

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, supporters of the winning party report substantially more optimistic beliefs about economic conditions than supporters of the losing party. We argue that this variation in beliefs is orthogonal to changes in fundamentals and find robust evidence that the shifts in sentiment affect spending intentions. Furthermore, using geographic variation in sentiment, vote-shares and automobile purchases we find evidence that stated spending intentions are indicative of actual spending. (JEL E20, E21)

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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

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economic conditions and in turn have a causal effect on consumption. For example, Hall (1993) and Blanchard (1993) argue 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 this, there is a sizable correlation between consumption growth and consumer sentiment (Figure 1). A growing theoretical literature provides mechanisms for sentiment-driven business cycles (e.g. Angeletos and La'O 2013 and Benhabib, Wang and Wen 2015).

< Figure 1 about here >

However, many 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, Friedman (1992, p. 523) argued that “They [consumer confidence indices] are mostly a reflection of what’s going on rather than a cause...” Despite these varying views, there has been little empirical work which assesses whether innovations in consumer sentiment contain independent information about consumption.

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 economic fundamentals. However, in this paper, we are able to consider cross-sectional variation in sentiment related to individuals’ political preferences to isolate variation in sentiment that is plausibly orthogonal to changes in 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 center-left Australian Labor Party (ALP) and the center-right Liberal/National Party. Over the period for which we have aggregate-level consumer sentiment data by voter type 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 precise timing of the shifts in sentiment at changes of government indicates that the variation reflects voting intentions affecting economic beliefs rather than perceptions of current economic conditions affecting voting behavior.

< Figure 2 about here >

Our identification approach uses voting intention as an instrument for sentiment. For our identification approach to be valid, voting intention must satisfy an exclusion restriction of affecting consumption only through sentiment, and thus not via economic fundamentals. We argue that this is the case for two key reasons. First, there is a sharp change in sentiment at changes of government. There have not been major economic events or changes in current economic policy occurring coincident with changes of government in our sample. Second, we argue that observable economic and demographic characteristics of survey respondents can be used to control for the effect of expected future changes in economic policy. Our argument is based on the fact that economic policy set by the federal government targets groups of people based on observable characteristics, such as an individual's age or occupation. We control in our analysis for a wide range of economic and demographic groupings that government policies could target. Furthermore, opinion polls and election betting odds predicted each change of government. This makes the changes of government less significant news events than had the election outcomes been a surprise. Nevertheless, the election outcomes were not certain and therefore contained some news, which is addressed through the use of controls. In summary, we argue that, conditional on many economic and

demographic observables, changes of government influence spending through sentiment and not 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 measures we use are self-reported spending intentions for a major household item and automobiles. These questions form part of the consumer sentiment survey, allowing us to match reported sentiment, voting intentions 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 United States) and new automobile purchases by households, as a postcode-level consumption proxy.

Using the self-reported spending intentions data, we show that consumers report significantly more positive spending intentions for both major household items and automobiles when the political party they support is in government. The shift in spending intentions coincide 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 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 individual voting intention as an instrument for sentiment. We employ an extensive set of economic and demographic controls. This approach uses only variation in beliefs correlated with voting intention to identify the effect of sentiment on spending intentions. 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 automobile purchases data we use span two changes in government. 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 automobile 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.¹ The estimated effects are large: moving from a hypothetical postcode with only Liberal/National voters to a postcode with only ALP voters leads to an average 10 percentage point increase in new automobile sales during the period the ALP held government. The results are similar when we include a wide range of postcode-level economic and demographic controls, when we allow for time varying shocks correlated with income and after controlling for income and house price growth.

Our identification approach differs from much of the existing literature, which has mostly considered time series data and used a control variable approach. Carroll, Fuhrer and Wilcox (1994) and Ludvigson (2004) find that, after controlling for income growth, interest rates and other macroeconomic variables, 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 information contained in other variables that have not been controlled for, rather than any independent causal effect of sentiment innovations on spending (Ludvigson 2004). An advantage of our cross-sectional approach relative to the time-series approach is that it removes all aggregate economic shocks that affect both sentiment and consumption.

Our paper makes two key contributions to the literature. First, we provide evidence that consumer sentiment has a causal effect on consumption. Given our extensive use of controls and the predictability of election results in our sample, our results provide a basis for believing that changes in pure sentiment can affect consumption. Our findings provide a necessary condition in support of recent theoretical models that highlight sentiment or beliefs as a non-fundamental driver of economic activity (e.g., Matsusaka and Sbordone 1995, Lorenzoni 2009, Angeletos and La'O 2013, Benhabib, Wang and Wen 2015 and Benhabib, Liu and Wang 2016).

¹We do not have automobile purchase data for the 1996 election.

Second, 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 settings (e.g., Levitt and List 2007).

The remainder of the paper is organized as follows. Section I provides background information and discusses the Australian consumer sentiment survey. In Section II we look at the effect of sentiment on consumer's stated spending intentions. The effect of sentiment on automobile purchases is discussed in Section III. We relate our results to the literature in Section IV and Section V concludes. Data sources are either mentioned in the text or listed in Table A7 in the online appendix.

I Consumer sentiment and voting intentions

A Background

Political system.—Australia has a parliamentary political system, with either the ALP or the Liberal/National party holding government since World War II. Electoral terms are a maximum of three years, with timing determined by the Prime Minister. During the 1995-2015 period spanned by the consumer sentiment data there were three changes of government: from the ALP to the Liberal/National Party in March 1996, to the ALP in November 2007 and back to the Liberal/National Party in September 2013. Each of the electoral terms preceding a change in government lasted close to three years.²

The federal government has primary control of fiscal policy, having sole responsibility for income and consumption taxation. The federal government's share of consolidated government revenues and spending is around 70 percent (ABS 2017). Monetary policy is controlled by an independent central bank.

²The shortest electoral term in the 1995-2015 period was 2 years and 7 months, between the 1996 and 1998 federal elections.

Economic outcomes.—The sharp revisions in sentiment at changes of government is not supported by historical aggregate economic outcomes. Using the methodology of Blinder and Watson (2016), we find that there is little difference in GDP growth, and a range of other economic outcomes, between ALP and Liberal/National governments in Australia (Table A1 in the online appendix). The exceptions are core inflation and the level of the unemployment rate. The difference in inflation performance stems from the Liberal/National party being in power for longer than the ALP since the introduction of inflation targeting. Despite the unemployment rate being a little higher on average under ALP governments, employment growth and the average annual change in the unemployment rate have been similar under ALP and Liberal/National governments.

B Consumer sentiment survey

Overview.—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.³

To measure economic beliefs, 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

³In the months since the 2016 United States presidential election the Michigan Survey of Consumers has asked people about their political affiliation. Consistent with our findings, Republicans have been substantially more optimistic about economic conditions than Democrats since the Republican party regained the Presidency. However, the Michigan Survey of Consumers has not regularly asked about political party affiliation so no consistent history of the differences in expectations by political affiliation is available (Curtin, 2017).

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 around 500 for the Michigan Survey of Consumers).⁴

Summary statistics.—Table 1 reports economic and demographic characteristics by voter type for respondents to the consumer sentiment survey. Statistics are reported separately for each election resulting in a change of government, and are an average over a period one year before and after each election. Survey respondents identifying as ALP and Liberal/National voters are similar along most dimensions. However, supporters of the Liberal/National party tend to be older, less likely to be renting their home, less likely to be unemployed and less likely to reside in a metropolitan area.

< Table 1 about here >

To assess the representativeness of the survey, we also report statistics from the Census closest to each election. Survey respondents are comparable with the overall population in terms of income, gender and metropolitan location. However, survey respondents are substantially more likely to be college educated and in a white-collar job than the overall population. This could mean that survey respondents are more informed than the overall population. The share of survey respondents reporting that they are unemployed is substantially higher than in the official statistics, most likely because there is no requirement to be actively searching for work to classify as unemployed in the sentiment survey. Survey respondents are also more likely to be home owners and older than the overall population. However, along each dimension for which the survey differs from the population, the difference in the survey

⁴The aggregate consumer sentiment index is constructed by averaging responses to these four questions as well as responses to a question asking whether now is a good time to purchase a major household item. We view this latter question as an outcome variable. We discuss the spending intentions data in Section II.

between ALP and Liberal/National supporters is modest.

C Consumer sentiment indices

For each of the four questions in the consumer sentiment survey, we construct a separate index for ALP and Liberal/National party voters, and the difference (ALP minus Liberal/National party voters) is shown in Figure 3. Consumers become more optimistic about both personal and national economic conditions when the political party they support wins office. Conversely, opposition party supporters become more pessimistic about both personal and national economic conditions. The relative change in sentiment occurs precisely in the month of an election at which there is a change of government, and persists for the entire period each party holds office.⁵

< Figure 3 about here >

We have argued that shifts in economic beliefs at changes of government cannot be explained by economic events or changes in economic policy coincident with the elections. Another possibility is that the shifts in economic beliefs at changes of government reflect expected future changes in economic policy that differentially affect ALP and Liberal/National voters. Notice, however, that supporters of the winning party report an improvement in their personal financial situation compared with a year ago almost coincident with the changes of government (Figure 3a). This shift in beliefs occurs before any changes in government policy could plausibly come into effect, and so cannot be driven by news.

Betting market data correctly assigned a high probability to the 2007 and 2013 changes of government (Figure 4b). For the 2007 election, the probability of government changing hands increased steadily from around 0.5 to above 0.8 over the year prior to the election. For the 2013 election, the probability of the ALP retaining government was never more than 34 percent. Betting market data are unavailable for the 1996 election and polling was only published for a

⁵Government changes hands as soon as the election result is known. For each change of government in our sample the election result was known within hours of the polls closing.

two-month period prior to the 1996 election but those polls consistently predicted the change of government.⁶ The greater the extent to which each change of government was expected, the smaller is the amount of news associated with the actual election outcomes.

< Figure 4 about here >

Although the changes of government should have been expected, some households may not have paid attention to polling data. Consistent with this, a *Newspoll* survey conducted between just two and four days prior to the 2007 federal election found that 46 per cent of Liberal/National party supporters believed their party would win the election, despite evidence to the contrary (Newspoll, 2007). For these people, the election result could have been a surprise. We formally address this possibility in the next section.

D Conditional consumer sentiment indices

The shifts in economic beliefs at changes of government could be a response to news about policy changes by the incoming government. That is, news about policies the incoming government may enact to favor its supporters. Our identification approach is based on the observation that economic policy set by the federal government can target groups of people (based on, for example, their income, age or occupation) but not specific individuals. We control for observed economic and demographic differences between ALP and Liberal/National party voters and look at whether shifts in economic beliefs at changes of government remain evident.

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 survey questions (positive, unchanged / don't know, or negative) mask a smooth

⁶Prior to 2003 the *Newspoll* survey was only published for a few months before each election. We use data from the *Newspoll* survey because of its long history and publication across the country. In an analysis of betting market data for the 2013 election, Jackman (2015) finds the *Newspoll* survey to be an important market mover.

underlying distribution of consumer attitudes. For each sentiment question, and each survey month, we fit an ordered probit model:

$$(1) \quad s_{i,j,t}^* = \mathbf{X}_{i,t}\boldsymbol{\Gamma}_{j,t} + \phi_{j,t}ALP_i + \varepsilon_{i,j,t},$$

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.⁷ $\mathbf{X}_{i,t}$ is a vector of covariates for person i , which is discussed in more detail below. $\boldsymbol{\Gamma}_{j,t}$ 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 that consumer i reports a positive response to question j in survey month t is

$$(2) \quad p_{i,j,t}^{pos} \equiv Pr\left(s_{i,j,t}^* > \mu_{j,t}^{high}\right) = Pr\left(\varepsilon_{i,j,t} > \mu_{j,t}^{high} - \mathbf{X}_{i,t}\boldsymbol{\Gamma}_{j,t} - \phi_{j,t}ALP_i\right)$$

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 $\boldsymbol{\Gamma}_{j,t}$ 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, ω_i .

We are interested in the effect of voting intention on economic beliefs. 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

$$(3) \quad \Delta \bar{p}_{j,t}^{pos} = \frac{1}{N} \sum_{i=1}^N \omega_i \left[\hat{p}_{i,j,t}^{pos}(ALP_i = 1) - \hat{p}_{i,j,t}^{pos}(ALP_i = 0) \right]$$

⁷The 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.

and similarly for negative responses,

$$(4) \quad \Delta \bar{p}_{j,t}^{neg} = \frac{1}{N} \sum_{i=1}^N \omega_i [\hat{p}_{i,j,t}^{neg} (ALP_i = 1) - \hat{p}_{i,j,t}^{neg} (ALP_i = 0)]$$

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

$$(5) \quad \Delta \bar{p}_{j,t}^{pos} - \Delta \bar{p}_{j,t}^{neg} = \frac{1}{N} \sum_{i=1}^N \omega_i [\hat{p}_{i,j,t}^{pos} (ALP_i = 1) - \hat{p}_{i,j,t}^{neg} (ALP_i = 1)] \\ - \frac{1}{N} \sum_{i=1}^N \omega_i [\hat{p}_{i,j,t}^{pos} (ALP_i = 0) - \hat{p}_{i,j,t}^{neg} (ALP_i = 0)]$$

The first term on the right-hand side of Equation (5) is the average probability for ALP voters of reporting a positive response less the average 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, occupation, education, home ownership status and whether they live in a metropolitan or non-metropolitan area. The consumer sentiment survey categorizes income to be within \$10,000 buckets 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. Our identification approach relies on these covariates capturing the economic and demographic groups that federal government policy can plausibly target.

