

# The Effect of Consumer Sentiment on Consumption: Cross-Sectional Evidence from Elections\*

Christian Gillitzer  
Reserve Bank of Australia

Nalini Prasad  
UNSW Australia

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## Abstract

This paper seeks to identify the effect of consumer sentiment on consumption. Using Australian consumer sentiment data, which is unique in asking individuals about their political preferences, we show 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. The relative change in sentiment occurs precisely at elections which result in a change of government, and is sustained for the entire period each party holds office. To determine whether changes in sentiment affect consumption, we match postcode-level vote-share data to new car sales to households. Using data from two elections which saw a change of government, we find that car sales to households increased relatively more in postcodes with a higher share of voters for the winning party. The results are robust to a variety of economic controls. Overall our results suggest that consumer sentiment contains useful independent information about future consumption.

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# 1 Introduction

Consumer sentiment is one of the most widely watched economic indicators. In the financial press, and in commentary by political and business leaders, consumer sentiment is often viewed to both predict and have a causal influence on future consumption growth. Central bank governors have also cited consumer sentiment as being an important factor in influencing economic activity (see Bernanke 2012 and Stevens 2011). The attention paid by policymakers and business economists to changes in consumer sentiment is in large part motivated by an impressive correlation between sentiment and consumption growth (see Figure 1). But many academic economists remain skeptical about the information contained in consumer sentiment. The correlation between sentiment and consumption growth may reflect a common factor, such as changes in current income, independently influencing sentiment and consumption, rather than sentiment containing any meaningful independent information.<sup>1</sup>

Although the academic literature on consumer sentiment is relatively sparse, a few studies have attempted to identify whether sentiment contains meaningful independent information about the economy. Using aggregate time series data, Carroll et al. (1994) and Ludvigson (2004) find that after controlling for economic fundamentals - measured by labor income growth, stock prices and short term interest rates - sentiment contains some small but statistically significant independent information about future consumption growth. But it is unclear what additional information is contained in consumer sentiment. The incremental predictive power of sentiment could reflect current or past events embedded in other fundamentals that have not been controlled for, rather than any independent information about the future path of spending (Ludvigson 2004). If sentiment does contain forward-looking information, it is unclear whether the information represents mostly news about future incomes or some other factor.

We use cross-sectional variation in sentiment related to individuals' political partisanship

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<sup>1</sup>Notable exceptions to the general skepticism among academic economists are Hall (1993) and Blanchard (1993), who argued that an autonomous drop in consumption – foreshadowed in consumer sentiment – was an important contributor to the 1990-91 recession in the United States.

to identify whether sentiment contains independent information about future consumption. Using individual response data from the Australian consumer sentiment survey, 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 where we show consumer sentiment separately for voters for the two major political parties in Australia: the Australian Labor Party (ALP) and the Liberal/National Party. Over the period for which we have consumer sentiment data, there were four federal elections which resulted in a change of government: 1983, 1996, 2007 and 2013. What is striking about Figure 2 is that the difference in sentiments between these two groups of voters is large, the relative change in sentiment occurs precisely at elections, and is sustained for the entire period each political party holds office.

The sharp and discrete change in sentiment precisely at elections – which in our sample have not coincided with major economic events – indicates that the variation in sentiment we exploit is unlikely to be related to changes in current or past events. These shifts in sentiment could reflect either biased beliefs or expectations about changes in the distribution of incomes. The consumer sentiment index is an average of five sub-indexes, and the most pronounced difference in sentiment between ALP and Liberal/National voters is for questions asking about expectations of future national economic conditions, indicating that beliefs about economic rather than distributional policy are a more likely cause of the differences in sentiment.

Because consumer sentiment surveys do not contain a unique identifier for individuals, it is in general difficult to match self-reported spending intentions to actual behaviour. But we are able to exploit geographic variation in vote shares at federal elections to identify whether differences in sentiment between ALP and Liberal/National voters match observed consumption behaviour. Our proxy for consumption at the postcode level is new car sales to households. New car sales is well-suited for our purposes, being an important spending decision for most households. It is also closely related to the consumer sentiment survey

question on whether it is a good time to buy a major household item.

Our data spans two changes in government, from the Liberal/National party to the ALP in 2007, and back to the Liberal/National party in 2013. We find that new car sales to households were at a relatively high level in ALP-leaning postcodes when the ALP held government between 2007 and 2013, consistent with differences in consumer sentiment between ALP and Liberal/National voters. The estimated effects are large: moving from a hypothetical postcode with only Liberal/National voters to a postcode with only ALP voters is estimated to have been associated with an average 10 percentage point increase in new vehicle sales during the period the ALP held government. This provides, we believe, some of the first evidence matching survey-based spending intentions data to actual behaviour.

Our cross-sectional approach implicitly controls for economy-wide shocks. But partisanship is correlated with economic variables, and it is possible that economic shocks to specific occupations or to parts of the income distribution independently influence consumption. To control for this, we regress postcode-level vote shares on a large set of economic variables and use only the variation in vote shares that cannot be explained by economic controls as our source of cross-sectional variation. The results are qualitatively similar, although these estimates are necessarily less precise, because about 60 percent of the variation in vote-shares is absorbed by the economic control variables.

Our paper makes several contributions to the literature. Firstly, by exploiting geographic variation in consumer sentiment and new car purchases, we are able to assess whether self-reported spending intentions match actual behaviour. Our results provide support for the usefulness of spending intentions elicited from surveys, and more generally speaks to the literature on the generalizability of opinions elicited in survey and experimental settings (see for example, Levitt and List (2007)).

Secondly, our paper provides evidence that consumer sentiment contains forward-looking information. The sharp change in sentiment between ALP and Liberal/National voters at elections, which is unlikely to be related to a change in current fundamentals, precedes

changes in new car purchases for the two groups. The earlier literature has largely been unable to identify whether the information contained in consumer sentiment mostly proxies current and past information contained in other series, or contains information about future consumption plans. Our evidence is consistent with the VAR-based evidence presented by Barsky and Sims (2012), which indicates that innovations to sentiment have a slowly building but large effect on consumption.

Thirdly, our results provide a basis for believing that changes in pure sentiment can affect consumption. The innovations to sentiment at elections are large – of comparable size to a recession – and the response of consumption to a change in government that we identify is robust to a range of controls, suggesting that the variation in sentiment we use is more likely to represent partisanship than news shocks.<sup>2</sup> Reinforcing this, the political science literature has documented that differences in political affiliations can affect how individuals perceive past economic events (see Bartels 2002). Thus our results suggest an expansive view of sentiment, providing some empirical support for recent theoretical models that highlight a role for non-fundamental drivers of consumption (see for example Lorenzoni 2009, and Angeletos and La’O (2013)).

Our paper is most similar to contemporaneous work by Mian et al. (2015), who use United States data to identify the effect of government economic policy views on consumption. They document how an individual’s political preferences influence their views about the success of government economic policy. However they find that differences in perceptions between Democrats and Republicans about the success of government policy do not translate into differences in new car consumption between these partisan groups. We believe the Australian setting provides three key advantages compared to the United States. Firstly, because the Australian consumer sentiment survey includes a question on voting intentions,

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<sup>2</sup>Barsky and Sims (2012) have argued that consumer confidence is likely to reflect information about future productivity rather than “animal spirits”. We do not believe that our results are inconsistent with theirs. They argue that changes in animal spirits cannot lead to long lived changes in consumption because animal spirits do not affect an economy’s productive capacity. Here we have two groups of consumers, so autonomous movements in consumption need not affect the productive capacity of the economy, if the consumption of one group of consumers moves in the opposite direction to the other.

we can directly observe political affiliation, rather than needing to impute it based on proxies for partisanship. Secondly, we use new car sales to households as our spending variable. Mian et al. (2015) use registration data, that also includes sales to business and the government, which adds noise to their measure. Finally, while voting is voluntary in the United States it is compulsory in Australia, reducing the possibility that local-area partisanship is mismeasured.

## 2 Consumer Sentiment and Partisanship

### 2.1 Consumer sentiment

The Westpac-Melbourne Institute Survey of Consumer Sentiment in Australia is modeled on the long running 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. The headline consumer sentiment index is an average of individual responses to five questions:

- (i) current personal financial situation compared to a year ago;
- (ii) expected change in personal financial situation over the year ahead;
- (iii) expected change in economic conditions over the year ahead;
- (iv) expected change in economic conditions over the next five years; and
- (v) whether or not now is a good time to purchase a major household item.

The questions are asked in the order listed, and individual responses are classified as either positive, unchanged / don't know, or negative. An index for each question is constructed by subtracting the proportion of negative responses from the proportion of positive responses, and then adding 100. The headline consumer sentiment index is an equally-weighted average of the five sub-indexes. An index level of 100 indicates neutral economic conditions, 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; the headline index of consumer sentiment has averaged close to 100 since its inception in the

mid-1970s. The survey is nationally representative and has sample size of about 1200 each month, compared to 500 for the Michigan Survey of Consumers.

For each question making up the headline consumer sentiment index, an index has been constructed separately for ALP and Liberal/National voters, and the difference (ALP minus Liberal/National) is shown in Figure 3. Notably, consumers report more positive responses to each question when the party they would vote for holds office federally. The most pronounced response is for questions asking about economic conditions. For the self-reported spending intentions question – which is of most interest to us – statistical tests confirm a break in the mean level of the series precisely at elections (see Table 1). We believe that this provides evidence that partisanship can effect economic perceptions.

Further using unit record data from the consumer sentiment survey, we use an ordered probit to construct sentiment indexes for ALP and Liberal/National party voters conditional on individual level economic and demographic characteristics. At this stage, the only microdata that has been made available to us is from 1995 to 2001. Details are of how we construct these indexes are provided in Appendix A. We find that even after controlling for an individual’s economic and demographic characteristics (such as age, income, occupation and income) that the difference in sentiment between ALP and Liberal/National party voters remains (Figure 12). Again we find that consumers are more likely to report positive sentiment when their partisanship matches the party in power. This provides us with more evidence that it is partisanship that is influencing an individual’s economic perceptions.

An entirely separate survey provides corroborating evidence that partisanship affects economic perceptions. 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 4 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.

## 2.2 Partisanship and economic beliefs

While there has been relatively little attention paid in the economic literature to the effect of partisanship on economic perceptions, a large survey-based political science literature routinely finds that voters are more likely to hold positive views about economic conditions if their partisanship matches that of the president or party in government (e.g., Bartels 2000, Bartels 2002, Evans and Andersen 2006, Gerber and Huber 2009 and Wlezien et al. 1997). Some of the most striking evidence comes from Bartels (2002), who 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, only about 20 percent of strong Democrats said that inflation was better than in 1980, compared with 70 percent of strong Republicans.

Although the political science literature provides clear evidence that partisanship acts as a screen through which people perceive economic conditions, there has been little testing of whether these beliefs expressed in surveys influence economic behaviour. The political science literature has noted that survey respondents may engage in partisan “cheer leading” when answering survey questions, in which case survey responses may be an inaccurate indicator of actual behaviour (e.g., Lau et al. 1990). More generally, the attitudes expressed in surveys may differ from the considerations consumers bring to mind when making spending decisions. An important contribution of this paper is to test for a relationship between survey responses and consumption behaviour.



## 3 Data

The unit of measurement in our analysis is a postcode. This allows us to work with a relatively small geographic area, with on average about 8,000 people residing in a postcode.

