Pontifícia Universidade Católica
do Rio de Janeiro

Rui Terra Neto

A stock market-based political factor

Dissertação de Mestrado

Thesis presented to the Programa de Pós–graduação em Economia , do Departamento de Economia da PUC-Rio in partial fulfillment of the requirements for the degree of Mestre em Economia .

Advisor : Prof. Carlos Carvalho
Co-advisor: Prof. Ruy Ribeiro
Co-advisor: Prof. Eduardo Zilberman

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Abstract

Terra Neto, Rui; Carvalho, Carlos (Advisor); Ribeiro, Ruy (Co-Advisor); Zilberman, Eduardo (Co-Advisor). **A stock market-based political factor**. Rio de Janeiro, 2020. 63p. Dissertação de Mestrado – Departamento de Economia, Pontifícia Universidade Católica do Rio de Janeiro.

We show that a political factor that exploits cross-sectional variation in individual stock returns can forecast national election results, including net House seat gains and the president. Using US presidential elections since 1928, we also find that this long-short portfolio constructed around the election period delivers information on presidential approval for a long period after the election.

Keywords

Firms; Stock returns; Forecast; Presidential elections; Congressional elections; Presidential approva.

Resumo

Terra Neto, Rui; Carvalho, Carlos; Ribeiro, Ruy; Zilberman, Eduardo. **Fator politico baseado no mercado de ações**. Rio de Janeiro, 2020. 63p. Dissertação de Mestrado – Departamento de Economia, Pontifícia Universidade Católica do Rio de Janeiro.

Nós mostramos que um fator político que explora a variação *cross-section* em retornos individuais de ações pode prever o resultado de eleições nacionais, incluindo o ganho líquido de assentos no congresso e o presidente. Usando eleições presidenciais dos Estados Unidos desde 1928, nós também encontramos que esse portfolio *long-short* construído ao redor da eleição entrega informação sobre aprovação presidencial por um longo período depois da eleição.

Palavras-chave

Politica dos Estados Unidos; Retorno de ações; Previsão; Eleições Presidenciais; Eleições para o Congresso; Aprovação presidencial.

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1
Introduction

National election outcomes influence the economic platform of a country and, consequently, the stock market[1]. A clear example is the surprise election of Donald Trump in the United States that caused an initial negative shock in the S&P futures[2] and ended with the market rising on the first day after the election. Given that the stock market reacts to political developments, a question that remains is if it is possible to extract information from stocks about a country's political future. In this paper, we construct a stock-based political factor using the cross-section variation of stock returns after US presidential elections since 1928. With our empirical strategy, we extract daily political information of stocks by exploiting heterogeneity in political sensitiveness across firms. We use this long-short index to forecast political outcomes, such as subsequent presidential elections, presidential approval and the outcome of mid-term elections.

To construct this political factor, we explore the individual reaction of companies in the D+1 of the elections[3] to determine the degree of connection between the firm and the winning platform. For this, we use the abnormal return of each stock calculated using Fama and French (1993) 3-factor model. This allows us to capture the cross-section variation of individual return shocks. And, with the hypothesis that this shock in the D+1 of the elections is due to the electoral result, the abnormal return becomes a measure of the firm's political exposure. With this measure, we develop an index long in companies with positive exposure to the winning campaign platform and short

[1] A larger number of asset price studies argue that the outcome of a national election or the possibility of changing the country ruler affects stock prices. For example, Nippani and Medlin (2002) look at how the delay in disclosing the election result of the 2000 election influenced the United States stock market. Nippani and Arize (2005) document that the 2000 US presidential election influenced not only the American stock market but also the Mexican and Canadian stock market. And Snowberg et al. (2007) suggested that in the D+1 of the elections, the US Stock Market generally reacts positively to the election of a Republican president. The study is done with elections since 1880. They also study the 2004 US presidential election and find that markets anticipated higher equity prices, interest rates and oil prices, and a stronger dollar under a George W. Bush presidency.

[2] Wolfers and Zitzewitz (2016) analyze the various reactions that the market had to the surprise of the election of Trump, beginning with great falls in the futures and in markets that were open in the dawn of the election day.

[3] First business day after the election.

in companies with negative exposure, that's why we call it the "Winner Political Factor". This index exposure remains constant until the next election when the stock weights are changed.

We first employ our political factor to verify if it helps predict the presidential approval for every month after the election until the next US presidential election. We find that the Winner Political Factor return is significant when we look at 6-month ahead and therefore contains information about the political future of the United States. Besides, when we use variables documented by Berlemann and Enkelmann (2014) that help explain the variation in the presidential approval, the factor maintains its significance. And, the R^2 out of sample improves when we add the factor. We also carry out an analysis with only elections followed by strong market movements. For this, we compare the standard deviation of the stock returns in the D+1 of the election with the history of the past standard deviation of the stock returns selected. We observe that the political factor is more significant in this analysis and the out of sample result improves. We also compare the results for the political factor return with the results using the stock market return and we find that the stock market is not significant.

Fair (1978) gave rise to a growing literature to explain how voters choose candidates and thereby try to predict the presidential election result. Lewis-Beck and Rice (1984), Abramowitz (1988) and Forsythe et al. (1992), for example, contribute to this literature, whether looking for variables that can help predict the electoral outcome or improving previous results. We also make our contribution by providing a new variable capable of predicting the next president. The return of the political factor is significant for the predictability of the incumbent party candidate's advantage in the presidential election. The same happens in probit regressions for the incumbent's victory. Among the last 22 presidential elections, this long and short index only missed 3 in an in-sample result. And, when we look at an out-of-sample result for the last 7 elections, the political factor hits all.

Finally, we show that that the political factor return forecasts the House seat gain of the ruling party. Using variables proposed by Lewis-Beck and Rice (1984), Marra and Ostrom Jr (1989) and Klarner (2008), the return of the winner political factor is significant. The exception is when we use the approval of the incumbent president in the month before the election. In this case, the factor loses its significance.

Our empirical strategy for constructing the index is based on Carvalho et al. (2017) who use the cross-section variation of abnormal returns in the first and second rounds of the 2014 presidential election of Brazil to develop

a political factor in which its daily return is a measure of the political shock degree in favor of the incumbent candidate. They conclude that the 2014 World Cup soccer game in which Germany humiliatingly eliminated Brazil negatively influenced the incumbent re-election.

Like them, we use the empirical fact that there is cross-section variation in individual stock returns after political developments. Fisman (2001) reports smaller returns from government-connected firms linked to President Suharto's health rumor in Indonesia. Knight (2006) shows that stock returns of firms favored under Bush platform of the campaign are positively associated with the probability of a Bush victory during the 2000 campaign in the US. The same happens with the Gore platform. Wagner et al. (2018) shows how different sectors of the industry reacted differently in the D+1 of Donald Trump's US election. These reactions took into account the prediction of tax cuts for the heavy industry as well as the possibility of changes in Obama Care. These reports focus on political events with high uncertainty about the outcome. As our results are significant using the entire election sample since 1928, we contribute to future studies about cross-section variation for elections with less uncertainty.

Despite the similarities in the way we construct the political factor with Carvalho et al. (2017), there is a clear difference. While they look at the political factor return before the election result (evaluating the most critical days for the presidential campaign), we look at the Winner Political Factor return after the D+1 of the election. Fisman and Zitzewitz (2018) also uses an index constructed with the cross-section variation between individual stock returns after an electoral result to look at the change of the index after the electoral outcome. However, while Fisman and Zitzewitz (2018) focus on knowing if the expectation generated by that event (Trump Election and Brexit) will materialize or not, we assume that the exposure of firms to the winning platform remains constant until the next election and look at how the political factor can help predict political variables.

In addition to the goal differences, there are some methodological differences between our political factor and the Fisman and Zitzewitz (2018) index. First, we use the abnormal return to determine the weights of each firm in the long and short index, and they use the own stock return[4]. Also, we calculate the Winner Political Factor return using the abnormal return of each firm. And when we compare the two methodologies, the use of abnormal return brings significant improvements. The results using only the stock return

[4]In Fisman and Zitzewitz (2018), the weight of each firm is proportional to its market value multiplied by the value of its return above the market return analyzed. If a stock goes up higher than the market, it has a positive weight and a negative weight otherwise

are less significant in general, and when we slightly change the way we distribute the stock weights in the index, the political factor return does not have the same robustness as when we use the abnormal return in its construction process. From a theoretical point of view, using the Fama and French (1993) three factor model, the return of each firm is composed of its exposure to three aggregate factors plus an individual shock return (abnormal return). Therefore, using this model, we can control the stock return for aggregate factors and obtain a cleaner measure of the firm's individual exposure to the electoral shock. And, keep using the abnormal return after the D+1 of the election to calculate the Winner Political Factor returns, allows us to continue obtaining the firm's returns linked to its exposure to the political platform more cleanly.

Looking at the results, we show that the political factor return can be used as a new daily variable for the predictability of electoral outcomes and the presidential approval. Thus, there is information about the political future of the United States in the stock price. Also, our political variable has a long history (since 1928) and costs nothing. The presidential approval measured by Gallup, for example, begins in 1941 and has no daily history.