The conditional estimates for each expectations question in the sentiment survey are shown in Figure 5 and are almost identical to the unconditional estimates, shown in Figure 3. Notably, the sharp relative movements in sentiment following elections with a change of government remain even after controlling for economic and demographic differences between ALP and Liberal/National

party voters. Supporters of each party continue to disagree on both expectations 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 federal government policy, which are likely to be related to observable differences between voters.

< Figure 5 about here >

An omission from the set of controls available in the consumer sentiment survey is information on wealth holdings. Data on past house price changes are available and can be matched to survey respondents using the location of their residence. As a robustness check, we have re-estimated the conditional consumer sentiment indices adding lagged changes in house prices to the set of covariates. Specifically, we included in each ordered probit model the year-over-year change in house prices for the previous three years: $\Delta^{12}hp_{it}$, $\Delta^{12}hp_{it-12}$, and $\Delta^{12}hp_{it-24}$, where hp_{it} is the log of the average level of house prices over the year to month t for the statistical division in which survey respondent i lives.⁸ The conditional indices including house price growth are almost identical to those shown in Figure 5; the correlation between the indices including and excluding house prices exceeds 0.99 for each sub-index.⁹

The absence of information on financial wealth would be a concern if there are both differences in financial assets held by ALP and Liberal/National voters and changes of government have an effect on stock prices. To the extent that financial wealth holdings are correlated with income, age and other covariates our approach controls for differences in financial asset holdings. However, there could still be unexplained differences in wealth holdings between ALP and Liberal/National voters. This would be a concern if changes of government affected stock prices. To address this concern, we look for evidence of a relationship between changes in election betting odds and stock returns.

⁸House price data is supplied by Securities Industry Research Centre of Asia-Pacific (SIRCA) on behalf of CoreLogic. We use data on house price changes at the statistical division level because in many cases there are too few transactions at the smaller postcode level to form reliable estimates of changes in house prices. There are 60 statistical divisions in Australia and house price data are available from 2000.

⁹The indices including house prices are available on request.

Specifically, we run the regression

$$(6) \quad r_t = \alpha + \beta \Delta p_t^{ALP} + \varepsilon_t,$$

where r_t is the daily return for the ASX200 share price index (which is the Australian equivalent to the S&P500 in the United States) and Δp_t^{ALP} is the daily change in the probability of the ALP winning the election. We use betting market data from the Betfair exchange close to the end of the stock market trading period each day, and convert the odds to a probability. Table 2 reports estimates of Equation (6) separately for each election for which data is available. We find no evidence of a relationship between expectations of a change in government and stock returns.¹⁰

< Table 2 about here >

E Other evidence

An entirely separate survey provides corroborating evidence that voting intention 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 6 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.

< Figure 6 about here >

Our finding that voting intention affects economic beliefs is not unique to 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

¹⁰Although insignificant, the magnitude of the coefficient for the 2007 election is relatively large. The sign of the β -coefficient is also surprising. A positive coefficient indicates that increases in the probability of the center-left ALP winning government were associated with more positive stock returns. If anything, we would have expected the stock returns to be more positive for the center-right Liberal/National party.

(e.g., Bartels 2000, Bartels 2002, Evans and Andersen 2006, Gerber and Huber 2009 and Wlezien, Franklin and Twiggs 1997).

The political science literature also provides evidence that partisanship can affect how individuals perceive economic events, independent 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, p.134) 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.

II Effect of sentiment on spending intentions

A Spending intentions data

In this section we investigate whether the shifts in sentiment at changes of government have a causal effect on spending intentions. We measure spending intentions using two questions in the consumer sentiment survey. The first question asks respondents whether ‘now is a good time to purchase a major household item’. The second question asks whether ‘now is a good time to buy an automobile’. These are separate categories of spending. Responses are classified as positive, unchanged / don’t know, or negative. Using the

other questions in the survey, we can match an individual's stated spending intentions to their sentiment, voting intention and the full range of economic and demographic characteristics. The data on spending intentions for a major household item are available on a monthly basis and span the changes of government in March 1996, November 2007 and September 2013. The automobile spending intentions question was asked on a quarterly basis until 2006, a monthly basis until 2014, and then discontinued. Accordingly the series covers a short period after the 2013 change of government; we report estimates at a quarterly frequency for this question.

A nice feature of spending intentions data is that they make the timing of changes in spending attitudes precise. That is, while actual consumption may take time to respond to a shift in sentiment, spending intentions should respond immediately. This allows us to look in a narrow window around changes of government for an effect of sentiment on spending intentions. We follow a growing literature in using spending intentions elicited from survey data to understand consumption behavior (e.g., Bachmann, Berg and Sims 2015 and Shapiro and Slemrod 2003).

B Identification

Identifying the causal effect of sentiment on spending intentions is challenging because it is hard to find variation in economic beliefs that is plausibly exogenous to fundamental drivers of consumption. Our approach is to use voting intention as an instrument for economic beliefs. Voting intention is a valid instrument if it affects economic beliefs but satisfies the exclusion restriction of having no direct effect on spending intentions.

As we argued in Section I, federal government policy can target groups of people but not individuals. We condition on demographic and economic characteristics and use only the within group variation in economic beliefs correlated with voting intentions for identification. This approach is valid under the assumption that the available set of covariates identify the key groups to which federal government policy can plausibly be targeted. Two arguments

made earlier further support the use of voting intention as an instrument. First, economic beliefs shift precisely at each change of government in our sample, and these shifts have not coincided with major economic events or changes in current economic policy. Second, betting market and opinion poll data assigned a high probability to each change of government, implying that informed voters should have incorporated most of the news effect of a change of government into their beliefs prior to the elections.

A remaining possibility is that changes of government differentially affect the marginal utility of private consumption. This could be the result of partisanship directly entering the utility function, or a result of heterogeneous valuation of public goods. The approach we take accounts for heterogeneity in utility functions to the extent that it is correlated with observed economic and demographic characteristics. We regard situations where partisanship directly affects the marginal utility of private consumption as a sentiment effect, broadly defined.

Formally, we estimate the following regression on the individual response consumer sentiment survey data:

$$(7) \quad spend_{i,t} = \delta_t + \sum_t \sum_j \gamma_{jt} X_{ijt} + \phi expect_{i,t} + \varepsilon_{it}$$

where $spend_{i,t}$ is the reported spending intention of individual i for either a major household item or an automobile in month t and $expect_{i,t}$ is an individual's reported expectations of economic conditions, X_{ijt} is the full set of economic and demographic control variables for person i listed in Section I–D and δ_t is a survey month dummy. We instrument $expect_{i,t}$ with a dummy variable that is equal to one if a survey respondent's voting intention matches the political party in office and zero otherwise. Our identification approach is most convincing in windows around changes of government. Accordingly, we estimate Equation (7) over the period one year before and after each election with a change in government.

We code the answers to the spending intentions and economic belief 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 model is estimated for both the first stage and second stage regressions.¹¹ Although the relationship between sentiment and spending intentions may not be linear, as assumed in the second stage regression, we are simply interested in identifying whether a casual channel from sentiment to spending intentions exists. A linear model satisfies this requirement.

We measure $expect_{i,t}$ using each of the four economic belief questions in the consumer sentiment survey. These questions measure survey respondents' beliefs about both personal and general economic conditions. Note that differences in expectations about general economic conditions between ALP and Liberal/National voters should be unaffected by any distributional effects of government policy. Thus, estimates based on expectations about macroeconomic conditions should further guard against the possibility that the available covariates do not adequately control for potential distributional effects of government policy.

C Results

Reduced form evidence.—We begin our presentation of the results by looking at the relationship between changes of government and spending intentions for major household items of ALP voters relative to Liberal/National voters. Figure 7a shows the difference in stated spending intentions between ALP and Liberal/National party voters. Consumers report higher spending intentions when the political party they support holds government at the federal level. Figure 7b shows the conditional analogue of Figure 7a, using the methodology outlined in Section I–D. A shift in spending intentions at a each change of gov-

¹¹We estimate the first-stage equation using a linear model, which ensures that the first-stage residual is uncorrelated with the exogenous variables. In contrast, first-stage estimates using an ordered probit model produce consistent estimates only under restrictive functional form assumptions. 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 results using a bivariate probit model. The results, available on request, are qualitatively the same as those reported. In our case, with discrete dependent, endogenous and instrumental variables, Wooldridge (2015) argues that control function methods are controversial, producing consistent partial effects only under non-standard assumptions. Thanks to Colin Cameron for discussing this issue with us.

ernment remains clearly evident even after controlling for survey respondents' economic and demographic characteristics.¹² A Bai and Perron (1998) multiple break point test confirms a break in the conditional spending intentions series at each change of government (Table A2 in the online appendix).¹³

< Figure 7 about here >

We find similar results using the automobile spending intentions data. Figure 8a shows the difference in spending intentions for automobiles between ALP and Liberal/National voters; Figure 8b shows the conditional analogue. A Bai and Perron (1998) multiple break point test identifies a break in the series for the 2007 election, and within one quarter of the 1996 election; there is insufficient data after the 2013 election to identify a break point (Table A3 in the online appendix).

< Figure 8 about here >

It is interesting to note that the difference in spending intentions between ALP and Liberal/National voters became larger during the ALP's term in government (Figure 7). The Bai and Perron (1998) test finds statistical evidence of an additional break in the spending intentions series in mid 2010 (Table A2 in the online appendix). The economic belief measures in the consumer sentiment survey moved similarly (Figures 3 and 5). Political events may explain this variation. In June 2010, parliamentary members of the governing Labor party voted to change their leader. Opinion polls conducted just after the change in leadership found that the majority of ALP voters viewed the change in leadership as good decision while the majority of Liberal/National voters viewed it as a bad decision (Farr and Benson, 2010). The ALP narrowly retained office at the August 2010 election and a period of heightened polarization between the ALP government and Liberal/National opposition

¹²The pseudo R-squared for the conditional spending intentions regressions is around 5 percent in most months. This is similar to that found in United States data by Bachmann, Berg and Sims (2015).

¹³In each case, the identified break dates are within one month of the election. A difference in timing can occur because the consumer sentiment survey is conducted at the beginning of the month, and so can precede the date of the election.

followed (Kelly, 2014). This may have contributed to the rise in disagreement about economic conditions between supporters of each party.

Instrumental variables results.—We turn now to the econometric analysis of spending intentions. Panel B of Table 3 reports the first-stage regression results for spending intentions on a major household item. The first-stage F -statistic exceeds 100 in each specification, easily satisfying standard thresholds for instrument relevance. The share of variation in personal economic conditions explained by the economic and demographic covariates is around 15 percent, consistent with there being substantial idiosyncratic variation in income processes (Browning, Ejrnæs and Alvarez, 2010). There is also substantial within-group heterogeneity in beliefs about macroeconomic conditions. This is in line with evidence on heterogeneity in consumer survey-based expectations about other economy-wide variables, such as inflation (Mankiw, Reis and Wolfers, 2004).

< Table 3 about here >

Panel A of Table 3 presents two-stage least-squares estimates of Equation (7). For each change of government in our sample, an improvement in perceived economic conditions has a statistically significant positive effect on that individual's spending intentions. A robust effect is evident for all four economic belief measures. These results provide statistically robust evidence that changes in sentiment have a causal effect on spending intentions.

Table 4 shows two-stage least squares estimates of Equation (7) with spending intentions on an automobile as the dependent variable. The results are analogous to those for spending intentions on a major household item: an improvement in expectations leads to an increase in automobile spending intentions. Both sets of results—for major household items and automobiles—are robust to including house price growth in the set of covariates (see Tables A4 and A5 in the online appendix).

< Table 4 about here >

III Effect of sentiment on automobile purchases

In this section we look at the relationship of sentiment and spending intentions with an observed measure of consumption. We do this by exploiting postcode-level variation in spending intentions, vote shares and automobile purchases. We use automobile purchases as a proxy for consumption because it the most geographically disaggregated measure of consumption available. We think that automobile purchases are a good proxy for consumption because they represent an important spending decision for households.

