OXFORD BULLETIN OF ECONOMICS AND STATISTICS, 71, 2 (2009) 0305-9049
doi: 10.1111/j.1468-0084.2008.00545.x

Does the World Economy Swing National Elections?*

Andrew Leigh

Research School of Social Sciences, Australian National University, HC Coombs Building, ANU, Canberra, ACT 0200, Australia (e-mail: andrew.leigh@anu.edu.au)

Abstract

Do voters reward national leaders who are more competent economic managers, or merely those who happen to be in power when the world economy booms? Using data from 268 democratic elections held between 1978 and 1999, I compare the effect of world growth (luck) and national growth relative to world growth (competence). Both matter, but the effect of luck is larger than the effect of competence. Voters are more likely to reward competence in countries that are richer and better educated; and there is some suggestive evidence that media penetration rates affect the returns to luck and competence.

I. Introduction

Are national leaders more likely to be re-elected when the world economy booms? Or do voters benchmark their country's economic performance against other nations? This paper provides new evidence on whether voters behave according to a purely rational model by considering the impact of an exogenous factor – the state of the world economy – on the outcomes of 268 national elections taking place in the last quarter of the twentieth century.

That the economy affects elections has been amply demonstrated, including in the United States House of Representatives (Stigler, 1973; Jacobson and Kernell, 1983; Lewis-Beck and Rice, 1984), the United States Presidential race (Hibbs, 1982;

*Thanks are due to Geoffrey Brennan, Magnus Feldmann, Seema Jayachandran, Dale Jorgenson, Warwick McKibbin, John Quiggin, Susanne Schmidt, Gilles Serra, Martin West, two anonymous referees and Associate Editor Jonathan Temple for feedback on earlier drafts. I am particularly indebted to Christopher Jencks and Justin Wolfers for valuable discussions.

JEL Classification numbers: D72, D80, O40.

Markus, 1988; Fair, 2002), Canada (Nadeau and Blais, 1993) and Australia (Jackman and Marks, 1994; Cameron and Crosby, 2000; Wolfers and Leigh, 2002; Leigh and Wolfers, 2006). Other studies have looked at Organization for Economic Co-operation and Development (OECD) countries (Alesina, Roubini and Cohen, 1999), Latin American nations (Remmer, 1991) and groups of developing countries (Pacek and Radcliff, 1995; Schuknecht, 1996). However, this literature has principally focused on political business cycles and election forecasting, rather than on separating the effect of the world economy from the effect of national economic performance.[1]

According to rational voting models, voters should make their decisions based purely on politicians' competence, and not on factors outside their control.[2] However, studies since that of Downs (1957) argue that voters will be 'rationally ignorant', as there is virtually no chance that their vote will influence the outcome (see also Brennan and Lomasky, 1993; Mulligan and Hunter, 2003). Another way of viewing the problem is that cognitive resources are scarce (Gabaix and Laibson, 2005; Gabaix *et al.*, 2006), and individuals therefore choose to economize on decision time by using rules of thumb to decide how to vote.

In the context of United States gubernatorial elections, Wolfers (2007) shows that a model of quasi-rationality may be more appropriate. Analysing whether voters parse out the effect of the national economy, he finds that while voters make some attempt to evaluate their state's economy relative to the national economy, those in pro-cyclical states are consistently fooled into re-electing incumbents during national booms, and dumping them during national recessions.[3]

Here, I shift the analysis up one level – exploring whether voters in national elections attempt to evaluate their country's economic performance relative to the world economy. So far as I am aware, this is the first paper to look at the effect of world growth on national election outcomes.

Figure 1 charts annual growth in real per capita GDP against the fraction of democratic elections in which the party of the incumbent national leader is re-elected (excluding the US and Japan). There appears to be a positive relationship between the two, with both re-election rates and growth notably rising in 1978, 1988 and 1999. This suggests that voters may not be consistently separating the

[1]When estimating political business cycle models across OECD countries, Alesina *et al.* (1999) control for the world business cycle in some of their specifications, but they do not focus upon the effect of world growth on national elections.

[2]For example, Alesina *et al.* (1999, p. 253) state that: 'Although important work in macro-political economics predates the rational expectations revolution in macroeconomics, a new literature emerged as a result of developments in the rational theory of economic policy. This literature emphasizes the constraints that the assumption of individual rationality imposes on the ability of policy-makers to systematically, predictably, and permanently influence the state of the economy along an inflation-unemployment trade-off; and policymakers' ability to systematically fool the electorate'. For evidence that politicians can affect the macroeconomy, see also Alesina and Rosenthal (1995) and Snowberg, Wolfers and Zitzewitz (2007).

[3]Ebeid and Rodden (2006) look at a narrower subset of years than Wolfers (2007), and find that the relative performance of the state economy matters more for voters in non-agricultural states. See also Leigh and McLeish (2009), who find similar results using data from Australian state elections.

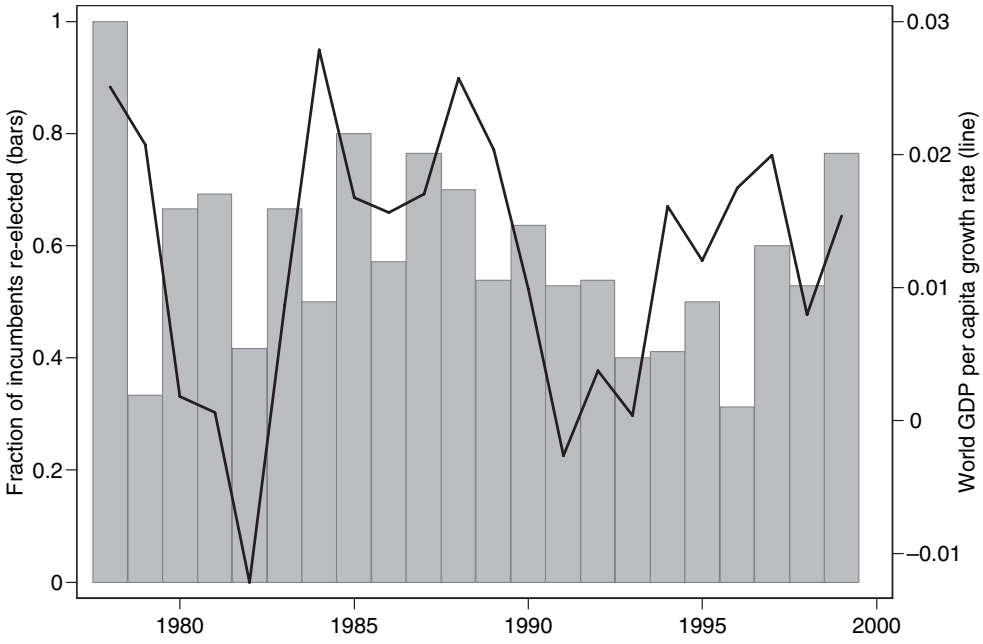

Figure 1. World growth and national elections

effects of the world economy from their national economic performance, as the rational voter model predicts.

