HUNTING THE SNARK - HOW WE SHOULD STUDY ELECTORAL CHOICE IN THE TWENTY-FIRST CENTURY

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Abstract

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How should we study electoral choice in the twenty-first century? Contemporary British electoral politics and public opinion more generally are characterized by substantial volatility. This arises from several sources including the weakening of partisanship among voters, the growing importance of leaders, the 24-hour news cycle, and the prominence of valence issues in a cold economic climate and a world of austerity politics. These developments create a number of theoretical and methodological problems for the study of elections and public opinion. They include problems of identifying and estimating parameters in theoretical models of complex processes with reciprocal causal linkage, the need for high frequency data collection to capture dynamic processes in a rapidly changing political context, the need for multi-wave panels to map individual-level stability and change, and the requirement for new forms of measurement and data collection in part linked to the rise of social media, but also to the necessity of identifying micro-level interactions between citizens on a very small scale during campaigns. This paper reviews theoretical and methodological approaches to electoral analysis since Butler and Stokes pioneering work in the 1960s and argues that we need a fundamentally different approach to studying the dynamics of the inter-related factors affecting party choice to advance understanding of voting behaviour and election outcomes in the twenty-first century.

Hunting the Snark - Studying Electoral Choice in the Twenty-First Century

'Just the place for a snark! I have said it thrice; What I tell you three times is true.'
Lewis Carroll, *The Hunting of the Snark*

Introduction

How should we study electoral choice in the twenty-first century? The answer to this question is that our methods need to reflect both theoretical developments and methodological innovations in the study of voting over time. Butler and Stokes (1969) made a seminal contribution to the study of British Elections in the 1960s but their models and, more to the point, their methods are now inadequate to study contemporary electoral behaviour. Consequently the central argument of this paper is that we need to move beyond both their theories and their methods if we are to understand electoral choice in twenty-first century Britain.

We have developed the valence politics model of electoral choice in various publications over the past decade (e.g., Clarke et al., 2004, 2009; Clarke, Kornberg and Scotto, 2009; Whiteley et al., 2013). Attempts to test the model raise important general issues for the social sciences about relationships between theory, model specification and empirical analyses and, in particular, the utility of major survey datasets gathered in traditional national election studies. The aim of this paper is to examine these issues and consider their implications for the future of election studies.

If readers are puzzled by the quote from Lewis Carroll, we use it as a metaphor for one of our key arguments, namely that 'hunting for the snark', i.e., seeking a mysterious and elusive variable which anchors electoral choice by providing a *strongly exogenous* determinant of electoral decision-making is a fruitless and unnecessary exercise—one which has preoccupied students of voting and elections for far too long. The early theorizing on electoral behaviour associated with Butler and Stokes (1969) suggested that there is such a

variable – partisanship. Spatial models of party competition contain an equally strong assumption of exogeneity, except in this case the relevant variables are thought to be voter preferences over issues (Downs, 1957; Black, 1958). This famous 'de gustibus' maxim was inherited from neo-classical economic theory which anchors choice models by simply assuming that consumer preferences are exogenous (see Hotelling, 1929; Blaug, 1997). However, in the valence politics model there is no such assumption since voting is seen as the product of dynamic, oftentimes fast-moving decision-making processes. Endowed with cognitive ability, but not omniscience, voters are 'smart enough to recognise that they are not smart enough' to make choices according to the canons of classical procedural rationality. Attempting to make sensible decisions in complex situations where stakes are high, uncertainty abounds, and personal influence on outcomes is vanishingly small, these 'street-smart' voters rely heavily on simple, but powerful, heuristics or information processing short-cuts to guide their choices.

According to valence politics theory, electoral choice is the result of multiple inter-relationships among key variables which 'bounce off' each other in an ongoing inter-temporal tennis match. So there is no strongly exogenous anchor to voter decision-making and the contest is viewed imperfectly through the lens provided by traditional election study data sets. The key concern of this paper is to address the question: How should we study electoral behaviour in a valence politics world? To address this we begin by reviewing the valence model of electoral choice.

The Valence Politics Model of Electoral Choice

Donald Stokes introduced the term *valence* in a path-breaking article published fifty years ago (Stokes, 1963, 1992), which was designed as a critique of the then emerging literature on spatial models of party competition. Stokes argued that voters rely heavily on their evaluations of rival parties' perceived capacities to deliver good policy performance in issue

areas where there is broad consensus about what government should do. In the language of spatial models, valence issues are those with very widely shared 'ideal points'. A canonical example is the economy. Virtually everyone wants vigorous, sustainable economic growth coupled with low rates of unemployment and inflation. Similarly, almost everyone wants affordable, accessible and effective public services in areas such as education, health, transportation, and environmental protection. Vast majorities also demand protection from threats to national and personal security posed by rogue regimes, terrorists and common criminals. Persistent public concern with these valence issues means that they typically dominate the political agenda in Britain and other mature democracies. Valence issues are important in emerging democracies as well (Ho et al., 2013). Although the ordering of specific valence issues on the political agenda varies over time, their persistent salience works to focus debate on 'who can do the job' rather than on 'what the job should be'. As a consequence, evaluations of which party and which leader are best able to deliver on consensually agreed-upon policy goals are key drivers of voting in most elections and strongly influence party support in inter-election periods as well.

The major alternative theoretical account of electoral choice—the one which Stokes criticised—is the spatial model of party competition. Since its inception, the spatial model has been developed as a formal theory and it also has been subjected to extensive empirical analysis (see, e.g., Adams, Merrill and Grofman, 2005; Merrill and Grofman, 1999). The spatial model's key assumption is that *position or spatial issues* are the dominant factors governing voting decisions. Ideal points are not widely shared; indeed, there is considerable *disagreement* among voters and political leaders over policy goals. For example, the Conservatives differ from Labour on the desirability of cutting taxes as a goal of government policy. Similarly, although both Labour and the Conservatives supported the invasion of

Iraq, the Liberal Democrats strongly opposed it, reflecting widespread public disagreement about British involvement in that conflict.

The point was made earlier that spatial theory inherited the assumption that voters have exogenously determined issue preferences from neo-classical economic theory. In fact experimental evidence shows that this assumption is a poor representation of reality (Sanders et al. 2008), but it nonetheless anchors the theory as individuals attempt to 'maximise utility' by supporting a party closest to them in a policy space defined by a general issue-based 'left-right' ideological orientation. For their part, parties are strategic actors who try to maximise electoral support in light of knowledge of voter distributions in the commonly shared issue/ideological space. Although spatial models have been imaginatively elaborated in various ways, they retain the core assumption that salient *position* issues drive the choices of utility-maximising voters.

With the notable exception of the literature on 'economic voting' (e.g., Lewis-Beck, 1988; Duch and Stevenson, 2008), considerably less attention has been accorded to valence issues compared with spatial ones—despite abundant evidence of the central role that they play in general elections in Britain and elsewhere. Repeated empirical analyses in diverse political milieus demonstrate that valence issues dominate explanations of electoral choice, with spatial issues playing statistically significant, but secondary roles (e.g., Clarke et al., 2004, 2009; Clarke, Kornberg and Scotto, 2009; Clarke and Whitten, 2013; Ho, 2013; Whiteley et al., 2013). As indicated above, there are good theoretical reasons why this is the case. The costs of information processing are much lower for valence compared with spatial issues, and the former are less subject to manipulation than are the latter. Valence-minded voters can rely heavily on readily available heuristics and easily acquired information about existing states of affairs rather than unfulfilled promises and untested policy programs offered by self-serving politicians (see Clarke et al. 2009: 30-52).