From the methodological point of view, we present alternative ways of constructing the Winner Political Factor and their respective results. The results are significant even when we do not use only evident events with electoral shock (close elections). Thus, the political factor can be constructed for all United States presidential elections. This contributes to the results of Carvalho et al. (2017) and Fisman and Zitzewitz (2018) that focus on close elections. Besides, we also construct a version of the political factor that we do the long and short within the economic sectors. And this version has excellent results, suggesting that the important information on the cross-sectional variation of abnormal returns after the electoral result is within the sectors.

This work proceeds as follows: Elections and data are described in Section 2; Section 3 describes how we construct the Winner Political Factor; Section 4 shows for what purposes this political factor can be used ; Section 5 concludes.

2
Elections and Data

The elections are defined according to the limitation of stock market data. CRSP U.S Stock data contains daily stock returns since January 01, 1926. Thus, we use all elections after this year. All presidential elections used to construct the Winner Political Factor are shown in table 2.1.

Table 2.1: US Presidential Elections

Date	Winner Name	Vote (%)	Party	Loser Name	Vote (%)	Party	Advantage	Stocks
06/11/1928	**Herbert Hoover**	**58.2**	**Republican**	**Al Smith**	**40.8**	**Democratic**	**17.4**	**422**
08/11/1932	Franklin D. Roosevelt	57.4	Democratic	Herbert Hoover	39.7	Republican	17.7	364
03/11/1936	Franklin D. Roosevelt	60.8	Democratic	Alf Landon	36.5	Republican	24.3	568
05/11/1940	**Franklin D. Roosevelt**	**54.7**	**Democratic**	**Wendell Willkie**	**44.8**	**Republican**	**9.9**	**557**
07/11/1944	Franklin D. Roosevelt	53.4	Democratic	Thomas E. Dewey	45.9	Republican	7.5	563
02/11/1948	**Harry S. Truman**	**49.6**	**Democratic**	**Thomas Dewey**	**45.1**	**Republican**	**4.5**	**805**
04/11/1952	**Dwight D. Eisenhower**	**55.2**	**Republican**	**Adlai Stevenson**	**44.3**	**Democratic**	**10.9**	**869**
06/11/1956	Dwight D. Eisenhower	57.4	Republican	Adlai Stevenson	42.0	Democratic	15.4	897
08/11/1960	**John F. Kennedy**	**49.7**	**Democratic**	**Richard Nixon**	**49.6**	**Republican**	**0.17**	**929**
03/11/1964	Lyndon B. Johnson	61.1	Democratic	Barry Goldwater	38.5	Republican	22.6	1625
05/11/1968	Richard Nixon	43.4	Republican	Hubert Humphrey	42.7	Democratic	0.7	1700
07/11/1972	Richard Nixon	60.7	Republican	George McGovern	37.5	Democratic	23.2	1699
02/11/1976	Jimmy Carter	50.1	Democratic	Gerald Ford	48.0	Republican	2.1	1364
04/11/1980	**Ronald Reagan**	**50.7**	**Republican**	**Jimmy Carter**	**41.0**	**Democratic**	**9.7**	**1319**
06/11/1984	Ronald Reagan	58.8	Republican	Walter Mondale	40.6	Democratic	18.2	1765
08/11/1988	George H. W. Bush	53.4	Republican	Michael Dukakis	45.6	Democratic	7.8	1761
03/11/1992	Bill Clinton	43.0	Democratic	George H. W. Bush	37.4	Republican	5.6	1678
05/11/1996	**Bill Clinton**	**49.2**	**Democratic**	**Bob Dole**	**40.7**	**Republican**	**8.5**	**1740**
07/11/2000	George W. Bush	47.9	Republican	Al Gore	48.4	Democratic	-0.5	1980
02/11/2004	George W. Bush	50.7	Republican	John Kerry	48.3	Democratic	2.4	1884
04/11/2008	**Barack Obama**	**52.9**	**Democratic**	**John McCain**	**45.7**	**Republican**	**7.2**	**1854**
06/11/2012	**Barack Obama**	**51.1**	**Democratic**	**Mitt Romney**	**47.2**	**Republican**	**3.9**	**1847**
08/11/2016	**Donald Trump**	**46.1**	**Republican**	**Hillary Clinton**	**48.2**	**Democratic**	**-2.1**	**1837**

The CRSP database contains stock returns by the end of 2018. Thus, to construct the political factor until the end of 2019, we use data from Reuters Datastream for the 2016 election. The sample includes all NYSE/AMEX/NASDAQ-listed securities. We only use CRSP share code of 10 or 11, to remove all ADRS, SBIs, Units, REITS, closed-end funds and companies incorporated outside the USA. And for Reuters data, we use only primary major equities.

Two criteria are used to choose the stocks that compose the political factor: market value and liquidity. First, we select the 2000 stocks with the highest market value on election day. Then, we exclude stocks where the traded volume was 0 in the D+1 of the election (important for the first elections[1])

[1]In the first elections, the stocks have much less liquidity than nowadays, and for that reason some of them end up not being traded every business day. Thus, excluding firms that were not traded on the D+1 from the election day avoids attributing weights to stocks that we do not know their real exposure to the government platform.

and stocks that have been listed after the start of the pre-election period[2]. The number of stocks used for each election can be seen in table 2.1.

The idea for construct the political factor, as mentioned earlier, is that different political platforms generate different stock prices. The greater this difference between the political platforms running for the presidential election and the greater the surprise factor of the electoral result, the greater the stock market movement in the D+1 of the election is expected to be. So, We define an election as an "election followed by strong market movements" if the variance around individual stock returns is above the 75th percentile[3]. In this case, the weights of the long and short index are more evident due to the high dispersion of the stock return. The elections followed by strong market movements are highlighted in bold in table 2.1.

The data on presidential approval ratings are based on as measured by Gallup, which in turn is compiled by Professor Gerhard Peters and Professor John T. Woolley, as part of the American Presidency Project[4]. An approval rating is a percentage determined by telephone-based polling of 1500 national adults conducted by Gallup (an American research-based, global performance-management consulting company), which indicates the percentage of respondents to an opinion poll who approve a particular person or program.

To construct a monthly series of presidential approval, we use the monthly average of all surveys carried out that month. In the months without surveys, we made a linear approximation centered on the 15th of the respective month. The data begins in May 1945 under Harry Truman and ends in December 2019 under Donald Trump. For regressions of approval by the president, the unemployment rate and inflation are also used. Data is provided by U.S. Department of Labor Bureau of Labor Statistic[5]. For the unemployment rate the data starts in January 1948. We use the CPI for all Urban Consumers for calculate the inflation rate (12 month variation) and its data starts in January 1913.

Industrial Production and GDP data are taken from the FRED Economic Data. The data of party House seats for each election since 1928 are from History, Art and Archives (United States House of Representatives)[6].

[2]Period in which we obtain the betas from the firms to calculate the abnormal return.

[3]For each election, the percentile is calculated using the distribution of the variances of the individual stock returns from the 500 days before the election day.

[4]The data is available for download from http://www.presidency.ucsb.edu/data/popularity.php

[5]The website is https://www.bls.gov/.

[6]the link for access is https://history.house.gov/Institution/Party-Divisions/Party-Divisions/?fbclid=IwAR1eIwN_MPz3sOfBI6vUA5TFKGd8_cxG7Ik4KawP3d0CS6cYyY61fbLSXTs

3
Constructing the Winner Political Factor

In this paper, we construct a Winner Political Factor from the 1928 US Presidential Election (due to data limitations) until the 2016 election. The goal of this factor is always to buy the winning platform using the stock market for each presidential election. We use the shock of the US Presidential Election results in individual stock prices to determine the degree of political exposure of firms. Following Carvalho et al. (2017), we assume that, after controlling for aggregate factors, the cross-section variation of abnormal return in the D+1 of US Presidential Elections was mainly about a election result shock[1]. The idea is that the winner political platform can bring costs or benefits to certain firms and the abnormal return is a measure of that exposure.

