>
<td>-0.60***</td>
<td>-0.42**</td>
</tr>
<tr>
<td></td>
<td>(0.16)</td>
<td>(0.17)</td>
</tr>
<tr>
<td>Arts and accommodation</td>
<td>-0.75***</td>
<td>-0.54**</td>
</tr>
<tr>
<td></td>
<td>(0.25)</td>
<td>(0.24)</td>
</tr>
<tr>
<td>Other</td>
<td>-1.16**</td>
<td>-1.37***</td>
</tr>
<tr>
<td></td>
<td>(0.52)</td>
<td>(0.48)</td>
</tr>
<tr>
<td>Region: inner regional</td>
<td>-4.82***</td>
<td>-5.09***</td>
</tr>
<tr>
<td></td>
<td>(1.45)</td>
<td>(1.56)</td>
</tr>
<tr>
<td>Region: outer regional</td>
<td>-5.16***</td>
<td>-5.91***</td>
</tr>
<tr>
<td></td>
<td>(1.77)</td>
<td>(1.75)</td>
</tr>
<tr>
<td>Region: remote</td>
<td>-2.00</td>
<td>-3.36</td>
</tr>
<tr>
<td></td>
<td>(2.50)</td>
<td>(2.50)</td>
</tr>
<tr>
<td>Region: very remote</td>
<td>1.87</td>
<td>1.15</td>
</tr>
<tr>
<td></td>
<td>(3.75)</td>
<td>(3.87)</td>
</tr>
</tbody>
</table>

| $R^2$                          | 0.61                 | 0.55                 |
| Observations                   | 2265                 | 2264                 |

Notes: This table reports coefficient estimates from a regression of the ALP vote share on postcode level characteristics. For the 2007 election, income is measured using 2006/07 financial year taxable income data and other variables are taken from the 2006 Census. For the 2013 election, income is measured using 2012/13 financial year taxable income data and other variables are taken from the 2011 Census. Observations are weighted by the number of voters in a postcode at each election. Baseline covariates are: home owner, blue-collar profession, public sector industry, and metropolitan location. Postcodes in the Australian Capital Territory is excluded. ***, **, and * indicate results statistically different from zero at the 1, 5 and 10 percent levels, respectively.

Summary: Economic covariates explain 61 and 55 per cent of the ALP vote share at the 2007 and 2013 federal elections, respectively.
Figure A1: Components of Consumer Sentiment: Imputed Partisanship, ALP minus Liberal/National Voters

Notes: These estimates repeat those of Figures 4 and 8 (right panel) using imputed rather than self-reported partisanship as the dependent variable. The measure of partisanship is the ALP vote share at the 2007 federal election in the postcode of residence for each survey respondent. See notes to Figure 4 for further details.

Summary: The effect of partisanship on spending intentions cannot be detected when partisanship is imputed based on the postcode-level ALP vote share of the survey respondent. But an effect of partisanship on views about general economic conditions is evident.
Figure A2: Partisanship and Automobile Purchases: By Total Registration and Sales Data to Households

Notes: The graph shows the estimated coefficients $\beta_j$ for Equation (7), using annual vehicles data and 2007 vote share data; the coefficients $\beta_j$ are relative to the omitted year 2007, when the ALP won government. We measure per capita automobile purchases in two ways: from sales to households and from registration data that includes sales to households, businesses and the government; registration data are available only at an annual frequency.

Summary: Measuring automobile sales using total registrations rather than sales to households adds noise, obscuring the relationship between changes in government and new automobile consumption.