

# Revisiting Clarke and Stewart's (1995) investigation of PM approval and vote intentions in the UK

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## ABSTRACT

*Economic Evaluations, Prime Ministerial Approval and Governing Party Support: Rival Models Reconsidered* by Harold D. Clarke and Marianne Stewart (1995) makes major contributions both substantive and methodological. Substantively, the article contributes to literatures on economic voting and the presidentialization of British politics. Methodologically, the paper is a model of how to conduct cointegration and error correction analyses between closely related political time series. In all, the authors established a long-run equilibrium between prime ministerial approval and vote intentions for the governing party. The two variables may diverge for short periods, but vote intentions will always revert back to a level that is in line with the popularity of the PM. We extend Clarke and Stewart's data to the present day and examine how the PM-vote intention link has endured while the effects of the economy on vote intentions have varied. We also show that, while time series analysis in political science has undergone several revolutions, Clarke and Stewart's process of conducting two-step cointegration analysis (Engle and Granger, 1987) stands up 30 years later as a blueprint for how to investigate long-run relationships with political data.

## 1. Introduction: Revisiting Clarke and Stewart 1995

“Economic Evaluations, Prime Ministerial Approval and Governing Party Support: Rival Models Reconsidered” by [Clarke and Stewart \(1995\)](#) makes major contributions both substantive and methodological. On the substance side, the paper is a key step forward in the development of popularity functions in the United Kingdom. In particular, the paper adds to the economic voting literature by comparing the effects of four types of subjective economic evaluations. Unlike findings that the American electorate relies on national (sociotropic) prospections of the economy ([MacKuen et al., 1992](#)) or perhaps national retrospections ([Norpoth, 1996](#)), C&S show the British electorate relies more on subjective and personal evaluations of the economy – that is, pocketbook voting à la [Key \(1966\)](#) fits best. The article helped shift the study of economic voting away from objective economic metrics (e.g., [Sanders et al., 1993](#)) in the UK.

Moreover, [Clarke and Stewart \(1995\)](#) were among the first to note the importance of prime ministerial approval in understanding the dynamics of aggregate vote intentions over time. They argued that PM approval and governing party support do not measure the ‘same thing’ despite their high correlation. C&S demonstrate that the strength of the short-term relationship between PM approval and vote intention is subject to change over time even as their long-run relationship remains

consistently positive. In other words, PM approval and governing party support move together over time, indicating that the two series are cointegrated.

On the methodological side, C&S expertly applied new approaches from the econometrics literature. Most especially, C&S remains the best applied example in political science of a key piece of Engle and Granger's case for the Nobel Prize – their two-step approach to cointegration testing ([Engle and Granger, 1987](#)). C&S do so by combining three factors. The first is that PM Approval and Vote Intentions for Britain's governing party are as close to the proverbial drunk and her dog ([Murray, 1994](#)) as one can find in all our discipline's databases. The two series are reliably tethered together – unlike U.S. presidential approval, which is decreasingly tied to anything ([Donovan et al., 2020](#)). Second, the length of the time series and the infrequency of changes in party control of British government lend themselves to cointegration analyses without interruptions or structural breaks. Last, C&S's aim to understand and properly demonstrate the methods they employed remains impressive. Political science has gone through several phases of how best to study series like these and test hypotheses about long-run equilibrium relationships. Nearly 30 years on, C&S still holds up and belongs on any graduate-level time series syllabus.

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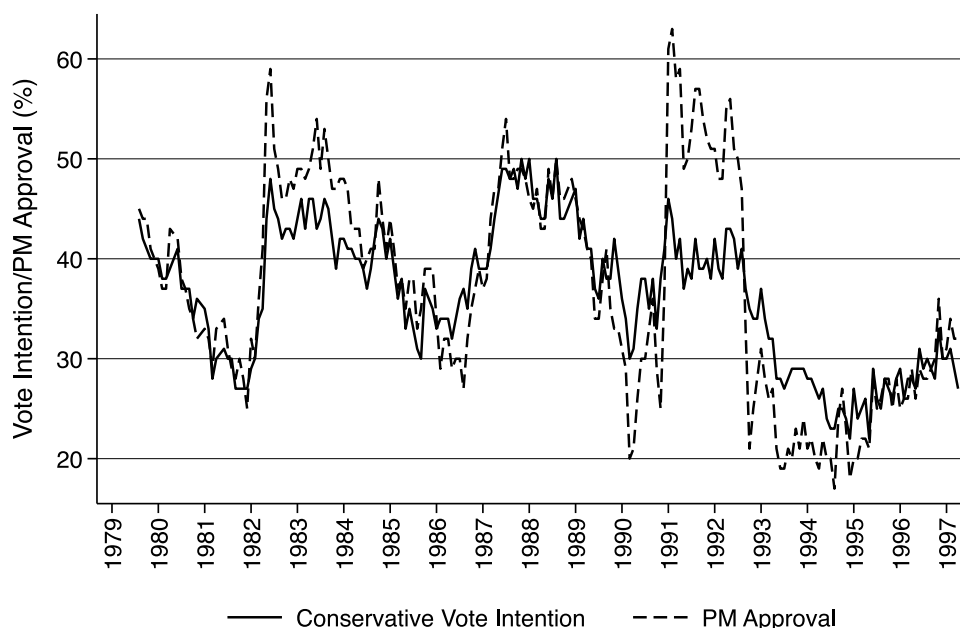


Fig. 1. Conservative Vote Intentions and Prime Minister Approval, 1979–1997.