As developed in our studies, the valence model has three key variables that drive voting behaviour and party support between elections: these are evaluations of party performance on valence issues, partisanship and leader images. Valence issues are at the core of the model. A major valence issue, the economy, often dominates electoral politics, although the quality of public services in areas such as health, education and crime prevention can be important too. A strong performance in delivering a prosperous economy, high quality public services and public safety produces electoral rewards for incumbent parties, whereas a weak performance generates substantial electoral risks.

Leader images and partisan attachments act primarily as *heuristic devices* in this analysis. In contexts where voters have few incentives to invest time and effort in learning the intricacies of policy proposals and recognise their limitations in gathering and processing relevant information, they will use cognitive and affective shortcuts to make decisions. Psychologists and experimental economists have stressed the centrality of heuristics (e.g., Gilovich, Griffin and Kahneman, 2002; Gigerenzer, 2008; Gigerenzer, Hertwig and Pashur, 2011; Kahneman, Slovic and Tversky, 1982; Kahneman, 2011) and political scientists have recognized their importance for making choices in elections and referendums (Popkin, 1991; Sniderman, Brody and Tetlock, 1991; Lupia and McCubbins, 1998; Lupia, McCubbins and Popkin, 2000). Although heuristics traditionally have been seen as inferior to classical expected utility theory which underpins the spatial model, research by Gigerenzer and associates (2008; 2011) demonstrates that 'fast and frugal' heuristics actually are superior to expected utility theory in many 'real-world' decision-making situations. This is because the classical model is excessively costly, too slow, and in many cases involves intractable calculations which prevent effective choice. Thus, it does not surprise that straightforward and readily available heuristics involving answers to questions like: 'What party do I identify with?', 'Has the economy been getting better or worse?' and 'Do I like this particular leader?'

play key roles in explaining why people vote the way they do. If voting involved the kinds of knowledge and calculation required by all but the simplest spatial models then very few people would, or could, do it (see, e.g., Conlisk, 1996).

There is of course an older theoretical tradition, in addition to the valence and spatial models, based on political sociology and the idea that electoral choice is really about long-standing personal allegiances based on early childhood socialisation and the characteristics of communities in which people spend their childhood and adolescence. From this perspective issues and leadership evaluations are purely short-term influences on electoral choice. This approach implies that enduring socialization processes in an individual's early life really drive things, and for this reason they can be regarded as strongly exogenous variables in voting models. The pioneering work on electoral analysis in Britain adopted this perspective from the early work on voting behaviour in the United States. We consider it next.

The Sociological Perspective on Electoral Choice

In the 'Michigan model' of voting behaviour developed by the authors of *The Voter Decides* and *The American Voter* over sixty years ago (Campbell, Gurin and Miller, 1954; Campbell et al. 1960) partisanship—what they called 'party identification'—is the key anchoring variable. These researchers argued that party identification is a directionally stable long-term force which influences other important predictors in voting models. In the classic 'Michigan' analysis, partisan attachments are typically the product of socialisation processes in the family and community, processes arising from experiences in childhood and early adulthood. Once formed partisanship is thought to be directionally stable, i.e., individuals stay with the same party over time except in rare periods of 'realignment' caused by major economic and socio-political upheavals. For this reason, partisanship could be reliably characterized as a directionally 'unmoved mover'—an autonomous anchor in the sea of forces affecting electoral choice.[1]

When the Michigan model was first introduced to British psephologists by Butler and Stokes (1969) the central claim was that partisanship in the UK was strongly rooted in social class. Since a person's class location changes very slowly if at all, the implication is that partisanship exerts a durable and powerful exogenous force on electoral choice. The core argument was summarized with rhetorical flourish by Peter Pulzer (1967) in his often-quoted phrase: 'in British party politics, class is everything, all else is embellishment and detail'. The class environment in which people were socialised created and subsequently reinforced their partisan attachments which, in turn, did much to explain how they vote. Although there were always some exceptions, the majority of working-class people identified with and voted Labour, whereas most middle- and upper-class people identified with and voted Conservative. Minor parties such as the Liberals were not accommodated in this theoretical scheme because, *circa* the mid-20th century, they had a small and apparently declining vote share. The Liberals and other minor parties were seen as inconsequential curiosities—eccentric relics of Britain's fading political past.

There are two major problems with this theoretical analysis. Firstly, sociological models of voting behaviour explain very little variance in estimating equations. For example, in the 2010 general election a predictive model of party choice which contained only social class and other socio-demographic variables explained only six per cent of the variance. In a fully specified version of the valence model social class was not even a significant predictor (Whiteley et al. 2013: 137-140). In models of contemporary electoral politics, social class plays a very minor role in explaining voting behaviour.

A second and more serious problem for the traditional model is that the interpretation of partisanship is seriously inconsistent with data from successive British Election Study panel surveys, including data collected by Butler and Stokes themselves in the 1960s. These data reveal substantial directional instability with substantial numbers of voters changing

their partisanship over time. The magnitude of this instability is too great to be explained by migration patterns or the natural turnover of the electorate in periods between adjacent general elections.[2]

Figure 1 illustrates the point. The figure depicts levels of *directional* partisan instability in several British Election Study (BES) multiwave panel surveys conducted since 1963 when the study began. The dynamics are consistently impressive—between 29 per cent and 43 per cent of the respondents report changing their partisan attachments across multiple waves of interviewing. Some people move between parties one or more times whereas others traverse between partisanship and non-partisanship.[3] Overall, partisan attachments appear slightly more stable in the 1960s than in the 2000s, but even in the Butler-Stokes era some 40 percent of the respondents in the BES panels failed to exhibit stable partisan attachments. The Michigan model, with its emphasis on directionally stable partisanship, is clearly inconsistent with this evidence.

(Figure 1 about here)

Reacting to reports of large-scale partisan instability in panel surveys, critics anxious to salvage the conventional Michigan wisdom argued that these analyses were misleading because they failed to take account of random measurement error in survey responses (e.g., Green, Palmquist and Schickler, 2002). However, as shown in our previous research (Clarke et al., 2004, 2009; Clarke and McCutcheon, 2009) Mixed Markov Latent Class (MMLC) models, which take into account such measurement error, consistently reveal that generalised 'mover-stayer' models outperform 'all stayer' models in BES multi-wave election study panel surveys conducted since the 1960s (van de Pol and Langeheine, 1990; Hagenaars and McCutcheon, 2002).[4] As Figure 2 illustrates, 'mover' groups, who change their partisan attachments in the MMLC analyses, are always substantial and quite similar in magnitude over time (e.g., 31 per cent between 1963 and 1970 and 30 per cent between 2005 and 2010).

The average over the eight BES panels shown in Figure 2 is 32 per cent. Partisanship in Britain clearly is not the 'unmoved mover' of Michigan lore.

(Figure 2 about here)

There is a well-known rival theoretical account of partisanship introduced by Fiorina (1981; see also Franklin and Jackson, 1983; Achen, 1992; Franklin, 1992; Clarke, Stewart and Whiteley, 1998) which argues that the variable constitutes a 'running tally' of present and past party performance evaluations with prior evaluations being progressively discounted in favour of more recent ones. In this interpretation since valence issues typically dominate the political agenda, partisanship is largely a weighted sum of over-time judgments about how parties have handled, or would handle, these issues. If a party does badly in delivering on valence issues its brand will be tarnished and its partisan base will erode, whereas a good performance will have the opposite effect of reinforcing the brand and building support. This idea is much more consistent with the evidence on partisan instability than the Michigan model. In the valence politics model partisanship and party performance judgments influence each other over time, and they are part of a larger dynamic system of information-processing which voters use to make political choices. Key variables in the system are mutually endogenous and feed off each other over time. If the underlying theory suggests that interactive dynamics of this kind are what matter, then searching for a mysterious master explanatory variable which is strongly exogenous to all others is a futile exercise.