The first step to construct the political factor is to estimate betas using the Fama and French (1993) three-factor model (excess return on the market, SMB and HML) for each stock (i) selected by the criteria mentioned in the previous topic. Carvalho et al. (2017) show that, next to the election, stocks are sensitive to political factors. This can bias the coefficients associated with the factors. So to avoid electoral influence, the regressions are run 100 days before the election day, using a year sample period. We use cumulative returns of 5 business days to prevent the lower volume of negotiations during the first elections from affecting the betas estimation. The regression can be seen below:

$$r_{i,t} - RF_{i,t} = \alpha_i + \beta_{i,1} RMRF_t + \beta_{i,2} SMB_t + \beta_{i,3} HML_t + \epsilon_{i,t}$$

$r_{i,t} - RF_{i,t}$ is the excess return of a stock; $RMRF_t$ is the excess return of the stock market, SMB_t is the return of Small Minus Big factor; HML_t is the return of High Minus Low factor

Then, we extract abnormal returns as follows:

$$AR_{i,t} = r_{i,t} - RF_{i,t} - \hat{\beta}_{i,1} RMRF_t - \hat{\beta}_{i,2} SMB_t - \hat{\beta}_{i,3} HML_t$$

To construct the weights of each stock, we use two baseline strategies: a version similar to Carvalho et al. (2017) (F) and a version in which we

[1]Fulford and Schwartzman (2019) use a similar empirical strategy, who exploit the cross-sectional variation impact of 1896 U.S. Presidential Election on bank leverage across U.S. states to recover a latent factor driving commitment to the gold standard around the election.

construct the long and short index within the sectors (F-IS Winner Political Factor Intra-Sector). To obtain F, we use the abnormal return from the D+1 of the election day $AR_{i,D+1}$ to order the stocks. To decide which stocks have a positive or negative weight within the index, we use the median. For each firm (i) above the median $(AR_{md,D+1})$, we calculate the weights using the decreasing ranking of abnormal return $(rank_i^d)$:

$$w_i = \frac{1}{(\sqrt{rank_i^d}) * \Big(\sum_{i}^{\{i \in \mathbb{N} | AR_{i,D+1} > AR_{md,D+1}\}} (1/\sqrt{rank_i^d}) \Big)}$$

And for firms with abnormal return below median, we use the increasing ranking $(rank_i^i)$ to calculate the weights:

$$w_i = \frac{-1}{(\sqrt{rank_i^i}) * \sum_{i}^{\{i \in \mathbb{N} | AR_{i,D+1} < AR_{md,D+1}\}} (1/\sqrt{rank_i^i})}$$

For the F-IS, our idea is to construct a long and short index controlling by sectors of the economy. Some sectors may benefit or suffer from the winning political platform. However, the political platform exposure of firms may be more linked to individual characteristics than their economic sectors. After isolating this possible sector expose effect from the political factor, we can verify which of these possible effects prevails. To classify industrial sectors, we use the Standard Industrial Classification (SIC) code at two-digit level [2]. These codes are available in the CRSP and Reuters databases[3] for the entire period used.

The process of determining firm weights for F-IS follows exactly F within the sectors. We exclude sectors with less than two stocks and determine the medians of abnormal returns within the sectors. Then, we calculate the weights following the previous formulas. And to aggregate the industries, we proportionally weigh the sectors by the square root of the number of companies each contained in the sample. Thus, we give more weight to sectors with more companies but without very large differences in weights between sectors.

So, we calculate the return of the political factor monthly (t):

$$R_{polit,t} = \sum_i \omega_i * AR_{i,t}$$

[2]With two digits, we avoid that there are several sectors with few companies, which could harm the construction of the long and short index within each sector. In addition, Kahle and Walkling (1996) argues that there is a high inconsistency between CRSP SIC codes and Compustat Historical SIC codes at the four-digit level. This inconsistency, while still significant, is minor at two-digit level.

[3]For Reuters Database, we use SIC code 1, which is the sic code of the activity with the highest revenue for the company. This only applies to the 2016 election.

The Winner Political Factor weights are always changed at the beginning of the D+2 of the election. So the return of the political factor starts from the day 08/11/1928 (D+2 of 1928 US Presidential Election day) until the last business day of 2019. The return in US Presidential Election months is the accumulated of the return until the D + 1 of the election with the last election weights and of the return from D + 2 of the election until the end of the month with new election weights. Note that the weights are changed only in the electoral shock[4] and, according to the description of the factor return calculation, there is a monthly re-balance. This is important if the reader tries to replicate the strategy in the stock market.

We also construct alternative forms of Winner Political Factor that can be seen in appendix A and in table A.1. And, we did tests using stock returns instead of abnormal return in each of the two stages of constructing factor returns. The description of winner political factors according to whether or not to use return instead of abnormal is in table A.2.

[4]When a company stops being traded on the stock exchange, its weight is re-balanced among those companies that have weights of the same sign

4
Winner Political Factor and Political Variables

4.1
Presidential Approval

The first political variable that we test, to show the effectiveness of the political factor, is the US monthly presidential approval. The return of the political factor can be seen as a measure of how much the campaign platform is being implemented or the strength of the president to achieve it. And, the connection of this return with the approval of the president can be thought as follows, for example: the more the president follows and succeeds in implementing his campaign promises, the higher will be his presidential approval. Thus, a positive return on the index must be associated with a positive variation of the presidential approval. Fisman and Zitzewitz (2018) shows that these two measures are associated but that the return on its index has a stronger response to the movements of the Trump administration. He describes the two variables as measures of the success of the presidential administration. However, they only calculate the index for a single presidential election and they do not perform any regression to prove this correlation between the two variables.

Following this idea of an association between the two variables, we look at how our Winner Political Factor can help predict Presidential Approval. One factor that supports this idea is that the index has daily returns [1] And the presidential approval is calculated in surveys that can take weeks at a cost that can make daily measures impossible. Another critical factor is that investors tend to anticipate the effects of actions that will be implemented by the government, and it may take months for society to feel the impact of these measures.

We follow Berlemann and Enkelmann (2014) to choose the variables that may be important to help explain the variation in the president's approval a few months ahead. It is important to emphasize that they do contemporary regressions and in this paper, we look at predictability. However, the factors that influence the presidential approval are the same regardless of the analysis

[1]This return can be calculated any time the stocks are traded.

you are doing. For economic variables, we choose the 3-month change in annual inflation and the 3-month change in the unemployment rate, which are the variables that showed the best results in Berlemann and Enkelmann (2014). For political variables, we only use the political factor that already measures relevant facts about the presidential administration. For the political factor, we use the return of the last three months (63 business days). Later in the paper, we show how the significance of the political factor coefficient varies when we change the number of months used to accumulate the return. We also use dummies for the "honeymoon" period[2], common in this literature, and dummies for democratic presidents[3]. We exclude from the sample months when the lagged presidential approval corresponds to a different party[4].

So, to check if the political factor brings information on 6-month ahead presidential approval, we use this main regression:

$$PA_{t+6} = \alpha + \rho PA_t + b_1 R_{polit_{,t}} + b_2 R_{markt,t} + b_3 \Delta_{t,t-3}\pi + b_4 \Delta_{t,t-3}\mu + \sum_{i=1}^{2} D_{i,t} + \epsilon_{t,t+6}$$

where PA is the monthly average presidential approval[5], R_{polit} is the last 3-month (63 business days) return of the political factor, R_{markt} is the last 3-month return of the stock market, π is annual inflation measured by the CPI, μ is the unemployment rate, D_1 is the honeymoon dummy and D_2 is the democratic dummy. We follow Welch and Goyal (2008) for the bootstrap method and impose the null hypothesis of no predictability to calculate the standard deviation and the significance of the predictor coefficients[6].

[2]The Honeymoon dummy is $1/i$ for the 12 first months of a new president's warrant where i is the number of months since the beginning of the president's term

[3]The variable is 1 when the presidential approval is referring to a Democratic president,0 if not. This prevents the political factor from being significant due to a dummy effect if the return is significantly greater in democratic or republican periods.

[4]This happens with party changes in the United States presidency. In addition, the return of the political factor for those months would also correspond to another party's platform. It is the only exclusion of months in the main regression.

[5]Nickelsburg and Norpoth (2000), using the ADF test, do not find a unit root in the Gallup series (1976-1996). We did the ADF test for our entire sample and also did not find a unit root. Anyway, as we use the presidential approval lag on the right side of the equation, we avoid possible problems regarding the stationarity or non-stationarity of the presidential approval.

[6]The model we want to predict is as follows:

$$PA_{t+6} = \alpha + \rho * PA_t + b * x_t + \epsilon_{t,t+6}$$

Since PA_t is the variable we want to predict (Presidential Approval) and x_t is its predictor (Political Factor return, inflation rate, ...), we assume that the model that generates the data under the null hypothesis is this:

$$PA_{t+1} = \alpha + \rho_1 * PA_t + u_{1,t+1}$$
$$x_{t+1} = \mu + \rho_2 * x_t + u_{2,t+1}$$

In table 4.1, we first look at all presidential elections since the 1948 election[7]. When we analyze the effect only of the political factor in the predictability of the presidential approval, we find that the Winner Political Factor is significant for the F-IS. We also do an R^2_{OOS} exercise using a 30-year rolling window to calculate OOS (Out of sample) errors. The initial window corresponds to the first 30 years of the sample, and then the window moves from month to month until the entire sample is completed. The R^2_{OOS} is calculated as follows:

$$R^2_{OOS} = 1 - MSE_F/MSE_M$$

where MSE_M is the mean square error from the historical mean model using OOS errors; MSE_F is the mean square error from the forecast model using OOS errors. The results of R^2_{OOS} for models with only the lagged presidential approval, with the lag plus the F, and with the lag plus the F-IS are, respectively, 0.606, 0.607 e 0.613. Note that there is an increase in R^2_{OOS} when we use the political factor, mainly for the F-IS. Logically, lagged presidential approval is responsible for much of R^2_{OOS} due to data persistence.

A similar effect occurs when we add all the variables of the main regression. The R^2_{OOS} for these three models are, respectively, 0.563, 0.562, 0.567. The best option looking at R^2_{OOS} is to use only the lagged presidential approval and the political factor return. The results in sample and out of sample are better using the F-IS, although the results are very similar.

