What's the Half-Life of the Economic Vote? (About a Year and a Half)*

Jack Bailey†

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Abstract

Economic voting research assumes that voters focus their attention on the recent past. Yet testing this assumption is difficult and previous research remains inconclusive. To estimate voters' economic time frames, I specify a new model that relies on insights from the physical sciences. I show that voter myopia is real and that the economic vote is strongest when economic time frames are shortest. After around a year and a half, its effect falls by half. After five years, it becomes practically equivalent to zero. This suggests that voters are less short-sighted than some past research suggests. Still, there is some cause for concern: voters' economic time frames remain short enough that governments are likely to receive undeserved leeway for mistakes they make early in their tenure.

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†Research Associate, Department of Politics, The University of Manchester, UK. If you have any comments or questions, feel free to contact me either by email (jack.bailey@manchester.ac.uk) or on Twitter (@PoliSciJack).

‡Click here for the most recent version of the paper and here for all associated replication materials.

Introduction

In 1992, MacKuen, Erikson, and Stimson argued that economic voting research had moved "little beyond introspection in understanding the processes by which citizens come to perceive economic movement" (MacKuen, Erikson, and Stimson 1992, 597). Three decades later, and we remain none the wiser. As in the early-1990s, economic voting scholars now believe that voters are both retrospective and myopic. They vote based on the difference between present and past conditions, though can only remember so far back in time. Yet — again as in the early-1990s — economic voting scholars still do not know just *how retrospective* or *how myopic* voters really are.

This matters because myopic voters are open to abuse. Two issues are most important. First, that voter myopia allows governments to do what they like early in their term, safe in the knowledge that voters will have forgotten by the next election. Clearly, this is bad for democratic accountability: it permits governments to pursue their own priorities and not those of their voters. Second, that myopic voters might not vote for the best economic *managers* but, instead, the best economic *manipulators*. When they control the levers of the state, parties can and do use their power to shape voters' preferences in their own favour (Dunleavy and Ward 1981). Voter myopia lets them do so strategically. They might, for example, pull out all the stops to make sure that the economy is booming come election time. And if this has negative consequences down the line, then so be it: voters will probably not remember next time anyway. As a result, myopic voters might expect the party to ensure strong economic growth, but be stuck with worse outcomes than if they voted for someone else.

Given these gaps in our understanding, most economic voting research makes do with as-hoc assumptions. And as different scholars make different assumptions, the time frames that they expect voters to use often vary from one project to the next. Consider the following examples. Some economic voting scholars assume that voters respond to economic change only in the year before an election (Bloom and Price 1975; Kramer 1971). Some, instead, that voters respond to the difference between the average economic growth in the first three quarters of the election year and the average of the entire previous year (Lewis-Beck, Martini, and Kiewiet 2013). But

this is not all. Further others assume that voters respond either to simple year-on-year (Palmer and Whitten 2011; Clarke, Stewart, and Zuk 1986; Goodhart and Bhansali 1970), quarter-on-quarter (Lanoue 1987), or even month-on-month (Lebo and Cassino 2007) changes in the state of the economy.

My intention is to put these assumptions to rest. I test voter myopia directly by estimating how voters' support for the incumbent party responds to economic change over different periods of time. In doing so, I rely on insights from the physical sciences. In particular, I borrow the concept of a "half-life" from pharmacology, biology, and nuclear physics. Like an hour, a minute, or a second, a half-life is a unit of time. But, unlike these familiar measures, it does not reflect a fixed interval. Rather, it reflects the average amount of time that it takes for some quantity to decay to half of its initial value. This is useful for scientists who want to estimate how long it takes for radioactive decay to reduce the mass of a block of uranium by half or for the body's various physiological processes to remove some drug from a patient's bloodstream. That is, to estimate the half-life of a *substance*. Here, instead, I use individual-level data from the British Election Study Continuous Monitoring Survey and aggregate-level economic indicators from the UK's Office for National Statistics to estimate the half-life of a *parameter*: the economic vote itself.

I show that voters are myopic: how they vote responds most closely to economic change in the recent past. As the time between the past and the present increases, the economic vote begins to fade away. After around a year and a half, it reaches its half-life. After five years, it decays to such an extent that it is all but equal to zero. As such, we should not expect voters to judge their governments based on the cumulative economic change across their time in office, even if that is what voters say they intend to do (Healy and Lenz 2014; Hibbs 2006). Instead, we should expect economic growth only over the final few years of a government's term to affect the choices that voters make, and with diminishing returns.

My results have two main implications. First, they suggest that voters are not quite as short-sighted as some past research would have us believe. They vote based not only on economic change at the time of the election, but on economic change further into the past too. Second, and nevertheless, voters myopia remains strong enough to provide governments with an effective

"get out of jail free" card. As I show, economic change over the past fives years has little to no effect on how people vote. Thus, governments stand to benefit from undeserved leeway for decisions that they make early in their tenure.

How Retrospective are Retrospective Voters?

It seems reasonable to expect voters to forget all sorts of details that political scientists think of as important. After all, voters often show little interest in politics (Zaller 1992; Campbell et al. 1960), no one has a perfect memory, and to forget the past appears to be a fundamental aspect of how humans process information (Ariely and Carmon 2000).

Presumably, this is even more true for complex topics like the economy. Not only are there no end of figures to remember, these figures also change value, are subject to revision, and relate to each other in all manner of different ways. To make matters morse, most people receive little to no formal education in economics. Thus, they must rely on folk theory and any information that they glean from the news or their day-to-day lives to make sense of what is going on. No wonder then that they seem not to know how the economy is really doing (Paldam and Nannestad 2000), or at least not without a little help (Ansolabehere, Meredith, and Snowberg 2013).