Despite this, the idea that partisanship is the fundamental anchoring variable has been resurgent in recent years. The claim is that partisanship influences issue perceptions, evaluations of leaders and a variety of other variables in models of electoral choice (Evans and Andersen, 2004, 2006; Evans and Pickup, 2010; Marsh and Tilley, 2010). These claims are entirely convincing, but none of them demonstrate that partisanship is directionally stable

and strongly exogenous to the other explanatory variables. In short, none of them indicate that the fabled snark has finally been discovered.

The Problem of Endogeneity

If partisanship is dynamic and interacts with other variables in the valence model what are the implications of this for estimating models of vote choice? In introductory research methods classes, political science graduate students are taught that statistical biases occur in the estimation of models where the left-hand- and right-hand-side variables influence other contemporaneously.[5] The use of lagged predictors and panel data may help to deal with this problem, but not if the actual lags resulting from the theoretical process are very different from the lags used to estimate models. Suppose for example, that there is an interactive relationship between voting and partisanship, with both variables having very rapid impacts on each other over time. This will produce biases in a contemporaneous regression where voting is a function of partisanship, or partisanship is a function of voting.

An obvious solution to this problem is to model the contemporary variables as functions of lagged values of the predictors utilising panel data. But the correct estimates will not be recovered using a panel analysis if the waves are far apart, say a year or more which has been typical for BES and other national election panel surveys.[6] Rather, the coefficients estimated using such panel data will reflect (possibly many) successive interactions between the two variables over the period between the panel waves with no guarantee that they will capture the true effects. To develop this point, it is important to note that the number of waves and the intervals between them in BES and other national inter-election panel surveys have been imposed by the practicalities of data collection and research funding constraints. Lags between adjacent waves of these panel surveys do not necessarily accord with—indeed, may have nothing to do with—the dynamics of voter decision-making.

Given that waves of panel surveys in past BES surveys are fully *one to two years apart*, lagging the models by one period involves assuming that there is no influence of voting on partisanship or vice versa within these periods. Intuition and analyses of monthly time series data gathered during the New Labour and Thatcher eras suggest that this assumption is quite implausible (see, e.g., Clarke, Stewart and Whiteley, 1998; Clarke, Ho and Stewart, 2000). If in these models time t effects exist, then the model is misspecified and parameter estimates of t-1 effects are biased and the results of Granger causality tests are suspect. There is in fact no reason for calling the lag t-1 other than to label the adjacent time point in a panel survey data set available for secondary analysis.

The problem will be compounded if there is heterogeneity in these decision-making processes. Some voters may switch their partisan attachments quite frequently depending on the performance of political leaders and the issues of the day, while others remain stable, not necessarily because they are strong partisans, but because they do not pay much attention to politics. For these reasons, aggregate analyses of closely spaced time series observations in which individual idiosyncrasies are averaged out is likely to provide a more accurate picture of dynamics than do individual-level analyses. It may of course be argued that including time t relationships running both ways between partisanship and voting intentions in the estimating equations will solve this problem. But inserting such linkages will violate the rank and order conditions for model identification thereby producing biased estimates (Greene, 2003: 385-395). In this case instrumental variables will be required for valid inference and suitable instruments are typically hard to find.

There is confusion about the meaning of exogeneity in the political science literature. Reliable estimates can be obtained from contemporaneous regressions as long as predictors are *weakly exogenous*. If variable y is thought to be explained by variable x, then x is said to be weakly exogenous to y if *current* values of y do not explain current values of x. Note that

unbiased estimation does not require that *past values* of y do not explain x. For weak exogeneity all that is required is that there is no immediate (time t) feedback from y to x. In a dynamic setting of the type that characterises voter decision-making, this means that if variable x has a rapid impact on y, while y has a rather slow impact on x, then x can assumed to be weakly exogenous and inferences are valid. Moreover, weak exogeneity is not simply a matter of assumption since it can be tested empirically, for example by a Hausman test (Hausman, 1978), *if* one is confident in the specification of the models that are hypothesised to drive the weakly exogenous variables (Charemza and Deadman, 1997).[7] However, if these models are contested or problematic, attempts to demonstrate weak exogeneity with statistical tests will prove unconvincing. In contrast, strong exogeneity is defined as weak exogeneity plus Granger noncausality. The latter is defined as follows: 'X is said to Granger-cause Y if Y can be better predicted using the histories of both X and Y than it can by using the history of Y alone' (Giles, 2011). In short, if there is no contemporaneous or lagged feedback from y to x, then x is strongly exogenous to y.

Problems of exogeneity are not confined to political science. Economists wrestled with the problem of estimating large-scale macroeconomic models with multiple simultaneous effects a generation ago (Fair, 1984). These 'Cowles Commission' models were complex, involving large numbers of simultaneous equations with a great many parameters (Greene, 2003: 587). However, they proved inadequate to the task of capturing economic dynamics and accurately forecasting quantities of interest, in part, because analysts had to make arbitrary and unrealistic assumptions about causal orderings and parameter values in order to identify the system, so that effects could be empirically estimated.

At the start of the 1980s, the econometrician Christopher Sims (1980) voiced an influential critique of this traditional simultaneous-equation approach to modelling the macro-economy. After delineating the shortcomings of the Cowles Commission approach,

Sims introduced his Vector Autoregressive (VAR) strategy as a way forward. The VAR approach starts with a set of theoretically interesting variables, but avoids making unrealistic assumptions about causal relationships among them (Enders, 2010; see also Juselius, 2006). Rather, the focus is on capturing dynamic relationships among these variables in a series of autoregressive 'reduced form' equations. Although promising, a limitation in early work on VAR modelling with mean non-stationary variables was that the models were only able to estimate short-term dynamics and did not incorporate theoretically interesting long-run relationships[8]. However subsequent work on cointegrated relationships has remedied this problem, at least in particular situations (Engle and Granger, 1987; Johansen, 1991, 1996; Juselius, 2006). Cointegrated variables are in dynamic long-run equilibrium with each other, and it is possible to estimate these relationships at the same time as the short-term dynamics. In the next section we investigate relationships among key variables in the valence model using a Vector Error Correction Model (VECM) which enables us to study the interrelationships of interest without making the kinds of possibly unwarranted assumptions that bedevilled 'Cowles Commission' economists.

A VECM Model of Governing Party Support in the New Labour Era

As discussed above, the VAR approach is a sensible way to study inter-relationships among key variables in the valence politics model given their many possible dynamic interactions. However, traditional BES panel data are inadequate for the purposes of VAR modelling. VAR requires abundant time series observations and, for reasons articulated above, it is desirable to have these data spaced as closely together in time as possible. Here, we employ a time series data set using monthly data gathered over virtually the entire New Labour Era from July 1997 to April 2010 (154 months)[9]. We analyse governing (Labour) party support as measured by vote intentions over this lengthy period focusing on the effects of key explanatory variables in the valence politics model. These variables include standard

measures of partisanship, approval of the job the prime minister is doing and judgments of Labour's performance on the economy. This large New Labour time series data set provides a useful basis for assessing the valence politics model. If the valence politics model cannot account for the dynamics of governing party support over this extended period which witnessed prolonged economic good times followed by a deep, protracted recession, then observers rightly should voice scepticism about the model's utility.

The dynamics of Labour vote intentions, Labour partisanship, prime ministerial approval and Labour performance judgments on the economy are displayed in Figure 3. As shown, all four series decline precipitously over time, with Labour vote intentions falling by 28 points—from 58 per cent in July 1997 to 30 per cent in April 2010. Partisanship, prime ministerial approval and Labour performance evaluations also decrease substantially, by 20 per cent in the case of partisanship, and by 40 per cent and 31 per cent, respectively, in the cases of prime ministerial approval and judgments about Labour performance on the economy. The numbers for Labour partisanship illustrate the point that partisan attachments in Britain have sizable aggregate- as well as individual-level dynamics. Figure 3 shows that the dynamics of the four valence politics variables are closely inter-related—their average contemporaneous inter-correlation is fully +.90 (range +.84 to +.95).