To preview the regression results, I find that voters in national elections are more likely to re-elect incumbents when the world economy booms. Indeed, world economic growth (luck) has a greater effect on incumbents' re-election chances than the amount by which national economic growth exceeds world growth (competence). In countries which have a richer or better educated population, voters are more likely to reward competence. Media penetration rates also seem to affect the returns to luck and competence.

The remainder of this paper is organized as follows. Section II outlines the data sources and variables of interest. Section III looks at the effect of the world and national economy on election outcomes. Section IV explores whether voters' ability to parse out luck from competence differs systematically according to a country's level of development, governance or media penetration. The final section concludes.

II. Data

Each of the specifications presented in this paper uses as the dependent variable whether the party of the country's 'chief executive' (generally, the President or Prime Minister) is re-elected. Elections that are marred by fraud are excluded, as are elections taking place in the world's two largest economies – the United States (which accounts for 32% of world GDP) and Japan (14% of world GDP). For these two nations, world

growth is not necessarily exogenous (the next largest economy, Germany, has only 6% of the world GDP).[4]

Political data are taken from the World Bank's Database of Political Institutions, which codes the party of the chief executive for the years 1975–2000. Because the key independent variable is growth since the last election, the first election for each country is excluded. In addition, because I code re-election based on the party of the chief executive in the year following the election, the last year of the sample is excluded. Finally, I drop countries in which national leaders are never ousted, or in which they are always ousted. This leaves a sample of 58 countries and 268 elections, held between 1978 and 1999. These countries and elections are listed in Appendix A. The average term length is 3.4 years.

The two main independent variables are constructed from the average annual growth in world real GDP per capita since the last election and that country's average annual growth in real GDP per capita (both from World Development Indicators 2004).[5] Using OECD growth in place of world growth makes no substantive difference to the results (over the period 1975–2000, the correlation between world growth and OECD growth is 0.96).

Growth in real GDP per capita is used in preference to inflation or unemployment for three reasons. First, accurate measures of growth are more readily available for a large panel of countries than unemployment or inflation. Secondly, growth fluctuates more over short periods than either of the other two variables. Thirdly, growth is a clearly measurable summary of changes in 'the average state of material well-being or prosperity in the electorate' (Goodman and Kramer, 1975, p. 1260).

In section IV, I test whether the returns to luck and competence vary systematically according to a country's level of development, governance and media penetration. The level of development is proxied with the level of GDP per capita, and a measure of education, this being the average number of years of schooling of the population aged 15 years and over, from Barro and Lee (2000). To test theories relating to governance, I include a measure of the quality of the democracy, this being a Polity IV-2004 regime score that ranges from +10 (full democracy) to −10 (full autocracy), and a measure of the regime's stability, this being the number of years since the last substantive change in authority characteristics (defined as a three-point change in the Polity score). More details on these two measures may be found in Marshall and

[4]Because other countries are affected by the world's largest economies, it is not possible to circumvent this problem by creating, for the United States and Japan, a measure of world GDP that excludes their output.

[5]Specifically, I use the variable in the World Development Indicators data set with the name NY.GDP.PCAP.KD.ZG. This is the annual percentage growth rate of GDP per capita based on constant local currency, with population estimated at midyear. World GDP is measured in constant US dollars, converted from local currency units using the DEC alternative conversion factor, which in most cases is the official exchange rate. This is then divided by world population to derive an estimate of world real GDP growth per capita. For each country, world growth is defined to exclude that country's own contribution to world growth, though these contributions are trivial in most cases. For each country–year observation in the sample, I calculate the country's share of world GDP. The mean share of world GDP is 0.9%, and the median share of world GDP is 0.2%.

TABLE 1

Summary statistics (N = 268)

	Mean	*SD*
Averaged over election term		
Whether party of national leader is re-elected	0.571	0.496
Growth in national real GDP per capita (%)	1.412	3.556
Growth in world real GDP per capita (%)	1.116	0.953
Averaged over 1975–2000		
National log real GDP per capita	8.365	1.521
Mean years of schooling of the population aged 15 or over	6.757	2.616
Polity IV regime score (+10 is full democracy, −10 is full autocracy)	5.854	4.945
Number of years since the last substantive change in authority characteristics (defined as a three-point change in the polity score)	32.461	28.039
General government final consumption expenditure as a share of GDP (%)	16.736	5.549
Daily newspaper circulation per person	0.161	0.148
Radios per person	0.519	0.338
Televisions per person	0.250	0.179

Notes: World GDP growth in a given year differs slightly for each country, as it excludes that country's contribution to world growth.

Jaggers (2005). I also include a measure of the government's share of the national economy (general government final consumption expenditure as a share of GDP, from the World Development Indicators database), as a proxy for how much election outcomes might affect the daily lives of most voters.

Three measures of media penetration are used: the number of newspapers, the number of radios and the number of televisions per person, all from World Development Indicators 2004 (based on data originally collected by UNESCO). For each country, development, governance and media penetration measures are averaged across the period 1975–2000. For a small number of countries, these interaction measures are unavailable, and hence are imputed using the average for countries in the same geographic region. Table 1 presents summary statistics.