Consequently, it would seem very unusual to expect voters to retain far-reaching and detailed memories of the economy's every ebb and flow. But, though the economic voting literature now includes more than 600 articles and books (Lewis-Beck and Costa Lobo 2017), research on voter myopia remains limited. Most simply assume it away. The few pieces that do engage with it tend to do so in one of two ways: a voter-centric approach that relies on individual-level data and experimental methods or an electorate-centric approach that relies on aggregate-level time series data. Each approach has its own strengths and weaknesses, and comparing findings from one to the other can be difficult. Still, both tend to come to the same conclusion: that voters' economic time frames are short. Yet how short they really are remains an open question.

Voter-Centric Research

Stiers, Dassonneville, and Lewis-Beck (2019) provide a useful starting point as they are perhaps the only scholars who believe that voters are "attentive to the government's performance in the long run as well as the short" (p.647). Their argument hinges on voter psychology. They claim that proponents of voter myopia make the implicit assumption that voters engage in memory-based information processing. Here, voters store information (e.g. economic conditions) in memory until such time as it is needed (e.g. to form an economic perception). As they note, storing such information over a government's entire term is burdensome and perhaps beyond what we might expect of the average voter. Instead, they contend that voters rely on online processing and update their beliefs as though maintaining a running tally.

My own view is that it is unclear why information processing style should affect voter myopia. I make this point because retrospective voting under either memory-based or online processing requires exactly the same amount of information. A running tally is certainly more efficient than cataloguing events if one's intention is to maintain a belief about the *present* state of the economy. But that is not the task at hand for retrospective voters. As Fiorina (1981) argues, when deciding how to vote "citizens need only calculate *the changes* in their own welfare" (p.5, emphasis own). In effect, they must ask themselves the same question that Ronald Reagan posed during the campaign for the 1980 US Presidential election, "Are you better off than you were four years ago?". Note that this requires not one but two pieces of information: *present* and *past* conditions. Thus, voters must retain either two specific memories (if we assume memory-based processing) or instead two running tallies (if we assume online processing). As a result, both information processing styles appear equally demanding.

Stiers, Dassonneville, and Lewis-Beck (2019) test their argument by using panel data from the Netherlands and the US to model incumbent voting as a function of voters' current and past satisfaction with the government in one model and with the economy in another. Yet, again, these models do not reflect retrospective voting theory. To see why, consider the following simple retrospective voting model:

$$Vote_i \sim \text{Bernoulli}(\pi_i)$$

$$logit(\pi_i) = \alpha + \beta(C_0 - C_t)$$

Consistent with Fiorina (1981), this model holds that respondent i's voting intention, $Vote_i$, is a function of the difference between conditions now, C_0, and conditions at some point in the past, C_t[1]. This is because retrospective voting concerns *change*. Stiers, Dassonneville, and Lewis-Beck (2019), however, use a different model which takes the following form:

$$Vote_i \sim \text{Bernoulli}(\pi_i)$$

$$logit(\pi_i) = \alpha + \beta_1 C_0 + \beta_2 C_t$$

The components here are the same as before. Yet now past and present conditions (in this case either satisfaction with the government or the economy) each have their own effect on voters' support for the incumbent party. This is a problem. As C_0 and C_t each have an independent effect on whether respondent i votes for the incumbent, the model privileges the *level of* — rather than the *change in* — conditions. This is akin to assuming that voters decide how to vote based on either a weighted sum of past conditions or that their past beliefs continue to have some effect that does not operate through their current beliefs[2]. But as neither interpretation concerns change, the model has little to say about voter myopia.

The remaining voter-centric work on voter myopia relies on experimental methods and not observational data. Huber, Hill, and Lenz (2012), for example, note that psychological evidence

[1]Note that this is also the form that conventional economic voting models take. The only difference is that we measure $C_0 - C_t$ using the standard retrospective voting question ("How do you think the *general economic situation in this country* has changed over the *last 12 months*?") and not two separate items that measure voters' perceptions of economic conditions now and in the past.

[2]It is worth nothing that stable aspects of voters' personalities affect how they respond to these items (Conover, Feldman, and Knight 1987) and that many attitudinal items exhibit trait-like stability (Kiley and Vaisey 2020). Thus, we cannot rule out the possibility that both current and past items really tap into some stable latent trait and not distinct and independent evaluations of real material conditions.

suggests that people use a heuristic called the "peak-end rule" to keep track of their utility over time: they rate an experience based on either how it ended or how it was at its most intense (Ariely and Carmon 2000). They specify an experimental game to test this in a retrospective voting setting and vary when they make their subjects aware of the upcoming "election". They find that those subjects who became aware later tended also to overweight incumbent performance closer to the event. This, they argue, suggests that voter myopia arises due to fundamental limits in people's ability to make retrospective judgements and not only the complexity that they face in the real world.

Healy and Lenz (2014) conduct a similar study, again drawing on the peak-end rule. Their design is interesting as they allow their subjects to explain how they intend to weight the economy in each year of the incumbent's term before they conduct their experiment. Consistent with Hibbs (2006), their subjects say that they intend to judge the incumbent party based on the cumulative economic change over its entire term in office. But, just like Huber, Hill, and Lenz (2012), Healy and Lenz (2014) show that their subjects do not. Rather, they "substitute the end for the whole" and focus their attention on election year performance.

Electorate-Centric Research

Most electorate-centric research follows the precedent set by Hibbs (1987) and focusses not only on how myopic voters are but also the functional form that their myopia takes. Hibbs' approach is as follows. First, he assumes that voters' memories of the economy decay at some known exponential rate. Next, he takes past estimates of year-on-year real income growth, weights them according to his exponential function, and then uses them to predict incumbent vote share at past US presidential elections. This, he claims, shows that voters are myopic. Achen and Bartels (2016) come to a similar conclusion using Hibbs' approach but with a long time series. But they also show that an more limited model which assumes that voters respond only to economic growth in the two quarters before an election performs just as well.