When we look only at elections followed by strong market movements (table 4.2), the results are more significant to the previous ones and the coefficient of the political factor is greater. To calculate R^2_{OOS}, in this case, we use a 20-year rolling window because the sample is smaller when we consider only the elections followed by strong market movements. The R^2_{OOS} for these six models are, respectively 0.903, 0.91, 0.912, 0.896, 0.9, 0.902. Note that the R^2_{OOS} gain also increases using these elections. And again, the best case looking at R^2_{OOS} is to use only the lag and the political factor.

In appendix B, first, we look at the regression of the president's approval by looking only at the first two years of government or only at the last two years of government in table B.1. We note that the predictability of the president's

In our case, there are three adaptations to Welch and Goyal (2008) model: we are looking at the 6-month ahead presidential approval; we assume autocorrelation in Y_t (Presidential Approval - PA_t) in the data generating process due to its persistence in the data; x_t is a vector of predictor variables. We use 10000 bootstrapped time series by drawing with replacement the residuals. According to Welch and Goyal (2008), this bootstrap procedure not only preserves the autocorrelation structure of the predictor variable but also preserves the cross-correlation structure of the two residuals.

[7]The unemployment rate data series starts in January 1948

Table 4.1: Forecasting US Presidential Approval 6-month ahead
This table presents US Presidential Approval forecast regressions (6 months ahead). The dependent variables are: lagged presidential approval; return of the last 3 months of the Winner Political Factor (F); return of the last 3 months of the stock market; variation of unemployment in the last 3 months; variation of inflation during the previous 3 months; return of the last 3 months of the stock market; honeymoon dummy; democratic dummy. Descriptions of the different versions of F are in tables A.1 and A.2. These models contain all elections since the 1948 election. The table shows bootstrapped standard deviations and bootstrapped significance calculated according to Welch and Goyal (2008). $*$, $**$,$***$ indicate significance at the 10, 5 and 1 percent levels, respectively.

	Presidential Approval 6 months ahead					
		F	F-IS		F	F-IS
Lagged P.A	0.796***	0.792***	0.791***	0.785***	0.782***	0.780***
	(0.022)	(0.022)	(0.022)	(0.021)	(0.021)	(0.021)
Political Factor		19.716	36.714*		19.460	36.547*
		(14.155)	(20.970)		(14.151)	(20.967)
Stock Market				4.436	5.055	5.265
				(7.613)	(7.578)	(7.515)
Inflation				−47.030	−46.818	−47.183
				(70.290)	(69.167)	(70.333)
Unemployment				−0.918	−0.990	−1.113
				(1.560)	(1.558)	(1.537)
Honeymoon Dummy				24.329**	24.292**	24.232**
				(10.192)	(10.101)	(10.040)
Democratic Dummy				−1.202	−1.115	−1.063
				(1.927)	(1.940)	(1.932)
Constant	9.865***	10.045***	10.116***	10.517***	10.613***	10.632***
	(1.184)	(1.180)	(1.176)	(1.214)	(1.208)	(1.204)
Observations	777	777	777	777	777	777
R^2	0.631	0.635	0.638	0.653	0.657	0.659
Adjusted R^2	0.631	0.634	0.637	0.650	0.654	0.656

Table 4.2: Presidential Approval 6 months ahead - only elections followed by strong market movements
This table presents US Presidential Approval forecast regressions (6 months ahead). The dependent variables are: lagged presidential approval; return of the last 3 months of the Winner Political Factor (F); return of the last 3 months of the stock market; variation of unemployment in the last 3 months; variation of inflation during the previous 3 months; return of the last 3 months of the stock market; honeymoon dummy; democratic dummy. Descriptions of the different versions of F are in tables A.1 and A.2. These models contain only elections followed by strong market movements since the 1948 election. The table shows bootstrapped standard deviations and bootstrapped significance calculated according to Welch and Goyal (2008). $*$, $**$,$***$ indicate significance at the 10, 5 and 1 percent levels, respectively.

	Presidential Approval 6 months ahead					
		F	F-IS		F	F-IS
Lagged P.A	0.899^{***}	0.889^{***}	0.887^{***}	0.889^{***}	0.876^{***}	0.874^{***}
	(0.024)	(0.024)	(0.024)	(0.024)	(0.023)	(0.023)
Political Factor		32.834^{*}	45.406^{*}		37.339^{*}	54.839^{**}
		(18.365)	(26.042)		(18.931)	(26.364)
Stock Market				−6.496	−6.250	−6.826
				(11.075)	(11.030)	(11.175)
Inflation				−44.905	−38.054	−36.389
				(95.578)	(95.341)	(94.835)
Unemployment				−2.347	−2.524	−2.687
				(2.108)	(2.096)	(2.094)
Honeymoon Dummy				18.333	19.427	19.864
				(20.398)	(20.213)	(20.354)
Democratic Dummy				−1.329	−1.768	−1.777
				(3.025)	(2.996)	(3.002)
Constant	4.770^{***}	5.555^{***}	5.680^{***}	5.871^{***}	7.086^{***}	7.288^{***}
	(1.330)	(1.307)	(1.315)	(1.410)	(1.376)	(1.380)
Observations	333	333	333	333	333	333
R^2	0.805	0.816	0.815	0.823	0.837	0.838
Adjusted R^2	0.805	0.815	0.814	0.820	0.834	0.834

approval is much stronger for the first two years of government. This indicates that the factor has a greater capacity for predictability when we look at data closer to the definition of weights.

We also can compare the results of our headline Fs with other different methodologies to construct the political factor.The details of these Fs are in the tables A.1 and A.2. First, we look at tables B.2 and B.3 to see the changes in the results when we use return instead of abnormal return. When we mix the two in the process of calculating the return of the winner political factor, the results are not significant. However, when we use only return, the results are significant for the F-IS-RR.

In tables B.2 (all elections) and B.3 (elections followed by strong market movements), the F and the F-IS have similar results when we change the initial criterion of the number of stocks for the construction of the index from 2000 to 500. Note that when we use only elections with strong market movements, the factors F-EW33, F-VW33 and F-MR are more significant. Although most of them are significant using the entire sample. It is important to note that these results are using bootstrapped p-values based on the null hypothesis of non-predictability. When we don't bootstrap the results are even stronger.

Still, in tables B.4 and B.5, we do the same exercise as before (tables B.2 and B.3) comparing the factor construction with abnormal return or return, but this time with the F-MR. When we use stock returns to construct the F-MR returns in the two steps (F-MR-RR), we have a version similar to the version of Fisman and Zitzewitz (2018). The F-MR-RR is not significant for predicting the approval of the president, even if the coefficient is in the expected direction (positive).

Besides that, we do tests to see how the significance of the political factor coefficient (using the bootstrap described above) varies with the number of months used to accumulate the return of the political factor. The results are in table B.1. We only use elections followed by strong market movements, and we look at the p-value of the coefficient of the political factor in the regression of the presidential approval, using only the lagged presidential approval and the political factor return as explanatory variables. The p-values of the F and F-IS are more significant when we use 2 or 3 months of accumulated return. To standardize the results, we use the accumulation of 63 working days (3 months) throughout the paper for all political variables. This return captures the political moment.

In summary, our outline factors perform well both in sample and out of sample. In addition, their results are more strong when we look at elections followed by strong market movements. The same is true for factors F-EW33,

F-VW33 and F-MR. Therefore, the factor is robust to small changes in its construction. The results are stronger and more robust when we use only abnormal return in the factor construction process. Anyway, we find that using only the political factor for predictability of the president's approval seems to be a better measure than using the standard variables of the literature from the out of sample point of view. The good performance of F-IS indicates that the effect of the cross-section variation of stock returns with the electoral shock is present within the sectors.

4.2 Presidential Elections

The work of Kramer (1971), which the vote depends on economic events during the election year, gave rise to several papers that used economic data both for electoral predictability and to explain what motivates the votes. Fair (1978) follows this line of research and uses an economic variable of the election year and dummies to capture the effect of the incumbent party in being able to have a better chance of winning. Lewis-Beck and Rice (1984) use a model that combines presidential approval with an economic indicator for predicting electoral results. Abramowitz (1988) introduces the idea of "time for change" when a party is in power for a long time. And to study elections more closely, Forsythe et al. (1992) created the Iowa Political Stock Market for the 1988 election and the market still works today. Since the bets traded in this market started to be used in models of electoral predictability. Another example of how to predict electoral results became important, it is the creation in 2007 of the Political Forecasting Group as an officially recognized research group within the American Political Science Association. These predictability models went to the internet with the creation of the sites Pollyvote and FiveThirtyEigth[8] that publish forecasts and electoral surveys.

Given this importance, in this topic, we see if the political factor can help to predict both the advantage of the incumbent party in the presidential election and whether that party will win or lose this election. For this, we use the return of the political factor accumulated over the last 3 months (63 business days) before the election result, including election day if it is a working day. To compose the main model with the winner political factor, we follow the idea of Fair (1978) and use a variable to compute the advantage of the incumbent party in power. However, as argued by Abramowitz (1988), when the party remains in power for a long time this advantage may be lost. Thus,

[8]One of the most accessible sites for information on American primary 2020.

we use a dummy that has a value of 1 when the ruling party is attempting re-election a second time[9].