A Postcode-level data

Automobile purchases.—We use administrative data (VFACTS) from the Federal Chamber of Automotive Industries on the number of new automobile purchases at the postcode level. The data record the postcode of the owner, not the location of the dealership where the automobile was purchased. One benefit of the VFACTS data is disaggregation by buyer type. We use only new automobile sales to households (and not sales to businesses and governments) because this maps most closely to the survey of consumer sentiment.¹⁴ We aggregate the monthly data to quarterly and annual frequencies.

The data span the 2007 and 2013 changes of 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.¹⁵

Vote shares.—To measure voter preferences, we use data from the Australian Electoral Commission to calculate the share of votes received by the ALP in the lower house of parliament, where government is formed.¹⁶ There

¹⁴Sales to businesses and governments account for around 55 per cent of total annual new automobile sales.

¹⁵For the period after 2011, the most recent Census for which data is available, we assume postcode-level population growth continues at its rate over the period 2006 to 2011.

¹⁶Australia has preferential voting. We use the Australian Electoral Commission's two-party

are currently 150 single-member federal electorates (equivalent to United States congressional districts) in Australia, 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 postcode level.

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 United States presidential elections has varied between 49 and 63 per cent since 1960.¹⁷

Control variables.—We use a range of postcode-level control variables. The Census provides economic and demographic variables every five years: the share of people with a college education, average age, the unemployment rate, the share of people who rent, the share of people employed in white-collar professions, and employment shares by industry, grouped according to the North American Industry Classification System (NAICS) classification. Information is also collected on geographic location: postcodes are classified as being in either a major city, inner regional, outer regional, remote or very remote location. The Australian Taxation Office reports annual taxable income data at the postcode level.

Throughout the paper, we exclude postcodes in the Australian Capital Territory (ACT), where the federal public service is primarily 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 may be affected through channels other than sentiment.

Summary statistics.—Table 5 reports postcode-level summary statistics by population-weighted quintiles of ALP vote share at the 2007 and 2013 federal

preferred vote share measure, which allocates votes received by minor party candidates to the major parties based on voters' preferences. Excluding electorates where a minor party candidate either won or came second does not change our results.

¹⁷Data on Australian voter turnout is sourced from the Australian Electoral Commission. US data is from the International Institute for Democracy and Electoral Assistance.

elections. Demographic and employment-by-industry data reported in Table 5 are for the Census closest in time to each election: the 2006 Census for the 2007 election and the 2011 Census for the 2013 election.

< Table 5 about here >

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.¹⁸ Consistent with the consumer sentiment survey, postcodes with a higher ALP vote share are more likely to be in a metropolitan location, tend to have a lower share of white-collar employment, a higher unemployment rate, and a higher share of renters.¹⁹ Differences in educational attainment and average age are relatively minor. By industry, postcodes with a high ALP vote share have a relatively large share of people in manufacturing employment and relatively low share of agricultural employment. Income and the mean level of new automobile purchases is decreasing in ALP vote share.

B Identification

We begin by looking for evidence that stated spending intentions are indicative of actual consumption behavior. We do this by using the consumer sentiment survey data to construct a postcode-level measure of spending intentions on automobiles and relate it to actual postcode-level automobile purchases.

We then look for evidence of a relationship between changes of government and automobile purchases. ALP voters reported substantially higher sentiment when the ALP won government at the 2007 election, and lower sentiment when the ALP lost government at the 2013 election. Accordingly, we expect

¹⁸These postcode-level vote shares are persistent through time. The correlation between the vote share in the 2007 and 2013 elections is 0.95.

¹⁹There are some differences between Census statistics reported in Tables 1 and 5. Employment statistics are expressed as a share of the population in Table 5 and as a share of the working-age population in Table 1, for comparability with the survey data. Income data are at the household level in Table 1 and at the individual level in Table 5. Other differences are minor and reflect the difference between population and postcode-level means/medians.

to observe automobile purchases to have increased in ALP-leaning postcodes relative to Liberal/National-leaning postcodes after the 2007 election, and to have decreased after the 2013 election.

As shown in Table 5, there are differences in economic and demographic characteristics between ALP and Liberal/National-leaning postcodes. The response of automobile consumption to changes of government could in part reflect news about changes in government policy that differentially affects voters. Furthermore, actual consumption may respond more sluggishly to changes of government than spending intentions, requiring us to look over comparatively wide windows around changes of government to detect an effect of sentiment on actual consumption. The use of control variables help address the concern that the wider the window around elections, the greater is the possibility of factors other than sentiment differentially affecting consumption of ALP and Liberal/National voters. We discuss the various empirical strategies employing control variables at the start of Section III-D below.

C Spending intentions and automobile purchases

To assess whether stated automobile spending intentions are indicative of actual automobile purchases, we use the consumer sentiment survey to construct a postcode-level measure of spending intentions for automobiles. By year for each postcode, we tabulate the number of positive, unchanged, and negative responses to the survey question asking whether ‘now is a good time to buy an automobile’. We construct a net balance measure by subtracting the number of negative responses from the number of positive responses and expressing the differences as a share of the total number of responses.

A regression of automobile purchases on the automobile spending intentions measure for the period 2004-2013 reveals a statistically significant cross-sectional relationship between stated and actual spending behavior:

$$(8) \quad \log(mv_{it}) = \alpha + \sum_{j=2005}^{2013} \delta_j d_t + \underset{(0.010)}{0.091} \text{automobiles}_{it} + \epsilon_{it},$$

where mv_{it} is per capita new automobile purchases in postcode i in year t , d_t

is an indicator variable taking the value unity in year t and zero otherwise, $automobiles_{it}$ is the net balance spending intentions measure for automobiles for postcode i in year t and ϵ_{it} is an error term.²⁰ We use the number of survey responses for each postcode as regression weights. The number of postcodes included in the regression is 2,221. We report two-way cluster robust standard errors, with clustering at the postcode and electoral division \times time levels (Cameron and Miller, 2015). The postcode-level clusters allow for serial correlation not captured by the time fixed effects, and the electoral division \times time clusters allow for cross-sectional dependence within electorates. Estimating Equation (8) separately by year also reveals a statistically significant relationship between automobile purchases and spending intentions in each year (see Figure A1 in the online appendix). Including postcode fixed effects in Equation (8) reduces the size of the coefficient on $automobiles_{it}$ but the coefficient remains significantly different from zero.²¹ Our results are consistent with Parker et al. (2013), who report a positive correlation between stated and actual spending in United States Consumer Expenditure Survey data.

D Changes of government and automobile purchases

In this section we look for evidence of a postcode-level relationship between automobile purchases and changes of government. We begin by presenting regression results absent any control variables. We then employ a variety of approaches to control for economic and demographic differences between postcodes. In the first approach, we construct a proxy measure of pure partisanship by isolating variation in the ALP vote share at each election that is uncorrelated with observable differences between ALP and Liberal/National-leaning postcodes. We then use this variation as our source of identification. This is the postcode-level analogue to the identification approach used for the spending intentions data in Section II. The second approach allows for unobserved time-varying economic shocks correlated with the level of income. The third approach employs long-difference regressions, allowing us to also control for

²⁰The automobile spending intentions survey question was discontinued at the start of 2014.

²¹The coefficient on $automobiles_{it}$ is 0.012 with a standard error of 0.004.

differences in income and house price growth across postcodes. Finally, we consider the role of financial wealth.

Without controls.— To see if there is an effect of sentiment on consumption, we look at whether following changes of governments automobile purchases increased by more in postcodes with a greater share of votes for the winning party. We do this by estimating the following regression, from the March quarter 2004 to the June quarter 2015:

$$(9) \quad \log(mv_{it}) = \alpha_i + \sum_{j=-T_0}^{T_1} \delta_j d_t + \sum_{j=-T_0, j \neq T_\tau}^{T_1} \beta_j (d_t \times ALP_i^\tau) + \epsilon_{it},$$

where mv_{it} is per capita new automobile purchases in postcode i in quarter t , α_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_i^τ is the ALP vote share in postcode i for an election held at time τ , and ϵ_{it} is an error term.²² The coefficients δ_j are quarterly fixed effects, capturing all variation in automobile purchases that is common across postcodes, such as seasonality, changes in new automobile prices, and aggregate economic shocks. The coefficients of interest are β_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 β_j -coefficients are relative to that period. Note that we estimate Equation (9) 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 τ .²³

Figure 9a presents the β -coefficient estimates using vote shares for the 2007

²²The 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 (9) 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, and so we present results using the log transformation to facilitate interpretation of our results.

²³Using population weights instead does not materially change the results.

federal election; Figure 9b presents 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. The dashed lines show two standard error confidence bands for the β -coefficients.²⁴ This is the postcode-level analogue to the individual-level results shown in Figure 8a.

< Figure 9 about here >

Following the ALP's move into government at the 2007 federal election, the estimated β -coefficients show an increase in the level of automobile purchases in ALP-leaning postcodes relative to Liberal/National-leaning postcodes. In the three years following the 2007 election, the β -coefficients average to about 0.1. This indicates that going from a hypothetical postcode with no ALP voters to one with only ALP voters would have been associated with a per capita increase in automobile purchases of about 10 per cent.

The solid horizontal lines in Figure 9a show an average of the β -coefficients for the three-year periods before and after the 2007 change of government; the associated p -value is for a Wald test of equality of these averages. A three-year window corresponds with the typical amount of time between elections. The change in automobile spending in the three-year window around the 2007 election is statistically significant.

Turning to the 2013 election, we find evidence of lower per capita automobile purchases in ALP leaning postcodes following the Liberal/National Party election victory. While, the fall in the estimated β -coefficients starts prior to the 2013 election, an average of the β -coefficients indicates a 7 percentage point lower level of automobile purchases by ALP voters relative to Liberal/National party voters in the period after the ALP's loss of government compared with the ALP's last three years in office. The solid horizontal lines shown in Figure 9b repeat those in Figure 9a, with the exception that we have two rather than

²⁴We use two-way clustering of standard errors at the postcode and electoral division \times time level.

three years of data after the election. The change in automobile purchases is estimated less precisely around the 2013 than the 2007 change of government.

Pure partisanship.—We now introduce controls and use only variation in the ALP vote share uncorrelated with observable postcode-level economic and demographic characteristics. We construct a measure of ‘pure partisanship’ by separately regressing the ALP vote share at the 2007 and 2013 elections on a wide range of economic variables and taking the residual series. The regression includes the full set of variables reported in Table 5.²⁵ (Regression results are reported in Table A6 in the online appendix). The control variables absorb 55 and 61 per cent of the postcode-level variation in vote shares.

We then re-estimate Equation (9) replacing the observed ALP vote share variable with our measure of pure partisanship:

$$(10) \log(mv_{it}) = \alpha_i + \sum_{j=-T_0}^{T_1} \delta_j d_t + \sum_{j=-T_0, j \neq T_\tau}^{T_1} \beta_j (d_t \times \xi_i^\tau) + \epsilon_{it},$$

where ξ_i^τ is the residual for postcode i from a regression of the ALP vote share for the election held at date τ 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. This estimation approach is the postcode-level analogue to the individual-level results shown in Figure 8b.

The β -coefficients using this residual variation in the ALP vote share show a qualitatively similar profile to those from Equation (9) without controls (compare Figures 9 and 10). Following the ALP victory at the 2007 election the point estimates indicate that a positive ALP vote share residual is associated with a higher level of automobile purchases. The β -coefficients increased further between 2010 and 2013, broadly in line with the difference in spending intentions between ALP and Liberal/National voters (Figures 7 and 10). This pattern reversed around the time of the 2013 election, at which the Liberal/National party formed government. 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. We cannot reject that the average

²⁵For the 2007 election, we use 2006/07 mean taxable income, and for the 2013 election we use 2012/13 data.

of the β -coefficients either side of the 2007 change of government is the same but we can for the 2013 change of government (Figure 10).

< Figure 10 about here >

Time-varying shocks correlated with income.—The approach just discussed controls for observed differences between postcodes. Here we allow for unobserved shocks correlated with the level of income. We group postcodes into population-weighted terciles based on average taxable income in each year prior to the 2007 and 2013 changes of government. We then add a tercile dummy variable interacted with year-quarter dummy variables to Equation (9). Specifically, we estimate:

$$(11) \quad \log(mv_{it}) = \alpha_i + \sum_{j=-T_0}^{T_1} \delta_j d_t + \sum_{j=-T_0, j \neq T_\tau}^{T_1} \beta_j (d_t \times ALP_i^T) + \sum_{k=1}^2 \sum_{j=-T_0}^{T_1} \gamma_j (d_t \times TER_{ik}) + \epsilon_{it},$$

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. The estimated β -coefficients are similar to those from Equation (9) without controls, suggesting that our earlier results were not primarily driven by shocks or news correlated with different parts of the income distribution (compare Figure 9 with Figure 11). There is a statistically significant difference in automobile purchases before and after the 2007 and 2013 changes of government.