### 3.1 Vote shares

Australia has a parliamentary political system, with either the ALP or the Liberal/National party holding government since World War II. Voting is compulsory, with failure to vote resulting in a fine. This has ensured turnout above 93 per cent 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 of eligible voters in the US has varied between 49 and 63 per cent since 1960.<sup>3</sup>

We measure partisanship on a postcode level as the fraction of votes going to the ALP in a federal election. We compute this from Australian Electoral Commission’s two party preferred (TTP) measure.<sup>4</sup> There are currently 150 federal electorates (equivalent to US 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 results to the roughly 2,300 postcodes in Australia.

Polling data indicate that a change of government for the two elections in our sample could have been anticipated in advance of the election (Figure 5). Despite this, consumer sentiment moves precisely when the government changes hands, rather than in advance based

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<sup>3</sup>Data on Australian voter turnout is sourced from the Australian Electoral Commission. US data is from the International Institute for Democracy and Electoral Assistance.

<sup>4</sup>Voters are required to order each candidate in their political division from most to least preferred. Candidates with the least number of first-preference votes are successively eliminated until two candidates remain. Votes for eliminated candidates are transferred to the next most preferred candidate indicated on each ballot. Thus the winning candidate in each political division captures least 50 per cent of the vote. Their share of votes is the two party preferred (TPP) vote share, our measure of partisanship. In all but a few electorates, the two candidates remaining at the end of the count are from the ALP or the Liberal/National party. For the few electorates where an independent or minor party either won or came second, we use a TPP measure constructed such that the top two candidates are from each of the major parties.

on polling data.<sup>5</sup> One possible explanation is that a majority of voters do not pay attention to polling data. Reinforcing this, in a Newspoll survey conducted between just four and six days prior to the 2007 federal election, 45 per cent of Liberal/National party supporters said they believed their party would win the election, despite reliable evidence to the contrary and widespread media coverage of opinion polls leading up to the election.

## 3.2 Consumption

We use the number of new car sales as our postcode-level consumption measure. As noted earlier we think that car purchases are a good metric of consumption because it represents an important spending decision for households. Further, between 2007 and 2013 the consumer sentiment survey included a question asking about whether it is a good time to buy a car. There is a very close relationship between attitudes toward buying a car and self-reported spending intentions for a major household item, indicating that new cars sales is a good measure of consumption to map to sentiment (Figure 6).

New car sales data are sourced from VFACTS. These are administrative data covering the universe of new car sales. The data record the postcode of the owner, not the location of the dealership where the car was purchased. One benefit of the VFACTS sales data is disaggregation by buyer type. We use only new car sales to households (and exclude sales to businesses and governments) because this maps most closely to the survey of consumer sentiment.<sup>6</sup> The data span the November 2007 and the September 2013 changes in government.

To control for differences in population growth across postcodes we measure new car 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.<sup>7</sup>

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<sup>5</sup>Unlike in the US, government changes hands as soon as the election result is known.

<sup>6</sup>Sales to businesses and governments account for around 55 per cent of total annual new car sales.

<sup>7</sup>For the period after 2011, the most recent Census, we assume postcode-level population growth continues at its rate over the period 2006-11.

### 3.3 Control variables

Differences in partisanship across postcodes are correlated with economic variables, and we use a range of postcode-level variables to control for these differences. We use average taxable income data, from the Australian Taxation Office, which are available annually until the 2012/13 financial year. The Census provides a range of postcode-level economic variables every five years: share of people with a college education, average age, the unemployment rate, the share of people who rent, and the share of employed people in white-collar professions. We also collect postcode level information on the share of employment by industry. Industries are grouped according to the NAICS classification. We also collect information on the geographic location of a postcode. Postcodes are classified - in increasing order of remoteness - as being in either a major city, inner regional, outer regional, remote or very remote. This data is sourced from the Australian Statistical Geography Standard. Throughout the paper, we exclude postcodes in the Australian Capital Territory (ACT), where the federal public service is located. Changes in government may have a direct effect on the incomes of federal public servants, through hiring or redundancies. Hence consumption here can be affected by other channels rather than via sentiment effects.

### 3.4 Summary statistics

The top and bottom panels of Table 2 report postcode-level summary statistics by population-weighted quintiles of ALP vote share at the 2007 and 2013 federal elections. Demographic and employment by industry data reported in Table 2 is sourced from the Census closest in time to each election: the 2006 Census for the 2007 election and the 2011 Census for the 2013 election. In the analysis that follows we refer to the 5th quintile as the top quintile (in terms of the ALP vote share), while we will refer to the 1st quintile as the bottom quintile (in terms of the ALP vote share).

Our analysis is able to exploit large differences in vote shares across postcodes, with the top quintile having a 36 percentage point higher ALP vote share at the 2007 and 2013

elections than the bottom quintile. Income is decreasing in ALP vote share, and so is the mean level of new car purchases. Postcodes with a higher ALP vote share also tend to have a lower share of white-collar employment, a higher unemployment rate, and a higher share of renters. However, differences in educational attainment and average age are relatively minor. By industry, the main differences are the relatively high share of manufacturing employment and low share of agricultural employment in high ALP vote share postcodes. By geographic location, 88 percent of postcodes in the top quintile are in metropolitan areas, compared with 50 percent of postcodes in the bottom quintile.

## 4 Consumer sentiment and consumption

### 4.1 Without controls

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

Figure 7 shows the share of total quarterly new car sales by quintile of ALP vote share at the 2007 election. The quintiles are constructed using population weights, with each quintile having the same number of people at the 2006 Census. The share of new car sales for each quintile is expressed relative to its 2007 average. Prior to the 2007 federal election, the share of new car sales for the top, middle and bottom quintiles by ALP vote share was stable. But following the ALP victory at the 2007 election, there was a sustained increase in the share of new car sales in the most ALP-leaning postcodes (top quintile) and a sustained decrease in

the share of new car sales in the most Liberal/National leaning postcodes (bottom quintile). Further, there was little change in the share of new car sales for the middle quintile, which had an approximately equal number of ALP and Liberal/National voters at the 2007 election. These changes in new car sales are strikingly consistent with the consumer sentiment survey; the peak difference between ALP and Liberal/National party supporters in terms of both new car purchases and spending intentions for a major household item occurs around mid-2012 (Figures 3 and 7).

However, the results for the 2013 election are less clear. While both spending intentions and new car sales moved together in the year prior to the 2013 change in government, the further shift in spending in intentions at the 2013 election is less evident in the new car sales data.

To exploit the full-range of variation in partisanship across postcodes, and to allow for different rates of population growth across postcodes, we adopt a regression approach. In particular, we estimate the following regression over the period 2004-2014:

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

where  $mv_{it}$  is per capita motor vehicle sales in postcode  $i$  in quarter  $t$ ,  $\alpha_i$  is a postcode-specific fixed effect,  $d_t$  is an indicator variable taking the value unity in quarter  $t$  and zero otherwise,  $ALP_i^\tau$  is the ALP vote share in postcode  $i$  for an election held at time  $\tau$ , and  $\epsilon_{it}$  is an error term.<sup>8</sup> The coefficients  $\delta_j$  are quarterly fixed effects, capturing all variation in new car sales that is common across postcodes, such as seasonality, changes in new car prices, and aggregate economic shocks. The coefficients of interest are  $\beta_j$ , indicating the relationship in quarter  $t$  between ALP vote share and per capita new car sales. The omitted category in the regression is the quarter in which the election is held, so all estimated  $\beta_j$ -coefficients

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<sup>8</sup>The use of a log transformation for the dependent variable results in the exclusion of observations with zero car sales in a given quarter. The excluded observations account for less than 1.5 percent of new car sales. As an alternative, we have estimated Equation (1) with the level rather than the log level of per capita new car 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.

are relative to that period. Note we estimate equation (1) separately for the 2007 and 2013 elections. So the December quarter 2007 is the omitted quarter in regression using 2007 vote share data, while the September quarter 2013 is the omitted quarter when we use the 2013 vote share data. We use weighted least-squares, with weights equal to the average number of new car sales over the two years prior to the change in government at time  $\tau$ .<sup>9</sup>

The top panel of Figure 8 presents the  $\beta$ -coefficient estimates from Equation 1 together with two standard error confidence bands, using vote shares for the 2007 federal election. The coefficient estimates indicate the log change in the quarterly level of new car sales, relative to the December quarter 2007, when moving from a hypothetical postcode with only Liberal/National voters to one with only ALP voters. Shortly after the ALP won government at the 2007 federal election, there was a sustained increase in the level of new motor vehicle sales in ALP-leaning postcodes relative to Liberal/National party leaning postcodes. In the three years following the 2007 election, the  $\beta$ -coefficients average to about 0.1. This indicates that going from a postcode with no ALP voters to a postcode where everyone votes for the ALP increases per capita car sales by 10 per cent. The estimated  $\beta$ -coefficients over this period are for the most part statistically significant. The largest difference in the average level of new motor vehicle sales between ALP and Liberal/National postcodes occurred around 2012. This lines up with the largest difference between ALP and Liberal/National voters in spending intentions for a major household item from the consumer sentiment survey.

The bottom panel of Figure 8 reports analogous results using vote share data from the 2013 election, at which the Liberal/National party won office. All estimated effects are relative to the September quarter 2013. Consistent with the consumer sentiment survey, an average of the  $\beta$ -coefficients indicates a 7 percentage point lower level of new motor vehicle purchases by ALP voters relative to Liberal/National party voters in the two years after the ALP's loss of government compared to the ALP's last two years in office. However, the estimated change in the level of motor vehicle sales is smaller for the 2013 than the 2007

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<sup>9</sup>Using population weights instead does not materially change our results.

change in government, so the average level of new motor vehicle purchases by ALP voters relative to Liberal/National party voters has not yet returned to its average over the pre-2007 period. The fall in our estimates of  $\beta$  also start prior to the 2013 election. This may in part reflect other factors independent of sentiment affecting new motor vehicle purchases, which we have not yet controlled for.

The results in this section indicate that differences in consumer sentiment between ALP and Liberal/National party voters are reflected in differences in new motor vehicle sales, providing some validation for information contained in the sentiment survey. Further, the results, particularly from the 2007 election, also suggest that consumer sentiment can contain forward looking information about consumption, given that sentiment changes precede consumption changes.

## 4.2 With controls

Partisanship is correlated with a range of economic indicators (Table 2), so it is possible that economic shocks borne primarily by either ALP or Liberal/National party voters could be responsible for the changes in new motor vehicle consumption described in the previous section. For example, because ALP leaning postcodes have a relatively high share of manufacturing employment, a change in economic conditions for the manufacturing sector could be expected to affect ALP voters more than Liberal/National party voters, and so directly influence new motor vehicle sales.

Another possibility is that an incoming government favors its supporters using tax policy. This can have a direct effect on consumption by changing the distribution of income. Given that policy set by the federal government cannot be targeted to specific individuals, but rather to particular groups of people (based on, for example, employment status, the industry they work in or their income) we attempt to address this concern by controlling for observed economic differences between ALP and Liberal/National party voters.

While our identification approach uses partisanship as a source of variation in economic

perceptions, there would ideally be no difference in economic fundamentals between ALP and Liberal/National party voters. We use two approaches to control for these differences. In the first approach, we try and construct a measure of pure partisanship by isolating variation in the ALP vote share at each election that is uncorrelated with observable economic differences between ALP and Liberal/National party voters. We then use this variation as our source of identification. The second approach uses difference-in-difference regressions, which allows us to control for difference in income growth across postcodes.

### 4.2.1 Pure partisanship

To construct a measure of pure partisanship, we separately regress the ALP vote share at the 2007 and 2013 elections on a wide range of economic variables, and take the residual series. The regression includes the full set of demographic and industry variables reported in Table 2, as well as controlling for geographic characteristics of a postcode. Regression results are reported in Table 3.<sup>10</sup> The economic control variables absorb between 55 and 60 per cent of the postcode-level variation in vote shares.