Here we replicate and extend Clarke and Stewart's data and analyses. The findings of cointegration between PM approval and governing party vote intention remain solid through the now eight post-Thatcher prime ministers. The methodological approach holds up as well. In demonstrating and defending the Engle–Granger approach, as opposed to single-equation error correction models, Clarke and Stewart were in the minority. We explain the logic of their approach to time series analysis and use some newer techniques to demonstrate the robustness of their findings.

## 2. Vote intentions, prime ministerial approval, and economic evaluations

Clarke and Stewart (1995) is a key piece among the wave of 1990s-era research on economic voting (e.g., Lewis-Beck and Rice, 1982; MacKuen et al., 1992; Sanders et al., 1993; Clarke and Stewart, 1994). There are several hallmarks. The first is establishing that the study of economic voting between elections is a subfield in its own right – understanding the movement of government approval, leader popularity, and vote intentions over time opens a variety of research avenues. Second, in relation to the various dependent variables in popularity functions, subjective measures of economic performance provide a more proximate measure of public opinion than do objective measures of the economy like inflation, GDP, and unemployment. Third, in C&S and similar papers, researchers not only brought advanced time series methods into political science, they also recognized the differences between political and economic data and set an agenda for political scientists to develop their own methodological toolkit.

Within those themes, Clarke and Stewart established the close relationship between PM approval and vote intentions for the governing party (see also Stewart and Clarke, 1992; Clarke and Stewart, 1996; Clarke and Lebo, 2003). C&S (1995) describe concerns that the two measures over time might be “too close for comfort” but treat this as an opportunity for theoretical development and methodological innovation. A popular prime minister should lead to upticks in vote intentions for their party. A PM with diminished popularity should drag down vote intentions for their party.

Fig. 1 visualizes the two measures over the Thatcher–Major years, 1979–1997. The series are closely related – seemingly tethered together. There are notable deviations from equilibrium such as Mrs.

Thatcher's post-Falklands popularity and John Major's honeymoon period during which PM approval outpaced Conservative voting intentions for extended periods. Deviations in the other direction are noticeable too – Mrs. Thatcher's approval dropped well below Conservative Party vote intentions in 1990 prior to her replacement by Mr. Major. Still, the two series are never too far apart for too long and being aligned seems the long-run equilibrium to which the series naturally tend.

Indeed, these variables should be closely aligned. The prime minister is the leader of the party with the most seats in the House of Commons, so voters naturally consider the prime minister to be the face of both the government and the governing party. This fits the logic of cointegration and error correction (Engle and Granger, 1987). Multiple series that are each non-stationary but whose linear combination is mean-reverting. When events move them apart, equilibrium-seeking behavior is soon to follow (Webb et al., 2020). In econometrics textbooks, the go-to examples for cointegration are the relationships between income and consumption or between 3-month and 12-month treasury bills (Stock and Watson, 1993). In political science, it is hard to think of a relationship as close as shown in Fig. 1.

Not all PMs are equal, however. While some prime ministers are less activist, others have sought broad social and economic change. Margaret Thatcher's time as prime minister certainly demonstrated the strength of the relationship between PM approval and vote intentions as she polarized the British electorate with her personality and policies. For a long while, the Conservative Party was unmistakably Thatcher's Party (Bale, 2016), and the era provides a baseline for comparing the closeness of the two time series over subsequent prime ministers. Fig. 1 indicates a relatively weaker link during the six-and-a-half year period under PM John Major beginning in late 1990 but a return to equilibrium remains the dominant pattern when the series move apart in the short-term. Moreover, C&S find that PM approval is weakly exogenous to vote intentions for the PM's party. When a short-term shock moves the series apart, it is vote intentions that moves back to be in line with the level of popularity of the PM. Put another way, the aggregate level of approval for the PM does not adjust to be in line with higher or lower levels of vote intentions.

Extending the data, we expect that PM approval has continued to be closely tethered to governing party vote intentions in the periods since Clarke and Stewart's (1995) analyses. Indeed, this has been

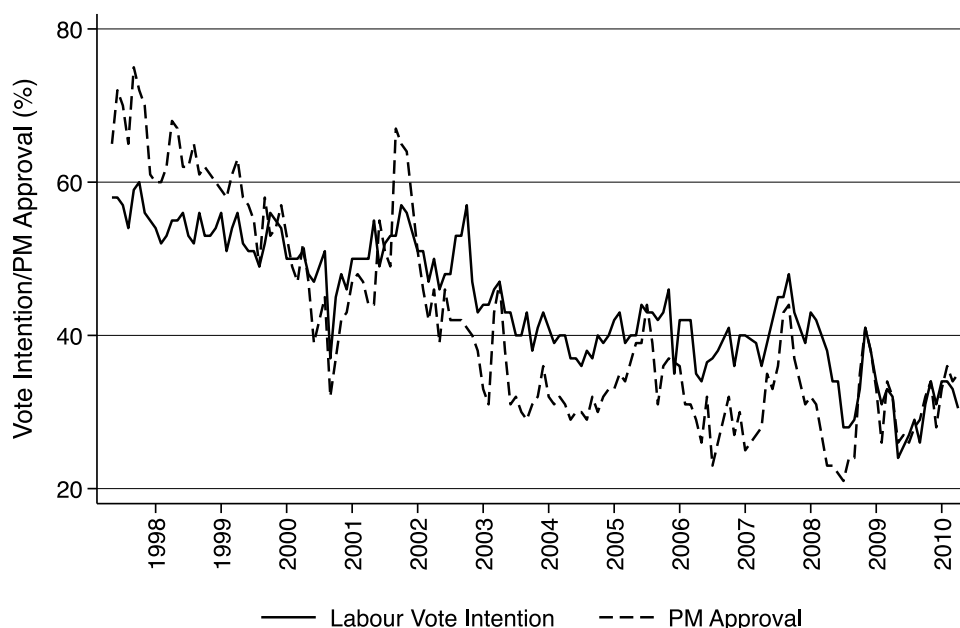


Fig. 2. Labour Vote Intentions and Prime Minister Approval, 1997–2010.