< Figure 11 about here >

Long-difference specification.—To this point, we have relied upon point-in-time data, mostly from the 2006 and 2011 Census. We now adopt a long-difference framework, which allows us to control for changes over time in postcode-level incomes and house prices. We estimate the following long-difference regression at an annual frequency:

$$(12) \quad \Delta^h \log(mv_{i,t+h}) = \alpha + \beta_h ALP_i^{2007} + \sum_j \gamma_j X_{ij,h} + \phi_h \Delta^h \log(inc_{i,t+h}) \\ + \varphi_h \Delta^h \log(hp_{i,t+h}) + \varepsilon_{i,h}$$

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 $h = \{1, 2, \dots, 6\}$. Control variables include postcode-level growth in taxable income, $\Delta^h \log(inc_{i,t+h})$, growth in house prices for the statistical division containing postcode i , $\Delta^h \log(hp_{i,t+h})$, and the full set of control variables $X_{i,j}$ listed in Table 5. Due to the relatively short span of data available after the 2013 election, we estimate Equation (12) only for the 2007 change of government. We use the average number of new automobile purchases over the two years before the 2007 election as regression weights. Standard errors are clustered at the electoral division level.

We estimate Equation (12) 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 β_h in the presence and absence of the control variables and can be interpreted as follows: the first data point at 2008 shows the effect on growth in new automobile purchases from 2007 to 2008 when moving from a hypothetical postcode with no ALP voters to one with only ALP voters. The second data point for 2009 shows this same effect, but for automobile purchases 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 incomes and house prices.

< Figure 12 about here >

Most of our identification comes from postcodes with either a high or low ALP vote share. Figure 12c and 12d restrict the estimation sample to postcodes in the top and bottom quintiles of ALP vote share at the 2007 election. The results are similar, although a little more pronounced when controls are included (Figures 12b and 12d).

Financial wealth.—To this point we have not considered differences in financial wealth across postcodes. Recall that the analysis of betting market data found no significant effect of anticipated changes of government on stock

returns (Section I). However, it is possible that movements in the stock market coinciding with changes of government differentially affected automobile purchases of ALP and Liberal/National voters. This could be the case if ALP and Liberal/National voters have large differences in financial wealth and the marginal propensity to consumer out of financial wealth is non-negligible. Unfortunately, data on wealth holdings at the household or postcode level are unavailable. As an alternative, we look at whether movements in the stock market can explain variation in automobile purchases between ALP and Liberal/National leaning postcodes. Specifically, we estimate the regression:

$$(13) \log(mv_{it}) = \alpha_i + \sum_{j=-T_0}^{T_1} \delta_j d_t + \sum_{j=-T_0, j \neq T_\tau}^{T_1} \gamma (ALP_i^\tau \times \Delta^{t-T_\tau} \log(ASX_t)) + \epsilon_{it},$$

where $\Delta^{t-T_\tau} \log(ASX_t)$ is the change in the ASX200 share price index between the date of the election (T_τ) and time t . This regression restricts the coefficients β_t in Equation (9) to be proportional to changes in the stock market. The estimated coefficient γ in Equation (13) is close to zero. Movements in the stock market explain a negligible fraction of the variation in automobile purchases between ALP and Liberal/National leaning postcodes (see Figure A2 in the online appendix).

Summary.—There was an economically significant increase in automobile purchases in ALP leaning-postcodes relative to Liberal/National leaning postcodes following the 2007 election, broadly in line with the spending intentions data. When the effect is averaged over multi-year periods either side of the election the difference is statistically significant in most of our regression specifications. For the 2013 election, the point estimates are similar to those for the 2007 election but they are generally less precisely estimated. Overall, we believe the postcode-level results provide support for our conclusions based on the individual-level data.

IV Relationship with the literature

Our paper is related to work by Barsky and Sims (2012) who find large and long-lasting effects of consumer sentiment on consumption in time-series data. In their DSGE model, autonomous innovations to beliefs have only a transitory effect on output leading them to conclude that innovations to sentiment represent news about future TFP, in the sense of Beaudry and Portier (2006). We do not believe that our results are inconsistent with theirs because we use cross-sectional variation in sentiment that likely has only modest aggregate effects. However, our results demonstrate in more disaggregated consumption data that innovations to sentiment separate from news can have a noticeable effect on individual consumption decisions.

Our paper is most similar to work by Benhabib and Spiegel (2016), Gerber and Huber (2009) and Mian, Sufi and Khoshkhoh (2015) who use cross-sectional data for the United States. Both Benhabib and Spiegel (2016) and Gerber and Huber (2009) find that an increase in sentiment associated with voting preferences leads to higher economic activity.²⁶ In contrast, Mian, Sufi and Khoshkhoh (2015) report no statistically significant effect of sentiment on consumption.

These differences in results partly reflect how each set of authors measure economic activity. Gerber and Huber (2009) use county-level sales tax revenue as a proxy for consumption, which is problematic because consumers may shop in one county but live in another. Benhabib and Spiegel (2016) use state level income growth. Mian, Sufi and Khoshkhoh (2015) use data similar to ours: self-reported spending intentions from the Michigan consumer sentiment survey and new automobile sales.

This leads to the question of why we find that changes in sentiment affect consumption while Mian, Sufi and Khoshkhoh (2015) do not. We believe that our data allows for more precise measurement of sentiment, voting preferences

²⁶Consistent with this, in an experimental setting McConnell et al. (2017) find that partisanship can affect individual behavior. They find that workers request lower reservation wages when their political affiliations match those of their employer and they also find consumers have a preference for interacting with sellers that share their political affiliations.

and consumption at a disaggregated level.

First, the Australian consumer sentiment survey asks respondents about their voting intentions. In contrast, Mian, Sufi and Khoshkhou (2015) have to impute an individual's partisanship based on the county where they live. To see the effect of imputing voting behavior, using our data we impute an individual's voting intention based on their postcode. We re-compute conditional consumer sentiment indices using the same methodology outlined in Section I-D, 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. In Figure 13 we show the results for expectations about economic conditions over the next year and for spending intentions for a major household item when voting intention is imputed (Figure A3 in the online appendix shows results for the other questions in the consumer sentiment survey). Comparing these results with those in Figures 5c and 7b where we observe voting intention, we can see that imputing voting intention introduces noise into the data. While these estimates do suggest that ALP voters became more optimistic about the national economy following the ALP winning government, the effect of voting intentions on spending intentions is difficult to detect. This is entirely consistent with the results in Mian, Sufi and Khoshkhou (2015), whose imputation strategy is able to detect an effect of political affiliation on attitudes to government economic policy but not spending intentions.

< Figure 13 about here >

Second, our measure of automobile purchases differs from Mian, Sufi and Khoshkhou (2015). Since we are interested in the effect of consumer sentiment on household consumption, we use automobile sales to households. Mian, Sufi and Khoshkhou (2015) use registration data which includes automobile sales to businesses and governments as well as to households. To see the effect of using total automobile sales data we re-estimate Equation (9) using automobile registration data which include sales to households, businesses and governments. The data are sourced from the Australian Bureau of Statistics (as the data used in the main text only includes sales to households). Figure

A4 in the online appendix shows the effect of an increase in the ALP vote share on automobile registrations. Measuring automobile sales using total registrations rather than sales to households adds noise, which obscures the relation between changes of government and new automobile purchases.²⁷

Finally, voting in Australia is compulsory. In contrast, voting in the US is voluntary. This can lead to selection issues if the individuals who choose to vote are not representative of individuals in a given electoral district.²⁸

V 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 purchases data. In particular, we find evidence that, 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 casual effect on spending intentions. Given our extensive use of controls, and the large movement in sentiment we

²⁷Mian, Sufi and Khoshkhrou (2015) also use credit card data in their analysis. Unfortunately we do not have access to credit card data.

²⁸Fowler (2013) uses the staggered introduction of compulsory voting in Australia prior to 1941 to estimate that compulsory voting increased the ALP's vote share by 7 to 10 percentage points.

observe at elections, we believe that the variation in sentiment we identify represents pure sentiment shocks rather than a response to news about changes in economic policy. 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 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

- Angeletos, George Marios, and Jennifer La'O.** 2013. "Sentiments." *Econometrica*, 81(2): 739–779.
- Australian Bureau of Statistics (ABS).** 2017. "Government Finance Statistics, Australia, 2015-16." Catalogue Number 5512.0, 24 April.
- Bachmann, Rudiger, Tim O. Berg, and Eric R. Sims.** 2015. "Inflation Expectations and Readiness to Spend: Cross-Sectional Evidence." *American Economic Journal: Economic Policy*, 7(1): 1–35.
- Bai, Jushan, and Pierre Perron.** 1998. "Estimating and Testing Linear Models with Multiple Structural Changes." *Econometrica*, 66(1): 47–78.
- Barsky, Robert B., and Eric R. Sims.** 2012. "Information, Animal Spirits, and the Meaning of Innovations in Consumer Confidence." *American Economic Review*, 102(4): 1343–77.
- Bartels, Larry M.** 2000. "Partisanship and Voting Behavior, 1952-1996." *American Journal of Political Science*, 44(1): pp. 35–50.
- Bartels, Larry M.** 2002. "Beyond the Running Tally: Partisan Bias in Political Perceptions." *Political Behavior*, 24(2): pp. 117–150.
- Beaudry, Paul, and Franck Portier.** 2006. "Stock Prices, News, and Economic Fluctuations." *American Economic Review*, 96(4): 1293–1307.

- Benhabib, Jess, and Mark M Spiegel.** 2016. "Sentiments and Economic Activity: Evidence from U.S. States." Federal Reserve Bank of San Francisco Working Paper 2016-19.
- Benhabib, Jess, Pengfei Wang, and Yi Wen.** 2015. "Sentiments and Aggregate Demand Fluctuations." *Econometrica*, 83: 549–585.
- Benhabib, Jess, Xuewen Liu, and Pengfei Wang.** 2016. "Sentiments, Financial Markets, and Macroeconomic Fluctuations." *Journal of Financial Economics*, 120(2): 420–443.
- Blanchard, Olivier.** 1993. "Consumption and the Recession of 1990-1991." *American Economic Review*, 83(2): pp. 270–274.
- Blinder, Alan S, and Mark W Watson.** 2016. "Presidents and the US Economy: An Econometric Exploration." *American Economic Review*, 106(4): 1015–1045.
- Browning, Martin, Mette Ejrnæs, and Javier Alvarez.** 2010. "Modelling Income Processes with Lots of Heterogeneity." *Review of Economic Studies*, 77(4): 1353–1381.
- Cameron, A Colin, and Douglas L. Miller.** 2015. "A Practitioner's Guide to Cluster-Robust Inference." *The Journal of Human Resources*, 50(2): 317–372.
- Carroll, Christopher D, Jeffrey C Fuhrer, and David W Wilcox.** 1994. "Does Consumer Sentiment Forecast Household Spending? If So, Why?" *American Economic Review*, 84(5): 1397–1408.
- Curtin, Richard.** 2017. "Partisan Impact on Sentiment." Report, Survey of Consumers, University of Michigan, February 17, Available at <<https://data.sca.isr.umich.edu/fetchdoc.php?docid=57509>> [Accessed 31 May 2017].
- Evans, Geoffrey, and Robert Andersen.** 2006. "The Political Conditioning of Economic Perceptions." *Journal of Politics*, 68(1): 194–207.
- Farr, Malcolm, and Simon Benson.** 2010. "Gillard set for early election." *The Daily Telegraph*, June 26, p. 2, Accessed 23 May 2017 from ProQuest Historical Newspapers database.
- Fowler, Anthony.** 2013. "Electoral and Policy Consequences of Voter

- Turnout: Evidence from Compulsory Voting in Australia.” *Quarterly Journal of Political Science*, 8(2): 159–182.
- Friedman, Milton.** 1992. Interview published in *The Commonwealth*, magazine of the Commonwealth Club of California, California: CA, 7 August.
- Gerber, Alan S, and Gregory A Huber.** 2009. “Partisanship and Economic Behavior: Do Partisan Differences in Economic Forecasts Predict Real Economic Behavior?” *American Political Science Review*, 103(03): 1537–5943.
- Hall, Robert E.** 1993. “Macro Theory and the Recession of 1990-1991.” *American Economic Review*, 83(2): pp. 275–279.
- Jackman, Simon.** 2015. “All That Glitters: Betting Markets and the 2013 Australian Federal Election.” In *Abbott’s Gambit: The 2013 Australian Federal Election.*, ed. Carol Johnson, John Wanna and Hsu-Ann Lee, Chapter 9, 143–160. ANU Press, Canberra.
- Kelly, Paul.** 2014. *Triumph and Demise: The Broken Promise of a Labor Generation.* Melbourne University Press, Melbourne.
- Leigh, Andrew, and Justin Wolfers.** 2006. “Competing Approaches to Forecasting Elections: Economic Models, Opinion Polling and Prediction Markets.” *Economic Record*, 82(258): 325–337.
- Levitt, Steven D., and John A. List.** 2007. “What Do Laboratory Experiments Measuring Social Preferences Reveal about the Real World?” *The Journal of Economic Perspectives*, 21(2): pp. 153–174.
- Lorenzoni, Guido.** 2009. “A Theory of Demand Shocks.” *American Economic Review*, 99(5): 2050–84.
- Ludvigson, Sydney C.** 2004. “Consumer Confidence and Consumer Spending.” *Journal of Economic Perspectives*, 18(2): 29–50.
- Mankiw, N. Gregory, Ricardo Reis, and Justin Wolfers.** 2004. “Disagreement about Inflation Expectations.” In *NBER Macroeconomics Annual 2003*. Vol. 18, , ed. Mark Gertler and Kenneth Rogoff, 209–270. MIT Press.
- Matsusaka, John G, and Argia M Sbordone.** 1995. “Consumer Confidence and Economic Fluctuations.” *Economic Inquiry*, 33(2): 296–318.
- McConnell, Christopher, Yotam Margalit, Neil Malhotra, and**