We then re-estimate Equation 1 replacing the observed ALP vote share variable with our measure of pure partisanship. Formally, we now estimate the regression

$$\log(mv_{it}) = \alpha_i + \sum_{j=-T_0}^{T_1} \delta_j d_t + \sum_{j=-T_0, j \neq T_\tau}^{T_1} \beta_j (d_t \times \xi_i^\tau) + \epsilon_{it}, \quad (2)$$

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

Results using this residual variation in ALP vote share for both the 2007 and 2013 elections show a qualitatively similar profile for the  $\beta$ -coefficients to the results from Equation 1 without controls (Figure 9). We again find little evidence of a pre-trend before the 2007

<sup>10</sup>For the 2007 election, we use 2006/07 mean taxable income, and for the 2013 election we use 2012/13 data, which is the most recent available.



election. Following the ALP's victory at the 2007 election we estimate that a positive ALP vote share residual is associated with a higher level of new motor vehicle purchases. Also consistent with the consumer sentiment survey, this pattern reverses around the time of the 2013 election, at which the Liberal/National party formed government. The change in new motor vehicle purchases is more pronounced than in the regression without controls. Although the downward trend in new motor vehicle purchases began about 18 months prior to the 2013 election, it does line up with the timing of the downward trend in the difference between ALP and Liberal/National voters on whether it is a good time to buy a major household item in the consumer sentiment series, which is also plotted in Figure 9.

Because the control variables absorb over half the variation in ALP vote share across postcodes, the standard errors around our estimates are now larger. But we nonetheless believe that the point estimates are informative, particularly given that they follow a broadly similar pattern to the point estimates from the regression without controls. These results provide further evidence that consumers' stated spending intentions in the sentiment survey do correspond with observed behaviour. Given our extensive use of controls, these results provide evidence that innovations to sentiment have a causal effect on consumption.

#### **4.2.2 Difference-in-difference regressions**

We have investigated whether the differential consumption response of ALP and Liberal/National party voters around changes in government can be explained by differences in observable economics characteristics. We relied on point-in-time data, mostly from the 2006 and 2011 Census. This approach controls for differential income shocks correlated with observable economic characteristics. To allow for differential income shocks not correlated with observable economic characteristics, we now adopt a difference-in-difference framework, which allows us to control for changes in postcode-level incomes over time. Here we argue that if different groups of voters experience different shocks than this should show up in their incomes.

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

income data is only available annually):

$$\Delta^h \log(mv_{i,t+h}) = \alpha + \beta_h ALP_i^{2007} + \sum_j \gamma_j X_{ij} + \phi \Delta^h \log(inc_{i,t+h}) + \varepsilon_{i,h} \quad (3)$$

where  $\Delta^h \log(mv_{i,t+h})$  is the percent change in per capita motor vehicle 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,  $\Delta^h \log(inc_{i,t+h})$ , and the full set of control variables  $X_{i,j}$  listed in Table 2. Because the latest release of Australian Tax Office income data is for the 2012/2013 financial year, we can only estimate Equation (3) for the 2007 election. As before, we use the average number of new motor vehicle purchases over the two years before the 2007 election as regression weights.

We estimate equation (3) 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 10 shows estimates of  $\beta_h$  in the presence and absence of the control variables (left- and right-hand panels, respectively). Figure 10 can be interpreted as follows: the first data point at 2008 on the figure shows the effect that moving from a postcode with no ALP voters to only ALP voters has on car sales over the period from 2007 to 2008. The second data point for 2009 shows this same effect, but for car sales over a two year window from 2007 to 2009 and so on. The size of these estimated effects are non-trivial: going from a hypothetical postcode with only Liberal/National party voters to another postcode with only ALP voters is estimated to have increased per capita new motor vehicle purchases by around 30 percent four years after the 2007 election, even after we control for changes in income.

Our identification strategy relies on variation in the ALP vote share across postcodes. We would expect that the effect of partisanship on car sales to be more pronounced in the postcodes that have either a high fraction of ALP or Liberal/National voters. We would like to see if just using these “extreme” postcodes makes a material difference to our results. The bottom panels of Figure 10 reports estimates for Equation (3) restricting the estimation sample to postcodes in the top and bottom quintiles of ALP vote share at the 2007 federal

election. The results are similar in this subset of postcodes, suggesting that most of our identification comes from postcodes at the extremes of partisanship.

Overall, the estimates presented in this subsection are consistent with our earlier results, providing further evidence that sentiment has a causal effect on consumption. Again there is also evidence of consumer sentiment contains forward looking information as changes in sentiment occur before changes in consumption.

## 5 Discussion of results and relation to the literature

Our results are interesting in showing evidence of a relationship between reported spending intentions and consumption. This helps validate research relying on spending intentions data elicited from sentiment surveys (e.g., Bachmann et al. 2015).

Our results are consistent with an earlier literature using aggregate time-series variation, which has found that consumer sentiment contains meaningful information about future consumption after controlling for macroeconomic fundamentals, such as income growth, stock prices and interest rates (see Bram and Ludvigson 1998, Carroll et al. 1994 and Ludvigson 2004). However, we believe our cross-sectional identification approach provides more compelling evidence. The information attributed to consumer sentiment by the time-series literature could reflect fundamentals that have not been controlled for, or non-linear relationships between macroeconomic fundamentals and consumption growth, rather than any independent information contained in consumer sentiment (Ludvigson 2004). By using cross-sectional variation, we difference out the effect of all common macroeconomic shocks on sentiment. Our approach also makes clear the source of variation used for identification - differences in sentiment related to partisanship.

Carroll et al. (1994) view the predictive power of lagged sentiment as a puzzle. They note that under the Permanent Income Hypothesis consumption growth should not be predictable based on lagged information. One possibility they identify is that an increase in

sentiment predicts stronger income growth but liquidity constrained households cannot raise their consumption until their incomes rise. However, Carroll et al. (1994) find that lagged sentiment has predictive ability for consumption growth even after accounting for its ability to predict future income growth. Consistent with this, we find that the shift in sentiment between ALP and Liberal/National party voters following changes in government is associated with a sustained difference in new motor vehicle purchases for the two groups even after controlling for differences in incomes. Our results also suggest that consumer sentiment contains forward looking information. This is consistent with the empirical evidence in Barsky and Sims (2012), who find using aggregate time-series data that innovations to sentiment have long-lasting effects on consumption.

While the time-series literature has generally argued that consumer sentiment contains meaningful independent about consumption growth, the amount of additional information from adding sentiment to a consumption growth forecasting regression, has typically been found to be small (see Ludvigson (2004)). In contrast, our results suggest that changes in sentiment can have a pronounced effect on consumption. One possibility is that time-series averages mask specific episodes in which sentiment contains a lot of additional information, as argued by Hall (1993) and Blanchard (1993) for the 1990-91 US recession. As a case in point, the variation we use is masked in aggregate data because there are a similar number of ALP and Liberal/National party voters.

Perhaps the most interesting interpretation of our results is that sentiment shocks unrelated to economic fundamentals can have a causal effect on consumption. We believe that the source of variation in sentiment we use for identification is more likely to represent pure sentiment shocks resulting from partisanship than unbiased expectations about changes in future incomes. Firstly, the shift in sentiment between ALP and Liberal/National party voters occurs immediately following a change of government. These movements in sentiment are sharp and of a similar magnitude to what we observe during recessions. Consumers are more optimistic about both personal and national economic conditions when the political party

they support holds office, suggesting that beliefs about changes in the income distribution are not the source of variation in sentiment. This interpretation is consistent with the political science literature, which finds that partisanship plays an important role in an individual’s assessment of both actual and expected macroeconomic conditions. Further we find it hard to think of any new information that would become available immediately following an election which would lead to such large movements in sentiment between ALP and Liberal/National voters.

Secondly, we make use of an extensive set of controls to account for the fact that partisanship is correlated with economic variables. Specifically, we regressed postcode-level vote shares on a broad set of economic variables and used only the unexplained variation in vote shares as our source of cross-sectional variation. Even after controlling for these factors, we still find that changes in sentiment between ALP and Liberal/National party voters predict changes in new motor vehicle sales. Overall, these two considerations lead up to believe that we are identifying changes in new motor vehicle purchases driven by misperceptions of future economic conditions rather than changes in economic fundamentals across postcodes. We believe that this provides some support for the notion that there could be exogenous movements in consumption predicted by sentiment surveys. As mentioned before, both Hall (1993) and Blanchard (1993) have argued that exogenous movements in consumption were one of the causes of the 1990-1991 US recession.

Our paper is most similar to Gerber and Huber (2009) and Mian et al. (2015), who both use cross-sectional data to identify a relationship between partisanship and consumption. In particular, they investigate whether changes in county-level consumption following US presidential elections are related to county-level voting outcomes. Each paper takes a different approach and reaches a different conclusion.<sup>11</sup>

Gerber and Huber (2009) find evidence that consumption increases more in counties that

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<sup>11</sup>In particular Mian et al. (2015) use responses from the question: “As to the economic policy of the government - I mean steps taken to fight inflation or unemployment - would you say that the government is doing a good job, only fair or a poor job?”

voted for the incoming president. In contrast, Mian et al. (2015) report no statistically significant effect. These differences in results partly reflect how each set of authors measure consumption. Gerber and Huber (2009) use county-level sales tax revenue data, which is problematic because consumers may shop in one county but live in another. Mian et al. (2015) use self-reported spending intention from the Michigan survey and actual spending measured using new car registrations and credit card data.

In terms of how consumption is measured, our paper is most closely related to Mian et al. (2015). This leads to the question why we find that changes in sentiment affect consumption while they do not. We offer a few explanations. We believe that our data allows us to better measure partisanship and consumption at a disaggregated level. Our first explanation deals with how new car sales are measured. Secondly, we can directly observe an individual's political preferences and, thirdly, the voting laws in Australia helps us avoid selection issues with our data. We discuss each of these in turn.

Starting with Australian voting laws, voting in Australia is compulsory, so we don't have to worry about selection effects in terms of who decides to vote. In contrast, voting in the US is voluntary so selection maybe an issue. For example, it is well known that voter turnout can be affected by opinion polls. This leads to measurement error when measuring political affiliations, downwardly biasing estimates of the effect of partisanship on consumption.

In terms of how cars are measured, because we are interested in the effect of consumer sentiment on consumption, we use car sales to households. Mian et al. (2015) use registration data which includes car sales to businesses and governments in addition to households. This leads to measurement error in their left hand side variable, which increases the standard errors around their estimates. To see the effect of using total car sales data we re-estimate equation (1) using Australian car registration data. The data is sourced from the ABS and is available on an annual basis. Figure 11 shows the effect of an increase in the ALP vote share on car sales. As the figure indicates, the standard errors around the  $\beta$ -coefficients are larger when we use registration data rather than just sales to households. We also find that

when we use registration data it is unclear whether changes in sentiment affect consumption as our estimated  $\beta$ -coefficients have a saw-toothed pattern around the 2007 election.<sup>12</sup>

As noted above, one unique aspect of the Australian consumer sentiment survey is that respondents are asked about their political preferences. In contrast, Mian et al. (2015) have to impute an individual’s partisanship based on the county where they live, as the Michigan survey does not ask respondents about their political preferences. While we can see in our data that partisanship affects an individual’s perceptions of whether it is a good time to buy a major household item (see Figure 2), Mian et al. (2015) do not find this in their data.<sup>13</sup> We believe that the reason that Mian et al. (2015) do not find this result in their data is because imputing partisanship leads to more noise in their data. To see the effect of imputing partisanship we re-calculate the difference in sentiment between ALP and Liberal voters for each component of the consumer sentiment index. Now instead of using respondents stated partisanship we impute their partisanship based on their postcode. Further details of the imputation are provided in Appendix A. The results from this imputation are shown in Figure 13. Comparing Figure 2 where we observe partisanship to Figure 13 where partisanship is imputed shows that imputing partisanship leads to more noisy sentiment data. It is also much harder to see changes in sentiment around elections from the imputed data than what you can see in the data where we observe partisanship.<sup>14</sup>

## 6 Conclusion

We use novel variation in consumer sentiment associated with political preferences to see if sentiment is informative about future consumption. In particular, we use the fact that consumers report substantially higher levels of sentiment when their political affiliations

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<sup>12</sup>Mian et al. (2015) also use credit card data in their analysis. Unfortunately we do not have access to credit card data.