(Figure 3 about here)

The powerful downward dynamics displayed in Figure 3 testify that the four valence politics variables are mean non-stationary, i.e., they all trend downwards over time. This conclusion is confirmed by Dickey-Fuller and KPSS unit-root tests (Dickey and Fuller, 1979; Kwiatkowski et al., 1992). As Table 1 indicates, the four variables are nonstationary in their original level form, but become stationary when first differenced. Of course, evidence that variables are non-stationary does not necessarily mean that they are cointegrated—cointegration must be demonstrated empirically. To test for this possibility, we employ the

trace and maximum eigenvalue tests proposed by Johansen (1991, 1996). Results of these tests displayed in Table 2 reveal that the four valence politics variables are indeed cointegrated and, moreover, there is one cointegrating vector. The existence of a single cointegrating vector for the four variables comports well with valence theory, implying that they all interact with each other in one long-term dynamic relationship. During the New Labour era, Labour vote intentions travelled in dynamic equilbrium with evaluations of the performance of Prime Ministers Tony Blair and Gordon Brown, assessments of Labour's management of the economy, and Labour partisan strength in the electorate.

(Tables 1 and 2 about here)

Within the general VAR modelling framework the existence of a cointegrating relationship between these four variables mandates the specification of a vector error correction model (VECM) to capture their mutual interrelationships (Juselius, 2006). The general VECM model is:

$$\Delta X_t = \mu + \Gamma_1 \Delta X_{t-1} + \ldots \Gamma_k \Delta X_{t-k} + \alpha B' X_{t-1} + Z_{t-p} + \varepsilon_t \quad (1)$$

where: X_t = vector of nonstationary variables with order of integration d;

Δ = differencing operator;

$\Gamma_{1\text{-}k}$ = matrix of parameters for short-run effects of variables, 1 to k lags;

α = adjustment parameters for r cointegrating vectors;

$\beta' X_{t\text{-}1}$ = r x 1 vector of stationary cointegrating relations;

$Z_{t\text{-}p}$ = vector of strongly exogenous variables operating at t-p lags;

μ = constant;

ε_t = stochastic error term $\sim N(0,\sigma^2)$

In the present analysis, the VECM system has four equations, one for each variable of interest, i.e., Labour vote intentions, prime ministerial approval, Labour performance on economy and Labour partisanship. In addition to the error correction mechanism implied by

the cointegrating relationship among the four variables, diagnostic tests indicate that three lags of first-differenced versions of these variables can be included in each of these four equations to capture short term effects. Three additional strongly exogenous dummy variables are added to take into account shocks to the system caused by the petrol crisis (September 2000), the replacement of Tony Blair by Gordon Brown as prime minister (June 2007) and the Northern Rock bank crisis (September 2007). Parameter estimates for the VECM (see Appendix) show that the error correction mechanism in the Labour vote intention equation is very strong. The adjustment parameter for the error correction mechanism is -.92, indicating that slightly over 90 per cent of a shock to the system, from whatever source, is eroded in the month following its occurrence. Valence politics considerations clearly dominate the system's dynamics in the new Labour era.

The existence of a very powerful long-run relationship among the four key valence variables implies that Granger-causal processes are at work (Granger, 1969). As Giles (2011) points out : '[i]f two or more time series are cointegrated then there must be Granger causality between them—either one-way or in both directions'. There are nine possibilities when dealing with the four variables in the system, i.e., Labour vote intentions, Labour partisanship, Prime Ministerial approval and judgments about Labour's performance on the economy. If valence politics theory is correct, these variables should have a variety of influences on each other over time.[10] Table 3 documents that this is the case. Prime ministerial approval, judgments about Labour performance on the economy and Labour partisanship all Granger-cause Labour vote intentions. In addition, Labour partisanship and Labour performance on the economy Granger-cause prime ministerial approval, and Labour performance on the economy and Labour vote intentions Granger-cause Labour partisanship. Only Labour performance on the economy appears to be autonomous vis á vis the other three

variables according to these Granger tests. These tests show clearly that partisanship is not exogenous in this system of equations.

(Table 3 about here)

Another perspective on the flow of influence in the VECM system is provided by converting it to a moving-average representation (MAR) and assessing the impact of shocks to one variable on the other variables. Using the conventional Cholesky decomposition for an impulse response analysis requires the analyst to order the variables according to a hypothesised flow of influence in the system, and so results are potentially sensitive to alternative orderings (see Enders, 2010: ch. 5). In the present case, the flow of influence in the system is a major point at issue. Accordingly, we employ the generalized impulse response analysis methodology developed by Pesaran and Shin (1998). Results of this approach are invariant to variable orderings in the VAR or VECM.

The results for the valence politics VECM are displayed in the four panels in Figure 4. As the figure shows, one standard deviation shocks to any of the four variables in the system have a variety of immediate and lagged effects on the other three variables. Of particular interest, the upper left-hand panel shows that Labour vote intentions respond quite strongly to shocks to Labour performance on the economy, Labour partisanship and prime ministerial approval. *Ceteris paribus*, after three months, Labour vote intentions would increase by from approximately 0.72 to 1.52 standard deviations as a result of shocks to other variables in the system, with the effects of judgments about Labour's performance on the economy being the strongest and Labour partisanship the weakest.

(Figure 4 about here)

The cumulative effects of shocks to variables in the system are shown in Figure 5. As one would expect given the powerful cointegrating relationship among vote intentions and the other three variables and evidence of Granger-causal effects, all of these cumulative

effects on Labour vote intentions should be very substantial. Although the *cet. par.* assumptions underlying the scenario in Figure 5 are unlikely to obtain in practice as negative shocks often quickly work to counteract positive ones, the potential power of valence politics considerations is clearly evident. The MAR analysis summarized in Figures 4 and 5 shows a wide variety of strong responses across the VECM for the valence politics variables. This is exactly what one would expect if these variables constitute the interactive dynamic system, predicted by valence theory.

(Figure 5 about here)

Implications for the Study of Electoral Choice

This analysis suggests that party support is dominated by dynamic processes which link a relatively small number of key variables together. It appears that there are no strongly exogenous variables which drive the system over time and anchor voter decision-making. For well over half a century, students of voting behaviour in Britain, the United States and elsewhere have employed data from periodic national election studies to try to find the fabled 'snark'—the strongly exogenous variable that moves all other movers.

These findings highlight the limitations of traditional election study data-gathering methods. Reluctant or unable to break free from the survey research techniques pioneered in Ann Arbor nearly 70 years ago, political scientists typically do not conduct the very large N, closely-timed, multi-wave cross-sectional and panel surveys that would provide needed leverage for studying the kinds of tightly inter-related dynamic systems of beliefs, attitudes and behaviour that drive electoral choice and other forms of citizen political action.[11] Whatever virtues traditional election surveys may have, they cannot do the methodological job demanded of them when asked to help answer theoretical questions such as those discussed above. Traditional in-person election surveys, always 'convenience samples in time', since respondents are non-randomly scattered over several months of data collection,

are now particularly problematic. Hugely expensive, their cost devours precious research funds and makes it very difficult for researchers to gather the quantities and types of data that would jump-start electoral inquiry in the 21st century. These surveys were leading-edge methodology when the Beatles were playing the Cavern in Liverpool and Stokes was enjoying the conviviality of the Nuffield high table. That moment is now long past and, wherever possible, old-style face-to-face election surveys need to be retired in favour of newer methodologies. Like their colleagues in the natural sciences, electoral researchers should design and implement data-gathering instruments that will enable them to address central theoretical questions.