- Matthew Levendusky.** 2017. "The Economic Consequences of Partisanship in a Polarized Era." *American Journal of Political Science*, DOI: <10.1111/ajps.12330>.
- Mian, Atif, Amir Sufi, and Nasim Khoshkhou.** 2015. "Government Economic Policy, Sentiments, and Consumption." National Bureau of Economic Research Working Paper 21316.
- Newspoll.** 2000-2015. "Standard of Living Poll." Available at <www.theaustralian.com.au/national-affairs/newspoll> [Accessed 24 July 2015].
- Newspoll.** 2003-2015. "Federal Voting Intention and Leaders' Ratings." Available at <www.theaustralian.com.au/national-affairs/newspoll> [Accessed 24 July 2015].
- Newspoll.** 2007. "November 20-22 Survey of Federal Voting Intention and Leaders' Ratings." Available at: <www.theaustralian.com.au/national-affairs/newspoll> [Accessed 1 May 2017].
- Parker, Jonathan A., Nicholas S. Souleles, David S. Johnson, and Robert McClelland.** 2013. "Consumer Spending and the Economic Stimulus Payments of 2008." *American Economic Review*, 103(6): 2530–2553.
- Shapiro, Matthew D., and Joel Slemrod.** 2003. "Consumer Response to Tax Rebates." *American Economic Review*, 93(1): 381–396.
- Wlezien, Christopher, Mark Franklin, and Daniel Twigg.** 1997. "Economic Perceptions and Vote Choice: Disentangling the Endogeneity." *Political Behavior*, 19(1): pp. 7–17.
- Wooldridge, Jeffrey M.** 2015. "Control Function Methods in Applied Econometrics." *The Journal of Human Resources*, 50(2): 420–445.

Table 1: Consumer Sentiment Survey Summary Statistics: by Voter Type

	Household income (\$ '000)	Median age (years)	College degree (percent)	Renter (percent)	Unemployed (percent)	White collar job (percent)	Female (percent)	Metropolitan location (percent)
1996 election								
ALP	40-50	34-44	31.9	23.5	22.5	21.1	48.8	68.2
Lib/Nat	40-50	34-44	28.5	14.1	17.5	26.0	50.8	62.7
Census	53.2	34	10.3	24.7	5.5	14.4	51.0	67.9
2007 election								
ALP	70-80	34-44	45.2	20.4	16.4	29.1	51.3	66.8
Lib/Nat	70-80	45-49	40.9	13.0	12.2	31.9	49.5	61.3
Census	78.2	37	15.4	27.6	3.1	18.7	51.1	69.3
2013 election								
ALP	80-90	45-49	54.8	19.0	17.0	32.0	53.1	72.5
Lib/Nat	90-100	50-54	50.0	9.8	12.4	35.3	49.0	63.9
Census	80.7	37	18.6	30.1	3.4	19.6	51.0	69.7

Notes: This table reports demographic characteristics by voter type for respondents to the consumer sentiment survey; household income and age are categorical variables. Statistics are an average over a period one year before and after federal elections that resulted in a change of government. The rows labeled *Census* report population statistics from the Census closest in time to the change of government: the 1996 Census for the 1996 federal election, the 2006 Census for the 2007 federal election and the 2011 Census for the 2013 federal election. Median household income data for the population is taken from the Australian Bureau of Statistics publication *Household Income and Wealth*.

Table 2: Probability of ALP Election Win and Stock Returns

$r_t = \alpha + \beta \Delta p_t^{ALP} + \varepsilon_t$				
	2004 election	2007 election	2010 election	2013 election
β	-0.590 (1.971)	6.009 (6.826)	-0.232 (5.215)	0.783 (5.341)
R^2	0.00	0.00	0.00	0.00
N	128	131	124	128

Notes: This table reports results from a regression of daily stock market returns (in percentage points) for the Australian ASX200 share price index, r_t , on the daily change in the probability of an ALP victory, Δp_t^{ALP} , for each election shown. Election probabilities are calculated from odds quoted on the Betfair exchange at each election. Data for 2004 are the last traded price; data for 2007, 2010 and 2013 are the mid-point of the bid-ask spread close to the end of the stock market trading day. The average bid-ask spread is 2 or 3 cents at each election. We restrict the sample to 6 months prior to each election because turnover was lower and spreads wider in earlier months. N is the number of observations. Robust standard errors in parentheses.

Sources: Authors' calculations, Betfair Australia, Leigh and Wolfers (2006).

Table 3: Sentiment and Major Household Item Spending Intentions

Panel A: Second stage: $spend_{it} = \delta_t + \sum_t \sum_j \gamma_{jt} X_{ijt} + \phi expect_{it} + \varepsilon_{it}$								
March 1996 election: Liberal/National victory								
<i>personal</i> : past yr	0.972	(0.099)						
<i>personal</i> : next yr			0.899	(0.094)				
<i>economy</i> : next yr					0.351	(0.030)		
<i>economy</i> : 5 yrs							0.512	(0.047)
November 2007 election: ALP victory								
<i>personal</i> : past yr	0.520	(0.098)						
<i>personal</i> : next yr			0.538	(0.107)				
<i>economy</i> : next yr					0.305	(0.059)		
<i>economy</i> : 5 yrs							0.328	(0.060)
September 2013 election: Liberal/National victory								
<i>personal</i> : past yr	0.715	(0.089)						
<i>personal</i> : next yr			0.684	(0.084)				
<i>economy</i> : next yr					0.423	(0.048)		
<i>economy</i> : 5 yrs							0.518	(0.061)
Panel B: First stage: $expect_{it} = \delta_t + \sum_t \sum_j \gamma_{jt} X_{ijt} + \lambda support_{it} + \varepsilon_{it}$								
	<i>personal</i> : past yr		<i>personal</i> : next yr		<i>economy</i> : next yr		<i>economy</i> : 5 yrs	
March 1996 election: Liberal/National victory								
<i>support</i>	0.154	(0.011)	0.160	(0.010)	0.439	(0.013)	0.303	(0.014)
R^2	0.146		0.148		0.139		0.097	
F-statistic	183.24		238.42		1070.45		483.51	
Observations	24,571		23,116		22,650		21,954	
November 2007 election: ALP victory								
<i>support</i>	0.144	(0.012)	0.138	(0.012)	0.233	(0.013)	0.240	(0.014)
R^2	0.167		0.145		0.192		0.100	
F-statistic	136.53		142.09		325.58		307.19	
Observations	26,462		24,854		24,985		24,045	
September 2013 election: Liberal/National victory								
<i>support</i>	0.188	(0.014)	0.195	(0.013)	0.316	(0.014)	0.254	(0.014)
R^2	0.170		0.166		0.146		0.130	
F-statistic	179.29		227.27		490.75		336.58	
Observations	26,806		25,911		26,241		26,000	

Notes: Each regression uses individual response data pooled one year before and after each election with a change of government. We measure *expect* using four different survey questions: '*personal*: past yr' asks individuals about their 'current personal financial situation compared to a year ago'; '*personal*: next yr' is responses to the analogous question about personal financial conditions over the next year; '*economy*: next yr' is beliefs about the 'expected change in general economic conditions over the next year' and '*economy*: 5 yrs' is responses to the analogous question about economic conditions over the next 5 years. The instrument *support* takes the value unity if a survey respondent's self-identified voting intention matches the political party in office and zero otherwise; *spend* is responses to the question 'do you think now is a good time to buy a major household item'. All responses are coded as 1 (bad time), 2 (neither good/nor bad), and 3 (good time). The set of controls X_{ijt} includes: gender, age, occupation, education, home ownership, income, metro/non-metro, and a constant; δ_t is a survey/month fixed effect. The categorical dependent variables are treated as linear variables; the first-stage is estimated using OLS and the second-stage is estimated using two-stage least squares. The F-statistic is for a test that the coefficient on the instrument *support* is equal to zero. Robust standard errors are in parentheses.

Table 4: Sentiment and Automobile Spending Intentions

Panel A: Second stage: $automobiles_{it} = \delta_t + \sum_t \sum_j \gamma_{jt} X_{ijt} + \phi expect_{it} + \varepsilon_{it}$								
March 1996 election: Liberal/National victory								
<i>personal</i> : past yr	0.886	(0.185)						
<i>personal</i> : next yr			0.740	(0.155)				
<i>economy</i> : next yr					0.318	(0.057)		
<i>economy</i> : 5 yrs							0.459	(0.087)
November 2007 election: ALP victory								
<i>personal</i> : past yr	0.550	(0.103)						
<i>personal</i> : next yr			0.580	(0.113)				
<i>economy</i> : next yr					0.373	(0.063)		
<i>economy</i> : 5 yrs							0.337	(0.062)
September 2013 election: Liberal/National victory								
<i>personal</i> : past yr	0.766	(0.111)						
<i>personal</i> : next yr			0.941	(0.145)				
<i>economy</i> : next yr					0.497	(0.063)		
<i>economy</i> : 5 yrs							0.701	(0.096)
Panel B: First stage: $expect_{it} = \delta_t + \sum_t \sum_j \gamma_{jt} X_{ijt} + \lambda support_{it} + \varepsilon_{it}$								
	<i>personal</i> : past yr		<i>personal</i> : next yr		<i>economy</i> : next yr		<i>economy</i> : 5 yrs	
March 1996 election: Liberal/National victory								
<i>support</i>	0.154	(0.021)	0.176	(0.019)	0.450	(0.025)	0.311	(0.026)
R^2	0.149		0.148		0.146		0.112	
F-statistic	53.77		82.84		338.03		146.93	
Observations	7,154		6,750		6,686		6,503	
November 2007 election: ALP victory								
<i>support</i>	0.149	(0.013)	0.138	(0.012)	0.235	(0.014)	0.244	(0.014)
R^2	0.178		0.157		0.200		0.108	
F-statistic	131.02		129.46		297.50		286.20	
Observations	23,442		22,142		22,340		21,567	
September 2013 election: Liberal/National victory								
<i>support</i>	0.186	(0.018)	0.152	(0.016)	0.298	(0.018)	0.208	(0.017)
R^2	0.174		0.151		0.148		0.121	
F-statistic	109.88		94.94		281.11		145.72	
Observations	17,445		16,831		17,067		16,989	

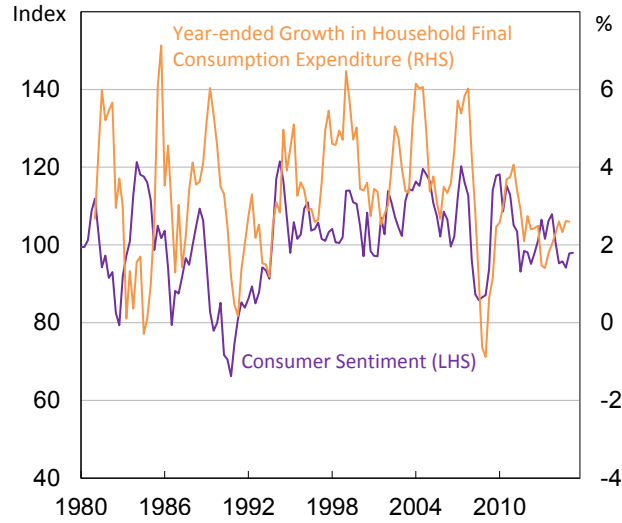
Notes: This table reports results analogous to Table 3, where the dependent variable in the second-stage is now spending intentions for automobiles. The spending intentions question for automobiles asked consumers whether ‘now is a good time to buy an automobile’, with responses classified as either *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. Accordingly, data is only available for four months following the 2013 election. See the notes to Table 3 for other details. Robust standard errors are in parentheses.