<sup>13</sup>An exception is following the Obama victory in 2008 respondents in Republican leaning counties become relatively more pessimistic about spending.

<sup>14</sup>Unfortunately at this stage we only have unit record consumer sentiment data from 1995 to 2001, so we cannot do this imputation over 2004 to 2015 period used in the main analysis of the paper.

match those of the governing political party compared to those who support the political party in opposition. The difference in sentiment between voters of the two parties is large, with the divergence in sentiment between these two groups opening up immediately following an election with a change in government. This difference in sentiment is sustained until there is another change in government.

To see if sentiment changes affect consumption, we match postcode level vote share data with postcode level new car sales. If changes in sentiment do affect consumption then we would expect that following a change of government postcodes with a greater proportion of voters for the incoming party would purchase relatively more cars than postcodes with a greater proportion of voters for the outgoing government. Results from two elections show this to be the case. We find that following an ALP election victory in 2007, that postcodes with a higher ALP vote share did purchase relatively more cars compared with postcodes with a high share of Liberal/National voters. This effect then reversed around the time of the Liberal/National Party election victory in 2013. Our results are robust to the inclusion of an extensive set of controls for postcode differences in voter characteristics and income growth.

Our results provide evidence that the information contained in the consumer sentiment survey is informative about consumption. Further we also find that consumer sentiment contains forward looking information, as the sharp change in sentiment between ALP and Liberal/National voters at an election precedes changes in car purchases. Our use of controls, and the sharp change in sentiment that we observe precisely at elections in which there is a change in government, lead us to believe that the relative changes in consumption that we find are related to misperceptions associated with political preferences rather than to differences in economic fundamentals across postcodes. In this sense, our results provide evidence that changes in pure sentiment can affect consumption.

The existing macroeconomic time series literature sought to identify whether consumer sentiment contains any independent information beyond that captured by other macroeco-



conomic economic indicators. If consumer sentiment does contain independent information, is it useful to policymakers? Our results indicate that sentiment does contain useful information beyond that captured by macroeconomic time series. Therefore, from a policy making perspective, we suggests that if policymakers do notice a divergence between consumer sentiment and the level of economic activity suggested by macroeconomic data, then this divergence may contain important information about future consumption.

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## A Conditional sentiment indices

This Appendix uses individual response microdata from the consumer sentiment survey to construct sentiment indexes for ALP and Liberal/National party voters conditional on individual level economic and demographic characteristics. At this stage, microdata data have only been made available to us for the 1995 to 2001 period.

Responses to each of the five questions in the consumer sentiment index are classified as either positive, unchanged/don't know, or negative. For each question, and each survey month, we fit an ordered probit model. We assume that the categorical response data mask a smooth underlying distribution of consumer attitudes:

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

where  $s_{i,j,t}^*$  is the latent sentiment of consumer  $i$  in response to question  $j$  in survey month  $t$ ,  $\mathbf{X}_{i,t}$  is a vector of covariates (e.g., age, income, occupation) for person  $i$ ,  $\boldsymbol{\Gamma}_{j,t}$  is the vector of coefficients on those covariates in 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.<sup>15</sup> 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

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

and analogously for negative and neutral/don't know responses. The thresholds  $\mu_{j,t}^{low}$  and  $\mu_{j,t}^{high}$ , the coefficient on the ALP dummy variable  $\phi_{j,t}$  and the vector of coefficients  $\boldsymbol{\Gamma}_{j,t}$  are

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<sup>15</sup>The 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.

jointly estimated using maximum likelihood, under the identification constraints that the error term  $\varepsilon_{i,j,t}$  has unit variance and the regression omits a constant term. Observations are weighted by their sampling frequency,  $\omega_i$ .

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

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

and similarly for negative responses,

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

Subtracting Equation (A.4) from Equation (A.3), and some re-arrangement gives:

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

The first term on the right-hand side of Equation (A.5) is the probability for an ALP voter of reporting a positive response less the probability of reporting a negative response; the second term is the same for Liberal/National party voters. Each term mirrors the unconditional published sentiment indices, which are constructed by subtracting the fraction of negative responses from the fraction of positive responses. Thus, estimates of Equation (A.5) provide conditional analogues to the unconditional sentiment indices. The conditional estimates for each question  $j$ , shown in Figure 12, are similar to the unconditional estimates, shown in Figure 3. This indicates that differences in sentiment between ALP and Liberal/National party voters remain even after controlling for a while range of economic variables.

In contrast to the Australian survey, the Michigan Survey of Consumers does not ask individuals about their voting intention. Mian et al. (2015) impute partisanship using the country-level Republican vote share of survey respondents. To assess whether this methodology has sufficient power to detect the effect of partisanship on sentiment, we repeat our estimates using the postcode-level ALP vote share at the 1996 federal election, rather than using self-reported voting intention as our measure of partisanship. The estimates, shown in Figure 13, are clearly much more noisy. Nonetheless, these estimates do suggest that ALP voters became more pessimistic about the national economy (sub-indices  $d$  and  $e$  in Figure 13) following the ALP's loss of government in March 1996. But the effect of partisanship on spending intentions is too small to detect when political preference is imputed from postcode-level vote shares. These results using the imputed measure of partisanship mirror the findings of Mian et al. (2015) for the US, and so provide a reconciliation between our findings.

Table 1: Bai and Perron (1998) Break Test:  
 Spending Intentions: ALP minus Lib/Nat Voters

Double maximum test	Information criteria	SupF test	Sequential test	Break dates
UD-Max	BIC	SupF(2 1)	3 breaks	Dec-07
87.16***	2 breaks	64.53***		Apr-10
WD-Max	LWZ	SupF(3 2)		Sep-13
87.16***	3 breaks	33.62***		
		SupF(4 3)		
		7.60		
		SupF(5 4)		
		16.27**		

Notes: This table reports tests for a break in the difference between the mean level of spending intentions for ALP and Liberal/National voters. The double maximum tests are for an unspecified number of breaks against the null of zero breaks. Both the WDMax and UDMax test statistics evaluate an F-statistic for 1–5 breaks, with the breakpoints selected by global minimization of the sum of squared residuals. The UDMax statistic weights the five F-statistics equally, while the WDMax statistic weights the F-statistics such that the marginal p-values are equal across the number of breaks. The WDMax test statistic reported is for a 1 per cent significance level test. The LWZ statistic is a modified Schwarz criterion. The  $\text{SupF}(i+1|i)$  test is for  $i+1$  breaks against the null of  $i$  breaks. The sequential test selects the number of breaks stepwise from zero breaks using the SupF test. The break dates are those identified by minimizing the sum of squared errors conditional on the number of breaks found. \*\*\*, \*\* and \* represent statistical significance at the 1, 5 and 10 per cent levels, respectively.

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

Table 2: Means: by Quintile of ALP Vote Share

Quintiles:	All	1	2	3	4	5
<b>November 2007 election: ALP victory</b>						
ALP vote share, 2007 election	0.53	0.36	0.46	0.53	0.60	0.72
Car purchases per capita	0.023	0.025	0.025	0.024	0.022	0.019
Income	48,107	54,186	49,042	47,380	46,264	43,627
Age	37	38	37	37	37	36
Share with college education	13.9	14.5	14.0	14.0	13.4	13.4
Share renting their home	27.6	22.8	25.1	26.7	29.5	33.8
Share with white collar job	32.7	39.0	33.8	32.6	30.2	27.7
Unemployment rate	5.5	4.3	4.8	5.0	5.6	7.7
Industry shares:						
Agriculture	3.3	9.0	2.9	2.4	1.2	0.8
Mining & construction	10.3	10.0	11.2	10.8	10.4	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	17.2	17.2	17.6
Health & education	18.6	18.7	19.4	19.3	18.5	17.1
Arts & accommodation	8.0	7.6	8.2	7.9	7.8	8.3
Public sector	6.4	5.5	6.5	6.8	7.1	6.4
<b>September 2013 election: Liberal/National victory</b>						
ALP vote share, 2013 election	0.47	0.30	0.40	0.47	0.54	0.66
Car purchases per capita	0.022	0.024	0.024	0.023	0.022	0.019
Income	62,784	71,223	64,127	61,802	60,345	56,271
Age	38	39	38	38	37	36
Share with college education	16.5	16.8	16.0	16.4	16.8	16.6
Share renting their home	30.1	26.4	29.1	29.2	30.6	35.5
Share with white collar job	33.8	39.2	33.9	33.3	32.6	30.0
Unemployment rate	5.8	4.7	5.6	5.5	5.9	7.4
Industry shares:						
Agriculture	2.6	7.6	2.3	1.6	0.9	0.6
Mining & construction	11.4	11.6	12.8	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	18.1
Health & education	20.1	20.0	20.7	20.7	20.2	18.9
Arts & accommodation	8.2	7.7	8.4	8.2	8.0	8.7
Public sector	6.6	5.5	6.3	6.9	7.6	6.4

Notes: This table reports population-weighted means for each variable by quintile of ALP vote share and for the total population. Postcode characteristics data are taken from the census that is the closest in time to the change in government: the 2006 census for the 2007 federal election and the 2011 census for the 2013 federal election. The Australian Capital Territory is excluded.