Wlezien (2015) argues that these approaches are overly-conservative and that the extent to which we consider the electorate to be myopic depends on the functional form that we assume

their myopia to take. Rather than use an exponential weighting function like Hibbs, he uses a logistic one instead. Due to its shape, his logistic function is less conservative and allows voters some time to reflect on the recent past. Wlezien's results imply that voters are myopic, though less so than often thought: they do not respond to economic growth at the very start of the incumbent's term, but they do respond to it over at least the past few years.

These conclusions satisfy the assumptions that their authors make about how voter myopia works. Though this is perhaps unsurprising, it is problematic. Consider the equation below, which characterises this approach:

$$Vote_i \sim \text{Normal}(\mu_i, \sigma)$$
$$\mu_i = \alpha + \sum_{q=1}^{Q} \beta w_q (GDP_q - GDP_{q-4})$$

Here, the incumbent party's vote share at election i, $Vote_i$, is equal to some constant, α, plus the sum of the product of year-on-year change in GDP growth in quarter q, $GDP_q - GDP_{q-4}$, the weight associated with that figure according to the chosen weighting function, w_q, and the economic voting effect, β.

This approach requires two ad-hoc assumptions. The first and most obvious is the assumption that voter myopia takes some known form, whether exponential or otherwise. But to do so reliably requires some prior knowledge of how myopic voters are. Of course, if this were possible then there would be no need to research it in the first place. The second is that these models assume that voters in the present should care about economic growth over the past year, but also, for example, between two years ago and one year ago or between 6 months ago and 18 months ago. For the same reasons that I point out above, this does not reflect how retrospective voting theory really works. If they engage in retrospective voting, voters should not care about lagged year-on-year economic growth, but instead the difference between economic conditions *now* and at different points in the past.

Towards a Hybrid Approach

I have hoped to show that much uncertainty remains in what we understand about voter myopia. Ultimately, this is because estimating voters' retrospective economic time frames is difficult. Voter-centric approaches have had to deal with items that suffer from known biases (Conover, Feldman, and Knight 1987) and experimental methods that may not generalise outside of the survey context (Barabas and Jerit 2010). Likewise, electorate-centric approaches have had to make ad-hoc assumptions about how voters forget and have often suffered with problems of ecological inference (Stewart and Clarke 2017).

The most sensible way forward would seem to be to combine the strengths of each approach. To avoid problems of ecological inference, we can draw on individual-level voting intention data. Likewise, to avoid problems of systematic perceptual bias, we can draw on aggregate-level economic statistics. Such a hybrid approach is rare in the economic voting literature (though see Reidy, Suiter, and Breen 2017). The reason is that it is hard to find individual-level data sets that span a long enough period of time to include a sufficient amount of aggregate-level economic variation. But where this data exists, it offers the possibility of estimating voters' retrospective time frames in a way that avoids many prevailing difficulties.

Data

My individual-level voting intention data come from the British Election Study Continuous Monitoring Survey (CMS). The CMS comprises a series of monthly political surveys that took place in Great Britain between April 2004 and February 2014. The polling company YouGov collected the data as a series of monthly repeated cross-sections. In total, 132,369 people took part in the CMS. To ensure that the data were representative, YouGov also weighted each respondent according to both their past voting behaviour and their socio-demographic characteristics (Twyman 2008).

My aggregate-level economic data come from the UK's Office for National Statistics (ONS). The ONS is the UK's national statistics body and is charged with producing and reporting a

range of economic statistics including GDP, the rate of unemployment, and the level of inflation. In most cases, it does so on a quarterly basis, though many popular indicators are available on a monthly basis too. The economic voting literature most often uses GDP as its indicator of choice. Indeed, some even call it "the most general objective measure of economic welfare" (Kayser and Wlezien 2011, 376). Thus, I follow suit and use the ONS' time series of monthly UK GDP. As may individual-level data covers a period of over one hundred months, this indicator showed much variation. With GDP in July 2016 indexed to 100, the economy grew from a GDP of 82.8442 in April 2004 to a GDP of 94.9459 in February 2014. But growth was not always positive. The economy also experienced some backsliding between 2008 and 2009 due to the impact of the global financial crisis.

Methods

Economic voting research that uses aggregate-level economic statistics faces a major constraint: the release schedule of the statistical agencies behind them. In most cases, these agencies release new data on a quarter-by-quarter, or even year-by-year, basis. This is of little use for research questions that concern much more granular time periods, as is true in the present case.

I circumvent this problem using a two-stage approach. In the first stage, I produce a time series of daily GDP estimates for the UK from 1 January 1997 to 1 December 2019. In the second stage, I link each of the individual respondents in the CMS to a random date up to five years before the day on which they took their survey, then calculate GDP growth between these two time points. I then fit a model to these linked data that estimates both the economic vote and voter myopia at the same time.