Many researchers regard face-to-face probability samples as the gold standard for studying electoral behaviour. But falling response rates, increasing costs and the long period of time taken to collect such data make them no longer cost effective or useful for studying the dynamics of electoral choice. The first British Election Study in-person survey conducted in 1963 had a response rate of 79 per cent, whereas the 2010 survey had a response rate of 56 per cent (Howat, Norden and Pickering, 2011, Table 3.1; see also Whiteley et al. 2013: 16). The 2010 survey took four months to complete during which huge changes occurred in the political context in which respondents were interviewed. This is not a unique problem to Britain since the first American National Election Study survey conducted in 1948 had a response rate of 84 per cent (Whiteley et al. 2013: 16). However, the most recent ANES survey the face-to-face components is reported to have had a response rate of only 38 per cent[12] and there is no reason to expect improvement in the future. Such surveys cannot be defended as the 'Rolls Royce' core of election studies since it is increasingly unlikely that they will deliver representative samples in space, let alone in time.

So what do we need to study the dynamics of electoral choice? We need large N, high frequency, national internet and smart-phone cross-sectional and panel surveys to

capture dynamic processes in a rapidly changing political context. The focus should be on multi-wave panels designed to map individual-level stability and change and these panel will impose new forms of measurement and data collection. Additional aspects of the proposed new data collection will be focus on harvesting social media data as well as mapping micro-level interactions between citizens on a very small scale during campaigns. Pioneering examples of the kinds of data collection we envisage include the BES Continuous Monitory Survey (CMS) as well as the 2008 and 2012 U.S. Cooperative Campaign Analysis Project (CCAP) surveys conducted by Simon Jackman, John Sides and Lynn Vavreck in the United States. These American studies consisted of multiple internet panel surveys conducted over the period of a year.

If the logic of our argument is followed then high frequency cross-sectional surveys with embedded panel samples will be the core of future election studies. Daily samples along the lines of the BES Internet Campaign Studies would be ideal, but they need to be extended well beyond the month of the official election campaign to capture effects. It is an urgent priority to map the dynamics of voter choice in Britain in the sense of finding out how frequently individuals change their voting intentions, partisan attachments and evaluations of political leaders and perceptions of policy delivery, particularly in relation to the economy. Some people do not change, whereas others change quite frequently but we need to know who they are and how important they are in influencing the outcome of elections. Resources need to be reallocated from the obsolescent face-to-face surveys to probability based high-frequency internet and smart phone surveys (see Atkeson and Alvarez, 2014; Ansolabehere and Schaffner, 2014).

The Continuous Monitoring Survey of the British Election Study came to an end in 2012 and so in the absence of a successor it will be no longer possible to chart the dynamics of voter behaviour on a monthly basis. In the new 2015 BES study the three monthly panel

surveys are more likely to capture opinion dynamics than their widely spaces predecessors but data collection may not be frequent enough to adequately model the dynamics of electoral choice in the context of a rapidly changing political landscape. As for the traditional face-to-face BES survey, this was ideal to measure the sociological determinants of electoral choice when the working assumption was that key variables do not change much over time and that partisanship is exogenous. Given those assumptions, the timing of fieldwork, while not irrelevant, was very much a secondary consideration. But in a world of dynamic choice behaviour such surveys are a waste of time and resources and they effectively block the road to inquiry by making it very difficult to test theories not rooted in mid-20th century 'Michigan-style' political sociology.

A final point about theory, we say again (more than three times!) *there are no snarks—no magic hidden variables* the powerful effects of which will be revealed by just one more regression/logit/probit/SEM analysis of traditional survey data from just one more new election study of the traditional sort. The variables in the valence politics model do not explain everything about electoral choice, but they provide powerful theoretical and empirical insights into what is going on in the minds of voters. Supplemented by selected variables from spatial theory, the result is a parsimonious composite model that goes a long way towards providing a satisfactory explanation of voting in Britain and elsewhere. There is no need to rummage around one more time in the dark recesses of the famed 'funnel of causality' to find that sly snark. It's not there.

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Figure 1. Observed Partisan Instability in British Election Study Multiwave Panel Surveys, 1963 - 2010

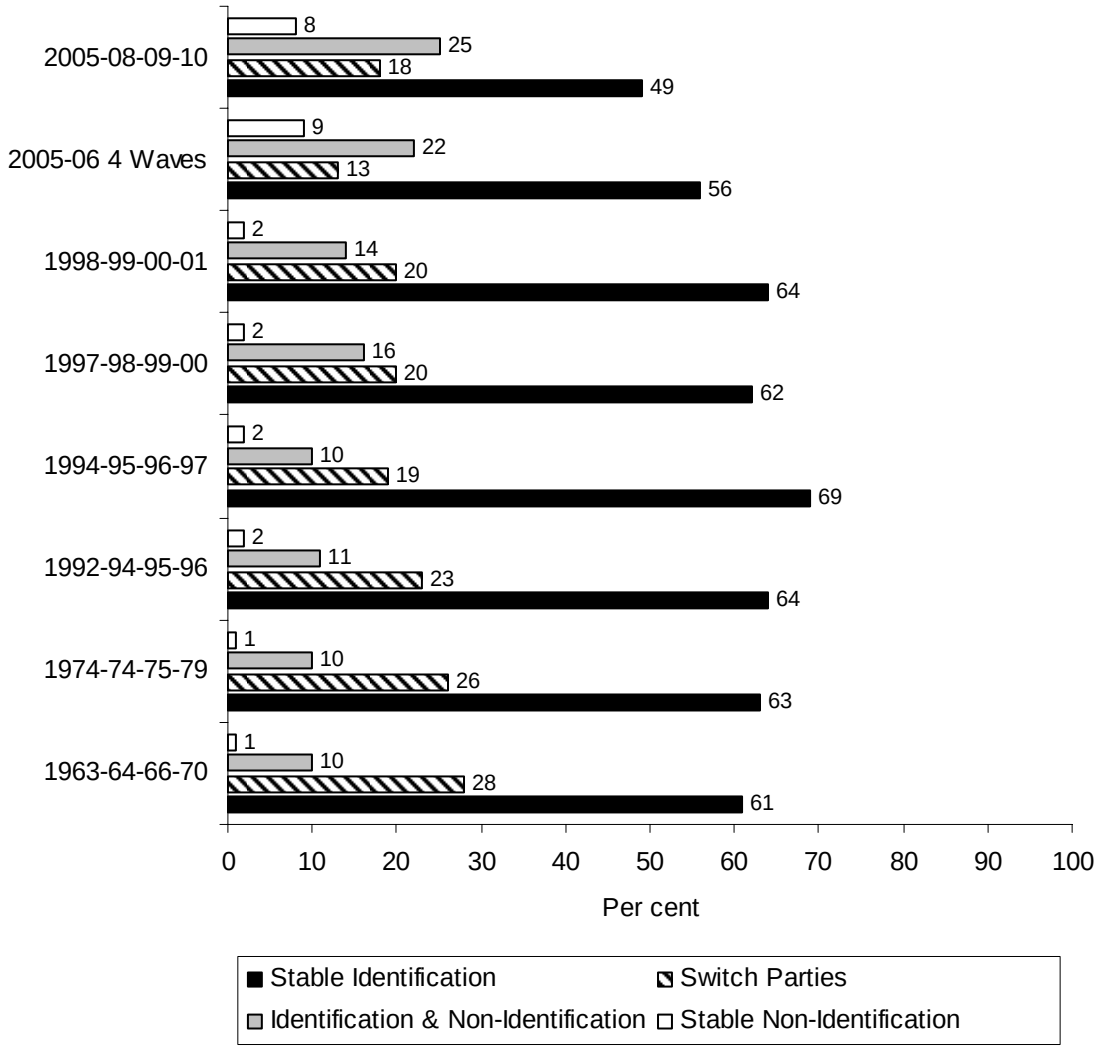


Figure 2. Size of Mover Groups in Mixed Markov Latent Class Analyses of British Election Study Multiwave Panel Surveys, 1963-2010