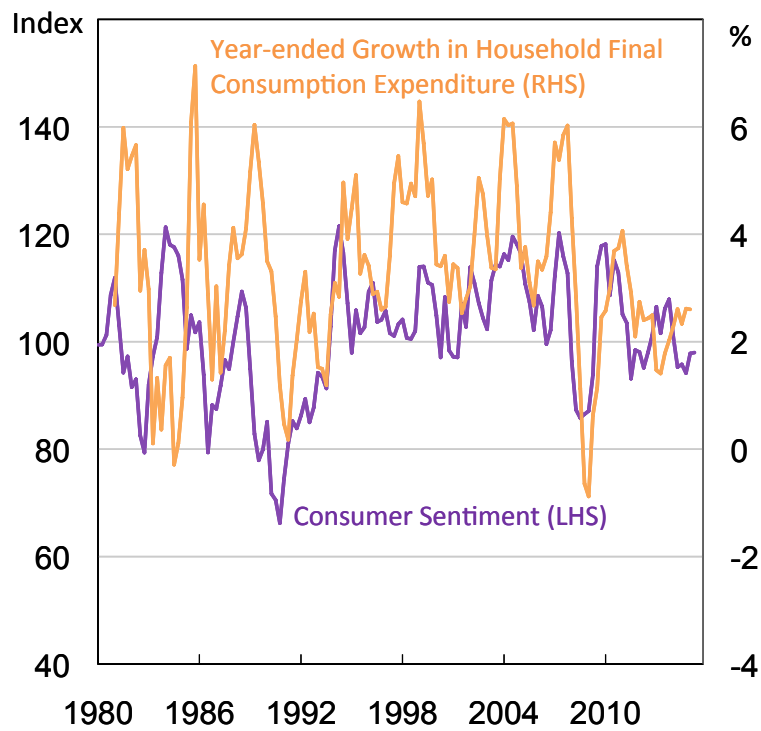
Table 3: ALP Vote Share Regressions

	ALP vote share: 2007	ALP vote share: 2013
Log taxable income	-0.1851*** (0.0265)	-0.2432*** (0.0112)
Bachelor's degree or higher: per cent	0.0121*** (0.0014)	0.0112*** (0.0013)
Average age: years	-0.0020*** (0.0009)	-0.0024*** (0.0009)
Unemployment rate: per cent	0.0171*** (0.0013)	0.0105*** (0.0018)
Share of renters: per cent	0.0001 (0.0003)	-0.0002 (0.0004)
White-collar profession: per cent	-0.0084*** (0.0010)	-0.0074*** (0.0013)
Industry of employment: per cent		
Agriculture	-0.0061*** (0.0009)	-0.0071*** (0.0010)
Mining & construction	-0.0039*** (0.0009)	-0.0036*** (0.0009)
Manufacturing	-0.0018** (0.0008)	0.0023*** (0.0011)
Retail & wholesale trade	-0.0093*** (0.0011)	-0.0113*** (0.0013)
Services	-0.0041*** (0.0012)	-0.0053*** (0.0013)
Health and education	-0.0060*** (0.0011)	-0.0042*** (0.0012)
Arts and accommodation	-0.0079*** (0.0015)	-0.0054*** (0.0016)
Other	-0.0115*** (0.0037)	-0.0137*** (0.0035)
Region: inner regional	-0.0506*** (0.0088)	-0.0502*** (0.0093)
Region: outer regional	-0.0545*** (0.0098)	-0.0591*** (0.0106)
Region: remote	-0.0213 (0.0153)	-0.0335 (0.0172)
Region: very remote	0.0031 (0.0293)	0.0115 (0.0243)
$R^2$	0.6064	0.5514
Observations	2265	2263

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

Summary: economic covariates explain 55 and 61 per cent of ALP vote share at the 2007 and 2013 federal elections, respectively.

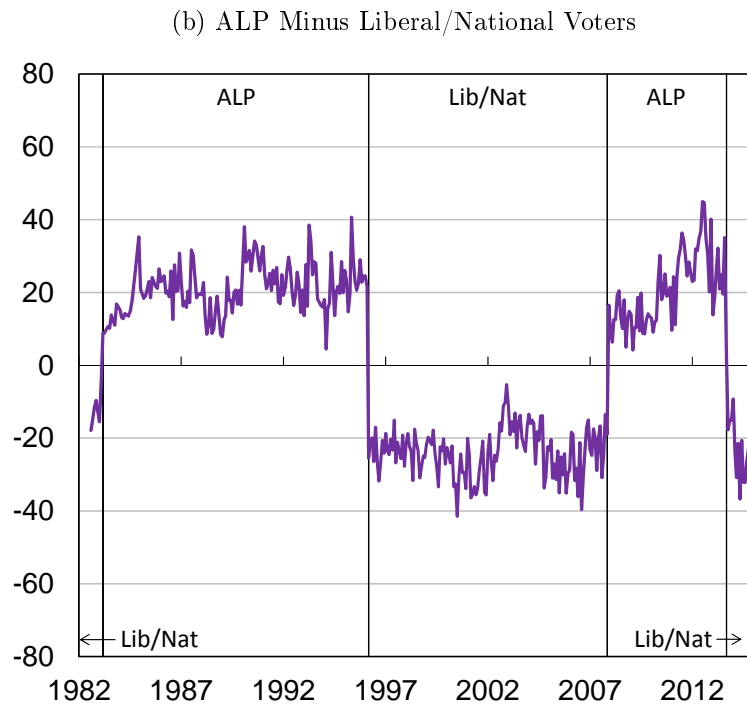
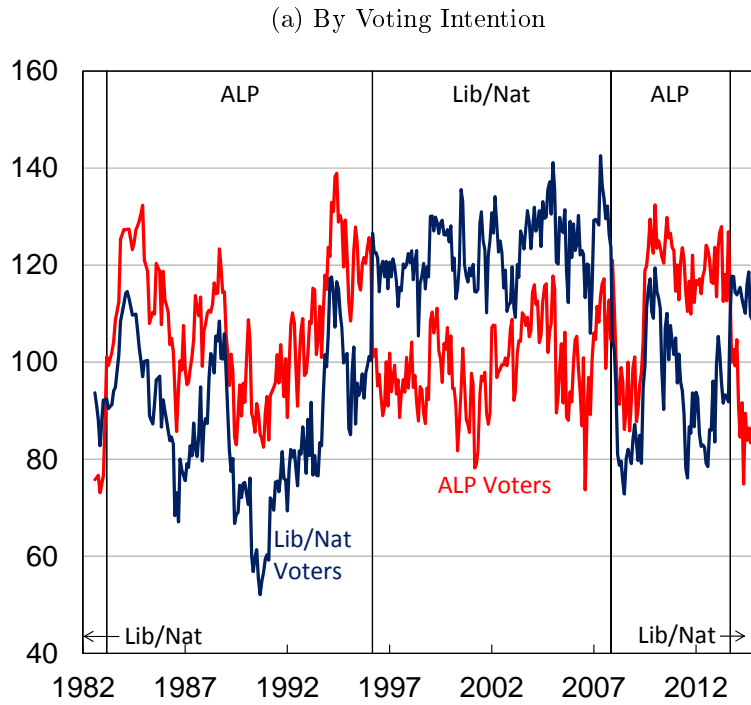
Figure 1: Consumer Sentiment and Consumption Growth



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

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

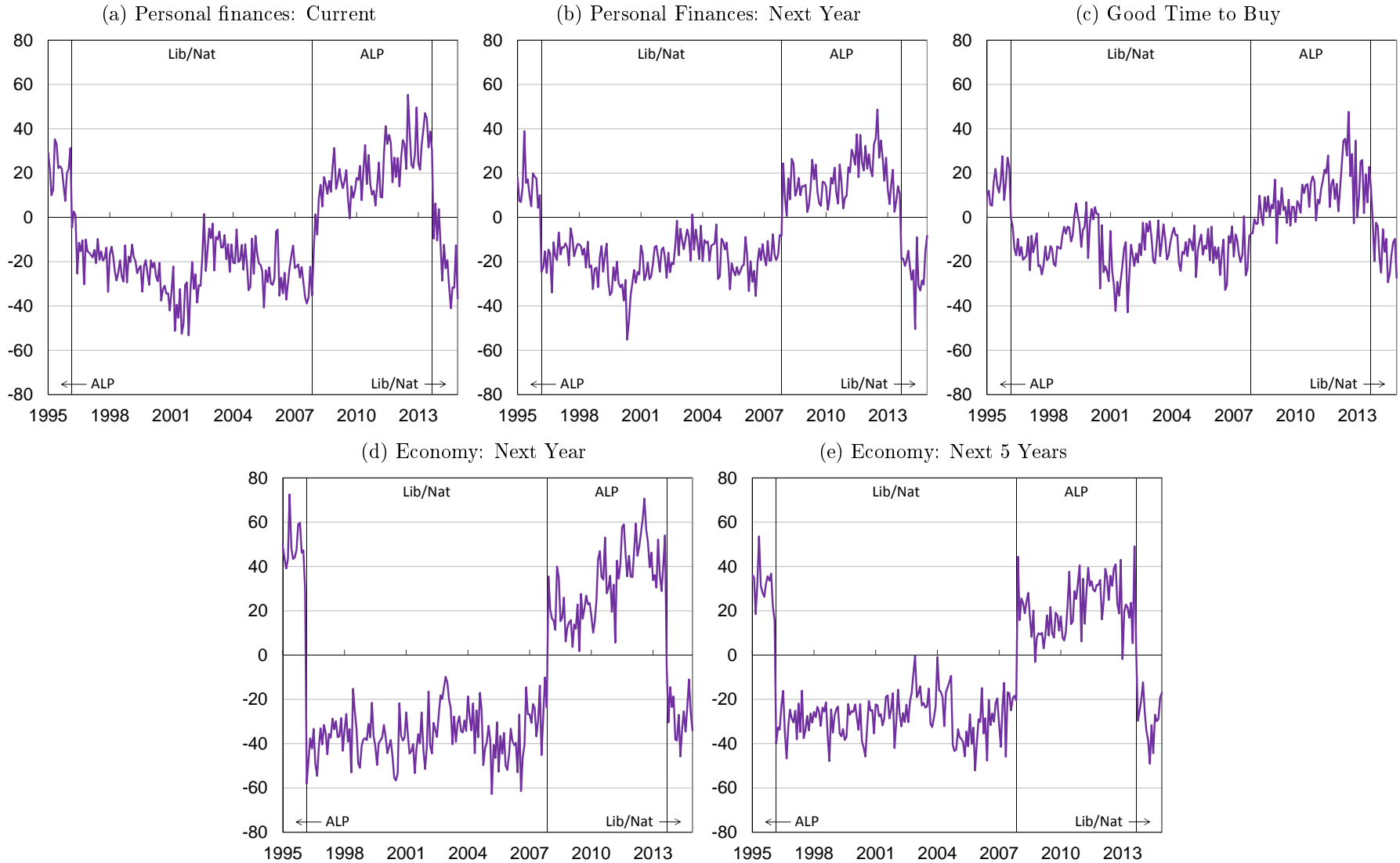
Figure 2: Consumer Sentiment Index



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

Summary: Sentiment is substantially higher when a consumer's self-identified political party holds government.

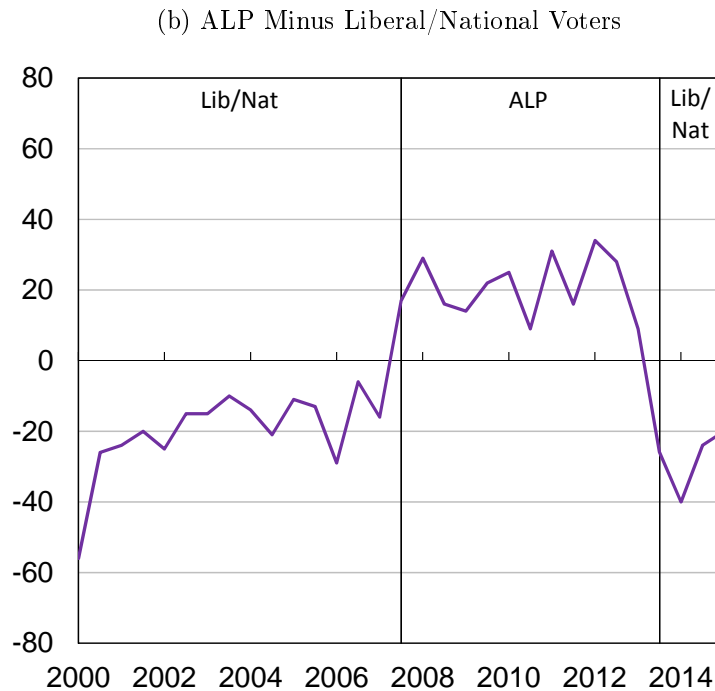
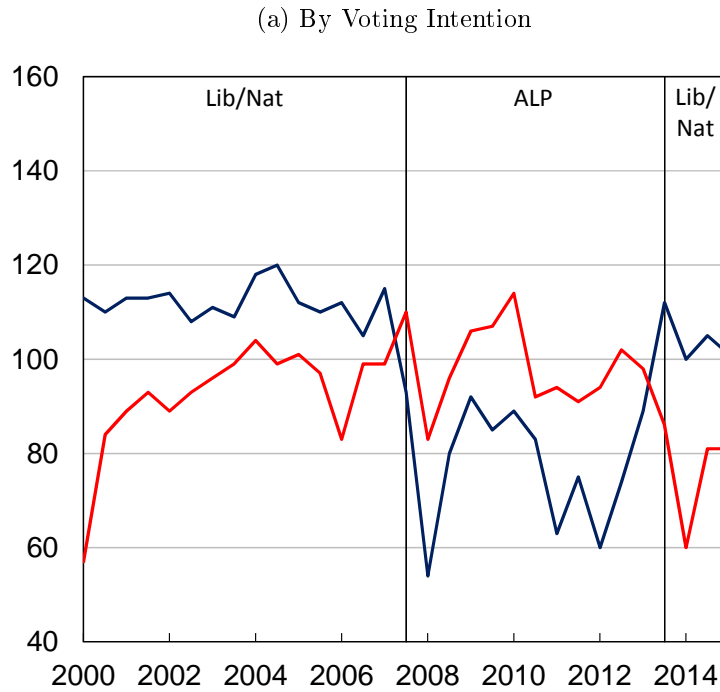
Figure 3: Components of Consumer Sentiment: ALP minus Liberal/National Voters



Notes: The consumer sentiment index is an average of responses to five questions. Each panel shows the difference in the index level for self-identified ALP minus Liberal/National voters. Vertical lines show dates when government changed hands. The five 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) good time to buy a major household item; (d) expected change in general economic conditions over the next year; (e) expected change in general economic conditions over the next five years.