Stage 1: Estimating Daily GDP

Figure 1 illustrates how I estimate daily UK GDP. Each point in the left-most panel represents a single estimate from the ONS' monthly time series of UK GDP. These begin in January 1997, end in December 2019, and are indexed such that July 2016 equals 100. As we can see, and as I mentioned above, UK GDP showed almost continuous growth over this period. Note, however,

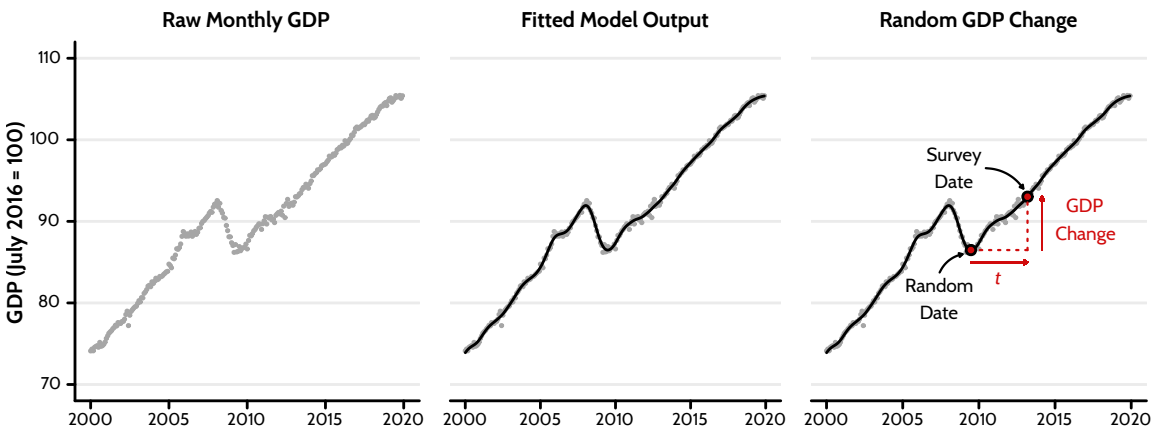

Figure 1: To estimate daily GDP, I fit a spline to monthly GDP data from the ONS. I then assign each case to a random date up to 5 years before and calculate GDP change between the two dates.

that the global financial crisis knocked this growth off course, with the economy receding by around 5 points before it started to grow again.

The centre-most panel shows the same estimates of UK GDP, though a curve now runs through them. To compute it, I fit a penalised cubic regression spline with 100 knots to the raw ONS time series data. As the centre-most panel makes clear, the model fits well and does not show any great deviation from the path that the data suggest. Given this, it would seem reasonable to assume that any estimates that the model produces for the time periods between each month should also reflect historic levels of UK GDP.

The right-most panel shows how I put these estimates to use. All respondents took their survey on some date between 8 April 2004 and 2 February 2014. Imagine, for example, a respondent who took their survey in March 2013. I allocate this respondent to a random date up to five years before the date on which they completed their survey. I then calculate the time that has passed between the two points. Next, I use the model to estimate UK GDP on each of these two days, and then compute UK GDP growth between the two dates in percentage terms.

Stage 2: Estimating Voters' Economic Time Frames

To specify a model that estimates both the economic vote and voter myopia requires some flexibility. This is difficult using conventional Frequentist methods. To account for this, I specify my model using Bayesian methods instead. As the resulting model is quite complex, the

most straightforward way to explain it is to start with a simpler, more familiar, model and then build up each new element step-by-step. To this end, consider the retrospective voting model that I discussed above:

$$Vote_i \sim \text{Bernoulli}(\pi_i) \quad \text{Likelihood function}$$

$$logit(\pi_i) = \alpha + \beta(C_0 - C_t) \quad \text{Linear model on } \pi_i$$

As a reminder, the object of retrospection is some abstract condition, C, which is thought to predict voter i's willingness to vote for the incumbent party, $Vote_i$. The dependent variable can take one of two values. Where voter i said that they would vote for the incumbent party, it takes the value 1. Otherwise, it takes the value 0[3]. The first step in building the model is to replace this abstract condition with a more meaningful one: change in the state of the economy. As I mentioned in the previous section, my measure of economic change is the percentage change in GDP between the date that each respondent took their survey and the random date to which I assigned them. As the CMS data were collected on a monthly basis, there is likely some survey-specific variation to account for. To this end, I also include an adaptive prior on the intercept, α, that allows it to vary from month to month:

$$Vote_i \sim \text{Bernoulli}(\pi_i) \quad \text{Likelihood function}$$

$$logit(\pi_i) = \alpha_{\text{wave}[i]} + \beta(\frac{\widehat{GDP}_0 - \widehat{GDP}_t}{\widehat{GDP}_t} \times 100) \quad \text{Linear model on } \pi_i$$

$$\alpha_{\text{wave}} \sim \text{Normal}(\overline{\alpha}, \sigma_\alpha) \quad \text{Adaptive prior on varying intercepts}$$

$$\overline{\alpha} \sim \text{Normal}(0, 1.5) \quad \text{Prior on grand mean of intercepts}$$

$$\sigma_\alpha \sim \text{Exponential}(5) \quad \text{Prior on standard deviation of intercepts}$$

[3]As my data cover the transition from the 1997-2010 Labour government to the 2010-2015 Coalition government, the incumbent party changes. Where the data were collected before 11 May 2010, when David Cameron became Prime Minister, the incumbent is the Labour Party. After, it is the Conservative Party or the Liberal Democrats, the two parties that went on to form the Coalition.