III. Separating luck and competence

At the outset, it is worth determining the extent to which national growth over the previous term (whether caused by world growth or not) affects election outcomes. This is done by estimating the following regression for country i in election term t:

$$\text{ReElect}(0,1)_{it} = \beta DY_{it} + \eta_i + \varepsilon_{it}. \quad (1)$$

In this equation, the dependent variable is an indicator for whether the party of the national leader is re-elected, DY denotes national growth and η is a country fixed effect.

This regression and all other specifications in the paper are estimated using both a conditional logit model and a fixed-effect linear probability model. While conditional

TABLE 2

Does growth help national leaders get re-elected?

	(1) Conditional logit	*(2) Linear probability*
Dependent variable: Whether the party of the national leader is re-elected		
National GDP growth (percentage points)	0.039***	0.039***
	(0.014)	(0.013)
Country fixed effects	Yes	Yes
R^2	0.04	0.04
Elections	268	268
Countries	58	58

Notes: Column 1 shows marginal effects from a conditional logit model, assuming that the fixed effect is zero. Standard errors in parentheses. *** denotes statistical significance at the 1% level. R^2 is the pseudo-R^2 for the conditional logit specification, and the within-R^2 for the linear probability specification.

logit has the advantage that it takes account of the binary nature of the dependent variable, it is potentially biased in short panels, because of the incidental parameter problem (Neyman and Scott, 1948; see also Greene, 2002). A linear probability model is therefore used as a check on the results. As Wooldridge (2002, p. 454) points out, the linear probability model 'should be seen as a convenient approximation to the underlying response probability'.[6]

Note that in principle the linear probability model could be estimated on a larger sample of elections, as unlike the conditional logit model, fixed-effect linear probability models do not automatically drop countries in which national leaders are always or never re-elected. However, to simplify exposition, both models are estimated on the same sample. Results are quite similar if the fixed-effect linear probability model is estimated on a larger sample of elections.

Based on the fixed-effect regressions in Table 2, an incumbent national leader (or a successor from the same party) is 4 percentage points more likely to win a re-election for every extra percentage point of GDP growth over the preceding electoral term. To put this into context, the mean growth rate in the sample is 1.4%, and incumbents are re-elected 57% of the time. These results imply that at a growth rate of 2.4%, incumbents would have a 61% chance of re-election.

Does world growth affect national elections? To test this, I separate growth into two components – world growth (luck) and the gap between national growth and world growth (competence). I then estimate the following fixed-effect model:

[6]Wooldridge (2002) suggests that a straightforward check on the linear probability model is to see how many of the fitted values do not lie between zero and one. For the linear probability models estimated in this paper, there are never more than eight of the 268 fitted values that lie outside the unit interval.

TABLE 3

Which matters more: luck or competence?

	(1) Assuming world growth has the same effect on national growth in all countries	*(2) Taking account of different degrees of global integration*
Dependent variable: Whether the party of the national leader is re-elected		
Panel A: Conditional logit model		
Luck (world growth)	0.109***	0.069**
	(0.036)	(0.036)
Competence (national growth – world growth)	0.032**	0.032**
	(0.013)	(0.015)
Country fixed effects	Yes	Yes
Pseudo-R^2	0.06	0.04
Elections	268	268
Countries	58	58
Panel B: Linear probability model		
Luck (world growth)	0.115**	0.074**
	(0.046)	(0.037)
Competence (national growth – world growth)	0.035**	0.032**
	(0.013)	(0.015)
Country fixed effects	Yes	Yes
Within-R^2	0.05	0.04
Elections	268	268
Countries	58	58

Notes: Panel (A) shows marginal effects from a conditional logit model, assuming that the fixed effect is zero. Standard errors in parentheses. *** and ** denote statistical significance at the 1% and 5% levels, respectively. Column 1 is based on equation (2). Column 2 is based on equation (4).

$$\text{ReElect}(0,1)_{it} = \beta DW_t + \gamma(DY_{it} - DW_t) + \eta_i + \varepsilon_{it} \tag{2}$$

where DW is world growth, and the other variables are as defined above. As the results in the first column of Table 3 indicate, the effects of luck and competence are statistically significant at the 5% level or better. However, in both the conditional logit and linear probability models, the size of the luck coefficient is more than twice as large as that of the competence coefficient.

To see the effect of luck and competence, suppose a country which is so highly integrated with the world economy that, on average, a 1 percentage point rise in world economic growth boosts its growth rate by 1 percentage point. In this case, an extra percentage point of world growth over the preceding electoral term raises an incumbent's chances of re-election by 11 percentage points when using a conditional logit

model and 12 percentage points in the linear probability model.[7] However, if that nation's growth has outpaced world growth by 1 percentage point over the preceding term, this only raises the incumbent's chances of re-election by 3 percentage points in the conditional logit model, or 4 percentage points in the linear probability model.[8] Residual plots from the linear probability model do not reveal the presence of any significant outliers.

However, in some sense, equation (2) is unrealistic, as it assumes that world growth affects national growth in all countries equally. In an alternative (preferred) specification, I first determine the relationship between world growth and national growth for each country, and then use this to calculate measures of luck and competence for each country. This more flexible specification accounts for the fact that some countries are more integrated with the world economy than others.

In order to determine the extent to which each country is integrated in the world economy, I first estimate the following equation with a within-group estimator, using annual data for all countries across the time span 1975–99. Note that in equation (3), the subscript 't' refers to a single year (in other equations, it refers to an election term):

$$DY_{it} = \lambda_i DW_t \eta_i + \varphi_i \eta_i + \varepsilon_{it}. \tag{3}$$

This equation allows for countries to differ both in their mean growth rate (φ) and their sensitivity to the world economy (λ).[9] From this, the fitted values ($\widehat{DY}$) can be considered to be luck – as they indicate the amount of national growth in a given year that one would expect, given that year's world growth rate. For a country entirely disengaged from the world economy, $\lambda_i = 0$. The residuals ($\hat{\varepsilon}$) are competence – the amount by which a country's growth rate exceeds or lags behind what one would predict, given world growth and that nation's degree of enmeshment in the global economy. For 23 of the 58 countries, the λ coefficient is statistically significant at the 10% level or better. The within-group R^2 from this regression is 0.15.

