



# Forecasting the 2015 British election through party popularity functions



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## ABSTRACT

To forecast the May 7, 2015 British General Election, we develop party popularity models based on Continuous Monitoring Survey (CMS) data from April 2004 to February 2015. Our models predict party vote shares three months prior to the election, using previous support levels, national economic evaluations, macro-partisanship and political measures. Our Seemingly Unrelated Regression (SUR) methodology allows us to predict support for the Tories, Labour, Liberal Democrats and “other” parties, separately, yet simultaneously, by constraining total support for all parties to 100%. Our model, estimated with data from February 2015, predicts that Labour will win the highest vote share in Great Britain, but that no party will win a majority of seats in parliament.

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## 1. Introduction

Who will win the election? This straightforward question has generated an array of methodological approaches to election forecasting, the diversity of which continues to expand due to advancements in public opinion polling (Lewis-Beck and Stegmaier, 2014). In this article, we take advantage of the monthly Continuous Monitoring Survey (CMS) data from April 2004 to February 2015 to estimate theoretically-grounded party popularity functions that we use to predict party vote shares in the May 2015 British General Election. The CMS allows us to avoid two challenges other models face. First, in the context of British elections, most structural models rely on data from past election years. With just 18 national elections in the post WWII era, these models are estimated on a very small number of observations, while our monthly models use data from 118 months. Further, predictions based on past election results rely on historical voting patterns that might not capture the recent changes in the British party system that affect how support shifts between parties. Because our models cover the past 10 years, our prediction is unaffected by the party dynamics in previous decades.

Our methodology differs from other structural models which

have typically predicted vote or seat shares for the governing party or for Conservatives versus Labour. We expand the range of party forecasts using Seemingly Unrelated Regression (SUR) which allows us to model support for the Conservatives, Labour, Liberal Democrats and all “other parties” as four separate, yet simultaneous, predictive equations, recognizing that support levels are inter-related and that total party support must equal 100%. Separate equations permit different factors, or different magnitudes of the factors, to influence support for each party.

## 2. Background on popularity functions

The term ‘popularity function’ refers to the analysis of government support or presidential approval using national aggregate time series data, measured monthly, quarterly or annually. This literature dates back to the seminal piece by Goodhart and Bhansali (1970), which identified the link between macroeconomic conditions and governing party support in Britain. The popularity function literature flourished, and while many debates continue, there is general agreement on the fundamentals that shape party preferences (Nannestad and Paldam, 1994; Lewis-Beck and Stegmaier, 2013). Specifically, these studies identify the strong role of the national economy, and suggest that models must account for political factors.

The idea of using popularity functions to forecast election outcomes is not new. In advanced democracies, predictive popularity functions complement the array of forecasting approaches

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(Stegmaier and Norpoth 2013). In young democracies with a short history of democratic elections, such as Hungary, structural forecasting models cannot be estimated using past election results. However, forecasting with a party support model with more frequently collected data, offers a viable alternative (Stegmaier and Lewis-Beck, 2009).

Popularity functions have been used previously to predict UK elections (Sanders, 1991, 2005); however, they faced data challenges that are overcome with the CMS. Previous work had to deal with differently-worded survey questions and incomplete time series from different polling agencies. Sanders (2005) used techniques to adjust for house effects and for inconsistent question wording as he combined data from different polls. He also interpolated data to fill in gaps in the time series to create a predictive popularity function model. These adjustments and data interpolation could affect the accuracy of the forecast, positively or negatively, in a way that a full series from the same agency with consistent questions would avoid.

### 3. Data and methods

To estimate our models we use monthly CMS data from April 2004 to February 2015. This dataset overcomes earlier data collection challenges in that it provides a continuous series with consistent question wording. Additionally, the survey asks well-established questions that inform election theory, which is important for our theoretically-driven model.

We aggregate the responses in each survey, weighted by the weight variable, to create monthly summary measures on vote intention, partisanship, and retrospective national economic evaluations. We supplement these data with variables capturing salient political events, the party of the Prime Minister, coalition partner, and the cost of ruling.