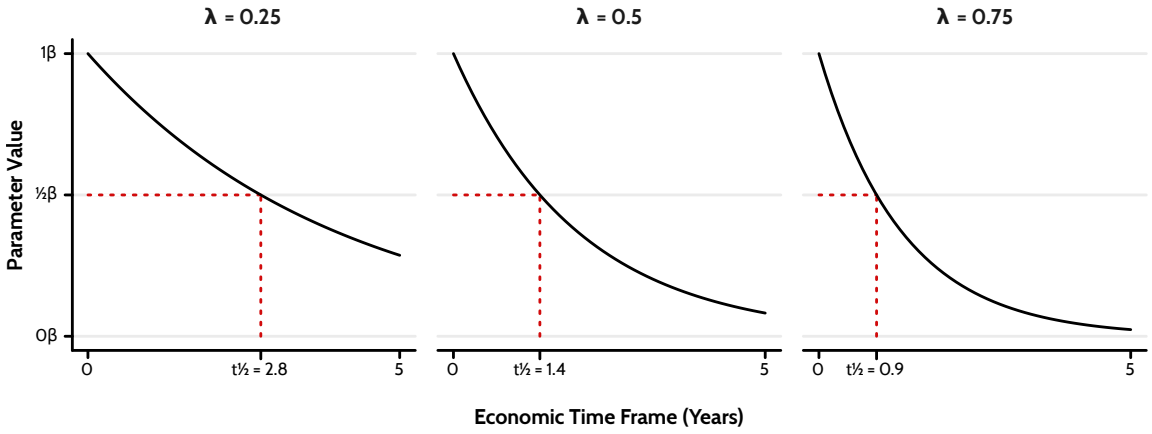

Figure 2: The decay constant and half-life are related. When the former increases, the latter decreases. This is because their relationship is deterministic. More specifically, t½ = log(2)/λ.

Note that the economic voting effect, β, is currently fixed for all values of t. Whether I link a respondent to GDP change over the past five years or the past five days, the estimate remains fixed. This makes little sense if voters are myopic. Instead, the economic voting effect should vary as a function of t. In particular, it should decay as t increases to reflect the fact that people are more likely to forget events that took place a longer time ago.

One way to conceive of voter myopia is as a process of exponential decay[4]. Where a quantity undergoes exponential decay, it begins at some initial value then diminishes quickly before levelling out as it approaches zero. Such processes are common in the physical sciences. Consider, for example, the radioactive decay of chemical elements like plutonium or how long a dosage of some drug spends inside a person's body. I draw on these insights and model voter myopia using the following equation (Rösch 2014):

$$N(t) = N_0 e^{-\lambda t}$$

Here, $N(t)$ represents the quantity of some substance N at time t. When $t = 0$, the equation simplifies such that $N(t) = N_0$, the substance's initial quantity. As time passes, the substance decays subject to its "decay constant", λ. The larger the decay constant, the faster the substance

[4]This is similar to Hibbs' (1987) approach. Note, however, that unlike Hibbs, I do not fix the degree of exponential decay a-priori. Instead, I estimate it from the data.

decays. The amount of time that it takes for the substance to decay by half is known as its "half-life", $t_{1/2}$. Note also that the decay constant, λ, and the half-life, $t_{1/2}$, share a deterministic relationship. As such, it is relatively easy to use one to compute the other:

$$t_{1/2} = \frac{log(2)}{\lambda}$$

Of course, in this case, the quantity of interest is not a substance. Instead, it is a parameter: the economic voting effect. Given this, substituting N for the economic voting effect, β, would allow the model to estimate the economic vote while also allowing its effect to vary according to the time interval t:

$$\beta_t = \beta_0 e^{-\lambda t}$$

At this point it is worth pausing for a moment and considering how the decay constant and the half-life parameter relate to one another in greater detail. Figure 2 shows how changes in the former affect changes in the latter. Moving from the left-most to the right-most panel, the value that the decay constant takes increases from 0.25, to 0.5, to 0.75. As it does so, two things happen. First, the economic voting effect decays more quickly. Second, the value of the half-life parameter, $t_{1/2}$, decreases to account for this increased rate of decay.

Figure 3 uses simulated data to show how this decay process affects the probability that a voter will vote for the incumbent across different economic time frames. In the left-most panel, the time interval between the date that the respondent answered their survey and their random reference date is set to zero. In effect, the voter evaluates the state of the economy in the immediate present where the economic vote has undergone no exponential decay and remains at its initial value. In this scenario, there is a strong economic voting effect: as GDP change increases, voters become more likely to vote for the incumbent party. This is true also in the centre-most and right-most panels, though, in both cases, the economic voting effect diminishes

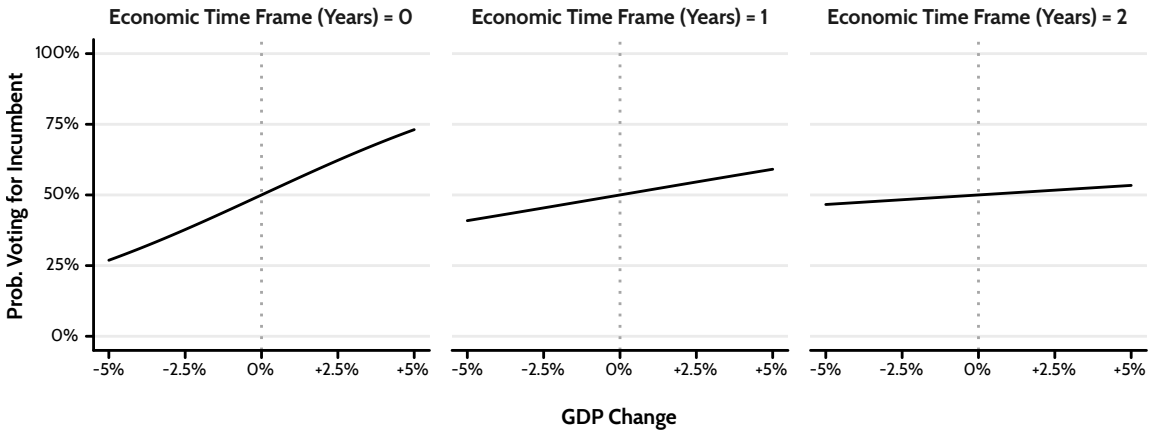

Figure 3: The slope is related to the time interval that voters use. As the interval increases, the slope decays. In this example, the slope at time 0 is held at 0.2 and the decay constant is held at 1.

due to voter myopia. In the centre-most panel, where the economic time frame stretches to one year, some effect persists, though it is now more modest than it was when the time interval was equal to zero. In the right-most panel, where the economic time frame stretches further to two years, the economic vote has decayed to such an extent that it is only just distinct from zero.