the finding of studies that extend into the Blair–Brown years (Lebo and Young, 2009; Lebo and Norpoth, 2011, 2013). Fig. 2 shows the continuation of the close relationship between the two time series once Labour becomes the governing party.<sup>1</sup> In comparison to the earlier Conservative period, the series do not appear as closely related even as they both trend downwards. There are periods of disequilibrium – as Mr. Blair entered office, he could not pull Labour vote intentions to as high a level as his own popularity – in part due to consistent party identification for the other parties. In later years, however, it is likely the party identification among Labour voters that prevented vote intentions from sinking as low as did Mr. Blair’s popularity. Still, the series appear to maintain a long-run equilibrium relationship.

The Conservative era since 2010 presents an especially interesting test. Through Brexit and five prime ministers, how close did the PM–VI link remain? As the success or failure of Brexit was perceived by the British public as being primarily the responsibility of the prime minister, the eras of May and Johnson should be marked by a particularly close connection between PM approval and governing party vote intentions. Moreover, this period may mark a change in the way we think about that relationship. Clarke and Stewart (1995) and subsequent studies (Clarke and Lebo, 2003) found PM Approval to be exogenous to vote intentions. From David Cameron’s tenure onwards, it might be the case that PM approval is endogenous – both affecting and affected by vote intention. Fig. 3 shows a close relationship but, for the most part, not the closeness of the Thatcher era. There is much to learn from these data. Before getting to those analyses, we next discuss the methodology of C&S and place it in the context of time series advances in political science in the subsequent decades.

### 3. Methodological innovations

The thirty years of data since Clarke and Stewart (1995) also provide fertile ground for revisiting their methodological approach.

<sup>1</sup> We rely on MORI data which first asks vote intentions for all expressing an opinion “How would you vote if there were a General Election tomorrow?” Then those undecided or refused are asked: “Which party are you most inclined to support?” This stops at February 2013. From March 2013 onwards, we use vote intentions among those “absolutely certain to vote”.

C&S is noteworthy for its structure – it sets up the data<sup>2</sup> and works through the key questions that should still guide any careful time series analysis: Are variables stationary? Is there cointegration? Are the independent variables weakly exogenous so that a single-equation approach is appropriate? Is the resulting model stable and well-specified?

Clarke and Stewart (1995) is not the first instance of political scientists paying attention to the stationarity question and differencing their data. Some earlier examples include Clarke et al. (1990), Clarke and Whiteley (1990), Norpoth (1992); and Clarke and Stewart (1994). C&S rely on the theoretical foundations of their time series and then employ rigorous testing. PM approval, vote intentions, and economic evaluations are not “white noise” time series – they are persistent with high correlations between consecutive timepoints. The results of C&S’s unit root tests suggest that the economic and political time series are non-stationary.<sup>3</sup> As such, ADL models are prone to spurious results. C&S recommend making their key inferences using error correction models with differenced data.

Indeed, C&S stands up as an excellent demonstration of Engle and Granger’s (1987) two-step approach to cointegration analysis. Engle and Granger (1987) explain cointegration as the situation in which two or more non-stationary series can be combined so that their linear combination is stationary. In the parable, a drunk and her dog might meander over time and not return to where they started, but the distance between them reverts to the same value again and again (Murray, 1994). Engle and Granger’s approach to dealing with such series begins with a linear regression of a non-stationary endogenous variable on non-stationary exogenous regressors thought to be in such a tethered relationship. If the residuals of that regression are stationary, there is evidence of cointegration. In a second step, those residuals, lagged

<sup>2</sup> *Economic Evaluations, Prime Ministerial Approval and Governing Party Support: Rival Models Reconsidered* is a great example of Clarke and Stewart’s practice of showing and discussing the data. Like so many of their time series contributions, they see an important first step as storytelling with the data. What is happening over this period of time? What does the relationship between variables look like? Hypotheses and modeling naturally follow from what Harold taught his students as “ocular inspection” of the data. This echoes the “eyeballing” approach endorsed by Berry and Lewis-Beck (1986).

<sup>3</sup> Clarke and Lebo (2003) later argued the series were fractionally integrated and applied new methods to the same data.