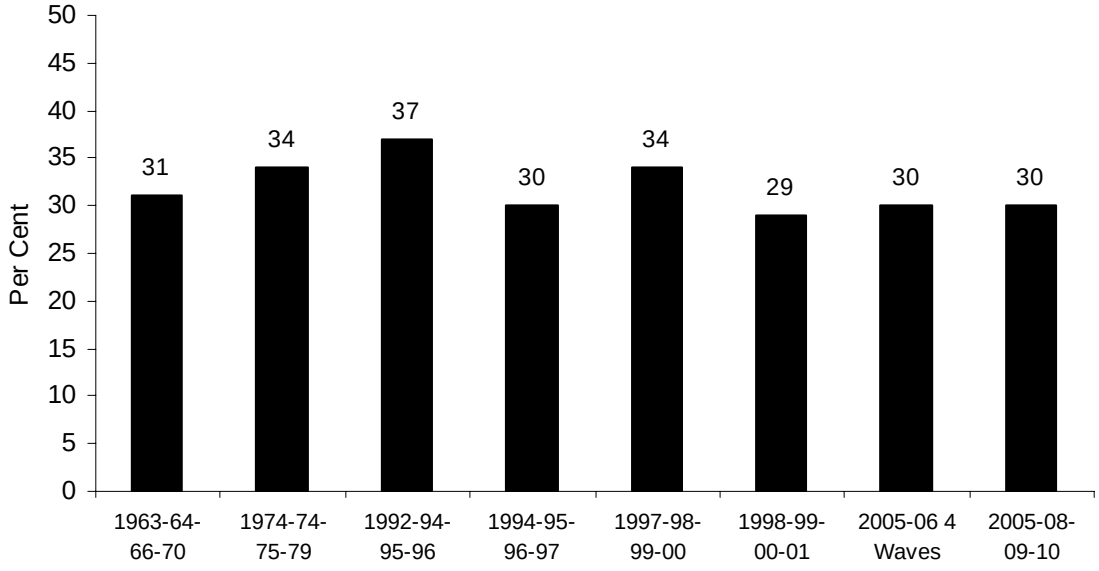
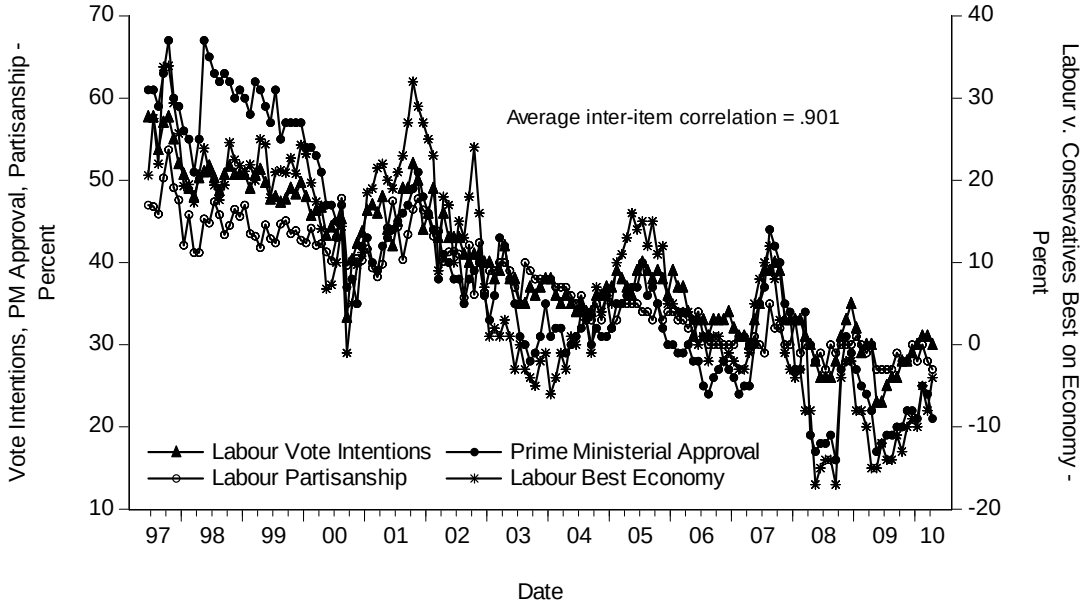


Figure 3. Dynamics of Labour Vote Intentions, Prime Ministerial Approval, Labour Performance on Economy and Labour Partisanship in the New Labour Era, July 1997-April 2010



Note: range of inter-item correlations (time t): r = +.844 to +.948

Table 1. Unit-Root Tests for Valence Politics Variables

	Dickey-Fuller Test		KPSS Test	
	Level	1st Difference	Level	1st Difference
Variables				
Labour vote intentions	-2.262	-11.692†	1.414‡	0.093
Prime ministerial approval	-1.709	-12.823†	1.336‡	0.033
Labour best on economy	-2.032	-14.670†	1.201‡	0.036
Labour partisanship	-1.453	-19.097†	1.476‡	0.210

† - rejects null hypothesis of nonstationarity, p = .05,
critical value = -2.880

‡ - fails to reject null hypothesis of stationarity, p = .05,
critical value = 0.463

Note: null hypothesis for Dickey-Fuller test is series is nonstationary; null hypothesis for KPSS test is series is stationary.

.

Table 2. Johansen Tests for Cointegrating Relationships Among Labour Vote Intentions, Prime Ministerial Approval, Labour Best on Economy and Labour Party Identification, September 1997-April 2010

Unrestricted Cointegration Rank Test (Trace)

Hypothesised No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.298876	74.03611	47.85613	0.0000
At most 1	0.083898	20.06533	29.79707	0.4185
At most 2	0.033287	6.745885	15.49471	0.6074
At most 3	0.010472	1.600062	3.841466	0.2059

Trace test indicates 1 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesised No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.298876	53.97078	27.58434	0.0000
At most 1	0.083898	13.31945	21.13162	0.4233
At most 2	0.033287	5.145824	14.26460	0.7233
At most 3	0.010472	1.600062	3.841466	0.2059

Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

Note: Johansen tests performed with 3 lags for the four variables. Single cointegrating vector also indicated by tests performed with 1 or 2 lags.

Table 3. Granger Causality Tests for Labour Vote Intentions, Prime Ministerial Approval, Labour Best on Economy and Labour Partisanship

	F	χ^2
A. Labour Vote Intentions		
Prime ministerial approval	5.33***	16.01***
Labour best on economy	7.59***	22.75***
Labour partisanship	9.18***	27.54***
B. Prime Ministerial Approval		
Labour best on economy	2.86*	8.59*
Labour partisanship	2.60*	7.80*
Labour vote intentions	0.79	2.38
C. Labour Best on Economy		
Prime ministerial approval	0.62	1.85
Labour partisanship	1.67	5.02
Labour vote intentions	1.35	4.06
D. Labour Partisanship		
Prime ministerial approval	0.84	2.53
Labour best on economy	2.76*	8.29*
Labour vote intentions	4.37***	13.12***

rejects null hypothesis of Granger non-causality; *- $p < .05$; ** - $p < .01$; *** - $p < .001$.

Note: block exogeneity tests using VAR in levels; 3 lags for each tested predictor and 4 lags for non-tested predictors.