Our dependent variable – which we use to predict vote shares – is based on the vote intention question “If there were a general election tomorrow, which party would you vote for?” Vote share is calculated as the percent of respondents supporting each party out of all respondents who indicated a vote choice. We use two additional questions from the survey as independent variables. Partisanship provides us with the long-term anchor in explaining party support (Campbell et al., 1960). The survey question asks “Generally speaking, do you think of yourself as Conservative, Labour, Liberal Democrat or what?” Partisanship is computed as the percent reporting each party out of all responses, including “no party”. The retrospective national economic evaluation question is included in our model since this measure has proven to be the strongest economic variable in numerous studies, more so than future expectations or personal finances (Lewis-Beck and Stegmaier, 2013). The survey question asks how the respondent thinks the national economic situation has changed over the last 12 months, with response options ranging from “got a lot better” to “got a lot worse” on a 5-point scale. Our measure is the percent of respondents who said “got a lot or got a little better” minus the percentage of respondent who said “got a lot worse or got a little worse”. A positive value indicates that more people think the economy has improved.

We expect economic evaluations to impact parties differently depending on whether they hold the prime ministership, sit in opposition, or serve as a junior coalition member. The Prime Minister's party should be rewarded when the public perceives economic improvement and punished for economic decline. The junior coalition party may have the same experience as the PM's party, or it might be insulated from the effects of economic changes if voters see the PM as responsible for economic management. To allow for this, we interact economic evaluations with dummy variables

accounting for a party's position in government.

Additional political variables are also in our models. We control for previous party vote shares, which is the lagged dependent variable. We also account for events that affected party support. While we tested a variety of events,<sup>1</sup> only the selection of Gordon Brown as PM impacted support in July/August 2007 and the MP Expense Scandal in May 2009. Finally, we measure a party's time in office. The theoretical argument stems from the observation that the longer a party is in power, the lower its support, and eventually the public is ready for a change (Lebo and Norpoth, 2007; Sanders, 2005). To capture this, the cost of ruling variable simply counts the number of consecutive months the party has governed.

To estimate our party support models, we use Seemingly Unrelated Regression. This allows us to separately, yet simultaneously, model support for the Tories, Labour, Liberal Democrats and “other parties”. This approach differs from most other structural models which predict support for the PM's party or Labour versus Conservatives, and enables us to account for the rise of smaller parties. With separate equations, the variables are not constrained to having the same impact on all parties. Rather, we will demonstrate that the variables have different effects (and levels of significance) across parties.

With monthly data, we can estimate predictive equations for any lead time. We observe, as one would expect, that the shorter the lead, the greater the accuracy. Because it is more interesting and meaningful for the public and politicians to have forecasts with a longer lead time (Lewis-Beck, 2005), our models are estimated three months prior to the election. This means that our British party vote share predictions for May 2015 are based on February 2015 CMS results.

### 4. British party vote share models

Table 1 presents the vote share models for the parties. Our time series includes 118 months, covering all months from April 2004 to February 2015, excluding May 2005 and May, June, July, and August 2010. May is excluded in both years since the CMS was not conducted in the election months. We exclude the three months following the 2010 elections to account for the change in government.

In all 4 models, we see that the lagged vote share is positively related to the predicted vote share, meaning that the higher the party's vote share 3 months ago, the higher it will be at the predicted time. As we expected, the prime minister's party is rewarded for perceived economic improvements and is punished when the public feels the economy is deteriorating. This is reflected the positive coefficients on the interaction “PM x Econ Evals”, which continues to be positive when we account for the coefficients on the economic evaluations variable. When the Tories or Labour sit in opposition, positive economic evaluations hurt their party support, as seen in the negative coefficients on economic evaluations. The Liberal Democrat equation shows that they reap no benefits from positive economic evaluations when in coalition. The combination of the interaction and economic coefficients (–0.04 and 0.05) is 0.01. Positive, but tiny. In fact, without rounding, the difference is 0.003. In essence, economic evaluations have had no impact on Lib Dem support during the time they have been in the coalition.

The MP expense scandal and the selection of Gordon Brown as PM have the expected directional impact on party support. The cost of ruling does, too. The longer Labour governed, the lower their

<sup>1</sup> Political event variables that were insignificant and therefore not included in our models: London underground bombings, Northern Rock bank run, Cameron's EU veto, and the “omnishambles” budget.