Substituting this exponential decay model into the retrospective voting model above gives the final model that I fit to my data. Note that I also include a set of covariates, x, that account for any macro-level factors that might confound my estimates. These variables are dummy indicators that account for the three Prime Ministers that the country had in this period; continuous variables to account for both the passage of time and each Prime Minister's time in office, thereby controlling for spurious time correlations (Woolridge 2012); and the interaction between each leader and their time in office to account for the costs of governing. Finally, as this is a Bayesian model, I must also include a prior distribution for each parameter. In all cases, I use conservative and weakly informative priors that gently regularise my estimates towards zero. Taken together, I specify the model that I fit to my data as follows:

$$Vote_i \sim \text{Bernoulli}(\pi_i) \quad \text{Likelihood function}$$

$$logit(\pi_i) = \alpha_{\text{wave}[i]} + \beta_t(\frac{\widehat{GDP}_0 - \widehat{GDP}_t}{\widehat{GDP}_t} \times 100) + \sum_{j=1}^{6} \delta_j x_{ji} \quad \text{Linear model on } \pi_i$$

$$\beta_t = \beta_0 e^{-\lambda t} \quad \text{Exponential decay model on } \beta_t$$

$$\alpha_j \sim \text{Normal}(\overline{\alpha}, \sigma_\alpha) \text{ for } j \text{ in } 1..114 \quad \text{Adaptive prior on varying intercepts}$$

$$\overline{\alpha} \sim \text{Normal}(0, 1.5) \quad \text{Prior on grand mean of intercepts}$$

$$\sigma_\alpha \sim \text{Exponential}(5) \quad \text{Prior on standard deviation of intercepts}$$

$$\beta_0 \sim \text{Normal}(0, 0.5) \quad \text{Prior on } \beta \text{ where } t = 0$$

$$\delta_j \sim \text{Normal}(0, 0.5) \text{ for } j \text{ in } 1..6 \quad \text{Prior on } \delta \text{ parameters}$$

$$\lambda \sim \text{Normal}(0, 0.5) \quad \text{Prior on the decay constant, } \lambda$$

Results

Table 1 shows the resulting parameter estimates from the fitted model[5]. In all cases, the model's parameters show relationships consistent with economic voting theory and voter myopia.

Contrary to the strong effects often found in individual-level economic voting research, I find only weak evidence of any economic voting effect (0.02, 95% CI: 0.00 to 0.04). Note that this is not due to how I specify my model or having estimated daily UK GDP. As I show in my appendix, a more conventional economic voting model using the raw ONS data and assuming a 12 month economic time frame comes to much the same conclusion (see table A1). Instead, these smaller effect sizes likely reflect the fact that, unlike subjective economic perception items, voters' own personal characteristics do not confound the effect that GDP data have on their willingness to vote for the incumbent party. Thus, there is little endogeneity to inflate them.

As past research on voter myopia would have us expect, the decay constant that controls the rate of decay in the economic vote is positive (0.44, 95% CI: 0.15 to 0.82). As I discuss above,

[5]The model converged well and showed no pathological behaviour: the number of effective samples was high in all cases, there were no divergent transitions, no iterations saturated the maximum treedepth, and $\widehat{R}$ statistics for all parameters equalled 1.

Table 1: Parameter estimates from the half-life model predicting incumbent voting intention. Data come from the BES Continuous Monitoring Survey, 2004–2014.

	Median	Error	2.5%	97.5%
Intercept	−0.60	0.23	−1.03	−0.16
GDP (t = 0)	0.02	0.01	0.00	0.04
Decay Constant	0.44	0.17	0.15	0.82
Years Passed	−0.01	0.04	−0.08	0.06
Time in Office	−0.06	0.03	−0.12	0.00
Gordon Brown (vs. Tony Blair)	−0.44	0.31	−1.04	0.16
David Cameron (vs. Tony Blair)	0.30	0.39	−0.44	1.06
Gordon Brown × Time	−0.06	0.04	−0.15	0.02
David Cameron × Time	−0.13	0.03	−0.20	−0.07
N (Individuals)				130, 145
N (Survey)				112

there is a simple transformation that converts between this and the half-life parameter. Doing so reveals that the economic vote has a half-life of 1.58 years (95% CI: 0.82 to 4.28), or about a year and a half[6]. In simpler terms, this implies that the economic vote is half as strong where voters compare the state of the economy now to the state of the economy 1.58 years ago than where they consider only the state of the economy in the immediate present[7].

As it can be hard to work out what these parameters really mean, figure 4 shows how the economic voting effect decays as voters' economic time frames increase. Where the time interval is equal to zero, the economic vote has the same effect as shown in table 1. As the time interval increases, the economic voting effect recedes, before it eventually diminishes to zero as it approaches the five year mark.

Note that as the economic voting effect diminishes, the uncertainty interval around its true value actually *decreases*. This might seem unusual: why should the model be any more certain about the effect of GDP growth over five years than, say, over one year or even over one month? To understand why, reflect on the nature of exponential decay. As I lay out above, any quantity

[6] I compute this figure by transforming the entire posterior distribution of the decay constant, λ, before taking its median and not simply transforming the point estimate shown in table 1. As such, there may be a small discrepancy between the values that one arrives at using these two approaches.