Figure 4. Generalized Impulse Response Functions over Six Time Periods for VEC Model of Relationships Among Labour Vote Intentions, Prime Ministerial Approval, Labour Best on the Economy and Labour Party Identification, September 1997-April 2010

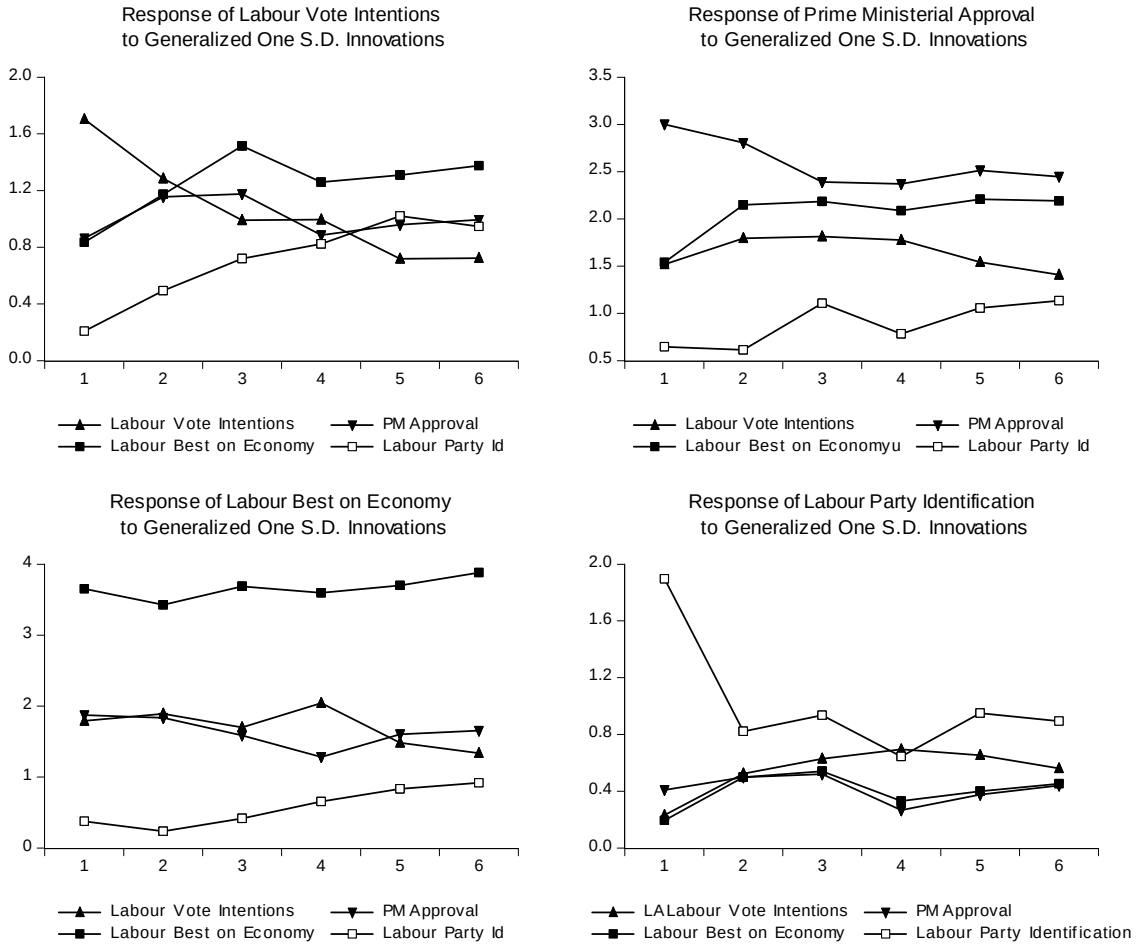
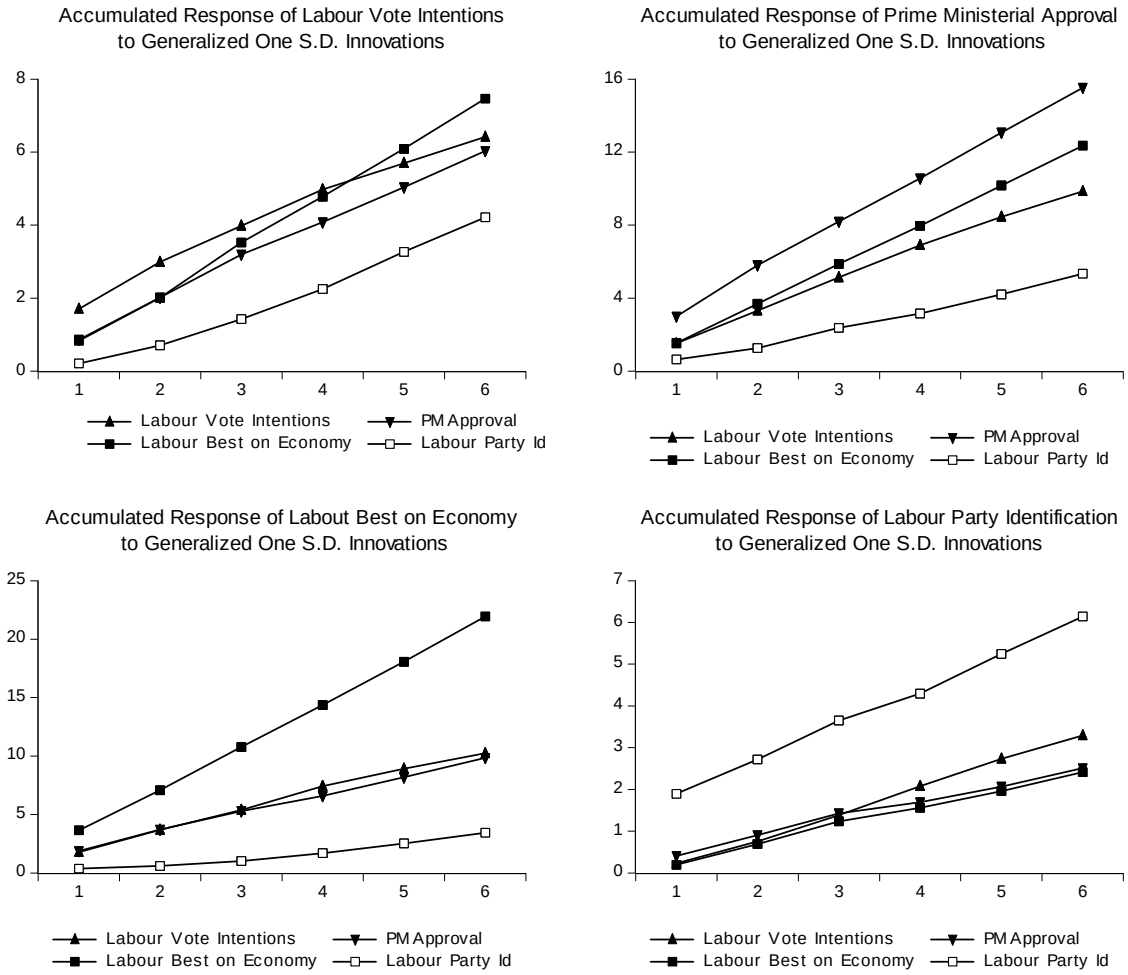


Figure 5. Accumulated Generalized Impulse Responses in Labour Vote Intentions Over Six Time Periods for VEC Model of Relationships Among Labour Vote Intentions, Prime Ministerial Approval, Labour Best on Economy and Labour Party Identification, September 1997-April 2010



Appendix. Vector Error Correction Model of Relationships Between Labour Vote Intentions, Prime Ministerial Approval, Labour Best on Economy and Labour Party Identification, September 1997 - April 2010