**Table 1**  
British vote share prediction models.

	Conservative		Labour		Lib Dems		Other parties	
<i>Vote share</i> <sub>t-3</sub>	0.19***	(0.06)	0.21***	(0.05)	0.22***	(0.06)	0.18***	(0.06)
<i>Party ID</i> <sub>t-3</sub>	-0.02	(0.06)	-0.02	(0.07)	0.02	(0.08)	-0.00	(0.06)
<i>PM</i> <sub>t-3</sub>	10.88***	(2.84)	2.97	(2.65)				
<i>Econ evals</i> <sub>t-3</sub>	-0.11***	(0.02)	-0.05**	(0.02)	0.05***	(0.02)	-0.01*	(0.01)
<i>PM</i> <sub>t-3</sub> × <i>econ evals</i> <sub>t-3</sub>	0.16***	(0.03)	0.12***	(0.03)				
<i>Coalition partner</i> <sub>t-3</sub>					-6.83***	(2.32)		
<i>Coalition partner</i> <sub>t-3</sub> × <i>econ evals</i> <sub>t-3</sub>					-0.04**	(0.02)		
<i>Expense scandal</i>	-7.38***	(2.70)	-3.16	(2.89)	2.11	(2.12)	8.31***	2.22
<i>Gordon Brown PM</i>	-3.46	(1.90)	7.13***	(2.04)	-4.61***	1.49	0.45	(1.56)
<i>Tory cost of ruling</i>	-0.14***	(0.03)	-0.05	(0.02)	-0.04	(0.03)	0.25***	(0.03)
<i>Labour cost of ruling</i>	0.03	(0.02)	-0.05**	(0.03)	0.01	(0.02)	0.01	0.01
Constant	22.12***	(2.73)	32.54***	(2.77)	15.01***	(2.36)	7.55***	(0.91)
N	118		118		118		118	
R <sup>2</sup>	0.72		0.77		0.84		0.81	
RMSE	2.67		2.84		2.07		2.17	

Note: \*p < .10, \*\*p < .05, \*\*\*p < .01 (two-tailed). Standard errors in parentheses.

Source: CMS monthly data April 2004–February 2015.

support. Likewise, the longer the Tories have been in power, the lower their support. Interestingly, the models show that as the Tories have lost support, the main recipients have been “other parties” where we see a positive and significant coefficient.

That the “other parties” have been the beneficiaries of losses in Tory support indicates a shift in underlying dynamics of British politics. During the time Labour was in power, as they lost support, support shifted primarily to the Tories. Since 2010, we do not see support shifting to the main opposition party, Labour. Instead, support has gone exclusively to the “other parties”. The coefficient, at 0.25, indicates that holding everything else in the model constant, for each additional month that David Cameron has been PM, the “other parties” gained a quarter of a point in support.

Before using these models to forecast party vote shares for 2015, we can assess how well our models predicted the actual British vote shares in the 2005 and 2010 elections. Since the CMS surveys are conducted in Great Britain (excluding Northern Ireland), we compare our forecasts to the actual vote shares in Great Britain (House of Commons, 2012; pg 8).<sup>2</sup> As we see in Table 2, our out-of-sample forecasts compare favorably to the actual votes shares. In both elections our forecasts for Labour and the Conservatives are well within a percentage point of the actual vote share, with a dead-on prediction for Labour in 2005. The Liberal Democrat vote predictions, however, were less accurate. This stands in contrast to the fit statistics for their party support equation which has a higher R<sup>2</sup> and lower RMSE compared to the Tory and Labour models.

## 5. 2015 British election prediction

We use the weighted February 2015 CMS values on our independent variables to forecast vote shares for the parties in the May 7, 2015 British General Election. The February vote intention data breaks down this way: Conservatives 32.4%, Labour 34.8%, Liberal Democrat 8.3%, other parties 24.5%. On the national retrospective economic evaluations, we see that a much higher share of voters think the economy has improved than those who think it has gotten worse. The percent difference between these two groups (and the value for the lagged economic evaluations variable) is 20.1%. Partisanship is Conservatives 28.2%, Labour 31.1%, Lib Dems 9.6%

<sup>2</sup> Typically party vote share statistics are reported for the UK as a whole. The vote shares in Great Britain are not widely reported, but since our data are based just on respondents in England, Scotland, and Wales, we need to compare our forecasts to the vote shares in Great Britain.

**Table 2**  
British vote share predictions 3 months before the 2005 & 2010 elections.

	Model vote share forecast	Actual vote share
<b>May 2005</b>		
Conservative	32.61	33.2
Labour	36.04	36.1
Lib Dems	20.39	22.6
<b>May 2010</b>		
Conservative	37.64	36.9
Labour	30.55	29.7
Lib Dems	19.44	23.6

Source: Actual vote shares for Great Britain come from a House of Commons (2012) report. <http://www.parliament.uk/briefing-papers/RP12-43.pdf>.

and other parties at 14.5%. 16.6% say they do not identify with any party. Finally the number of months the Conservatives will have been in power by May is 60, which is the value used for the Tory Cost of Ruling variable.