[7] To ensure that this estimate is robust, I also fit a model where I link *all* respondents to GDP change over the past 1.58 years, i.e. at the expected half-life. Consistent with my main model, this produces an economic voting effect of 0.01 (95% CI: -0.01 to 0.03), or half the initial economic voting effect shown in table 1, as we would expect (see table A2)

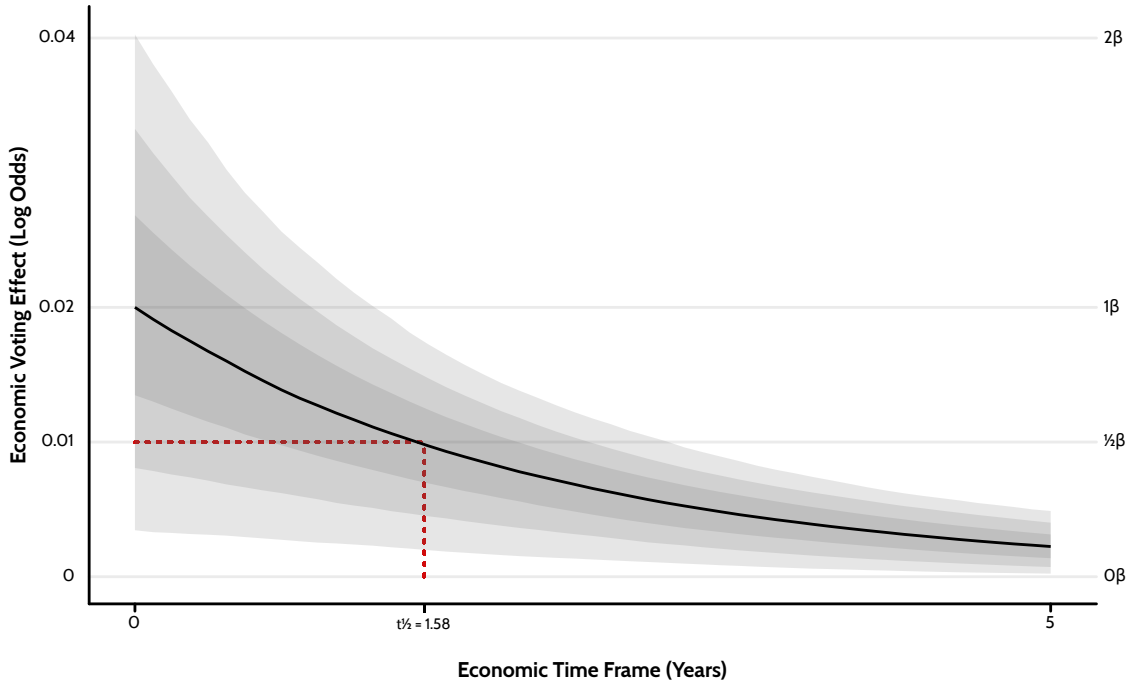

Figure 4: The economic vote diminishes as the time interval between the survey and reference date increases. At a time interval of 1.58 years, the economic voting effect decays to half of its initial value. Here light, medium, and dark areas reflect 95%, 80%, and 50% credible intervals, respectively.

that undergoes this process will eventually decay to such a small value that it is, for all intents and purposes, equal to zero. This is an informative constraint: it implies that we know that the larger the time interval, the more certain we should be that the economic vote equals zero. Thus, the uncertainty interval grows narrower to reflect this.

Figure 5 shows how voter myopia conditions voters' willingness to support the incumbent party at three different time intervals. The left-most panel shows how voters' probability of supporting the incumbent changes where they consider the state of the economy in the immediate present. The effect is reasonable in size, if uncertain: voters appear a few percentage points more likely to support the incumbent where the economy is growing than where it is not. Their level of support then appears to diminish as their retrospective time frames increase in the centre- and right-most panels. Indeed, where voters compare the state of the economy now to the state of the economy five years hence, it appears to have no practical effect on their probability of voting for the incumbent party[8].

[8]It is worth also noting that the economic time frame that voters use and the level of economic growth will have a strong positive correlation. After all, the economy almost always grows over time. Still, as the coronavirus pandemic

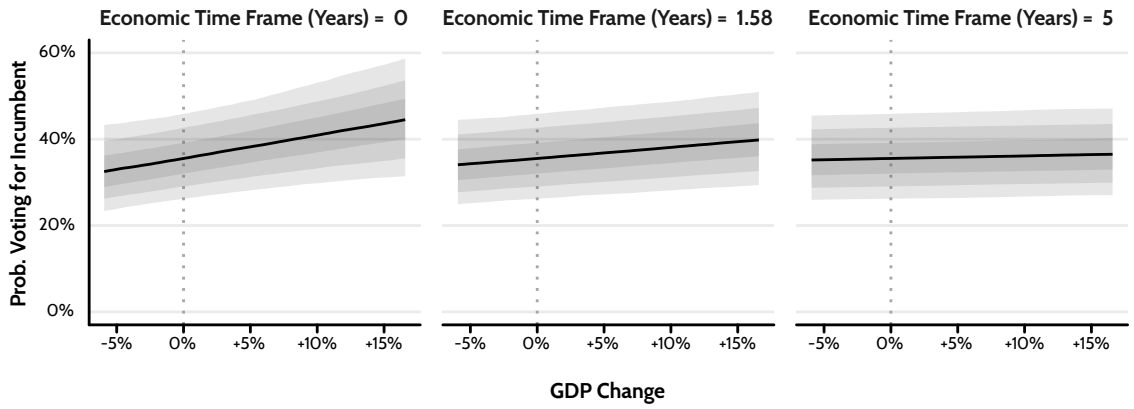

Figure 5: At t = 0, the economic vote shifts the probability of voting for the incumbent by a few percentage points. After 1.58 years, this effect lessens. And after 5 years, it is practically-equivalent to zero. Again, light, medium, and dark areas reflect 95%, 80%, and 50% credible intervals.