To determine the relationship between luck and competence, I then take the average of $\widehat{DY}$ and in $\hat{\varepsilon}$ each election cycle (call these $\overline{\widehat{DY}}$ and $\bar{\hat{\varepsilon}}$), and estimate the following regression:

$$\text{ReElect}(0,1)_{it} = \beta \overline{\widehat{DY}}_{it} + \gamma \bar{\hat{\varepsilon}}_{it} + \eta_i + v_{it}. \tag{4}$$

[7]Note the importance of the assumption that – on average – a 1 percentage point increase in world growth causes the nation's economy to grow 1 percentage point faster. This means that in a typical year, $DY = DW$. I relax this assumption in the specifications shown in column 2 of Table 3.

[8]This is the opposite finding to that of Wolfers (2007), who looks at the effect of unemployment, house prices and real income on US gubernatorial elections, and finds that there is a higher return to competence (ΔState – ΔNational) than to luck (ΔNational). This suggests that voters in US states are better at parsing out national effects than voters in national elections are at parsing out world effects.

[9]The φ_i terms are intended to capture underlying factors that may influence a country's long-run average growth rate (e.g. natural endowments). However, in a 25-year panel, it is possible that a highly competent incumbent who stays in office for a long period may raise the country's mean growth rate, which would bias the coefficient on competence downwards.

As in equation (2), β is the coefficient on luck and γ is the coefficient on competence. This specification has the advantage over equation (2) that it allows for countries to be differentially integrated into the world economy. However, a limitation of this approach is that mis-specification of equation (3) may bias the estimated coefficients in equation (4).[10] For example, this might occur if a country's degree of integration into the global economy changed over the sample period.

These results are presented in column 2 of Table 3. In this specification, the coefficients on luck and competence fall slightly, but luck still matters most. In both the conditional logit and linear probability specifications, an extra percentage point of world growth over the electoral term boosts an incumbent's chances of re-election by 7 percentage points, while outpacing world growth by 1 percentage point only makes the leader 3 percentage points more likely to be re-elected (both significant at the 5% level).

One might think that this effect could be driven by the price of oil, the world's most traded commodity. However, when I estimate equation (2) using the change in the world oil price in place of world GDP growth, the coefficient on the change in the price of oil is statistically insignificant.[11] This is true even when the sample is restricted to countries that are energy importers. It therefore seems likely that the effect of world growth on national elections operates through other channels, such as trade, investment, capital flows and business confidence.

IV. What affects the returns to luck and competence?

Is it possible to explain differing returns to luck and competence by a nation's level of development, the quality of its democracy, the size of its government or the strength of its media? Theory suggests reasons why each of these factors might matter. If the average voter is richer or better educated, it might be that he or she does a better job of parsing out the effect of the world economy when deciding whether to re-elect a national leader. If a country is more democratic, its institutions might better help voters separate signal from noise. If the government's share in the economy is larger, voters may put more effort into parsing out luck.

Some insight into why the media might be important is given in Besley and Burgess (2002), who find that Indian state governments provide calamity relief in a more timely fashion when newspaper circulation is higher and there is more electoral competition.[12] In the US context, Gentzkow, Glaeser and Goldin (2006) find that the expansion and increasing independence of the media helped reduce corruption.

[10] A possible solution is to estimate equation (4), weighting the estimates by the inverse of the variance on the predictions. This produces results similar to those shown in Table 4.

[11] Results are available from the author upon request.

[12] Besley and Burgess (2002) theorize that newspaper circulation and political competitiveness should affect politicians' behaviour because they increase the incentives for some politicians to signal that they are not of the 'selfish' type.

Other studies have also shown that across US counties, radio ownership was positively correlated with New Deal spending in the 1930s (Strömberg, 2004). Across countries, press freedom has been shown to be negatively correlated with corruption (Ahrend, 2002; Brunetti and Weder, 2003), and with the political longevity of the national leader (Besley and Prat, 2006).[13]

To test these theories, I interact luck and competence with two measures of development (per capita GDP and the mean number of years of schooling of the adult population), three measures of governance (democratic quality, system stability and the government share in the economy), and three measures of media penetration (the number of newspapers, radios and televisions per person). For each country, these figures are averaged across the period 1975–2000 (as the model has a country-specific effect, it is unnecessary to also include the main effects of income and education).[14] For ease of interpretation, GDP, education and media penetration are normed to a mean of zero and a standard deviation of one. In the case of a single interaction variable, K, the equation to be estimated is:

$$\text{ReElect}(0,1)_{it} = \beta\widehat{\overline{DY}}_{it} + \gamma\bar{\hat{\varepsilon}}_{it} + \zeta K_i\widehat{\overline{DY}}_{it} + \xi k_i\bar{\hat{\varepsilon}}_{it} + \eta_i + v_{it}. \quad (5)$$

Appendix B shows the correlation matrix for the interaction variables. Not surprisingly, they are highly correlated with one another, with correlations ranging from 0.42 to 0.89. In the results that follow, I generally present specifications that interact both GDP and another variable. However, Appendix B shows that GDP is highly correlated with education, and also with television ownership, suggesting that results from these specifications may be fragile. As an additional diagnostic, I therefore include chi-squared and F-tests on the joint significance of all interaction terms.

Table 4 shows the results from specifications interacting GDP and education. Both appear to increase the returns to competence. For a country of average per capita income (the geometric mean in the sample is US$4300), luck plays a greater part than competence in determining re-election. However, a one standard deviation increase in per capita GDP (approximately a 150% increase in national income) increases the effect of competence by 4 percentage points in both the conditional logit and the linear probability specifications. However, while competence

[13]The exercise performed by Besley and Prat (2006) is perhaps most closely related to this one, with two caveats: their study looks only at political longevity at a single point in time (1997) and covers both democracies and non-democracies.

[14]Averaging the development, governance and media measures over the period 1975–2000 implicitly allows for some lagged effects in later years. In addition, it has the advantage that it should ameliorate the effects of measurement error in the interaction terms (to the extent that such error is classical). An alternative way of estimating the interaction models is to also exploit the time-series variation in the development, governance and media measures. Estimating the model in this way requires interpolating for missing years and including the relevant development, governance and media measures as main effects (as they are not fully absorbed by the country fixed effects). These models produce results qualitatively similar to those shown in Tables 4–6.