Summary: Each component of the consumer sentiment index is higher for consumers when the political party they support holds government.

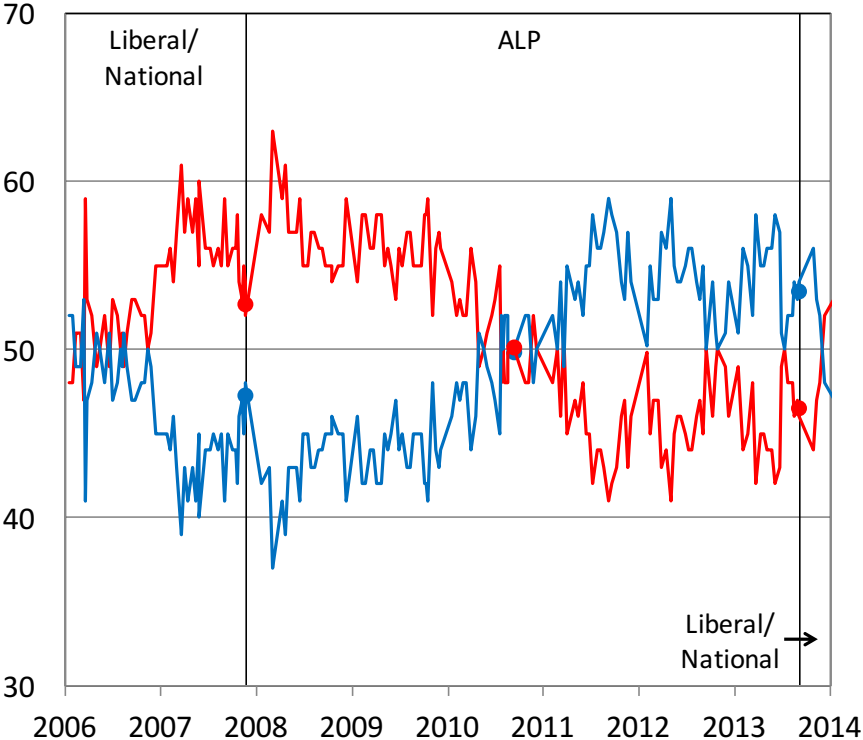
Figure 4: Newspoll: Expected Change in Standard of Living



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. The top panel shows the index level by consumers' voting intention. The bottom panel shows the difference between the two series in the top panel: ALP minus Liberal/National party voters. Vertical lines show dates when government changed hands. The survey has been conducted in June and December each year since 2000.

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

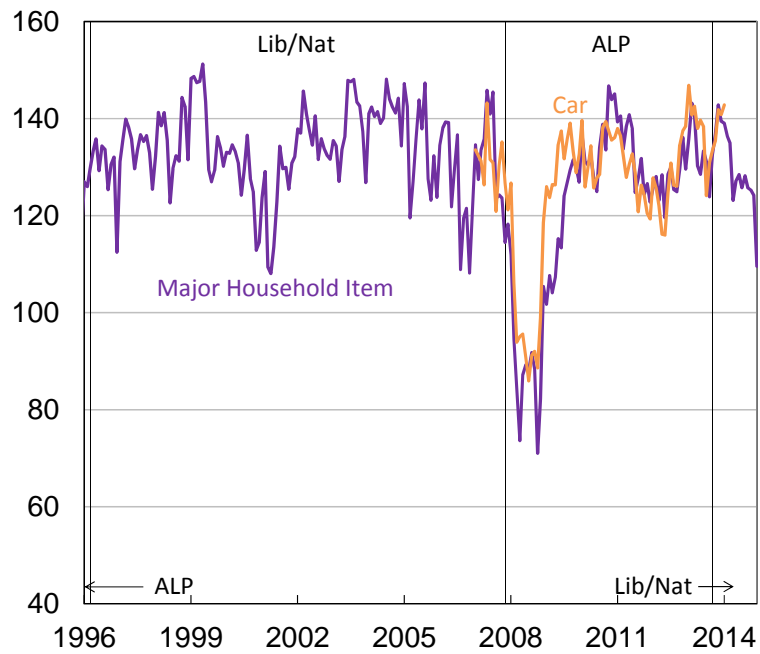
Figure 5: Political Opinion Polling: *Newspoll* Two-Party Preferred Vote Shares



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

Summary: The Liberal/National party trailed in the *Newspoll* survey for over a year before losing the 2007 election; polling before the 2013 change of government was more mixed.

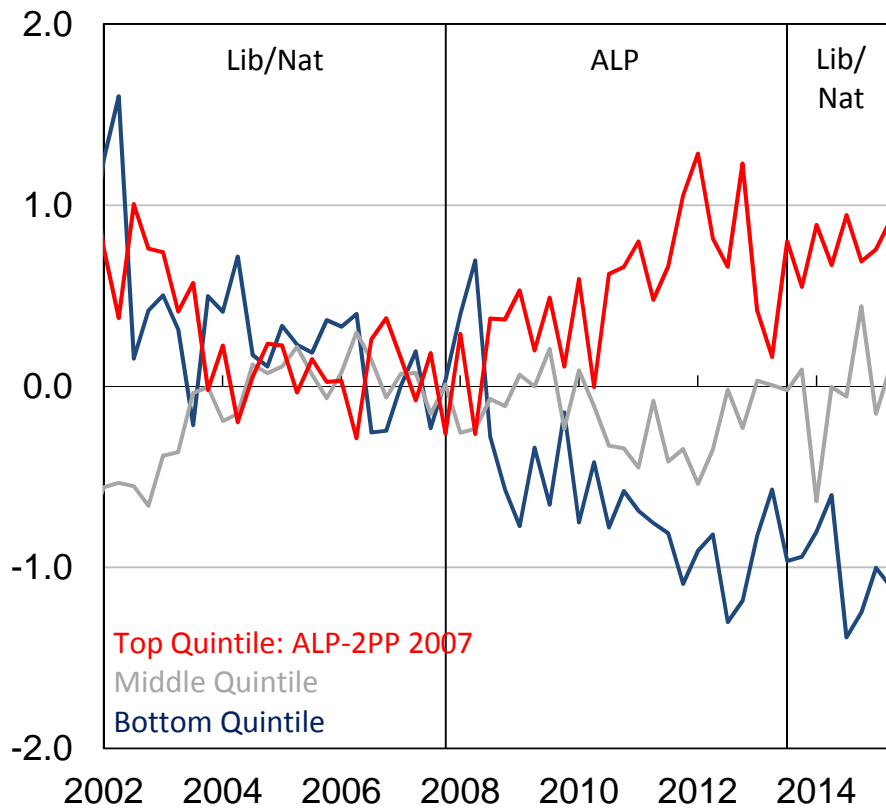
Figure 6: Good Time to Buy: All Consumers



Notes: The figure shows aggregate spending intentions for: *a major household item* and a *car*. The consumer sentiment survey only asked about consumer spending intentions for cars for the period shown. We have not been able to obtain a breakdown by voter type.

Summary: Spending intentions are similar for: *a major household item* and a *car*.

Figure 7: Share of Vehicle Sales Relative to 2007:  
By Quintiles of ALP Vote Share at 2007 Election



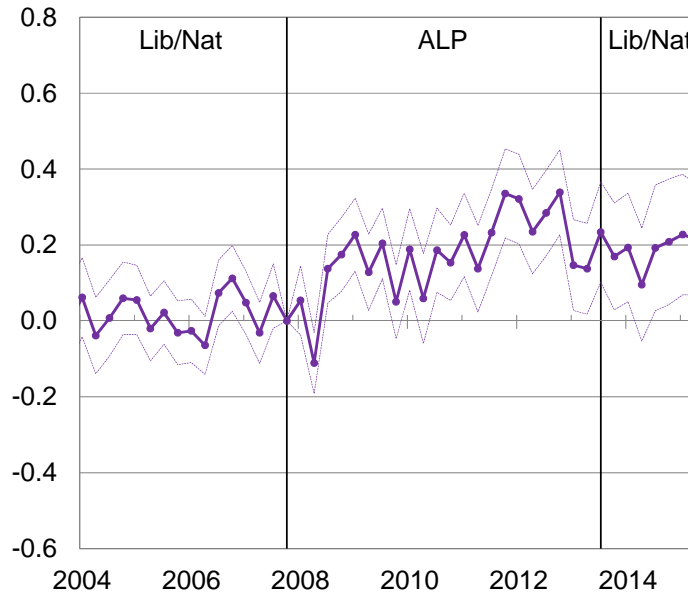
Notes: The figure shows the share, relative to the 2007 average, of total private motor vehicle sales in each quarter for quintiles of ALP vote share. Quintiles are constructed by sorting postcodes from lowest to highest ALP vote share at the 2007 federal election, with an equal population in each quintile, using 2006 Census population data. The ALP vote share is 0.36 in the first quintile, 0.53 in the middle quintile, and 0.72 in the fifth quintile.

Summary: There was a sustained increase in motor vehicle sales in ALP-leaning postcodes relative to Liberal/National leaning postcodes following the November 2007 federal election, at which the ALP won government.