With respect to the economic variable, we follow Kramer (1971) and Fair (1978) and use the variation in the election year. Knowing that we need variables available on election day, we test two variables: 6-month variation of the industrial production [10] and the GDP variation[11] for the first two quarters of the year. Industrial production proved to be more effective than the use of the GDP, which is the reason for its choice, possibly because it contains more recent data.

Another variable we use is the presidential approval of the incumbent president in the month before the election. The probit regression with all variables that we use follows below:

$$P(IW_t = 1) = \Phi(\alpha + b_1 PA_{t-1} + b_2 R_{polit,t} + b_3 \Delta_{t-3,t-9}\log(IP) + \sum_{i=1}^{1} D_{i,t} + \epsilon_t)$$

where IW is the incumbent party winner dummy, PA is the monthly average presidential approval, R_{polit} is the last 3-month return of the political factor, IP is the monthly industrial production, D_1 is the incumbent party dummy.

In table 4.3, we also compare the headline political factors with F-VW33 which is constructed with value weighted. When we use only the political factor and the incumbent dummy, the political factors are significant. Between the political factors, the F-VW33 obtains the biggest log likelihood. Note that when we look at industrial production without the political factor, this model has performance similar to F-VW33 in terms of log likelihood. And when we analyze industrial production and the return of the political factor together, neither of them is significant despite their coefficients pointing in the right direction. In the case where we add the incumbent presidential approval with the political factor, neither of the two variables is significant, but the political factor was almost significant at 10% and its coefficient is in the expected direction. The presidential approval does not seem to be an excellent variable to measure the probability of a candidate winning within the sample of elections that we have data from Gallup.

Since the sample is small, we take an alternative approach to the probit regression. Midterm elections, which take place two years after the presidential election, play a crucial role in the governance of the incumbent president. Thus, a victory in these elections can be considered a national win for the ruling party.

[9]In the case of Roosevelt, for example, who remained for 4 terms, this variable was 1 only in the second election.

[10]This variation ends in August due to the delay in the release of data

[11]Data for GDP is not available for the first elections, Fair (1996) uses the GNP variation as an approximation.

Table 4.3: Incumbent Party Victory Probit Regression
This table presents Incumbent Party Victory probit regressions. The dependent variables are: the last 3-month return of the Winner Political Factor (F); variation in industrial production in the election year; presidential approval one month before the election; incumbent dummy. Descriptions of the different versions of F are in tables A.1 and A.2. ∗, ∗∗,∗ ∗ ∗ indicate significance at the 10, 5 and 1 percent levels, respectively.

	Incumbent Party Victory										
	F	F-IS	F-VW33		F	F-IS	F-VW33		F	F-IS	F-VW33
Political Factor	12.429*	21.587*	30.079**		−1.277	3.684	16.785		−179.000	4.570	2,718.529
	(7.467)	(12.623)	(14.296)		(12.338)	(20.126)	(16.295)		(210.988)	(27.378)	(408,849.900)
Industrial Production				35.408**	36.843	33.139	21.838				
				(17.456)	(23.065)	(21.025)	(19.375)				
Presidential Approval								0.226	3.381	0.215	15.608
								(0.147)	(4.134)	(0.154)	(2,344.835)
Incumbent Dummy	2.282***	2.438**	4.147**	2.452**	2.446**	2.497**	3.311*	3.637	36.597	3.630	210.098
	(0.838)	(0.949)	(1.722)	(1.129)	(1.136)	(1.158)	(1.729)	(2.396)	(1,312.689)	(2.364)	(36,513.530)
Constant	−0.477	−0.382	−0.654	−0.934*	−0.958*	−0.883	−0.793	−12.829	−189.619	−12.207	−841.883
	(0.400)	(0.397)	(0.429)	(0.506)	(0.568)	(0.574)	(0.505)	(8.146)	(231.643)	(8.582)	(126,503.400)
Observations	22	22	22	22	22	22	22	17	17	17	17
Log Likelihood	−9.342	−9.209	−7.523	−7.244	−7.239	−7.229	−6.586	−4.063	−2.373	−4.050	−0.00000

As will be shown in the next topic, there is a tendency to lose deputies in the midterm elections of the party that holds the presidency. Therefore, we will consider winning the midterm election, a loss less than the average number of seats lost in the entire sample (29.04 House seats)[12].

In this alternative, we add a dummy with a value of 1 for midterm elections to see if there is an additional effect for these elections. And in table 4.4, the headline political factors gain significance. Also, they remain significant even with the addition of industrial production in the regression, which has lost its significance even when analyzed without the political factor. In the appendix B (table C.4), we add the stock market return of the last 3 months (63 days) before the electoral result in the regressions. And the political factor remains significant, with F-VW33 again obtaining a better result looking at its significance and the probit's log likelihood. However, when we add the president's approval, the political factors lose their significance but continue with their coefficients in the expected direction.

Another way of looking at the result of a presidential election is for the percentage of votes obtained. Being able to win with a big advantage, can allow the winner to quickly pass laws in congress thanks to his initial level of

[12]In this case, we are using a given average of the entire sample to create a variable, so a forecasting analysis could only be done for the next national election

Table 4.4: Incumbent Party Victory Probit Regression (Alternative Approach) This table presents Incumbent Party Victory probit regressions. The dependent variables are: the last 3-month return of the Winner Political Factor (F); variation in industrial production in the election year; presidential approval one month before the election; incumbent dummy; midterm dummy. Descriptions of the different versions of F are in tables A.1 and A.2. $*$, $**$,$***$ indicate significance at the 10, 5 and 1 percent levels, respectively.

	Incumbent Party Victory										
	F	F-IS	F-VW33		F	F-IS	F-VW33		F	F-IS	F-VW33
Political Factor	11.651**	18.656**	22.716***		11.516**	18.559**	22.653***		4.989	8.682	7.408
	(4.927)	(7.903)	(7.761)		(5.023)	(8.056)	(7.862)		(7.340)	(10.833)	(9.577)
Industrial Production				2.839	0.816	1.168	2.563				
				(3.525)	(3.920)	(4.037)	(3.902)				
Presidential Approval								0.095***	0.095***	0.093***	0.089***
								(0.034)	(0.034)	(0.034)	(0.034)
Incumbent Dummy	2.238***	2.303***	3.408***	1.710**	2.232***	2.306***	3.414***	2.161**	2.403**	2.435**	2.521**
	(0.770)	(0.806)	(1.105)	(0.675)	(0.778)	(0.818)	(1.149)	(0.950)	(1.074)	(1.073)	(1.165)
Midterm Dummy	0.515	0.341	0.735	0.491	0.496	0.316	0.668	1.243*	1.151*	1.057	1.106*
	(0.482)	(0.482)	(0.496)	(0.458)	(0.491)	(0.490)	(0.511)	(0.649)	(0.657)	(0.677)	(0.647)
Constant	−0.476	−0.386	−0.600	−0.513	−0.483	−0.401	−0.610	−5.686***	−5.647***	−5.503***	−5.261***
	(0.396)	(0.391)	(0.401)	(0.366)	(0.399)	(0.396)	(0.407)	(1.880)	(1.902)	(1.879)	(1.892)
Observations	45	45	45	45	45	45	45	36	36	36	36
Log Likelihood	−23.743	−23.682	−21.640	−26.744	−23.722	−23.638	−21.439	−14.789	−14.556	−14.455	−14.506

popularity. Thus, it is also essential to predict this variable. For this model, we use only the votes of the Republican and Democratic parties in the presidential election. Thus we can compare the results with other models of predictability of votes in which they take into account only the votes of these two parties. In this primary model, we try to explain the percentage advantage of the ruling party to the other party. The regression follows the same approach presented above, and it is now an OLS regression:

$$IA_t = \alpha + b_1 PA_{t-1} + b_2 R_{polit,t} + b_3 \Delta_{t-3,t-9} \log(IP) + \sum_{i=1}^{1} D_{i,t} + \epsilon_t$$

where IA is the incumbent party advantage, PA is the monthly average presidential approval, R_{polit} is the last 3-month return of the political factor, IP is the monthly industrial production, D_1 is the incumbent party dummy

In table 4.5, When we look at the return of the political factor and the dummy for the incumbent party, the factor turns out to be quite significant. However, when we add industrial production, it loses its significance. The same happens in the analysis with the presidential approval in a smaller sample. Industrial production, presidential approval and incumbent dummy are significant in all analyzes.

Table 4.5: Incumbent Party Advantage Regression
This table presents Incumbent Party Advantage regressions. The dependent variables are: the last 3-month return of the Winner Political Factor (F); variation in industrial production in the election year; presidential approval one month before the election; incumbent dummy. Descriptions of the different versions of F are in tables A.1 and A.2. $*$, $**$,$***$ indicate significance at the 10, 5 and 1 percent levels, respectively.