TABLE 4

Development and the returns to luck and competence

	(1)	*(2)*	*(3)*
Dependent variable: Whether the party of the national leader is re-elected			
Panel A: Conditional logit model			
Luck	0.078**	0.075**	0.077**
	(0.032)	(0.033)	(0.032)
Competence	0.053***	0.047***	0.054***
	(0.018)	(0.017)	(0.019)
Luck × GDP	0.007		−0.021
	(0.038)		(0.059)
Competence × GDP	0.043**		0.037
	(0.017)		(0.024)
Luck × education		0.022	0.041
		(0.038)	(0.059)
Competence × education		0.036**	0.008
		(0.017)	(0.024)
Country fixed effects	Yes	Yes	Yes
Pseudo-R^2	0.08	0.07	0.08
Elections	268	268	268
Countries	58	58	58
Chi-squared test on significance of all interactions	6.576 ($P = 0.037$)	4.730 ($P = 0.094$)	3.262 ($P = 0.515$)
Panel B: Linear probability model			
Luck	0.088**	0.075**	0.085**
	(0.038)	(0.037)	(0.038)
Competence	0.053***	0.048***	0.053***
	(0.016)	(0.016)	(0.017)
Luck × GDP	0.003		−0.013
	(0.038)		(0.052)
Competence × GDP	0.043***		0.036*
	(0.016)		(0.022)
Luck × education		0.014	0.026
		(0.040)	(0.056)
Competence × education		0.036**	0.012
		(0.017)	(0.023)
Country fixed effects	Yes	Yes	Yes
Within-R^2	0.08	0.07	0.08
Elections	268	268	268
Countries	58	58	58
F-test on significance of all interactions	3.774 ($P = 0.025$)	2.689 ($P = 0.070$)	2.040 ($P = 0.090$)

Notes: Panel (A) shows marginal effects from a conditional logit model, assuming that the fixed effect is zero. Standard errors in parentheses. ***, ** and * denote statistical significance at the 1%, 5% and 10% levels, respectively. All estimates in this table are based on equation (4), which takes account of different degrees of global integration across countries. GDP is log real per capita GDP. Education is the average number of years of education of the population aged 15 years and over. Both GDP and education are averages over the period 1975–2000, and are normed to a mean of zero and a standard deviation of one.

matters more in countries with affluent and highly educated voters, luck does not matter less. This implies that election results in developed countries are more sensitive to economic growth. Higher levels of income and education increase voters' ability to assess their country's economic performance relative to the rest of the world, but do not diminish the impact of the world economy on their voting decisions.

Similarly, for every one standard deviation increase in average education (2.6 years of schooling) the effect of competence on re-election rises by 4 percentage points in both the conditional logit and linear probability specifications. But as with income, education does appear to have a significant impact on the 'luck' coefficient (the effect of the world economy on national elections). When both the GDP and education interactions are included in the model, the coefficients on both competence interactions are positive, but only the GDP interaction is statistically significant (and then only in the linear probability specification). As pointed out above, GDP and education are highly correlated with one another, so I also present a test on the joint significance of the interaction terms. This is statistically different from zero for the linear probability model, but not the conditional logit model, suggesting that the results in column 3 are somewhat fragile.

Next, I test the relationship between governance and the returns to luck or competence, using three variables: a measure of the quality of the democracy, a measure of the stability of the democracy and a measure of the size of government. To ensure that these results are not being driven by a country's level of development, I also include an interaction between luck and GDP, and between competence and GDP. This ensures that the luck$\times$governance and competence$\times$governance interactions pick the effect of the governance variable on luck and competence, holding constant the effect of income on luck and competence. Again, as the model has a country-specific effect, it is unnecessary to also include the main effects of each country's average income and mean governance score.

The results of this specification are shown in Table 5. For each of the three governance measures – democracy quality, stability and size of government – the interactions with luck and competence are statistically insignificant, though the standard errors are large enough that it is not possible to reject large effects in either direction. In each of these specifications, the competence$\times$GDP interaction remains positive and statistically significant at the 5% level or better. This is also captured by chi-squared and F-tests on the joint significance of the four interaction terms, which in most specifications reject the hypothesis that the interactions are jointly equal to zero.

Might the media also affect the returns to luck or competence? To test this hypothesis, I include a further set of interactions: the number of newspapers per person, radios per person and televisions per person. As in Table 5, I also control for the interaction of log real GDP per capita with competence and luck.

The results in Table 6 provide a modicum of evidence that different types of media have different impacts on the returns to luck and competence. In column 1,

TABLE 5

Governance and the returns to luck and competence

	(1) *Polity*	*(2)* *Durable*	*(3)* *Gov. %*
Dependent variable: Whether the party of the national leader is re-elected			
Panel A: Conditional logit model			
Luck	0.082**	0.083***	0.089***
	(0.033)	(0.032)	(0.030)
Competence	0.049**	0.052***	0.050***
	(0.019)	(0.019)	(0.019)
Luck × governance	0.038	0.049	−0.068
	(0.044)	(0.046)	(0.054)
Competence × governance	−0.016	0.001	−0.024
	(0.020)	(0.023)	(0.020)
Luck × GDP	−0.034	−0.014	0.028
	(0.058)	(0.043)	(0.040)
Competence × GDP	0.062**	0.042**	0.052***
	(0.028)	(0.018)	(0.019)
Country fixed effects	Yes	Yes	Yes
Pseudo-R^2	0.09	0.09	0.09
Elections	268	268	268
Countries	58	58	58
Chi-squared test on significance of all interactions	6.612 ($P = 0.158$)	7.069 ($P = 0.132$)	10.988 ($P = 0.027$)
Panel B: Linear probability model			
Luck	0.090**	0.092**	0.094**
	(0.038)	(0.038)	(0.038)
Competence	0.048***	0.050***	0.048***
	(0.018)	(0.017)	(0.017)
Luck × governance	0.034	0.044	−0.064
	(0.046)	(0.045)	(0.058)
Competence × governance	−0.011	−0.003	−0.016
	(0.020)	(0.021)	(0.020)
Luck × GDP	−0.028	−0.013	0.022
	(0.054)	(0.041)	(0.042)
Competence × GDP	0.053**	0.043**	0.048***
	(0.025)	(0.017)	(0.017)
Country fixed effects	Yes	Yes	Yes
Within-R^2	0.08	0.08	0.09
Elections	268	268	268
Countries	58	58	58
F-test on significance of all interactions	2.117 ($P = 0.08$)	2.119 ($P = 0.08$)	2.397 ($P = 0.052$)