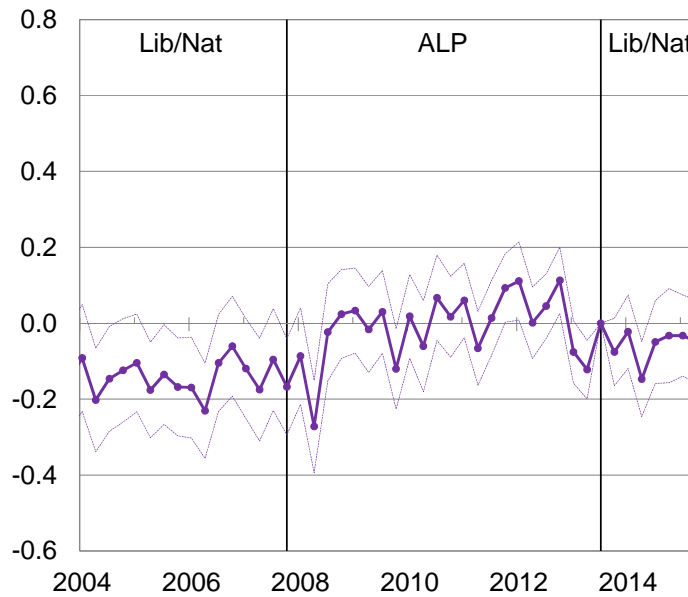


Figure 8: Partisanship and Motor Vehicle Purchases:  
Coefficient on ALP Vote Share

(a) 2007 Election Vote Shares



(b) 2013 Election Vote Shares

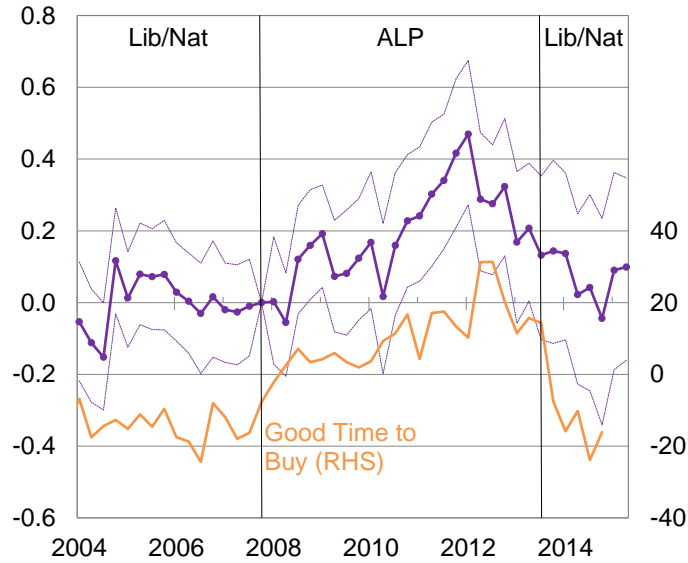


Notes: The top panel shows the coefficients  $\beta_j$  from the regression  $\log(mv_{it}) = \alpha_i + \sum_{j=-T_0}^{T_1} \delta_j d_t + \sum_{j=-T_0}^{T_1} \beta_j (d_t \times ALP_i^{2007}) + \epsilon_{it}$ , where  $mv_{it}$  is motor vehicle sales in postcode  $i$  in quarter  $t$ ,  $\alpha_i$  is a postcode-specific fixed effect,  $d_t$  is a dummy variable taking the value unity in quarter  $t$ , and  $ALP_i^{2007}$  is the ALP vote share in postcode  $i$  at the 2007 federal election; the coefficients  $\beta_j$  are relative to the omitted quarter December 2007, when the ALP won government. The bottom panel reports the coefficients  $\beta_j$  using vote shares from the 2013 federal election, and the omitted category is the September quarter 2013, when the Liberal/National party won government.

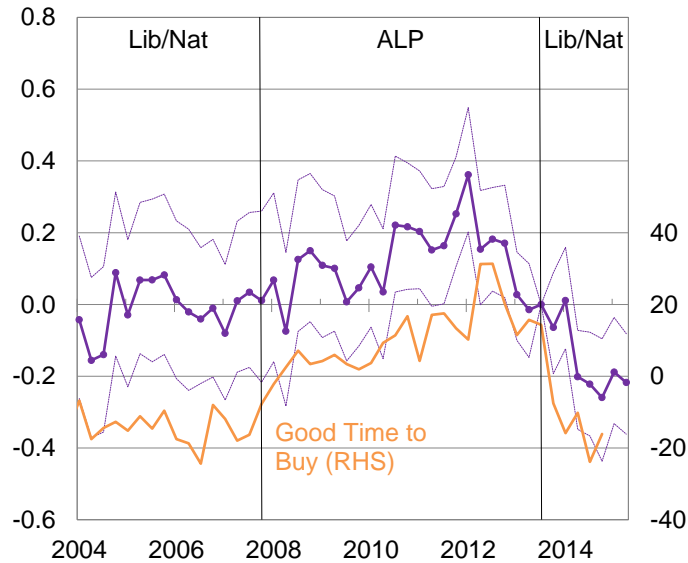
Summary: Motor vehicle sales were higher in ALP-leaning postcodes relative to Liberal/National leaning postcodes when the ALP held office between November 2007 and September 2013.

Figure 9: Partisanship and Motor Vehicle Purchases:  
Coefficient on Unexplained Variation in ALP Vote Share

(a) 2007 Election Vote Shares



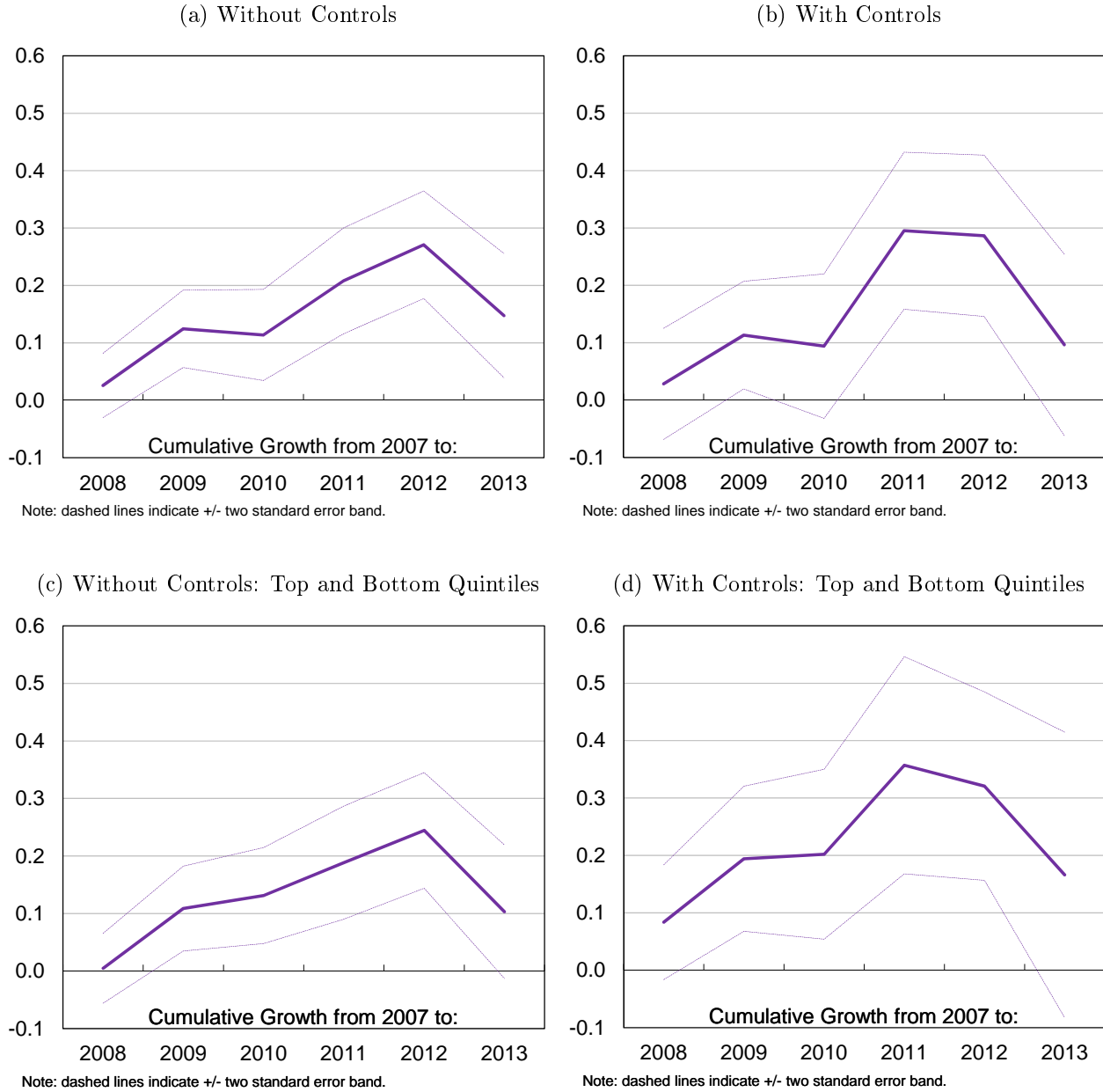
(b) 2013 Election Vote Shares



Notes: The dotted line on the top panel shows the coefficients  $\beta_j$  from the regression  $\log(mv_{it}) = \alpha_i + \sum_{j=-T_0}^{T_1} \delta_j d_t + \sum_{j=-T_0}^{T_1} \beta_j (d_t \times \xi_i^{2007}) + \epsilon_{it}$ , where  $mv_{it}$  is motor vehicle sales in postcode  $i$  in quarter  $t$ ,  $\alpha_i$  is a postcode-specific fixed effect,  $d_t$  is a dummy variable taking the value unity in quarter  $t$ , and  $\xi_i^{2007}$  is the residual for postcode  $i$  from a cross-sectional regression of ALP vote share at the 2007 federal election on controls; see Table 2 for details. The coefficients  $\beta_j$  are relative to the omitted quarter December 2007, when the ALP won government. The bottom panel reports the coefficients  $\beta_j$  using vote shares from the 2013 federal election, and the omitted category is the September quarter 2013, when the Liberal/National party won government. Dashed lines show 95 per cent confidence bands calculated from 1000 bootstrap replications. The *Good Time to Buy* series is the difference between ALP and Liberal/National party voters in self-reported spending intentions for a major household item.

Summary: Controlling for observable differences in characteristics of postcodes, motor vehicle sales were higher in ALP-leaning postcodes relative to Liberal/National leaning postcodes when the ALP held office between November 2007 and September 2013.

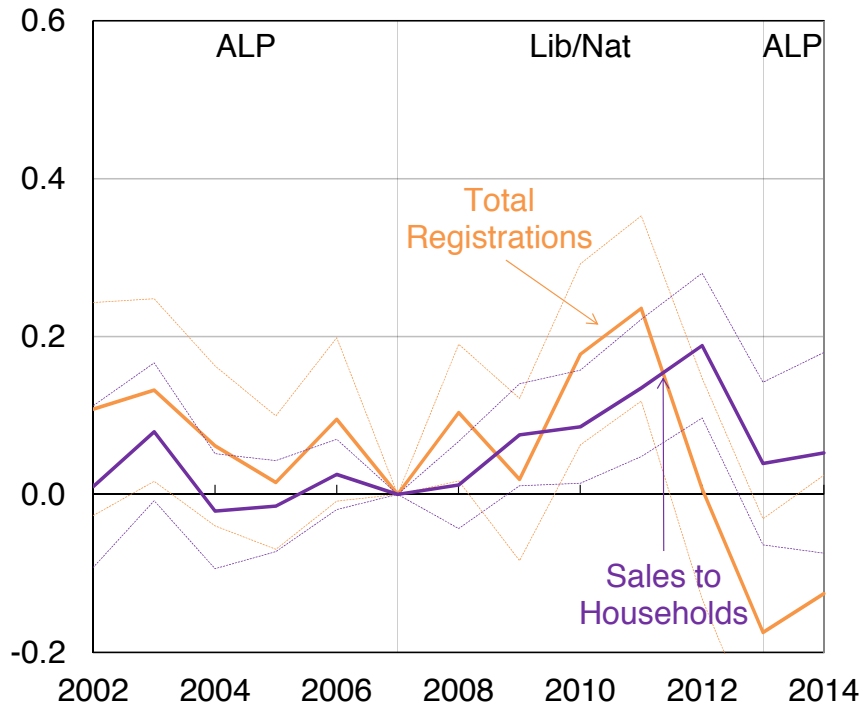
Figure 10: Partisanship and Motor Vehicle Sales: Difference-in-Difference Regressions  
Coefficient on ALP Vote Share at 2007 Election



Notes: Each panel reports coefficients  $\beta_h$  from a regression of the form  $\Delta^h \log(mv_{i,t+h}) = \alpha + \beta_h ALP_i^{2007} + \sum_j \gamma_j X_{ij} + \phi \Delta^h \log(inc_{i,t+h}) + \varepsilon_{i,h}$ , where  $mv_{i,t}$  is motor vehicle sales in postcode  $i$  in year  $t$ ,  $\Delta^h$  is the  $h$ -year difference operator,  $ALP_i^{2007}$  is the ALP vote share in postcode  $i$  at the 2007 federal election,  $X_{ij}$  is characteristic  $j$  for postcode  $i$ , and  $inc_{i,t}$  is mean taxable income for postcode  $i$  in year  $t$ . Each coefficient  $\beta_h$  reported in the figures is from a separate regression. The first panel reports coefficients  $\beta_h$  from a regression including no controls, and the second panel includes the full set of controls listed in Table 2. The third and fourth panels repeat the first two panels restricting the data sample to postcodes in the top and bottom population-weighted quintiles of ALP vote share at the 2007 federal election.