	Incumbent Party Advantage							
	F	F-IS		F	F-IS		F	F-IS
Political Factor	85.332**	130.124**		24.946	30.091		−31.305	−10.979
	(33.303)	(51.118)		(33.654)	(53.458)		(34.271)	(49.556)
Industrial Prod.			129.761***	114.200***	116.816***			
			(29.566)	(36.552)	(37.890)			
Pres. Approval						0.631***	0.706***	0.643***
						(0.115)	(0.142)	(0.131)
Incumbent Dummy	14.862***	14.528***	9.999***	10.849***	10.611***	5.926**	4.943	5.698*
	(3.818)	(3.806)	(3.173)	(3.410)	(3.409)	(2.740)	(2.959)	(3.019)
Constant	−0.138	0.695	−0.991	−0.731	−0.593	−30.651***	−34.760***	−31.357***
	(2.438)	(2.511)	(1.971)	(2.026)	(2.129)	(5.729)	(7.311)	(6.736)
Observations	22	22	22	22	22	17	17	17
R^2	0.501	0.499	0.666	0.676	0.672	0.781	0.794	0.782
Adjusted R^2	0.448	0.446	0.631	0.622	0.617	0.750	0.747	0.731

For the three main types of regressions mentioned above, we test the alternative versions. The results can be seen in Appendix C, in the following tables: C.1,C.2, C.5, C.6, C.7 and C.8. The alternative forms to abnormal return perform poorly in general. When we use 2000 stocks, the results are stronger than with 500 stocks, especially for F-IS. This may be due to the low number of firms in some sectors when we use only 500 companies. Long and short within sectors can be affected. The results for F-VW33, F-EW33, F-MR are generally similar, which leads to a robust construction of the political factor. We also tested alternative asset pricing models (Carhart (1997) four-factor model; Carhart (1997) four-factor model + short-term reversal factor) to obtain abnormal return, and the results were even stronger when we use the momentum and short-term reversal factors. These results are in the tables C.3 and C.9.

As the sample is small in the regression of the probit and the advantage, we verify the robustness of these results using bootstrapped standard deviations and bootstrapped significance calculated under the null hypothesis of non-predictability. We draw with replacement N pairs (y_i, x_j) using the entire

sample (22 data), that is, a draw for y_i and another for x_j[13] each time, and ran the regression. We do this 10,000 times and estimate the standard deviation and p-value of the coefficients using the sampled distribution. The results are in the table C.10. And the results are very similar to those we get without the bootstrap.

To compare the political factor with other methods of predicting the percentage of votes of the Democratic and Republican parties in the presidential elections, we use the data stored by PollyVote[14]. These data include the following predictability models: Prediction Markets (IOWA Electronic Market); Experts[15]; Mean of Expectation Polls[16]; Mean of Intention Polls; Mean of Econometric Models; Mean of Index Models[17]. The PollyVote model is the arithmetic media of these models.

In figure 4.1, we look at the absolute mean error of the model predictability as we move away from election day. We only use the last 7 elections in which most models have a history. The models that have no history for these elections, we exclude. F(blue) and F-IS(red) performance can be compared at times with the intentions polls. And the F is better for this model. . To better understand the performance of the political factor compared to the other models, we plot the individual graph of these 7 elections in the figure C, in the Appendix C. Note that, with the exception of the 2004 election, the performance of the political factor can be compared with the other models. Thus, the 2004 election ended up affecting the performance of the factor compared to the other methods. For the 2000 election the F behaved extremely well. For the 2016 election, PollyVote only released the data for the last 6 days before the election.

In figure 4.2, we attempt to incorporate F into the model. For this we make a weighted average with the econometric model, which is the average of 14 other econometric models according to Graefe et al. (2014). The political factor adds gain to the model for some days analyzed.

In all results of this research, we use the accumulated return of the political factor during 3 months (63 business days). However, one question that remains is what happens to the significance of the political factor when we vary the cumulative period of return. For this, we look at the previous model of predictability of advantage with the political factor and the incumbent

[13]Thus, i and j do not need to be the same number, generating a model of non-predictability.

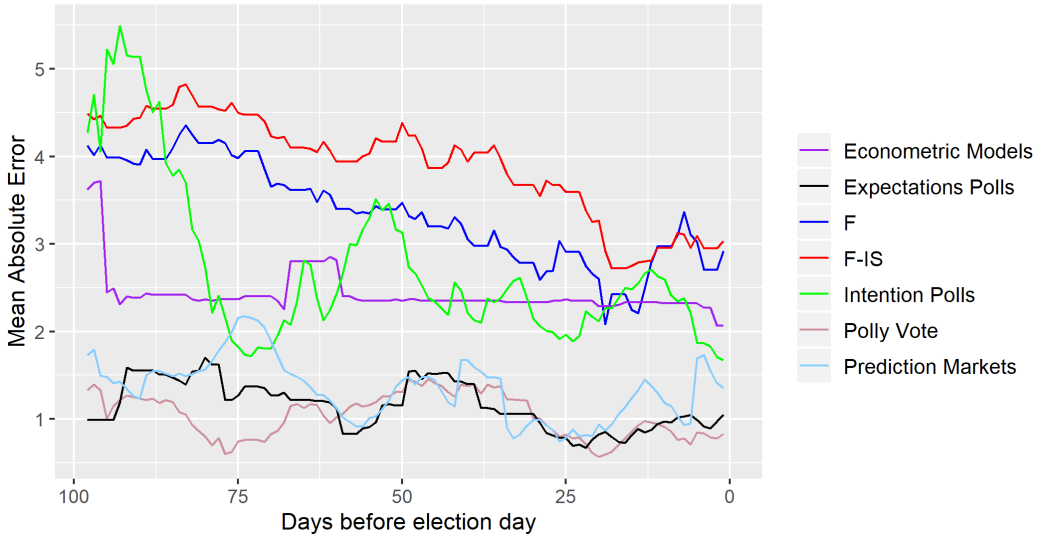
[14]https://pollyvote.com/en/about/data/

[15]They conduct expert surveys as part of the PollyVote project since its launch in 2004. In these surveys, they ask experts to predict the national popular vote.

[16]"Who do you think will win the US presidential election?"

[17]Graefe et al. (2016)

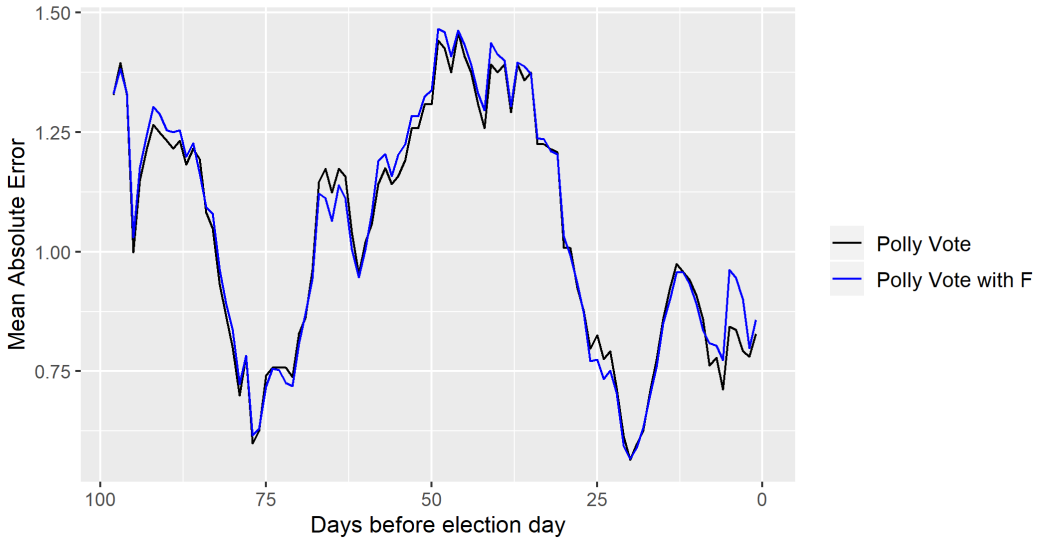
Figure 4.1: Mean Absolute Error of vote predictability models
This figure presents the mean absolute error (% of useful votes) for vote predictability models taken into account by PollyVote and also for models with F and F-IS before the election day. The Winner Political Factor model takes into account the return of 3 months before the day analyzed plus the incumbent dummy.



dummy. The results are in figure C.2 in the appendix C. They show the 90% confidence interval of this regression for the political factor coefficient. As expected, the political factor, like any other stock index, is very volatile when we use a few accumulation days. The significance of the coefficients starts to gain greater clarity with 45 days of accumulated return. However, when we accumulate the return after 80 days, this significance disappears as we increase the number of days of the accumulated return. This may be linked to the fact that voters basically look to the pre-election period to decide their votes. Thus, only the measure of the administration's success in that period would matter. Something that collaborates with Kramer (1971) and Fair (1978)'s idea of the importance of the electoral year in the voter's decision. Note that the result is very similar to what we have for the presidential approval regression. For both the best results achieved are using 2 to 3 months of accumulated return. This contributes to the idea that this return of 3 months captures a political moment.