Notes: Panel (A) shows marginal effects from a conditional logit model, assuming that the fixed effect is zero. Standard errors in parentheses. *** and ** denote statistical significance at the 1% and 5% levels, respectively. All estimates in this table are based on equation (4), which takes account of different degrees of global integration across countries. GDP is the log of real per capita GDP. *Polity* is a regime score that ranges from +10 (full democracy) to −10 (full autocracy). *Durable* is a variable denoting the number of years since the last substantive change in authority characteristics (defined as a three-point change in the Polity score). *Gov%* is general government final consumption expenditure as a share of GDP. GDP and governance variables are averages over the period 1975–2000 and are normed to a mean of zero and a standard deviation of one.

TABLE 6

Media penetration and the returns to luck and competence

	(1) Newspapers	*(2) Radios*	*(3) Televisions*
Dependent variable: Whether the party of the national leader is re-elected			
Panel A: Conditional logit model			
Luck	0.080**	0.082**	0.094***
	(0.034)	(0.033)	(0.030)
Competence	0.056***	0.053***	0.047**
	(0.020)	(0.019)	(0.019)
Luck × media	−0.103	0.012	0.02
	(0.064)	(0.060)	(0.066)
Competence × media	−0.04	−0.013	−0.071*
	(0.030)	(0.023)	(0.037)
Luck × GDP	0.072	−0.001	−0.022
	(0.057)	(0.056)	(0.067)
Competence × GDP	0.070***	0.052**	0.097***
	(0.027)	(0.024)	(0.034)
Country fixed effects	Yes	Yes	Yes
Pseudo-R^2	0.10	0.08	0.10
Elections	268	268	268
Countries	58	58	58
Chi-squared test on significance of all interactions	12.884 ($P = 0.012$)	4.975 ($P = 0.290$)	12.073 ($P = 0.017$)
Panel B: Linear probability model			
Luck	0.087**	0.092**	0.103**
	(0.038)	(0.039)	(0.040)
Competence	0.051***	0.054***	0.043**
	(0.017)	(0.017)	(0.018)
Luck × media	−0.106*	0.006	0.006
	(0.059)	(0.061)	(0.069)
Competence × media	−0.034	−0.012	−0.058
	(0.027)	(0.021)	(0.038)
Luck × GDP	0.068	−0.001	−0.008
	(0.054)	(0.056)	(0.065)
Competence × GDP	0.063***	0.053**	0.084***
	(0.022)	(0.023)	(0.032)
Country fixed effects	Yes	Yes	Yes
Within-R^2	0.10	0.08	0.09
Elections	268	268	268
Countries	58	58	58
F-test on significance of all interactions	3.245 ($P = 0.013$)	1.951 ($P = 0.103$)	2.460 ($P = 0.047$)

Notes: Panel (A) shows marginal effects from a conditional logit model, assuming that the fixed effect is zero. Standard errors in parentheses. ***, ** and * denote statistical significance at the 1%, 5% and 10% levels, respectively. All estimates in this table are based on equation (4), which takes account of different degrees of global integration across countries. GDP is the log of real per capita GDP. 'Media' variable differs across columns: number of newspapers (column 1), radios (column 2) or televisions (column 3) per person. GDP and media variables are averages over the period 1975–2000 and are normed to a mean of zero and a standard deviation of one.

the linear probability specification (though not the conditional logit specification) shows that in countries with a higher newspaper circulation, the returns to luck are lower. Moreover, chi-squared and *F*-tests indicate that the GDP and newspaper circulation interactions are jointly significant. Radio ownership (column 2) does not appear to affect the returns to luck or competence. For television ownership (column 3), the conditional logit specification (though not the linear probability specification) suggests that in countries with higher television ownership, the returns to competence are lower.

One possibility is that this reflects a 'dumbing down' effect of television.[15] However, there are reasons to be cautious of this finding. Recall that the correlation between GDP and television ownership is quite high. Therefore, although the chi-squared test on the specification in column 3 (Panel A) suggests that the GDP and television ownership interactions are jointly significant, it is possible that the television interaction may be driven by only a few observations. Moreover, it is important to note that the two significant media interaction terms are only significant at the 10% level. As multiple hypotheses are being tested in Table 6, it is conceivable that this reflects nothing more than chance.

V. Conclusion

This paper has provided evidence that voters commit systematic attribution errors when casting their ballots – tending to oust their national leaders when the world economy slumps and retain them when it booms. In the preferred specification (Table 3, column 2), a 1 percentage point increase in world GDP growth is associated with a 7 percentage point increase in the probability that an incumbent leader will be re-elected. To put this into perspective, national leaders are re-elected, on average, 57% of the time. An extra 1 percentage point of world growth raises this probability to 64%. In the late 1990s, there were approximately 17 democratic elections per year in my sample. Typically, 10 of 17 of these elections would see the incumbent leader returned – but an extra percentage point of world GDP growth would see 11 of 17 leaders returned.

Across a wide range of countries, voters appear to behave only quasi-rationally. If one regards voters as principals and politicians as agents, this finding is akin to Bertrand and Mullainathan's (2001) conclusion that CEO compensation tends to be as responsive to a 'lucky dollar' as to an 'earned dollar'. In the case of voting, the problem is likely to be exacerbated by the fact that there is only a miniscule chance that any individual voter will affect the outcome. If shareholders make systematic attribution errors when the stakes are reasonably high, it is hardly surprising that

[15] For example, Gentzkow (2006) finds that the introduction of television in the United States lowered voter turnout, crowded out radio and newspapers, and reduced political knowledge. Similarly, Blinder and Krueger (2004) find that economic literacy among those who primarily use newspapers is substantially higher than among those who get most of their information from television.

voters do so when there is only an infinitesimal chance that their vote will turn out to be pivotal.