Table 5: Postcode-level Summary Statistics: Means by Quintile of ALP Vote Share

Quintiles:	All	1	2	3	4	5
November 2007 election: ALP victory						
ALP vote share, 2007 election	53.4	36.3	46.0	52.9	60.1	71.7
Automobile purchases per capita	0.025	0.027	0.027	0.025	0.024	0.020
Income	50,317	57,132	51,330	49,552	48,243	45,319
Age	37	38	38	37	37	36
Share with college education	13.9	14.5	14.0	14.1	13.4	13.4
Share renting their home	27.6	22.8	25.1	26.7	29.6	33.8
Unemployment rate	5.5	4.3	4.8	5.0	5.6	7.7
Share with white collar job	32.7	39.0	33.8	32.7	30.1	27.6
Share in metropolitan location	69.1	49.9	58.7	67.6	80.8	88.4
Industry shares:						
Agriculture	3.2	9.0	2.9	2.4	1.2	0.8
Mining & construction	10.3	10.0	11.2	10.8	10.5	9.1
Manufacturing	11.1	8.9	10.0	10.3	12.1	14.3
Retail & wholesale trade	21.2	19.9	20.8	21.3	21.8	22.5
Services	17.2	16.9	17.2	17.3	17.2	17.6
Health & education	18.6	18.7	19.4	19.4	18.5	17.1
Arts & accommodation	8.0	7.6	8.2	7.9	7.8	8.3
Public sector	6.4	5.4	6.4	6.8	7.1	6.4
Other	3.8	3.6	3.9	3.9	3.9	3.9
September 2013 election: Liberal/National victory						
ALP vote share, 2013 election	47.2	30.1	39.8	46.6	53.9	65.7
Automobile purchases per capita	0.026	0.028	0.027	0.026	0.026	0.021
Income	68,424	77,614	70,192	67,501	65,831	60,969
Age	38	39	38	38	37	36
Share with college education	16.5	16.8	16.0	16.3	16.9	16.6
Share renting their home	30.1	26.4	29.1	29.2	30.7	35.4
Unemployment rate	5.8	4.7	5.5	5.5	5.8	7.4
Share with white collar job	33.8	39.2	34.0	33.3	32.7	30.0
Share in metropolitan location	69.6	48.7	57.6	69.4	79.3	92.8
Industry shares:						
Agriculture	2.6	7.6	2.4	1.6	0.9	0.6
Mining & construction	11.4	11.6	12.7	12.2	11.0	9.6
Manufacturing	9.5	7.7	8.6	9.1	9.9	12.3
Retail & wholesale trade	20.1	18.8	19.7	20.1	20.6	21.4
Services	17.5	17.4	17.2	17.2	17.8	18.0
Health & education	20.1	20.0	20.7	20.7	20.2	19.0
Arts & accommodation	8.2	7.6	8.4	8.2	8.0	8.7
Public sector	6.6	5.5	6.3	6.9	7.7	6.4
Other	3.9	3.7	3.9	4.0	3.9	3.9

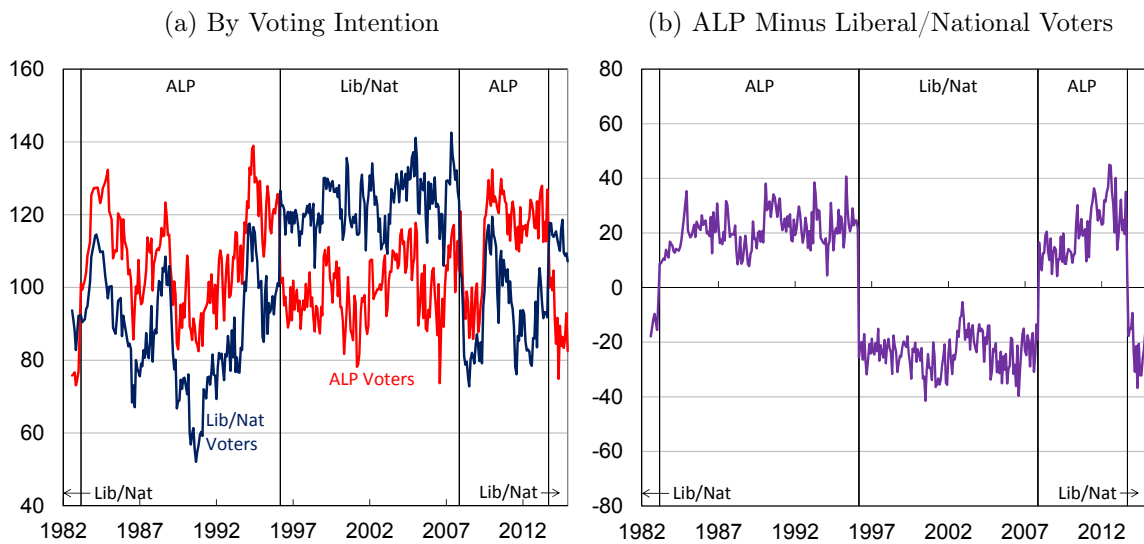
Notes: This table reports population-weighted means for each variable by quintile of the ALP vote share and for the total population. Postcode characteristics data are taken from the Census that is the closest in time to the change of government: the 2006 Census for the 2007 federal election and the 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.

Figure 1: Consumer Sentiment and Consumption Growth



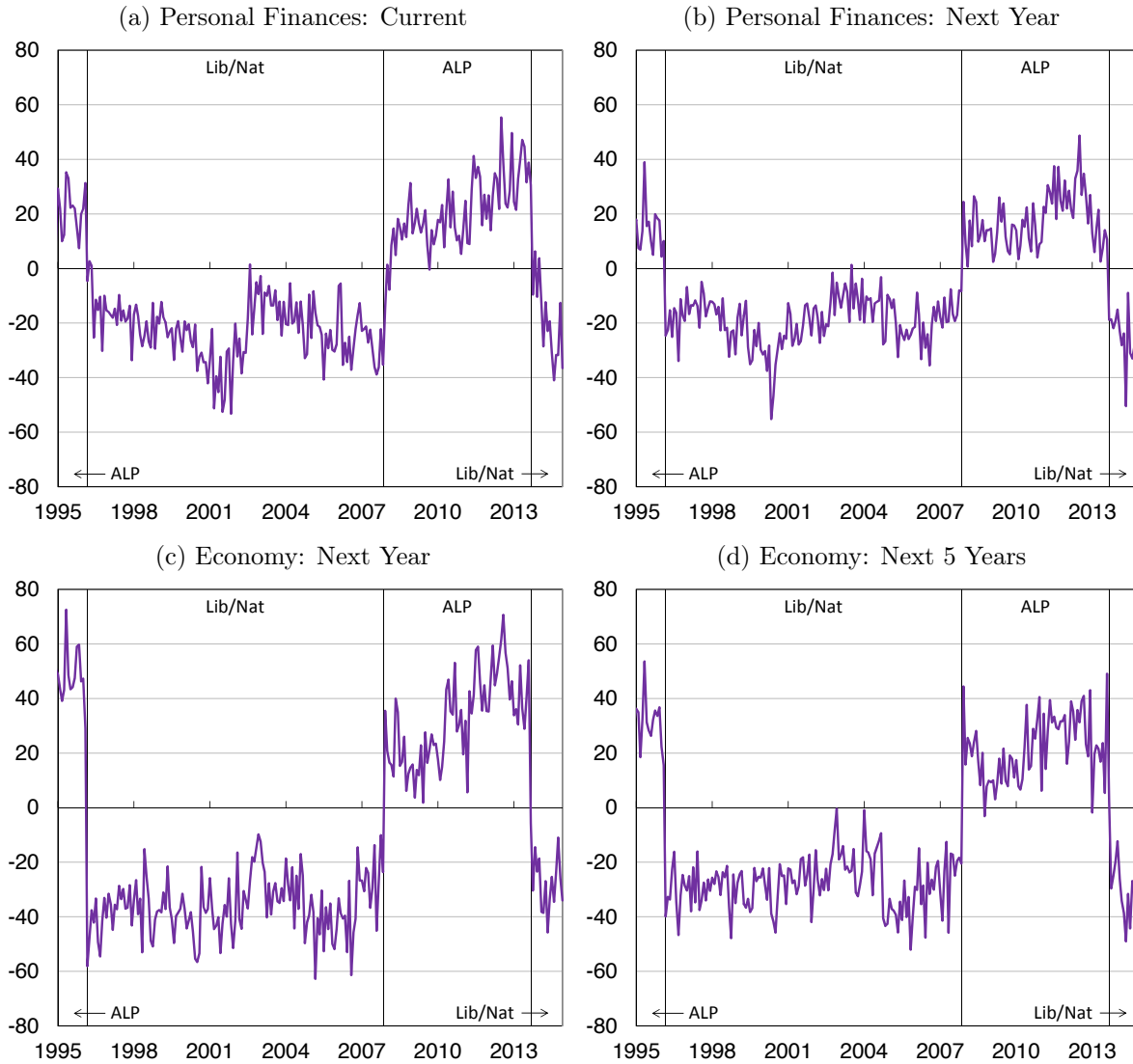
Notes: The figure shows year-ended growth in household final consumption expenditure, sourced from the national accounts (ABS catalogue 5206.0, March 2015), and the aggregate Westpac-Melbourne Institute consumer sentiment index.

Figure 2: Consumer Sentiment Index



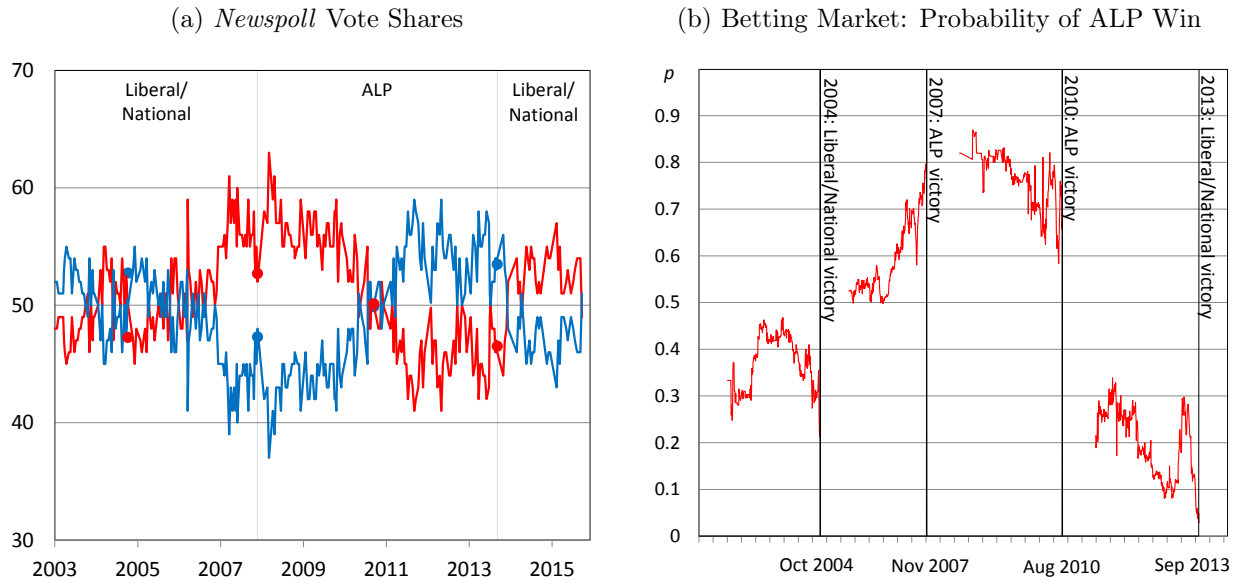
Notes: (a) shows the consumer sentiment index by consumers' self-identified voting intention; (b) shows the difference between the two series in the left panel: ALP minus Liberal/National party voters. Vertical lines show dates when government changed hands.

Figure 3: Economic Belief Components of Consumer Sentiment Survey
ALP minus Liberal/National Voters



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.