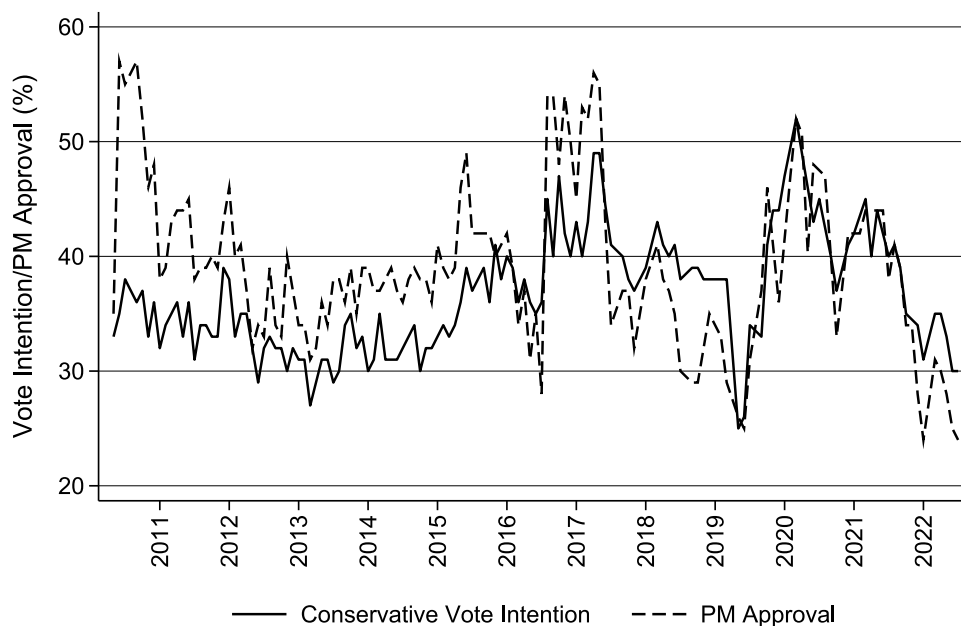


Fig. 3. Conservative Vote Intentions and Prime Minister Approval, 2010–2022.

back one period and called the error correction mechanism (ECM), can be used as a regressor in a regression of the differenced dependent variable on differenced independent variables. The coefficient on the ECM in the second step is an estimate of how much the dependent variable moves back to equilibrium when a shock separates the series. Between these two tests, one can establish the existence of a long-run equilibrium relationship between level-form series. In practice, correctly establishing a long-run equilibrium is quite rare. Many studies look for long-run relationships between political time series but few find legitimate evidence (Lebo and Kraft, 2017). There simply are not many political relationships as close as we see in Figs. 1, 2, and 3.

But while the Engle and Granger approach is intuitive, it is also laborious. Studies like C&S that employ it are the exception. Instead, political scientists have more often employed single-step models to investigate short- and long-run relationships. The generalized error correction model (GECM) was developed in econometrics by Davidson et al. (1978) among others and then introduced to political science by Beck (1991). The GECM estimates:

$$\Delta y_t = D_t + \alpha_1^* y_{t-1} + \sum_{j=1}^n \beta_{j1}^* x_{jt-1} + \sum_{j=1}^n \beta_{j0}^* \Delta x_{jt} + \varepsilon_t \tag{1}$$

in which  $\varepsilon_t$  is a well-behaved (white noise) error term and the deterministic components,  $D_t$ , could include a constant,  $\alpha_0^*$ , a trend,  $\alpha_\tau^* t$ , and/or interventions. Like the second step of the Engle–Granger approach, the GECM has a differenced dependent variable. On the right-hand side are both differenced and level-form independent variables. Inferences from the GECM are straightforward when the researcher is certain all of the variables are non-stationary. In that case, cointegration would occur when  $y_{t-1}$  and  $x_{jt-1}$  are jointly stationary alongside the differenced (and thereby stationary) versions of  $y_t$  and  $x_{jt}$ . The significance of  $\alpha_1^*$  is a cointegration test with a null of no cointegration (Kraft et al., 2022). However, inferential problems occur if the variables are not, in fact, unit roots. In that case,  $\alpha_1^*$  moves away from zero due to mean reverting behavior in the dependent variable and the coefficient’s significance is not useful by itself in establishing a long-run relationship between the series.

It is notable that Clarke and Stewart’s preference for the Engle–Granger two-step procedure put them in the minority among political science practitioners. Following the publication of DeBoef and Keele (2008), the GECM became the go-to method for political scientists with

time series data. Some re-evaluation of the GECM and the applications that relied on it have shown the wisdom of C&S’s more careful research and also led to the development of new methods to study long-run relationships. With new tools, we can revisit studies like C&S (Keele et al., 2016; Lebo and Grant, 2016)

In a recent advance, Webb et al. (2019, 2020) provide a bounds test of the long-run multiplier (LRM) that does not require knowledge of the univariate properties of the variables – that is, whether or not they are stationary. The LRM can be calculated from Eq. (1) as  $\lambda_j = -\beta_{j1}^*/\alpha_1^*$  and is an estimate of the total, long-run effect of an independent variable,  $x_t$ , on  $y_t$ . For a long-run relationship to exist, the LRM must be non-zero with both  $\alpha_1^* \neq 0$  and  $\beta_{j1}^* \neq 0$ . The exact limiting distribution and critical value of the  $t$ -test for  $\lambda_j$  cannot be precisely known without knowing a great deal of information – specifically, are the series all stationary, or all unit roots, or some combination? Webb et al. (2020) develop bounds using simulations for every possible data type and provide an upper and lower bound for different numbers of independent variables and data lengths. When the test statistic is below the lower bound, we fail to reject the null hypothesis of no long-run relationship. When the test statistic is above the upper bound, we can reject the null of no long-run relationship. When the test statistic is between the bounds, the test is inconclusive – the uncertainty about the data carries forward into uncertain inferences from the model’s results. Being between the bounds can be unsatisfying but adds transparency to the process of hypothesis testing.

The bounds method provides a good way of reassessing and extending the findings of Clarke and Stewart (1995). In the next section, we replicate their findings and use Engle–Granger, GECMs, and bounds methods to evaluate the existence of long-run relationships between these long time series across three blocks of party control of the House of Commons – Conservatives from 1979–1997, Labour from 1997–2010, and Conservatives again from 2010–2022. We also explore questions of temporal ordering and exogeneity.