What factors are associated with voters rewarding competence and luck? In countries with a richer and better educated population, voters are better able to parse out competence from luck in deciding whether to re-elect their national leaders. I also find suggestive evidence that the media affects the returns to luck and competence, though these effects seem to differ across media types.

Final Manuscript Received: November 2008

References

Ahrend, R. (2002). *Press Freedom, Human Capital and Corruption*, DELTA Working Paper No. 2002–11, DELTA, Paris.

Alesina, A. and Rosenthal, H. (1995). *Partisan Politics, Divided Government, and the Economy*, Cambridge University Press, Cambridge.

Alesina, A., Roubini, N. and Cohen, G. (1999). *Political Cycles and the Macroeconomy*, MIT Press, Cambridge, MA.

Barro, R. J. and Lee, J. W. (2000). *International Data on Educational Attainment: Updates and Implications*, Center for International Development Working Paper 42, CID, Cambridge, MA; available at: http://www.cid.harvard.edu/ciddata/ciddata.html.

Bertrand, M. and Mullainathan, S. (2001). 'Are CEOs rewarded for luck? The ones without principals are', *Quarterly Journal of Economics*, Vol. 116, pp. 901–929.

Besley, T. and Burgess, R. (2002). 'The political economy of government responsiveness: Theory and evidence from India', *Quarterly Journal of Economics*, Vol. 117, pp. 1415–1451.

Besley, T. and Prat, A. (2006). 'Handcuffs for the grabbing hand? Media capture and government accountability', *American Economic Review*, Vol. 96, pp. 720–736.

Blinder, A. S. and Krueger, A. B. (2004). 'What does the public know about economic policy and how does it know it?' *Brookings Papers on Economic Activity*, Vol, 2004, pp. 327–387.

Brennan, G. and Lomasky, L. (1993). *Democracy and Decision: The Pure Theory of Electoral Preference*, Cambridge University Press, Cambridge.

Brunetti, A. and Weder, B. (2003). 'A free press is bad news for corruption', *Journal of Public Economics*, Vol. 87, pp . 1801–1824.

Cameron, L. and Crosby, M. (2000). 'It's the economy stupid: macroeconomics and federal elections in Australia', *Economic Record*, Vol. 76, pp. 354–364.

Downs, A. (1957). *An Economic Theory of Democracy*, Harper Collins, New York, NY.

Ebeid, M. and Rodden, J. (2006). 'Economic geography and economic voting: evidence from the US States', *Journal of Political Science*, Vol. 36, pp. 527–547.

Fair, R. (2002). *Predicting Presidential Elections and Other Things*, Stanford University Press, Stanford, CA.

Gabaix, X. and Laibson, D. (2005). 'Bounded rationality and directed cognition', Unpublished Paper, New York University, New York, NY.

Gabaix, X., Laibson, D., Moloche, G. and Weinberg, S. (2006). 'Costly information acquisition: experimental analysis of a boundedly rational model', *American Economic Review*, Vol. 96, pp. 1043–1068.

Gentzkow, M. (2006). 'Television and voter turnout', *Quarterly Journal of Economics*, Vol. 121, pp. 931–972.

Gentzkow, M., Glaeser, E. and Goldin, C. (2006). 'The rise of the fourth estate: how newspapers became informative and why it mattered', in Glaeser E. and Goldin C. (eds), *Corruption and Reform: Lessons from America's Economic History*, University of Chicago Press, Chicago, IL, pp. 187–230.

Goodman, S. and Kramer, G. H. (1975). 'Comment on Arcelus and Meltzer, "The effect of aggregate economic conditions on congressional elections"', *American Political Science Review*, Vol. 69, pp. 1255–1265.

Greene, W. (2002). 'The bias of the fixed effects estimator in nonlinear models', mimeo, New York University, New York, NY.

Hibbs, D. (1982). 'The dynamics of political support for American presidents among occupational and partisan groups', *American Journal of Political Science*, Vol. 26, pp. 312–332.

Jackman, S. and Marks, G. (1994). 'Forecasting Australian elections: 1993, and all that', *Australian Journal of Political Science*, Vol. 29, pp. 277–291.

Jacobson, G. and Kernell, S. (1983). *Strategy and Choice in Congressional Elections*, Yale University Press, New Haven, CT.

Leigh, A. and McLeish, M. (2009). 'Are state elections affected by the national economy? Evidence from Australia', *Economic Record* (forthcoming).

Leigh, A. and Wolfers, J. (2006). 'Competing approaches to forecasting elections: economic models, opinion polling and prediction markets', *Economic Record*, Vol. 82, pp. 325–340.

Lewis-Beck, M. and Rice, T. (1984). 'Forecasting US house elections', *Legislative Studies Quarterly*, Vol. 9, pp. 475–486.

Markus, G. (1988). 'The impact of personal and national economic conditions on the presidential vote: a pooled cross-sectional analysis', *American Journal of Political Science*, Vol. 32, pp. 137–154.

Marshall, M. G. and Jaggers, K. (2005). *Polity IV Project: Political Regime Characteristics and Transitions, 1800–2004. Dataset Users' Manual*, George Mason University, Arlington, VA.

Mulligan, C. B. and Hunter, C. G. (2003). 'The empirical frequency of a pivotal vote', *Public Choice*, Vol. 116, pp. 31–54.

Nadeau, R. and Blais, A. (1993). 'Explaining election outcomes in Canada: economy and politics', *Canadian Journal of Political Science*, Vol. 26, pp. 775–790.

Neyman, J. and Scott, E. (1948). 'Consistent estimates based on partially consistent observations', *Econometrica*, Vol. 16, pp. 1–32.

Pacek, A. and Radcliff, B. (1995). 'The political economy of competitive elections in the developing world', *American Journal of Political Science*, Vol. 39, pp. 745–759.