Discussion and Conclusion

Voter myopia is real. When it comes to the economy, voters respond most strongly to how things are *right now*. But, as Wlezien (2015) argues, this does not mean that they are as short-sighted as past research would suggest. My results show that voters do not have economic times frames that span only the election year (Healy and Lenz 2014) or even just the past few months (Achen and Bartels 2016). But neither do they imply that the past economy has some abiding effect on which party voters choose to support (Stiers, Dassonneville, and Lewis-Beck 2019). Rather, voters respond to economic change over the past few years, though with diminishing effect.

In one respect, that voter myopia is less severe than we might have thought is reassuring. Put simply, it means that governments must contend with the consequences of more of their actions. Some suggest that this myopia might reflect a rational decision on the part of the electorate (Achen and Bartels 2016; Wlezien 2015): it makes sense to ignore the first view years of economic change if decisions that the incumbent's predecessor made continue to reverberate through the system. I am not so sure. Roughly half of my data cover a period of time when the government had been in power for almost a decade. Yet it stills suggests that voters are myopic. Instead, like Huber, Hill, and Lenz (2012), I suspect that this myopia arises due to fundamental limits in

demonstrates, it is perfectly possible for a country to experience double-digit negative growth in only a very short period of time. That Irish GDP grew 26% in a single year (OECD 2016; Halpin 2016) shows that the opposite case is also possible, if rare.

human cognition. Accordingly, I expect that it is simply a happy accident that voters remember more than we might have given them credit for in the past.

Even so, that voters are myopic at all suggests that the two issues I raised in my introduction remain a problem. First, voters use economic time frames that are short enough to ensure that "myopic policies for myopic voters" (Tufte 1978, 143) remain a real concern. One way to combat this and to disincentivise government malfeasance might be to look to countries like Australia and New Zealand which have term lengths of only three years. After all, it is much easy to hold your government to account if you also have to evaluate less information when it comes time to vote. Second, as voters respond most strongly to recent economic change, strong economic manipulators might still outperform strong economic managers. To prevent this, we might begin to consider policies or campaigns that inform the public about the cumulative change that they say they consider most important in shaping how they vote (Healy and Lenz 2014).

Though these implications may be worrisome, it is worth noting that longer-term economic change might still influence voters through other means. As Fieldhouse et al. (2020) argue, economic downturns can have long and lasting consequences beyond the direct effect that they have on jobs and living standards: they can affect how competent voters consider the incumbent party to be. Arguably, the UK Labour Party still suffers from a lack of economic competence in 2020, more than a decade since the global financial crisis first began. Another possibility is that the small economic voting effects that I find here indicate only that voters respond to some other economic indicator. One obvious alternative is those topics made salient in the media that they consume (Garz and Martin 2020; B. B. Park 2019; Soroka, Stecula, and Wlezien 2015).

There are many opportunities to extend my analysis. Though I expect my findings to generalise to other contexts, one extension would be to replicate them in other countries and at other points in time. Given the shear amount of data that now exists on elections and voting, one possibility might be to compile many data sets, whether within a single country or, instead, a comparative setting and fit my model to them. Another possible extension would be to engage with the literature on the apparent grievance asymmetry in economic voting (J. Y. Park 2019; Soroka 2006; Bloom and Price 1975). Given the serious ramifications that economic

downturns can have for voters' material well-being, it seems reasonable to expect their memories of bad times to outlast those of good ones. Allowing the decay constant, $lambda$, and the initial economic voting effect, β_0 to vary, say, pre- and post-crash would test for this. Finally, we might expect voters' economic time frames to differ according to their own personal characteristics. Though some voters do not pay attention to politics, some do. As such, more attentive voters might also be less myopic. Again, allowing the parameters to vary over these characteristics would allow one to test this hypothesis. In doing so, we might finally come to understand how voter myopia shapes democratic countries and the governments that they elect.

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Table A1: Parameter estimates from my conventional economic voting model. Here, year-on-year GDP change data come from the ONS' monthly time series of UK GDP and individual-level voting intention data come from the BES Continuous Monitoring Survey, 2004–2014.

	Median	Error	2.5%	97.5%
Intercept	−0.64	0.23	−1.09	−0.19
Year-on-Year GDP Change	0.02	0.01	0.00	0.03
Years Passed	−0.01	0.04	−0.08	0.06
Time in Office	−0.05	0.03	−0.11	0.01
Gordon Brown (vs. Tony Blair)	−0.41	0.31	−1.01	0.21
David Cameron (vs. Tony Blair)	0.32	0.40	−0.45	1.07
Gordon Brown × Time	−0.05	0.05	−0.13	0.04
David Cameron × Time	−0.13	0.03	−0.19	−0.06
N (Individuals)				130, 145
N (Survey)				112

Table A2: Parameter estimates from my economic voting model where all respondents are linked to GDP growth over the past 1.58 years. This is equal to the half-life parameter than I estimate with my main model. Data come from the BES Continuous Monitoring Survey, 2004–2014.

	Median	Error	2.5%	97.5%
Intercept	−0.62	0.23	−1.08	−0.17
GDP Change (t = 1.58)	0.01	0.01	−0.01	0.03
Years Passed	−0.01	0.04	−0.08	0.06
Time in Office	−0.05	0.03	−0.11	0.01
Gordon Brown (vs. Tony Blair)	−0.43	0.31	−1.01	0.18
David Cameron (vs. Tony Blair)	0.31	0.39	−0.45	1.07
Gordon Brown × Time	−0.05	0.06	−0.16	0.06
David Cameron × Time	−0.13	0.04	−0.20	−0.06
N (Individuals)				130, 145
N (Survey)				112