Our prediction for the vote share each party will win in the May 2015 British election is Labour 34.75%, Conservatives 31.13%, the Lib Dems 7.89%, and the other parties 26.26%.

While our forecasting method is specifically designed to predict British vote shares, and this is what we hang our hat on, we also want to know the composition of parliament. Various methods have been used to convert votes to seats, but the UK single member district system combined with the regional concentration of party support mean that focusing on the constituency level should prove most accurate. Because the CMS sample sizes are too small to consider what will happen in each of the 632 British constituencies, we base our seat predictions on the *New Statesman* May 2015 Seat Calculator: <http://may2015.com/category/seat-calculator/>, using the Electoral Calculus strong transition model including Ashcroft polls and by-elections. This converts our vote share forecasts for the 3 parties into 299 Labour seats, 245 Tory seats, and 26 Lib Dem seats. The remaining 62 British seats will go to other parties. Thus, we expect Labour to win the plurality, but not majority of the seats, resulting in a hung parliament.

## 6. Conclusion

Our prediction is based on data 3 months prior to the election. Our forecasts for the 2005 and 2010 elections suggest that even with this long lead time, our model can accurately predict British vote shares for Labour and the Conservatives. Only time will tell whether or not this holds for the 2015 election. Since our model

**Table 3**

Comparison of the 3-month forecast to the polls and actual election result, Britain 2015.

	3-month forecast	Range in election-eve polls	Average of election-eve polls	Actual election result
Conservative	31.13	[31, 36]	33.6	37.8
Labour	34.75	[31, 35]	33.6	31.2
Lib Dems	7.89	[8, 10]	9	8.1

Source: The British Polls and British election result data come from the [British Polling Council's](http://www.britishpollingcouncil.org/general-election-7-may-2015/) report on the General Election: 7 May 2015. <http://www.britishpollingcouncil.org/general-election-7-may-2015/>.

provides a prediction before the official launch of the campaign, the dynamics of the campaign could significantly alter party support in ways our model cannot anticipate.

As we have demonstrated, popularity functions offer an alternative to models that forecast based on a small number of elections. With a larger sample size, we can account for more factors that shape party support and we can concentrate our statistical relationships based on the most recent trends in a changing British political landscape. Finding ways to account for the regional concentration of parties is an avenue for future research. Currently the CMS monthly sample sizes are too small to estimate popularity functions separately for England, Scotland, and Wales. But given the distinct party competition in these countries, this could be a fruitful approach to predicting vote shares that are more readily convertible into seat shares and could help us better understand the nature of party competition in these areas.

## 7. Post-mortem on the British election

Our survey-based monthly time-series model does a fair job predicting election-eve polling results a full 3 months before Election Day, but we miss the mark on predicting vote shares in the actual election.

The dependent variable in our model is the *aggregate vote intention* for the parties. To predict this, we use the 3-month lag on vote intention and economic conditions while controlling for other factors. At any point in our time series, we can forecast what the vote intention polls will be 3 months in the future. Using this model to predict the actual *vote share* on Election Day assumes that the polls are accurate reflections of what would happen if an election were held at that time. In other words, we predict the vote intention polls, which ought to mirror the election results. In this election, they did not.

Table 3 presents a comparison of our forecast to the election-eve polls and the actual election result in Britain ([British Polling Council](http://www.britishpollingcouncil.org/)). The polls showed the Conservatives and Labour running neck-and-neck, with an average vote share of 33.6% for both parties. Across these polls, the Tory vote share ranged from 31% to 36%, while the Labour range was 31%–35%. Our forecast, estimated 3 months prior to the election, predicted the Tories would get 31.16% and Labour would win 34.75%. Thus, our forecast, while near the extremes for both parties, fell within these ranges.

That the Tory leaders seemed shocked by their resounding victory has implications not only for election forecasting, but also for campaigning and policymaking. Would PM David Cameron have run a different campaign or made different promises had he known he might win an outright majority? With competition from an increased number of parties, and polls showing the Tories had no hope of attaining a majority of seats, the Conservative Party

strategists were likely working to identify groups of voters they might pick up as they tried to improve their election chances. In an effort to appeal to potential UKIP voters, Cameron promised actions that he might not have (such as the referendum on exiting the EU), if the polls had indicated he had such a lead. Now, he is expected to make good on those promises. So, while public and media focus on the horse race, the accuracy of public opinion polls matters for much more than that.

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