#### 4. Results

To begin, Table 1 shows our replication of C&S’s Table 6 models of differenced vote intentions for the incumbent (Conservatives) party for the 1979M8–1992M4 period. These are the second step of Engle–Granger two-step error correction models. In the first step, the variables test as non-stationary and an error correction mechanism is created

**Table 1**  
Replication of Clarke and Stewart, 1979–1992.

	PE	PR	NR	NE
Constant	0.057 (0.153)	0.062 (0.151)	0.073 (0.152)	0.056 (0.155)
ΔPM Satisfaction,	0.366* (0.045)	0.370* (0.044)	0.370* (0.045)	0.375* (0.047)
Error Correction Mechanism, <sub>t-1</sub>	-0.319* (0.055)	-0.354* (0.054)	-0.369* (0.055)	-0.334* (0.055)
ΔPersonal Prospections,	0.066* (0.033)			
ΔPersonal Retrospections,		0.077* (0.034)		
ΔNational Retrospections,			0.009 (0.014)	
ΔNational Prospections,				0.007 (0.014)
Falklands War – May 1982	5.490* (1.889)	5.852* (1.856)	5.378* (1.881)	5.778* (1.915)
Falklands War – June 1982	1.285 (1.864)	1.323 (1.842)	0.999 (1.848)	1.201 (1.893)
Poll Tax	-2.867* (1.317)	-3.638* (1.305)	-3.186* (1.297)	-3.158* (1.330)
Political Events	1.940* (0.341)	1.971* (0.338)	2.075* (0.339)	1.982* (0.346)
National Elections – 1983	3.067* (1.323)	3.302* (1.298)	3.277* (1.303)	3.398* (1.339)
National Elections – 1987	-0.623 (1.300)	-0.875 (1.295)	-0.554 (1.297)	-0.530 (1.322)
National Elections – 1992	1.748 (1.867)	1.905 (1.837)	2.124 (1.848)	2.000 (1.893)
Observations	153	153	153	153

p ≤ 0.05 (two-tailed). Standard errors in parentheses.

from an initial regression using the level-form data. As seen in other key economic voting articles of the era (e.g., [Mackuen et al., 1992](#); [Clarke and Stewart, 1994](#)), C&S estimated four separate models with each subjective measure of economic opinions – personal expectations, personal retrospections, national retrospections, and national expectations – taking its turn as a predictor of vote intentions. This approach allows some comparisons of various theories predicting how the economy affects opinions of the governing party. Over this time period in Britain, changes in personal retrospections has the most predictive power of the four subjective measures on short-term changes in vote intentions for the governing Conservatives. Personal prospctions are a close second, implying that the British electorate is most concerned with their pocketbooks and less with the state of the national economy.

In terms of long-run relationships, there are several key points. First, Dickey–Fuller tests on the residuals of the first step regression (the ECM) reject the null of a unit root – the ECM is stationary. This indicates the existence of a long-run relationship between the variables in the first step – PM approval, vote intentions, and subjective economic evaluations – although more work should be done to discern whether only one or both of the independent variables is in long-run relationship ([Kraft et al., 2022](#)). Since the ECM is stationary and all of the continuous variables in the model are differenced, we know that the equations are *balanced* ([Grant and Lebo, 2016](#); [Pickup and Kellstedt, 2023](#)). We can make inferences from these models and, especially, on the ECM with fewer caveats. The significance of the ECM in the models is further evidence of a long-run relationship and tells us how quickly vote intentions react to a shock that separates PM approval (though probably not economic evaluations) from vote intentions. If the original variables are truly unit roots, this is cointegration. If they are not, there is other evidence here of a different type of long-run equilibrium relationship between the variables.

In [Table 2](#) we extend the investigation to the 1997–2010 and 2010–2022 periods – eras with very different issues and patterns of voter volatility ([Fieldhouse et al., 2021](#)). There are a few differences in our set-up compared to the original C&S models. First, following [Lebo and](#)

[Young \(2009\)](#), we add approval of the Leader of the Opposition as a predictor in each of the two periods.<sup>4</sup> For the New Labour period, approval of the Conservative leader proves to be a significant predictor of vote intentions for Labour. Once the Conservatives reassume government in 2010, however, approval of the Labour leader is not helpful. The tenuous inference is that Conservative leaders loom larger over the British electorate, even when out of office.

A second difference from the C&S models is that the Gallup data which tracked four separate subjective evaluations of the economy ceased to be available. We instead use Mori’s Economic Optimism Index which is best characterized as a National Prospections variable. This is not optimal, especially considering the earlier finding that the British electorate focuses more on pocketbook finances than a sociotropic outlook. That the variable is no longer demonstrably significant could be because the economy is less important to voters’ vote intentions than in previous periods (e.g., [Donovan et al., 2020](#)). [Chzhen et al. \(2014\)](#) use British Panel Election Studies to demonstrate that economic perceptions exert an exogenous effect on government approval, but only when economic circumstances are extremely poor. It may be that uncertainty about how to perceive the economy during and after Brexit has resulted in the electorate placing greater weight on other politically salient factors. Alternately, it could be that Mori is simply asking the wrong question to capture *how* the economy matters to the electorate.

The final change we make from the original C&S models is that we include a time trend in each model and find, perhaps surprisingly, that once accounting for the other independent variables, there is an upward trend in vote intentions for the Conservatives in the 2010–2022 period. This is perhaps explained both by the Conservatives consolidating the pro-Brexit vote in the middle of the period or by longer term trends in the political positioning of the working class ([Kavanagh, 2022](#)). [Cutts et al. \(2020\)](#) use aggregate-level election results to demonstrate that the relationship between Labour and working class voters has been faltering since 2010 or earlier, and the polarizing effect of Brexit probably accelerated this trend ([Ford and Goodwin, 2017](#)).