Remmer, K. (1991). 'The political impact of economic crisis in Latin America', *American Political Science Review*, Vol. 85, pp. 777–800.

Schuknecht, L. (1996). 'Political business cycles and fiscal policies in developing countries', *Kyklos*, Vol. 49, pp. 155–170.

Snowberg, E., Wolfers, J. and Zitzewitz, E. (2007). 'Partisan impacts on the economy: evidence from prediction markets and close elections', *Quarterly Journal of Economics*, Vol. 122, pp. 807–829.

Stigler, G. (1973). 'General economic conditions and national elections', *American Political Science Review*, Vol. 63, pp. 160–167.

Strömberg, D. (2004). 'Radio's impact on public spending', *Quarterly Journal of Economics*, Vol. 119, pp. 189–221.

Wolfers, J. (2007). 'Are voters rational? Evidence from gubernatorial elections', mimeo, University of Pennsylvania, Philadelphia, PA.

Wolfers, J. and Leigh, A. (2002). 'Three tools for forecasting federal elections: lessons from 2001', *Australian Journal of Political Science*, Vol. 37, pp. 223–240.

Wooldridge, J. M. (2002). *Econometric Analysis of Cross Section and Panel Data*, MIT Press, Cambridge, MA.

Appendix A: Full list of elections

Country	*Elections*
Argentina	1989, 1991, 1993, 1995, 1997, 1999
Armenia	1996, 1998, 1999
Australia	1980, 1983, 1984, 1987, 1990, 1993, 1996, 1998
Bahamas	1982, 1987, 1992, 1997
Bangladesh	1986, 1988, 1991, 1996
Barbados	1981, 1986, 1991, 1994, 1999
Belgium	1981, 1985, 1987, 1991, 1995, 1999
Benin	1989, 1991, 1995
Brazil	1985, 1986, 1989, 1990, 1994, 1998
Bulgaria	1992, 1996
Canada	1980, 1984, 1988, 1993, 1997
Colombia	1982, 1986, 1990, 1994
Congo	1989, 1992, 1993
Costa Rica	1982, 1986, 1990, 1994, 1998
Cyprus	1983, 1985, 1993, 1996
Czech Rep.	1996, 1998
Dom. Rep.	1982, 1986, 1990, 1994, 1998
Ecuador	1986, 1988, 1990, 1992, 1994, 1996, 1998
El Salvador	1989, 1991, 1994, 1997, 1999
FRG/Germany	1980, 1983, 1987, 1990, 1994, 1998
Finland	1982, 1983, 1987, 1988, 1991, 1994, 1995, 1999
France	1981, 1986, 1988, 1993, 1995, 1997
Greece	1981, 1985, 1989, 1993, 1995
Grenada	1995, 1999
Guatemala	1995, 1999
Honduras	1985, 1989, 1993, 1997
Hungary	1980, 1985, 1990, 1994, 1998
Iceland	1979, 1983, 1987, 1991, 1995, 1999
India	1984, 1989, 1991, 1996, 1998
Indonesia	1982, 1987, 1992, 1997, 1999
Ireland	1981, 1982, 1987, 1989, 1992, 1997
Israel	1981, 1984, 1988, 1992, 1996, 1999
Italy	1979, 1983, 1987, 1992, 1994, 1996
Jamaica	1980, 1983, 1997
Madagascar	1993, 1996, 1998
Malta	1981, 1992, 1996, 1998
Mauritius	1987, 1991, 1995
Mongolia	1986, 1990, 1992, 1993, 1996, 1997
Nepal	1991, 1994, 1999
Netherlands	1981, 1982, 1986, 1989, 1991, 1994, 1998
New Zealand	1978, 1981, 1984, 1987, 1990, 1993, 1996, 1999
Norway	1981, 1985, 1989, 1993, 1997
P. N. Guinea	1982, 1987, 1992, 1997
Pakistan	1990, 1993, 1997
Portugal	1983, 1985, 1987, 1991, 1995, 1999
S. Africa	1981, 1984, 1987, 1989, 1994, 1999

Appendix A: *(continued)*

Country	*Elections*
Spain	1982, 1986, 1989, 1993, 1996
St Lucia	1987, 1992, 1997
Sudan	1978, 1980, 1981, 1983, 1986
Sweden	1979, 1982, 1985, 1988, 1991, 1994, 1998
Togo	1986, 1994, 1998, 1999
Trinidad-Tobago	1981, 1986, 1991, 1995
UK	1983, 1987, 1992, 1997
Uruguay	1994, 1999
Vanuatu	1987, 1998
Venezuela	1983, 1988, 1993, 1998
W. Samoa	1982, 1985, 1988, 1991, 1996
Zambia	1983, 1988, 1991

Notes: Sample is elections held between 1978 and 1999, which (according to the World Bank's Database of Political Institutions) were not marred by fraud. The dependent variable is whether the party of the country's 'chief executive' is re-elected. If this does not vary within a country, then all elections for that country are dropped (a consequence of estimating a conditional logit model). Elections in the United States and Japan are excluded from the sample, as world growth is not necessarily exogenous for these two nations.

Appendix B: Correlations between interaction variables

	GDP	*Educ*	*Polity*	*Durable*	*Gov %*	*Papers*	*Radios*	*TVs*
GDP	1.000							
Educ	0.794	1.000						
Polity	0.718	0.606	1.000					
Durable	0.473	0.672	0.516	1.000				
Gov %	0.586	0.620	0.547	0.472	1.000			
Papers	0.739	0.761	0.529	0.489	0.589	1.000		
Radios	0.773	0.757	0.485	0.555	0.417	0.710	1.000	
TVs	0.887	0.790	0.617	0.504	0.520	0.748	0.812	1.000

Notes: GDP = national log real GDP per capita; Educ = mean years of education of the population aged 15 years or over; Polity = regime score that ranges from +10 (full democracy) to −10 (full autocracy); Durable = the number of years since the last substantive change in authority characteristics (defined as a three-point change in the Polity score); Gov% = general government final consumption expenditure as a share of GDP; Papers = daily newspaper circulation per person; Radios = radios per person; TVs = televisions per person. All variables are country averages for the period 1975–2000.