To check the number of elections that our probit model can predict, we use three strategies. The variables used in the regression are only the 3-month political factor return and the dummy for the incumbent. The first, which we call "False Real-time", consists of using previous elections to do

Figure 4.2: Mean Absolute Error of predictability models- PollyVote with the F
This figure presents the mean absolute error for the PollyVote model and also for an attempt to use the F model to calculate PollyVote. For that, we make a geometric average with the econometric models. And then, we add it to calculate PollyVote. The Winner Political Factor model takes into account the return of 3 months before the day analyzed plus the incumbent dummy.



probit regression, and with these coefficients determines the incumbent party candidate's chance of winning the election. In the second strategy ("False out of sample"), we exclude the analyzed election from the regression, and with the regression coefficients, we determine the candidate's chance. And finally, we also do an "in sample" analysis in which we use all the elections to determine the coefficients and then determine the candidate's chance of winning for each election with its respective variables.

In the table 4.6, we show the chances of victory of the candidates of the incumbent parties for the analyzed presidential elections. We also calculate the number of errors for each model. In "False Real-time", both headline factors have a high degree of accuracy. This for the most recent elections. Now when we look at the other two strategies, encompassing all the presidential elections, the performance of the factors drops. According to the probit regressions,the F-VW33 (value-weighted factor) obtained the lowest log likelihood and the highest significance among the factors analyzed. So, we also look at their performance. And his performance was satisfactory, missing 6 elections in the second strategy and only 3 in the "in sample" analysis. The F-EW33 (equally-weighted factor) has the best performance on the "False-out of sample". We

also check how the betting markets perform. For that, we use Snowberg et al. (2007)'s data until the 2004 election, and then we complete with the probabilities of Iowa's betting market. Note that F-VW33 had a very similar performance to the betting markets.

Note that all winner political factors, shown in table 4.6, got the result of Trump's election in 2016 right. In the meantime, several models missed the predictability of this election. FiveThirtyEight website estimated Hillary Clinton's chance of being elected President at 72%, the Huffington Post 98%, and the Princeton Election Consortium 99%, the New York Times estimated Clinton at 91%.

The C.11 table in appendix C shows the performance of the probit models that combine presidential elections with midterm elections. In this case, we made the strategy "False Real-time" and "In Sample". In the first strategy, we calculate the average loss in midterm elections using the elections before the analyzed election. And we started the analysis at the twenty-first election. Note that the number of errors for the headline factors is worse using this model than with just presidential elections. And again, F-VW33 gets the best results.

4.3 Ruling Party House Seats

Tufte (1978) suggest that the US Congressional elections are mainly influenced by two factors: the public's evaluation of incumbent performance on non-economic issues and short-run economic conditions. As previously reported, our Winning Political Factor provides information on the incumbent's approval. And, according to Tufte (1975) and Tufte (1978), the president's approval is related to non-economic factors but is contaminated with the perception of how the economy is performing.

It is important to remember that the political factor is constructed with the return of stock and is therefore linked to economic changes. And that can involve both micro and macro factors. Tufte (1978) account of "how the economy is performing" is more linked to the performance of the market as a whole. A micro example could be a campaign proposal to loosen the release of weapons. This would benefit arms sales companies, and they would have a positive weight in the index. And if this proposal were to be carried out, it should lead to a positive return on the index and an increase in the approval of the president since he fulfilled a campaign proposal for which he was elected.

In any case, the political factor is a measure of the success of the incumbent's administration and therefore, it can be linked to a performance

of the incumbent's party in the house election. So in this topic, we check if the political factor helps in predicting House seats even with variables known in the literature. We follow Lewis-Beck and Rice (1984), Marra and Ostrom Jr (1989) and Klarner (2008) to construct the predictability models. We use the cumulative return of the last 63 business days (three months) of the Winner Political Factor before the electoral result be released and the Gallup presidential approval in the month prior to the election as political variables. As an economic variable, we use the 6-month variation of industrial production for the month of August due to the delay in the release of data.

According to Klarner (2008), there is a well-known tendency of the party of the president to lose seats during midterm elections. To capture this effect, we use a dummy for midterm elections. And to see if it has a party effect, we use a dummy for incumbent Democratic president. So, to check if the Winner Political Factor brings information on the net gain of ruling party House seats, we use this main regression:

$$HS_t = \alpha + b_1 HS_{t-1} + b_2 PA_{t-1} + b_3 R_{polit,t} + b_4 R_{markt,t} + b_5 \Delta_{t-3,t-9} \log(IP) + \sum_{i=1}^{2} D_{i,t} + \epsilon_t$$

where HS is the incumbent party House seats, PA is the monthly average presidential approval, R_{polit} is the last 3-month return of the political factor, R_{markt} is the last 3-month return of the stock market, IP is the monthly industrial production, D_1 is the honeymoon dummy and D_2 is the democratic dummy In table 4.7, we can see that when we used the entire sample since the midterm election of 1928, the winner political factor is significant. Among the headline political factors, F-IS has the best result. However, note that when we add the president's approval and consequently narrow the sample, the political factor loses its significance. The presidential approval seems to incorporate more information than the political factor for the predictability of House seats. However, it is important to remember that the political factor reacts quickly and is measured daily and can catch changes in trends in these elections.

In Appendix D (table D.1), we add two variables (stock market return and Industrial Production change) to the regression with the entire sample of elections. The F-IS remains significant, even when we add stock market and industrial production, while F remains significant only when we add industrial production. The stock market and industrial production are not significant in any case analyzed in table D.1. The effect of losing deputies in midterm elections is significant in all cases analyzed.

Table 4.6: Probability of the incumbent party candidate winning - Presidential Elections

This table presents the incumbent party candidate's winning probabilities calculated with the probit model. The two variables of the model are the 3-month Winner Political Factor return and a dummy for the incumbent. We mark with X the victory of the incumbent party candidate. In the case of "false real-time", we do the regression using all previous elections and calculate the out of sample result. In the case of "false out of sample", we exclude the election that we are analyzing from the regression and calculate the probability for that election with the coefficients obtained in the regression. In the case of "in sample", we use all elections to regress and calculate the probability according to the variables for each election. Descriptions of the different versions of Winner Political Factors are in tables A.1 and A.2. The number of errors is the number of elections that the model wrongly predicted.

Election	Incumbent	False Real-Time		False-Out of Sample				In Sample				Betting
Year	victory	F	F-IS	F	F-IS	F-EW33	F-VW33	F	F-IS	F-EW33	F-VW33	Markets
1932				3%	0%	3%	21%	2%	0%	2%	19%	17%
1936	X			91%	92%	92%	98%	92%	93%	93%	99%	72%
1940	X			76%	65%	76%	85%	87%	76%	85%	89%	67%
1944	X			27%	25%	35%	44%	34%	32%	43%	52%	79%
1948	X			14%	21%	20%	11%	23%	28%	27%	20%	11%
1952				24%	27%	23%	24%	21%	24%	21%	22%	45%
1956	X			97%	97%	97%	100%	97%	97%	98%	100%	80%
1960				46%	52%	48%	12%	41%	46%	42%	11%	39%
1964	X			95%	98%	98%	97%	96%	98%	98%	98%	100%
1968				51%	73%	74%	99%	44%	58%	59%	75%	46%
1972	X			97%	98%	97%	100%	98%	99%	98%	100%	99%
1976				36%	48%	40%	51%	33%	43%	36%	44%	53%
1980				100%	100%	100%	100%	75%	74%	76%	37%	23%
1984	X			73%	43%	64%	57%	79%	63%	73%	74%	83%
1988	X			13%	19%	8%	17%	22%	27%	19%	26%	81%
1992		48%	41%	38%	32%	36%	14%	35%	29%	33%	12%	8%
1996	X	89%	94%	92%	97%	95%	100%	93%	98%	95%	100%	93%
2000		59%	28%	59%	23%	24%	8%	50%	20%	22%	7%	39%
2004	X	97%	98%	99%	99%	99%	100%	99%	99%	99%	100%	55%
2008		3%	8%	2%	5%	3%	21%	2%	5%	3%	19%	10%
2012	X	77%	80%	77%	80%	69%	97%	81%	84%	76%	97%	78%
2016		15%	14%	15%	14%	14%	0%	13%	12%	12%	0%	68%
Number of errors		1	0	6	7	5	6	4	5	5	3	3

Table 4.7: Ruling Party House Seats Regression

This table presents Ruling Party House Seats regressions. The dependent variables are: the last 3-month return of the Winner Political Factor (F); presidential approval one month before the election; midterm dummy; democratic dummy. Descriptions of the different versions of F are in tables A.1 and A.2. $*$, $**$,$***$ indicate significance at the 10, 5 and 1 percent levels, respectively.