As [Grant and Lebo \(2016\)](#) show, differences between estimated coefficients in one-step and two-step error correction models will be subtle when series are all non-stationary or highly autoregressive.<sup>5</sup> This is the case here – for the 1997–2010 period the results are very similar across the two specifications. It is notable that the ECM in the second step is -0.49 here compared to its range of -0.32 to -0.37 for the Thatcher era. This could indicate a closer relationship between PM approval and vote intention for the Blair–Brown era than earlier.

The inferences made from both one- and two-step error correction models rely on making the correct conclusions about the stationarity of the data. But since stationarity tests notoriously lack statistical power, it is useful to try the bounds technique of [Webb et al. \(2020\)](#) which does not rely on correctly classifying our series. [Table 3](#) shows the bounds tests for long-run relationships in the three periods. The key relationship that C&S found between PM Approval and Vote Intentions is affirmed by finding the LRM’s *t*-statistic above both bounds. Regardless of the univariate properties of the time series, we can safely reject the null hypothesis of no long-run relationship. The National Prospections variable is between the bounds for each of the three periods. Without more certainty about the properties of the series, we have an indeterminate result. Opposition leader approval is above both bounds in the middle period but not the last period. The key finding is that the relationship Clarke and Stewart identified in 1995 – a long-run equilibrium between prime ministerial approval and vote intentions

<sup>4</sup> See, also [Green and Jennings \(2012\)](#) on the importance of evaluations of the opposition party.

<sup>5</sup> Still, the GECM models are unbalanced equations – the EOI in level-form is non-stationary on its own and in combination with other level-form regressors. Thus, it does not belong in an equation with a stationary dependent variable. The two-step approach followed by Clarke and Stewart (1995) is preferable and logically sound ([Pickup and Kellstedt, 2023](#)).

**Table 2**  
General Error Correction Model & 2-Step Engle Granger Models.

	1997–2010		2010–2022	
	GECM Coef (Std. Err.)	Engle–Granger Coef (Std. Err.)	GECM Coef (Std. Err.)	Engle–Granger Coef (Std. Err.)
Vote Intention <sub>t-1</sub>	-0.500* (0.071)		-0.405* (0.068)	
ΔPM Satisfaction <sub>t-1</sub>	0.294* (0.047)	0.314* (0.044)	0.302* (0.048)	0.270* (0.046)
PM Satisfaction <sub>t</sub>	0.186* (0.039)		0.245* (0.047)	
ΔNational Prospections <sub>t-1</sub>	-0.021 (0.012)	0.008 (0.022)	-0.020 (0.014)	-0.025 (0.014)
National Prospections <sub>t</sub>	0.009 (0.023)		-0.017 (0.009)	
ΔOpposition Approval <sub>t-1</sub>	-0.134* (0.054)	-0.138* (0.048)	-0.003 (0.056)	0.010 (0.055)
Opposition Approval <sub>t</sub>	-0.176* (0.041)		-0.027 (0.028)	
Events				
2001 Election	-5.866* (2.447)	-6.039* (2.424)		
Fuel Protests	-8.516* (2.457)	-8.080* (2.420)		
Buncefield Fire	-9.612* (2.363)	-9.722* (2.329)		
May Appointed PM <sub>t-1</sub>			3.439 (2.589)	3.538 (2.622)
Time Trend	-0.014 (0.011)	-0.005 (0.004)	0.026* (0.007)	0.019* (0.006)
Error Correction Mechanism		-0.488* (0.069)		-0.352* (0.065)
Constant	23.264* (4.982)	1.726 (1.262)	-5.779 (3.193)	-8.552* (2.672)
Observations	156	156	147	147

\* p ≤ 0.05 (two-tailed). Standard errors in parentheses.

**Table 3**  
Long-run multiplier & bounds tests.

		LRM (Std. Error)	LRM t-statistic Bounds
1979–1997	PM Approval	0.377 (0.081)	4.63 Beyond
	National Prospections	0.117 (0.070)	1.68 Between
1997–2010	PM Approval	0.372 (0.058)	6.47 Beyond
	National Prospections	-0.042 (0.023)	-1.80 Between
	Opposition Approval	-0.352 (0.075)	-4.70 Beyond
2010–2022	PM Approval	0.605 (0.075)	8.12 Beyond
	National Prospections	-0.042 (0.221)	-1.88 Between
	Opposition Approval	-0.067 (0.070)	-0.95 Below

for the incumbent party – is still evident using new methods and new data. No variable in British politics better predicts the dynamics of vote intentions than opinions of the Prime Minister.

Table 4 shows Granger causality tests (Freeman, 1983) and is the first step in establishing that weak exogeneity still holds for PM approval. The results are that PM approval Granger causes governing party vote intentions in the latter two periods and is not Granger caused by any of the other variables. As with the data from the Thatcher–Major era, this is an indication that approval of the PM is the first variable among those here in the chain of opinion formation.