Cointegrating Equation	Cointegrating Coefficients (B)
LAB(-1)	1.000000
PMSAT(-1)	-0.191028 (0.02645) [-7.22274]
LABM(-1)	-0.176246 (0.02501) [-7.04699]
LABID(-1)	-0.539110 (0.05335) [-10.1043]
Constant	-10.78250

Error Correction:	D(LAB)	D(PMSAT)	D(LABM)	D(LABID)
Error Correction Mechanism	-0.916454 (0.13183) [-6.95173]	-0.169727 (0.23220) [-0.73095]	-0.330445 (0.28254) [-1.16955]	0.452104 (0.14678) [3.08024]
D(LAB(-1))	0.365126 (0.12205) [2.99167]	0.301492 (0.21497) [1.40249]	0.494862 (0.26157) [1.89188]	-0.292021 (0.13588) [-2.14906]
D(LAB(-2))	0.187986 (0.10337) [1.81853]	0.358492 (0.18208) [1.96892]	0.279982 (0.22155) [1.26376]	-0.209305 (0.11509) [-1.81861]
D(LAB(-3))	0.377382 (0.07957) [4.74295]	0.369561 (0.14015) [2.63698]	0.753102 (0.17053) [4.41630]	0.040352 (0.08859) [0.45551]
D(PMSAT(-1))	-0.031458 (0.06277) [-0.50113]	-0.288633 (0.11057) [-2.61044]	-0.050145 (0.13454) [-0.37272]	0.109587 (0.06989) [1.56797]
D(PMSAT(-2))	-0.081801 (0.06229) [-1.31316]	-0.385995 (0.10972) [-3.51800]	-0.238088 (0.13351) [-1.78335]	0.060434 (0.06935) [0.87138]
D(PMSAT(-3))	-0.116784 (0.05900) [-1.97950]	-0.150444 (0.10391) [-1.44777]	-0.336400 (0.12644) [-2.66051]	-0.027426 (0.06568) [-0.41754]
D(LABM(-1))	-0.010759 (0.04889) [-0.22008]	0.214170 (0.08611) [2.48728]	-0.158702 (0.10477) [-1.51472]	0.148596 (0.05443) [2.73014]

D(LABM(-2))	0.069398	0.113405	0.077973	0.100100
	(0.05061)	(0.08914)	(0.10846)	(0.05635)
	[1.37128]	[1.27222]	[0.71889]	[1.77655]
D(LABM(-3))	-0.073799	-0.059232	-0.046047	-0.026433
	(0.04504)	(0.07934)	(0.09654)	(0.05015)
	[-1.63838]	[-0.74657]	[-0.47699]	[-0.52708]
D(LABID(-1))	-0.361309	-0.084010	-0.254916	-0.362301
	(0.08587)	(0.15125)	(0.18404)	(0.09560)
	[-4.20764]	[-0.55545]	[-1.38514]	[-3.78960]
D(LABID(-2))	-0.200585	0.237985	-0.118927	-0.080596
	(0.09032)	(0.15909)	(0.19357)	(0.10056)
	[-2.22081]	[1.49595]	[-0.61438]	[-0.80148]
D(LABID(-3))	-0.116604	-0.048552	0.031860	-0.118559
	(0.07791)	(0.13724)	(0.16699)	(0.08675)
	[-1.49655]	[-0.35379]	[0.19079]	[-1.36672]
Constant	-0.096448	-0.195093	-0.064335	-0.185574
	(0.14296)	(0.25181)	(0.30640)	(0.15917)
	[-0.67463]	[-0.77476]	[-0.20997]	[-1.16587]
NROCK(-1)	0.255028	-1.709320	-6.084825	-1.252766
	(1.81350)	(3.19422)	(3.88670)	(2.01908)
	[0.14063]	[-0.53513]	[-1.56555]	[-0.62046]
BLAIRBROWN(-1)	1.433782	7.849236	1.432513	4.807102
	(1.78677)	(3.14714)	(3.82941)	(1.98932)
	[0.80244]	[2.49408]	[0.37408]	[2.41645]
PETROL	-13.40364	-12.62720	-15.98820	-5.570300
	(1.82132)	(3.20798)	(3.90344)	(2.02778)
	[-7.35932]	[-3.93618]	[-4.09592]	[-2.74699]
R-squared	0.502042	0.260317	0.276228	0.424750
Adj. R-squared	0.443024	0.172651	0.190447	0.356573
S.E. equation	1.704221	3.001738	3.652484	1.897412
F-statistic	8.506692	2.969416	3.220172	6.230045
Log likelihood	-287.6970	-373.7417	-403.5666	-304.0192
Akaike AIC	4.009171	5.141339	5.533770	4.223937
Schwarz SC	4.347368	5.479536	5.871968	4.562135

Note: LAB = Labour vote intentions; PMSAT = prime ministerial job approval;
LABM = Labour best on economy; LABID = Labour partisanship;
D() = difference operator; standard errors in parentheses; t-statistics in brackets.

Endnotes

[1] In the 1960s Converse (1969) argued that partisanship tended to strengthen as voters aged as a product of behavioural reinforcement attendant upon repeatedly voting for the same party. This argument reinforced the central Michigan claim that partisanship is directionally stable and, at any time t, exogeneous to voting.

[2] In a subsequent edition of their book, Butler and Stokes (1974: 268) recognised the scale of electoral change over relatively brief time periods was quite large: '[I]n the five intervals of change that we have examined in the 1960s, there were never as much as two thirds of the public positively supporting the same party at two successive points in time'.

[3] These numbers are tallied using data produced by responses to the first question in the traditional BES party identification sequence: 'Generally speaking, do you think of yourself as Labour, Conservative, Liberal Democrat or what?' The numbers are minimum estimates of levels of change. Respondents abandoning a party and then changing back to that party within the period encompassed by adjacent waves of a panel survey will not be recorded as having changed.

[4] This is true for Canada, Germany and the United States as well. Clarke and McCutcheon (2009) show that the generalized mover-stayer model also outperforms Converse-style 'black-white' models that have mover groups who chose parties randomly. See also Neundorf, Stegmueller and Scotto (2011).

[5] Correlation between right-hand side variable and the error term in regression analyses renders parameter estimates biased and inconsistent. See, e.g., Greene (2003).

[6] A related problem is that the fieldwork for traditional in-person election panel surveys take months to complete, thereby introducing variable time lags between adjacent waves of interviewing for various subsets of respondents.

[7] In previous work, we demonstrate weak exogeneity of vote intentions vis ά prime ministerial approval and/or partisanship. See Clarke, Stewart and Whiteley (1998). In Clarke et al. (2004: ch. 4), we demonstrate Labour voting in the 2004 general election is weakly exogenous to feelings about then Prime Minister Tony Blair.

[8] This is largely because of the need to avoid the problem of spurious regressions which can occur when non-stationary variables are regressed on one another (Granger and Newbold, 1974). The standard approach was to transform non-stationary variables into stationary form by differencing them once or more, but this has the effect of eliminating any long-term relationships between them (see Charemza and Deadman, 2003: 150-212).

[9] The data used in this analysis comes from three different projects conducted by the authors: the 'Government Performance, Valence Judgements and Dynamics of Party Support' project funded by the US National Science Foundation; the 'Democracy and Participation Programme' funded by the Economic and Social Research Council; and the '2010 British Election Study', also funded by the Economic and Social Research Council.

[10] The Granger causality tests are carried out using the methodology for VECMs recommended by Toda and Yamamota (1995). See also Clarke and Mirza (2006) and Giles (2011).

[11] Elsewhere, we argue that the Continuous Monitoring Surveys (CMS) in the 2005 and 2010 BES are an example of the kind of data-gathering device we envisage. See Whiteley et al. (2013: ch. 1).

[12] This figure is reported in the *User's Guide and Codebook for the ANES 2012 Time Series Study*, p. 31.