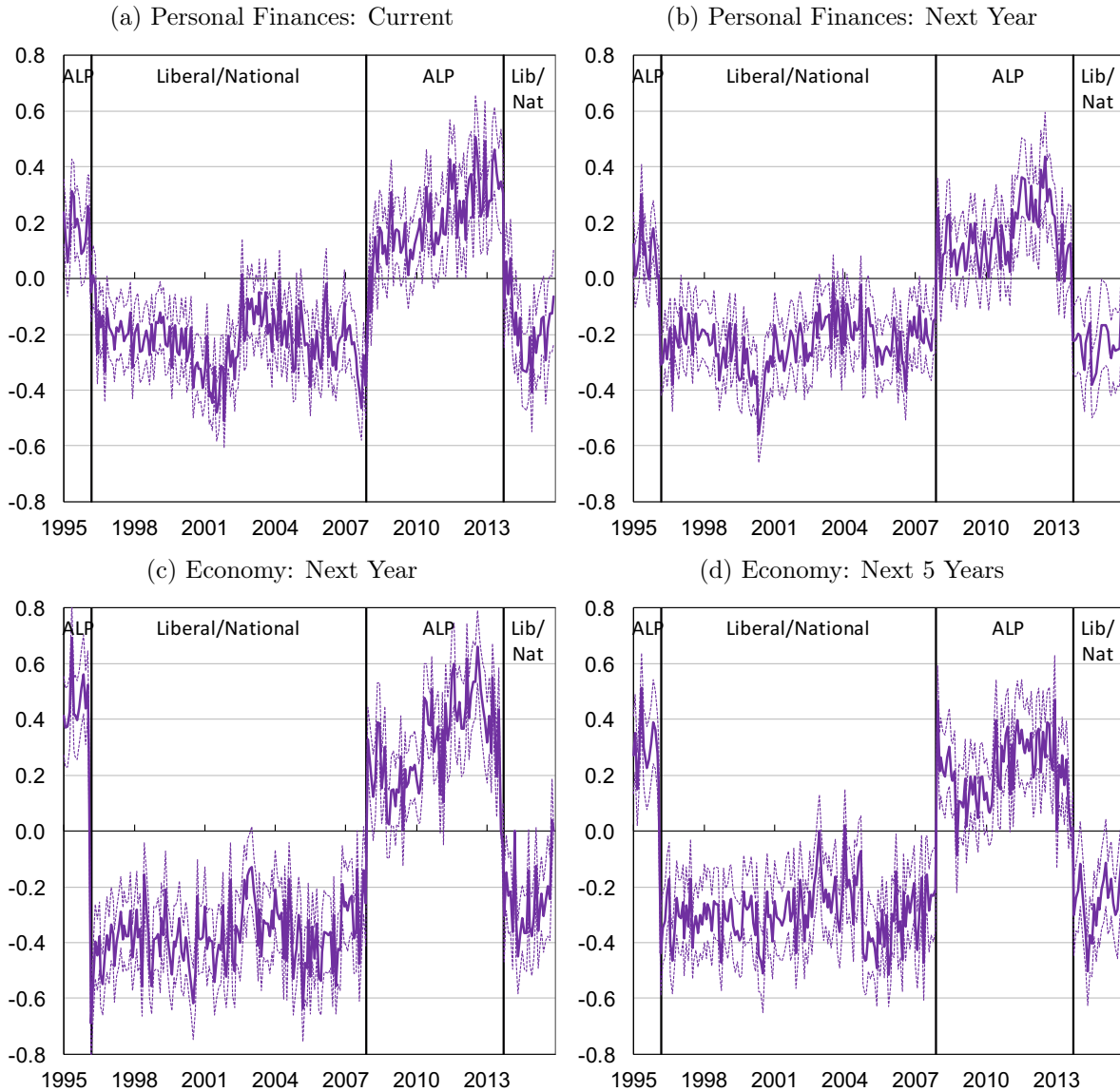
Figure 4: Political Opinion Polling and Betting Market Data



Notes: (a) shows ALP (red) and Liberal/National party (blue) vote shares from the generally fortnightly *Newspoll* survey. Vertical lines indicate elections at which there was a change of government. Circles indicate actual vote shares at the October 2004, November 2007, August 2010, and September 2013 elections. (b) shows the probability of the ALP winning each election; betting data are the probability of an ALP win calculated using the daily weighted average odds from the Betfair exchange. Depending on data availability we show the betting data between nine and 12 months before each election.

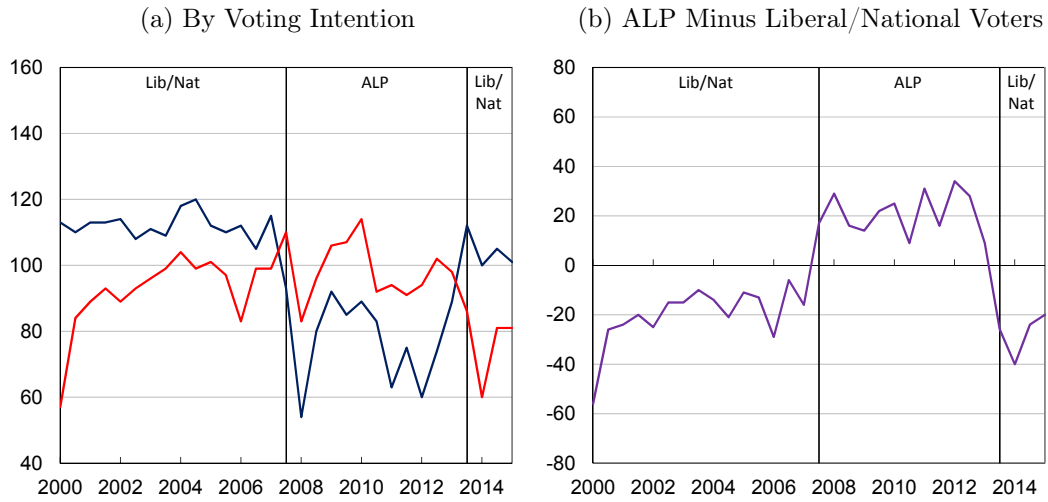
Sources: Authors' calculations, Betfair Australia, *Newspoll* (2003-2015), Leigh and Wolfers (2006).

Figure 5: 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 show two standard error confidence bands. Vertical lines show dates when government changed hands.

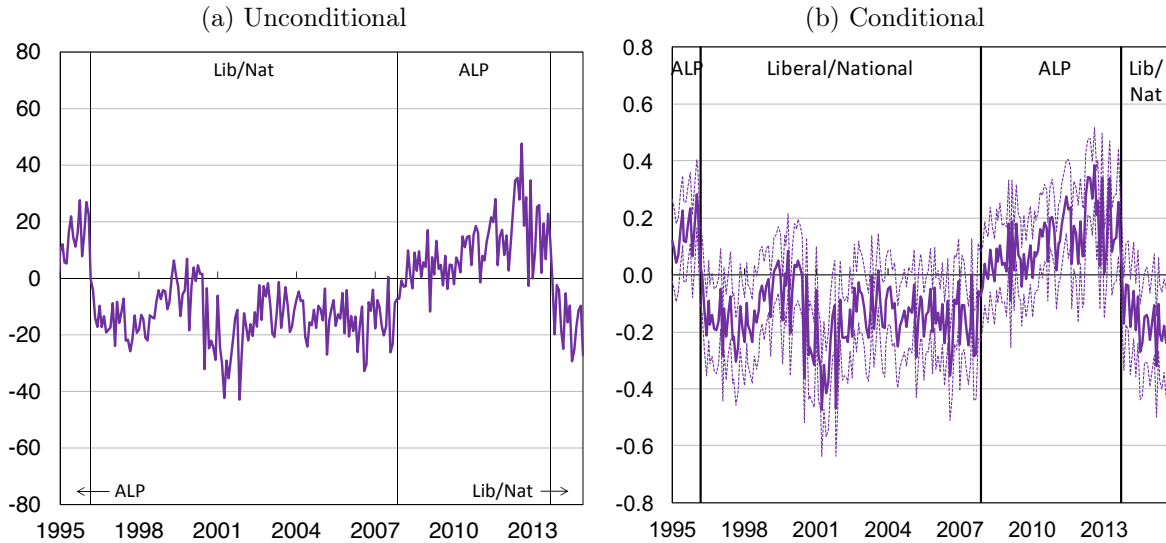
Figure 6: Newspoll: Expected Change in Standard of Living



Notes: *Newspoll* 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 and adding 100. (a) shows the index level by consumers' voting intention; (b) shows the difference between the two series in (a): 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.

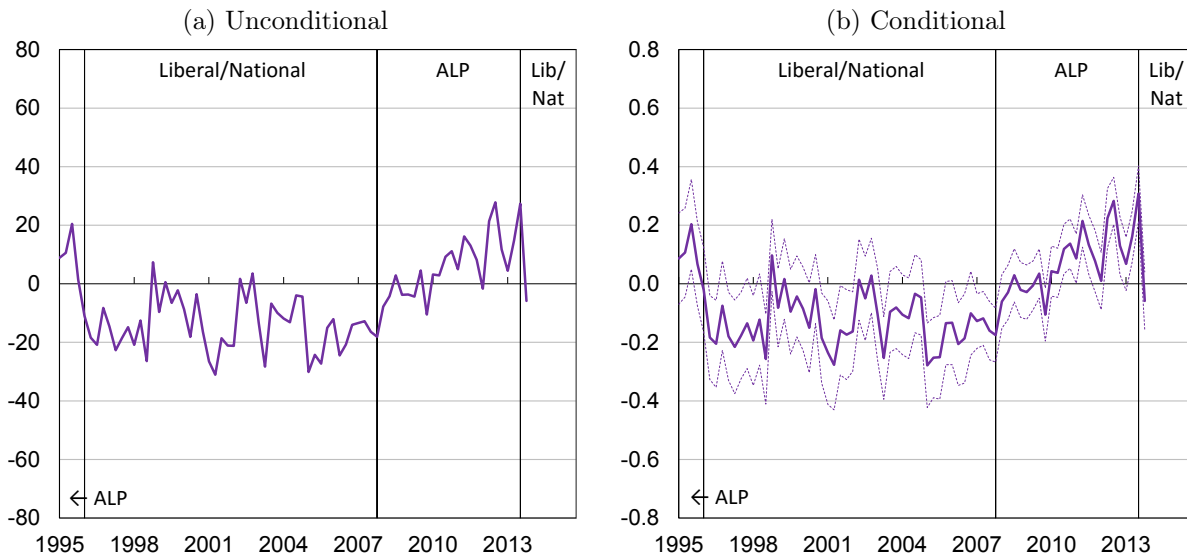
Sources: Authors' calculations, Newspoll (2000-2015).

Figure 7: Spending Intentions: Good Time to Buy A Major Household Item
ALP Minus Liberal/National Voters



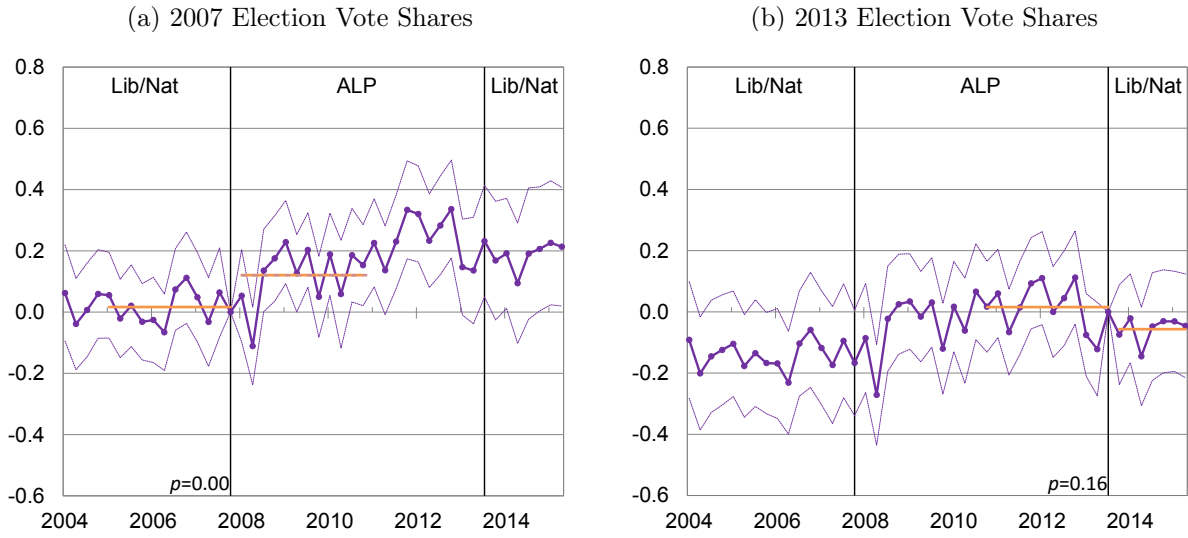
Notes: The figure shows the effect of changes of government on spending intentions for a major household item. Consumers were asked whether ‘now is a good time to buy a major household item’, and responses classified as either *good*, *neutral*, or *bad*. A separate index is constructed for ALP and Liberal/National voters as one hundred plus the share of positive responses less the share of negative response. (a) shows the difference between these two indices, ALP minus Liberal/National voters. (b) shows the conditional analogue; see notes to Figure 5 for details.