Table 5 presents the results of more intensive testing to determine whether PM approval remains weakly exogenous to governing party support in the period since Clarke and Stewart concluded their analyses. Following the method explained in Charemza and Deadman (1997) and used by C&S, for each time period we first estimated a model of PM approval including the ECM (Model A). Weak exogeneity requires this ECM to be insignificant at this stage. The model is then re-estimated omitting the ECM and the residuals saved (Model B). These residuals are then included in a model of governing party support. Again, weak exogeneity requires these residuals be insignificant. As shown in Table 5, the ECM is insignificant in Model A for both time periods and the residuals from Model B are insignificant in a model of governing party vote intention. We also performed the same tests on the period from July 2016, one month after the Brexit vote, to the last full month of Boris Johnson’s premiership, August 2022. While one may speculate that an event as large as Brexit could seismically shift the relationship between PM approval and vote intention, that is not born out by the data. Taken together, these findings confirm and extend through time the weakly exogenous relationship of prime ministerial approval and party support found by C&S.

### 5. Conclusion

Clarke and Stewart (1995) remains a key contribution to the literature on popularity functions in the United Kingdom. It also stands as a methodological template for political scientists to follow – get deep into the data, sort out causal ordering, test the data’s properties, and conduct hypothesis testing. There are many ways to go wrong with time series data, but C&S follow the more laborious route of two-step cointegration testing to great effect: opinions about Margaret Thatcher preceded and predicted vote intentions for her Conservative Party. The key relationship they identified – the long-run equilibrium between PM approval and vote intentions for the governing party –

**Table 4**  
Granger causality tests.

Granger causality	1997–2010		2010–2022	
	F-test	p-value	F-test	p-value
Party Support → PM Approval	2.06	0.089	1.32	0.265
PM Approval → Party Support	4.08	0.003	2.90	0.024
Economic Prospections → Party Support	0.36	0.836	0.29	0.882
Economic Prospections → PM Approval	0.88	0.480	0.30	0.877
Party Support → Economic Prospections	1.31	0.270	1.18	0.324
PM Approval → Economic Prospections	1.62	0.172	0.55	0.699

**Table 5**  
Weak exogeneity testing of prime ministerial approval in governing party support models.

	1997–2010		Vote Intentions	2010–2022	
	PM Approval			PM Approval	Vote Intentions
	Model A	Model B		Model A	Model B
$\Delta$ Governing Party Vote Intentions <sub>t-1</sub>	0.070 (0.111)			0.097 (0.115)	
ECM <sub>t-1</sub>	0.064 (0.134)		-0.506* (0.070)	0.025 (0.083)	-0.341* (0.063)
$\Delta$ National Prospections <sub>t</sub>	0.183* (0.037)	0.178* (0.037)	-0.031 (0.038)	0.067* (0.022)	0.069* (0.022)
$\Delta$ Opposition Approval <sub>t</sub>	-0.108 (0.107)	-0.126 (0.104)	-0.073 (0.071)	-0.086 (0.088)	-0.083 (0.087)
$\Delta$ PM Satisfaction <sub>t</sub>			0.490* (0.147)		0.165 (0.102)
Residuals of Model B			-0.193 (0.154)		0.135 (0.114)
Constant	-0.150 (0.343)	-0.152 (0.341)	1.557 (1.267)	-0.379 (0.313)	-0.381 (0.312)
Observations	156	156	156	147	147

\* p ≤ 0.05 (two-tailed). Standard errors in parentheses. Interventions omitted from table.

extends through eight subsequent prime ministers and is demonstrable using recent advances that rely on critical value bounds. Clarke and Stewart’s testing for Granger causality and weak exogeneity are also great demonstrations that hold up substantively and methodologically. Almost since Methuselah was a little boy, political scientists have struggled to analyze time series data in ways that provide trustworthy statistical inferences. Our analyses are a reminder that C&S got things right and explain why their cautious approach to analysis remains best. Like so much of their work, Clarke and Stewart’s Economic Evaluations, Prime Ministerial Approval and Governing Party Support made major contributions to the study of British politics while also demonstrating transparent and careful time series modeling.

**Declaration of competing interest**

There is no conflict of interest for this paper

**Data availability**

Data will be made available on request.

**References**

Bale, Tim, 2016. *The Conservative Party: From Thatcher to Cameron*. Polity.  
 Beck, Nathaniel, 1991. Comparing dynamic specifications: The case of presidential approval. *Political Anal.* 1, 51–87.  
 Berry, William D., Lewis-Beck, Michael S., 1986. *New Tools for Social Scientists: Advances and Applications in Research Methods*. Sage Publications.  
 Charemza, Wojciech W., Deadman, Derek, 1997. *New Directions in Econometric Practice: General to Specific Modelling, Cointegration and Vector Autoregression*, second ed. Edward Elgar Publishing.  
 Chzhen, Kat, Evans, Geoffrey, Pickup, Mark, 2014. What do economic perceptions matter for party approval? *Political Behav.* 36 (2), 291–313.  
 Clarke, Harold D., Lebo, Matthew, 2003. Fractional (Co)integration and governing party support in Britain. *Br. J. Political Sci.* 33 (2), 283–301.  
 Clarke, Harold D., Mishler, William, Whiteley, Paul, 1990. Recapturing the Falklands: Models of conservative popularity, 1979–83. *Br. J. Political Sci.* 20 (1), 63–81.