Summary: Controlling for income growth and other observable differences in characteristics of postcodes, motor vehicle sales were higher in ALP-leaning postcodes relative to Liberal/National leaning postcodes when the ALP held office between November 2007 and September 2013.

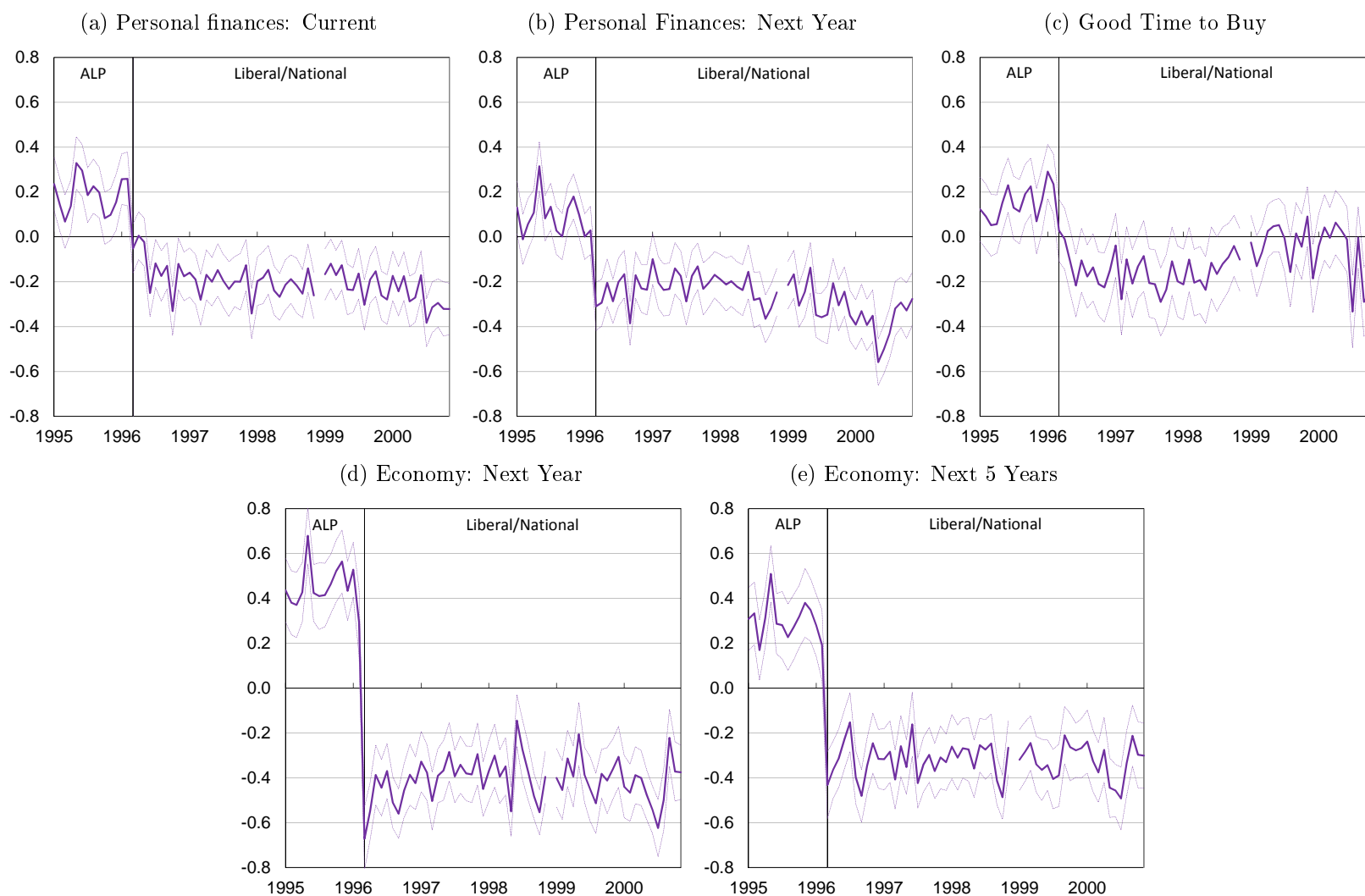
Figure 11: Partisanship and Motor Vehicle Purchases:  
By Total Registration and Sales Data to Households



Notes: The graph shows the coefficients  $\beta_j$  from the regression  $\log(mv_{it}) = \alpha_i + \sum_{j=-T_0}^{T_1} \delta_j d_t + \sum_{j=-T_0}^{T_1} \beta_j (d_t \times ALP_i^{2007}) + \epsilon_{it}$ , where  $mv_{it}$  is motor vehicle sales in postcode  $i$  in quarter  $t$ ,  $\alpha_i$  is a postcode-specific fixed effect,  $d_t$  is a dummy variable taking the value unity in quarter  $t$ , and  $ALP_i^{2007}$  is the ALP vote share in postcode  $i$  at the 2007 federal election; the coefficients  $\beta_j$  are relative to the omitted quarter December 2007, when the ALP won government. We measure per capita motor vehicle purchases in two ways: from sales to households and from registration data that includes sales to households, businesses and the government.

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

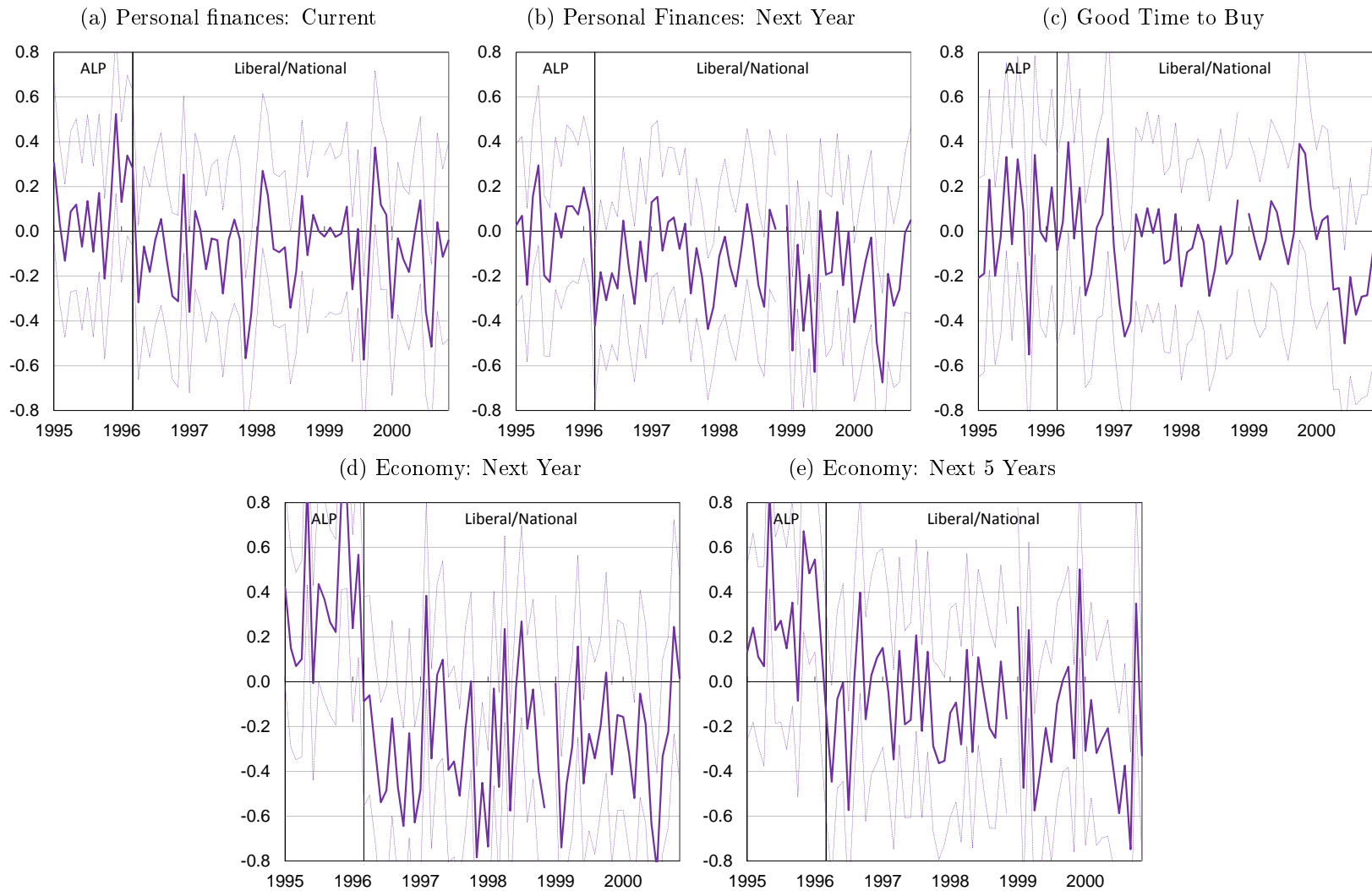
Figure 12: Components of Consumer Sentiment: Econometric Approach, ALP minus Liberal/National Voters



Notes: Responses to each question are either positive, unchanged/don't know, or negative. (See notes to Figure 3 for details on each question.) For each question and each survey month an ordered probit model is fitted; the set of included variables are: gender, age, occupation, education, home ownership, income, metro/non-metro and voting intention. For each month, the estimated average marginal effect of reporting a positive response is calculated for an ALP voter relative to a Liberal/National party voter; the same is done for negative responses. The lines reported in each figure are the difference (positive minus negative) between these two estimated average marginal effects, providing an econometric analogue to the unconditional means shown in Figure 3. Dashed lines are two standard error bands. Vertical lines show dates when government changed hands. We do not currently have access to the microdata to compute estimates after 2000.

Summary: After controlling for individual level characteristics, each component of the consumer sentiment index is higher for consumers when the political party they support holds government.

Figure 13: Components of Consumer Sentiment: Imputed Partisanship, ALP minus Liberal/National Voters



Notes: These estimates repeat those of Figure 12 using imputed rather than self-reported partisanship as the dependent variable. The measure of partisanship is the ALP vote share at the 1996 federal election in the postcode of residence for each survey respondent. See notes to Figure 12 for further details.

Summary: The effect of partisanship on spending intentions cannot be detected when partisanship is imputed based on the postcode-level ALP vote share of the survey respondent. But an effect of partisanship on views about general economic conditions is evident.