Figure 8: Spending Intentions: Good Time to Buy An Automobile
ALP Minus Liberal/National Voters



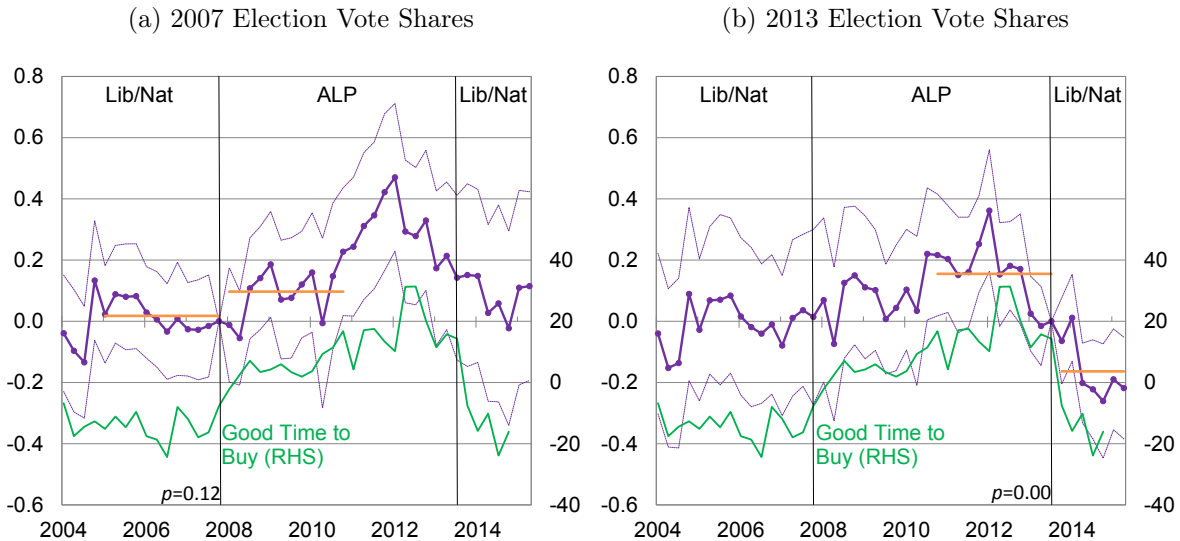
Notes: The figure shows the effect of changes of government on spending intentions for an automobile. Consumers were asked whether ‘now is a good time to buy an automobile’, and responses classified as either *good*, *neutral*, or *bad*. The *automobiles* question was asked on a quarterly basis from 1995-2006, then monthly until January 2014, when it was discontinued; the figures here show data on a quarterly basis for the whole time period. (a) shows the unconditional difference in spending intentions between ALP and Liberal/National voters; (b) shows the conditional analogue. See the notes to Figures 5 and 7 for details.

Figure 9: Vote Shares and Automobile Purchases:
Coefficient on ALP Vote Share



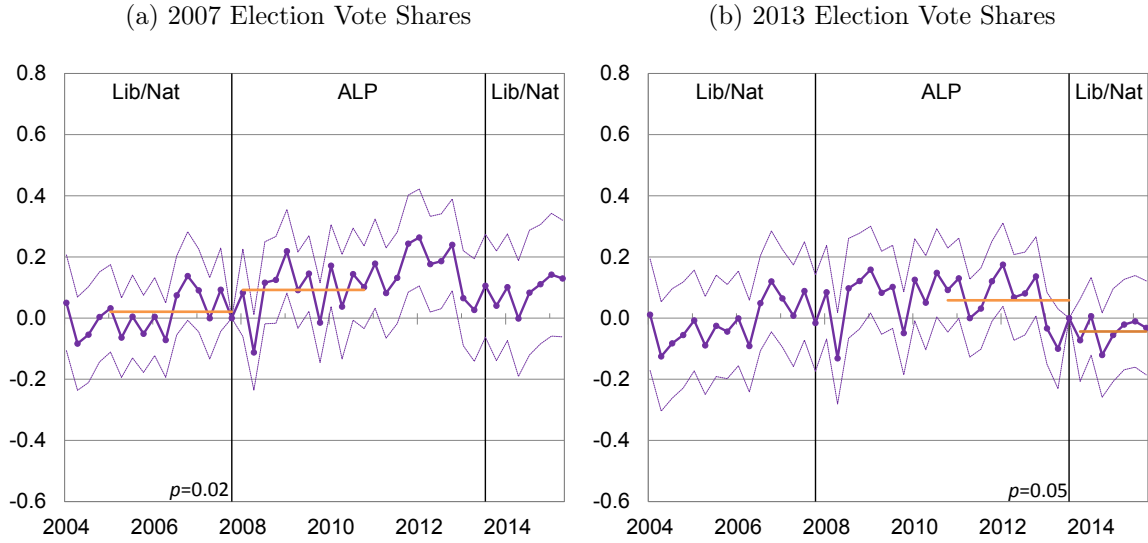
Notes: (a) shows coefficient estimates β_j for Equation (9) using vote share data from the 2007 federal election; the omitted category is the December quarter 2007, when the ALP won government. (b) reports β_j coefficients using vote share data from the 2013 federal election; the omitted category is the September quarter 2013, when the Liberal/National party won government. Dashed lines show two standard error confidence bands. The orange lines show the average value of the β_j coefficients three years before and after each election, except for the period after the 2013 election for which we have two years of data; the p -value is for a test of the null hypothesis that the β_j coefficients are the same on average before and after the election.

Figure 10: Vote Shares and Automobile Purchases:
Coefficient on Unexplained Variation in ALP Vote Share



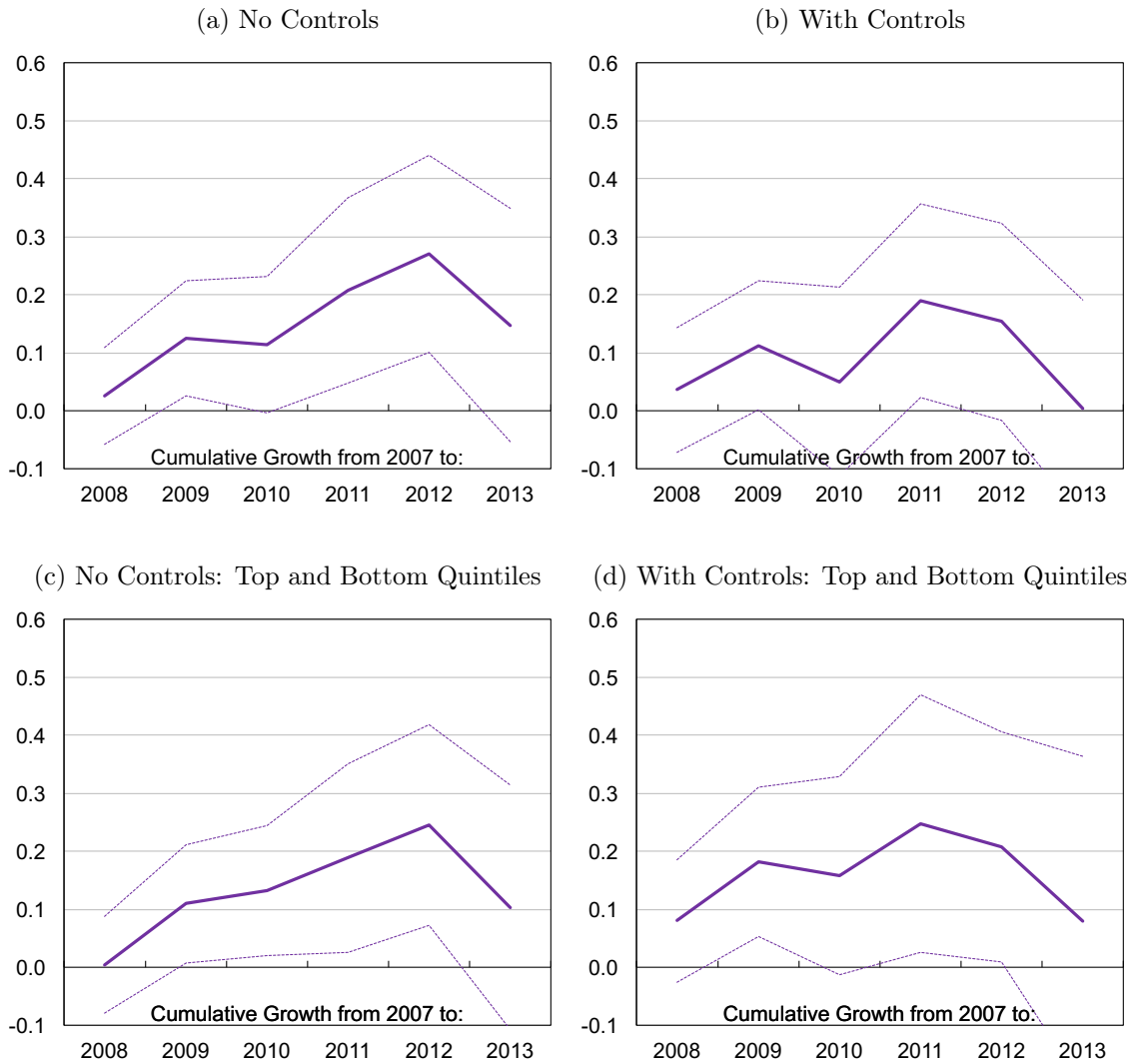
Notes: The figures show coefficient estimates β_j for Equation (10). Dashed lines show two standard error confidence bands calculated from 1000 bootstrap replications. The *Good Time to Buy* series is the difference between ALP and Liberal/National party voters in spending intentions for a major household item; the correlation with the equivalent series for automobile spending intentions is 0.82, but the automobiles series was discontinued after the 2013 election. See the notes to Figure 9 for other details.

Figure 11: Vote Shares and Automobile Purchases:
Coefficient on ALP Vote Share Controlling for Income Terciles



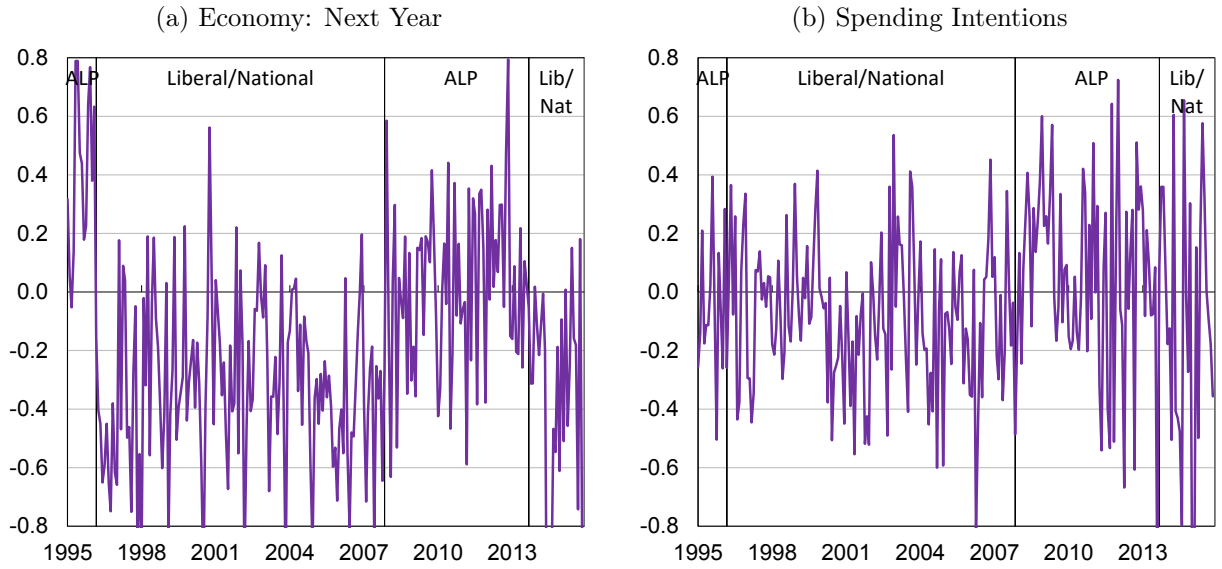
Notes: The figures show coefficient estimates β_j for Equation (11), where we control for time-varying shocks to income terciles. Dashed lines show two standard error confidence bands. See the notes to Figure 9 for other details.

Figure 12: Vote Shares and Automobile Purchases: Long-Difference Regressions
Coefficient on ALP Vote Share at 2007 Election



Notes: Each panel reports coefficient estimates β_h for Equation (12); each coefficient β_h is from a separate regression. (a) reports coefficients β_h from a regression including no controls; (b) includes the full set of controls listed in Table 5, plus income and house price growth over horizon h ; (c) and (d) repeat (a) and (b) restricting the data sample to postcodes in the top and bottom population-weighted quintiles of ALP vote share at the 2007 federal election. Dashed lines show two standard error confidence bands.

Figure 13: Components of Consumer Sentiment: Imputed Voting Intention
ALP minus Liberal/National Voters



Notes: These estimates repeat those of Figures 5c and 7b using imputed rather than self-reported voting intention. Voting intention is imputed using the ALP vote share at the 2007 federal election in the postcode of residence for each survey respondent. Standard error bands are not shown for clarity. See the notes to Figures 5 and 7 for further details.