Clarke, Harold D., Stewart, Marianne C., 1994. Prospections, retrospections and rationality: The ‘bankers’ model of presidential approval reconsidered. *Am. J. Political Sci.* 38, 1104–1123.  
 Clarke, Harold D., Stewart, Marianne C., 1995. Economic evaluations, prime ministerial approval and governing party support: Rival models reconsidered. *Br. J. Political Sci.* 25, 145–170.  
 Clarke, Harold D., Stewart, Marianne C., 1996. Economists and electorates: The subjective economy of governing party support in Canada. *Eur. J. Political Res.* 29, 191–214.  
 Clarke, Harold, Whiteley, Paul, 1990. Perceptions of macroeconomic performance, government support and conservative party strategy in Britain 1983–1987. *Eur. J. Political Res.* 18 (1), 97–120.  
 Cutts, David, Goodwin, Matthew, Heath, Oliver, Surridge, Paula, 2020. Brexit, the 2019 general election and the realignment of British politics. *Political Q.* 91 (1), 7–23.  
 Davidson, James E.H., Hendry, David F., Srba, Frank, Yeo, Stephen, 1978. Econometric modelling of the aggregate time-series relationship between consumers’ expenditure and income in the United Kingdom. *Econ. J.* 88 (352), 661–692.  
 DeBoef, Suzanne, Keele, Luke, 2008. Taking time seriously. *Am. J. Political Sci.* 52 (1), 184–200.  
 Donovan, Kathleen, Kellstedt, Paul M., Key, Ellen M., Lebo, Matthew J., 2020. Motivated reasoning, public opinion, and presidential approval. *Political Behav.* 42, 1201–1221.  
 Engle, Robert F., Granger, C.W.J., 1987. Co-integration and error correction: Representation, estimation, and testing. *Econometrica* 55, 251–276.  
 Fieldhouse, Edward, Green, Jane, Evans, Geoffrey, Mellon, Jonathan, Prosser, Christopher, Schmitt, Hermann, Van der Eijk, Cees, 2021. *Electoral Shocks: The Volatile Voter in a Turbulent World*. Oxford University Press.  
 Ford, Robert, Goodwin, Matthew, 2017. Britain after brexit: A nation divided. *J. Democracy* 28 (1), 17–30.  
 Freeman, John R., 1983. Granger causality and the time series analysis of political relationships. *Am. J. Political Sci.* 27, 327–358.  
 Grant, Taylor, Lebo, Matthew J., 2016. Error correction methods with political time series. *Political Anal.* 24 (1), 3–30.  
 Green, Jane, Jennings, Will, 2012. The dynamics of issue competence and vote for parties in and out of power: An analysis of valence in Britain, 1979–1997. *Eur. J. Political Res.* 51 (4), 469–503.  
 Kavanagh, Dennis, 2022. Brexit and the 2019 general election. *French J. Br. Stud.* XXVII (2).  
 Keele, Luke, Linn, Suzanna, Webb, Clayton McLaughlin, 2016. Treating time with all due seriousness. *Political Anal.* 24 (1), 31–41.  
 Key, Jr., V.O., 1966. *The Responsible Electorate*. Harvard University Press, Cambridge.  
 Kraft, Patrick, Key, Ellen M., Lebo, Matthew J., 2022. Hypothesis testing with error correction models. *Political Sci. Res. Methods* 10 (4), 870–878.

- Lebo, Matthew J., Grant, Taylor, 2016. Equation balance and dynamic political modeling. *Political Anal.* 24 (1), 69–82.
- Lebo, Matthew J., Kraft, Patrick, 2017. The general error correction model in practice. *Res. Politics* 4 (2), 1–17.
- Lebo, Matthew J., Norpoth, Helmut, 2011. Yes, Prime Minister: The key to forecasting British elections. *Elect. Stud.* 30 (2), 258–263.
- Lebo, Matthew J., Norpoth, Helmut, 2013. Forecasting British elections: The ‘PM and the Pendulum’ model reconsidered. *J. Elect., Public Opin. Parties* 23 (1), 66–85.
- Lebo, Matthew J., Young, Everett, 2009. The comparative dynamics of party support in Great Britain: Conservatives, labour and the liberal democrats. *J. Elect., Public Opin. Parties* 19 (1), 73–103.
- Lewis-Beck, Michael S., Rice, Tom W., 1982. Presidential popularity and the presidential vote. *Public Opin. Q.* 46, 534–537.
- MacKuen, Michael B., Erikson, Robert S., Stimson, James A., 1992. Peasants or bankers: The American electorate and the U.S. economy. *Am. Political Sci. Rev.* 86, 597–611.
- Murray, Michael P., 1994. A drunk and her dog: An illustration of cointegration and error correction. *Amer. Statist.* 48 (1), 37–39.
- Norpoth, Helmut, 1992. *Confidence Regained: Economics, Mrs. Thatcher, and the British Voter*. University of Michigan Press.
- Norpoth, Helmut., 1996. Presidents and the prospective voter. *J. Politics* 58 (3), 776–792.
- Pickup, Mark, Kellstedt, Paul M., 2023. Balance as a pre-estimation test for time series analysis. *Political Anal.* 31 (2), 295–304.
- Sanders, David, Marsh, David, Ward, Hugh, 1993. The electoral impact of press coverage of the British economy, 1979–1987. *Br. J. Political Sci.* 23, 175–210.
- Stewart, Marianne C., Clarke, Harold D., 1992. The (un)importance of party leaders: Leader images and party choice in the 1987 British election. *J. Politics* 54, 447–470.
- Stock, James H., Watson, Mark W., 1993. A simple estimator of cointegrating vectors in higher order integrated systems. *Econometrica* 783–820.
- Webb, Clayton, Linn, Suzanna, Lebo, Matthew J., 2019. A bounds approach to inference using the long run multiplier. *Political Anal.* 27 (3), 281–301.
- Webb, Clayton, Linn, Suzanna, Lebo, Matthew J., 2020. Beyond the unit root question: Uncertainty and inference. *Am. J. Political Sci.* 64 (2), 275–292.