	Ruling Party House Seats					
		F	F-IS		F	F-IS
Lagged House Seats	0.707***	0.747***	0.776***	0.810***	0.810***	0.809***
	(0.119)	(0.116)	(0.114)	(0.111)	(0.113)	(0.112)
Political Factor		154.722**	297.252**		0.723	72.653
		(76.324)	(113.049)		(75.680)	(112.391)
Pres. Approval				1.222***	1.221***	1.179***
				(0.283)	(0.303)	(0.294)
Midterm Dummy	−22.027**	−26.261***	−30.918***	−24.579***	−24.605***	−26.806***
	(8.741)	(8.682)	(8.843)	(6.629)	(7.293)	(7.528)
Democratic Dummy	19.849*	14.864	14.281	13.392*	13.382*	13.346*
	(10.173)	(10.112)	(9.743)	(7.652)	(7.846)	(7.725)
Constant	52.973**	49.993**	46.479**	−26.012	−25.943	−22.280
	(22.821)	(22.051)	(21.476)	(28.739)	(30.088)	(29.582)
Observations	45	45	45	36	36	36
R^2	0.678	0.708	0.726	0.785	0.785	0.788
Adjusted R^2	0.655	0.679	0.698	0.757	0.749	0.752

5
Conclusion

We present evidence that our Winner Political Factor is linked and helps to predict US political variables. This long and short index with history since the 1928 US Presidential Election is constructed, following Carvalho et al. (2017), with the electoral shock in individual stock returns of the US presidential election results.

Our baseline political factors delivers information on presidential approval a few months ahead for a long period after the election. This index is also significant in predicting the outcome of the presidential election, as well as the advantage of the incumbent candidate. In addition, it helps to predict the net gain of House seats in national elections. One of our alternative versions has excellent performance to predict the victory of the incumbent party's candidate. In an in-sample analysis of 22 elections, the factor only missed 4. One of the two baseline versions is constructed with a long and short within the sectors and has an excellent performance. This indicates that the main information on the cross-section variation between stock returns after the electoral result is within the sectors. However, this does not mean that there is no variation between sectors.

We also tested different methodologies for constructing the Winner Political Factor, contributing to future literature. And, when we use abnormal return in the stages of constructing the return of the political factor, we get more consistent results.

Another important result is that even using elections where the electoral shock is not so evident, the Winner Political Factor is significant. With that, the index has a long history, allowing other studies. Besides, we collaborate with a variable that has a daily return and at no cost.

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A
Alternative Winner Political Factors

To construct the weights of each stock, we use three alternative strategies: an equally weighted long and short index (F-EW33), a value weighted long and short index (F-VW33), and a version similar to Fisman and Zitzewitz (2018) (F-VW). To obtain F-EW33 and F-VW33, we use the abnormal return from the D+1 of the election day $AR_{i,D+1}$ to order the stocks. For the F-EW33, firms above the 66.66th percentile have equally positive weight and firms below the 33.33th percentile have equally negative weight. And for the F-VW33, firms above the 66.66th percentile have equally positive weight and firms below the 33.33th percentile have equally negative weight.

For the F-MR, the sign of the weights of the firms follows the sign of the abnormal return. And the weights are proportional to the value of the multiplication of the abnormal return by the value weighted of the firms on election day.

In addition, we also tested the Fs without the use of abnormal return in their construction of weights and return calculus. Thus, instead of the abnormal return, we use the stock return in the two stages of the construction of the Winner Political Factor (F-RR) or in only one of the two (F-AR or F-RA). To facilitate the understanding of which F we are using in each regression, we set up table A.1 with the methods of constructing the weights of the Fs and table A.2 with which return we are using in the construction steps. For details on how to calculate the political factor return, look at the topic "Construction the Winner Political Factor".

Table A.1: Description of the construction method for each Winner Political Factor
The weights of the winner political factor are always determined in the D + 1 of the presidential elections. For that, in the main versions, we used the abnormal return of that day. We also make alternative versions in which we use the return instead of the abnormal return to calculate the weights. More details of these alternative versions are found in table A.2. For F-IS, we only use sectors with at least 2 firms.

F	Description
F	We divide the firms by the 50th percentile. Above this percentile, firms have positive weight and below, negative weight. Firms with + weight: The higher your abnormal return, the greater your weight. Firms with - weight: The lower your abnormal return, the greater your weight.
F-IS	We separate the firms by sectors using the first two digits of the SIC CODE. And then we followed exactly the steps of F within each sector.
F-EW33	We rank the firms by their abnormal return. We buy firms above the 66.66th percentile with equally weighted and we sell firms below the 33.33th percentile with equally weighted.
F-VW33	We rank the firms by their abnormal return. We buy firms above the 66.66th percentile with value weighted and we sell firms below the 33.33th percentile with value weighted.
F-MR	We buy firms with positive abnormal return and sell firms with negative abnormal return. Weights are proportional to the abnormal return multiplied by the market value on election day.

Table A.2: Description of what type of return is used in each stage of the construction of the Winner Political Factor
This table shows which type of return is used for the two construction stages of the Winner Political Factor: Determination of political factor weights and calculation of political factor returns. The X mark refers to the type of return used.

Winner Political Factor	Return used in the construction of the factor weights		Return used to calculate factor returns	
	Abnormal Return	Return	Abnormal Return	Return
F	X		X	
F-AR	X			X
F-RA		X	X	
F-RR		X		X

B
Presidential Approval Regressions

Table B.1: Presidential Approval 6 months ahead - First two years of government/ Last two years of government
This table presents US Presidential Approval forecast regressions (6 months ahead). The dependent variables are: lagged presidential approval; return of the last 3 months of the Winner Political Factor (F). In the first 2 regressions, we look at the presidential approval for only the first two years of the government. In the other two columns, we look at the last two years of government. Descriptions of the different versions of F are in tables A.1 and A.2. These models contain all elections since the 1948 election. The table shows bootstrapped standard deviations and bootstrapped significance calculated according to Welch and Goyal (2008). $*$, $**$,$***$ indicate significance at the 10, 5 and 1 percent levels, respectively.

	Presidential Approval 6 months ahead			
	Presidential Term:			
	First two years		*Last two years*	
	F	F-IS	F	F-IS
Lagged P.A	0.773^{***}	0.772^{***}	0.833^{***}	0.832^{***}
	(0.034)	(0.034)	(0.029)	(0.029)
Political Factor	35.868^{*}	59.339^{*}	-3.369	6.011
	(21.232)	(31.580)	(25.737)	(37.009)
Constant	10.321^{***}	10.379^{***}	8.716^{***}	8.774^{***}
	(1.940)	(1.933)	(1.498)	(1.499)
Observations	366	366	411	411
R^2	0.602	0.605	0.668	0.668
Adjusted R^2	0.600	0.603	0.667	0.667

Table B.2: Presidential Approval 6 months ahead - Alternative Fs
This table presents US Presidential Approval forecast regressions (6 months ahead). The dependent variables are: lagged presidential approval; return of the last 3 months of the Winner Political Factor (F). Descriptions of the different versions of F are in tables A.1 and A.2. These models contain all elections since the 1948 election. The table shows bootstrapped standard deviations and bootstrapped significance calculated according to Welch and Goyal (2008). $*$, $**$,$***$ indicate significance at the 10, 5 and 1 percent levels, respectively.

	Presidential Approval 6 months ahead					
	F-AR	F-IS-AR	F-RA	F-IS-RA	F-RR	F-IS-RR
Lagged P.A	0.795***	0.798***	0.796***	0.803***	0.797***	0.798***
	(0.022)	(0.022)	(0.022)	(0.022)	(0.022)	(0.022)
Political Factor	−6.301	34.521	2.404	46.651	13.243	50.761*
	(24.029)	(37.346)	(21.622)	(35.458)	(16.732)	(29.090)
Constant	9.933***	9.697***	9.829***	9.357***	9.823***	9.762***
	(1.192)	(1.187)	(1.196)	(1.196)	(1.183)	(1.176)
Observations	777	777	777	777	777	777
R^2	0.631	0.632	0.631	0.634	0.632	0.637
Adjusted R^2	0.630	0.632	0.630	0.633	0.631	0.636

Table B.3: Presidential Approval 6 months ahead - Alternative Fs - only elections followed by strong market movements
This table presents US Presidential Approval forecast regressions (6 months ahead). The dependent variables are: lagged presidential approval; return of the last 3 months of the Winner Political Factor (F). Descriptions of the different versions of F are in tables A.1 and A.2. These models contain only elections followed by strong market movements since the 1948 election. The table shows bootstrapped standard deviations and bootstrapped significance calculated according to Welch and Goyal (2008). $*$, $**$,$***$ indicate significance at the 10, 5 and 1 percent levels, respectively.

	Presidential Approval 6 months ahead					
	F-AR	F-IS-AR	F-RA	F-IS-RA	F-RR	F-IS-RR
Lagged P.A	0.898***	0.900***	0.902***	0.904***	0.896***	0.899***
	(0.025)	(0.024)	(0.025)	(0.025)	(0.024)	(0.024)
Political Factor	−4.262	10.953	14.998	30.371	31.156	52.819
	(36.555)	(53.551)	(34.052)	(50.597)	(23.722)	(35.933)
Constant	4.822***	4.705***	4.494***	4.426***	4.924***	4.917***
	(1.346)	(1.340)	(1.356)	(1.349)	(1.312)	(1.308)
Observations	333	333	333	333	333	333
R^2	0.805	0.805	0.806	0.807	0.811	0.813
Adjusted R^2	0.804	0.804	0.805	0.805	0.810	0.811

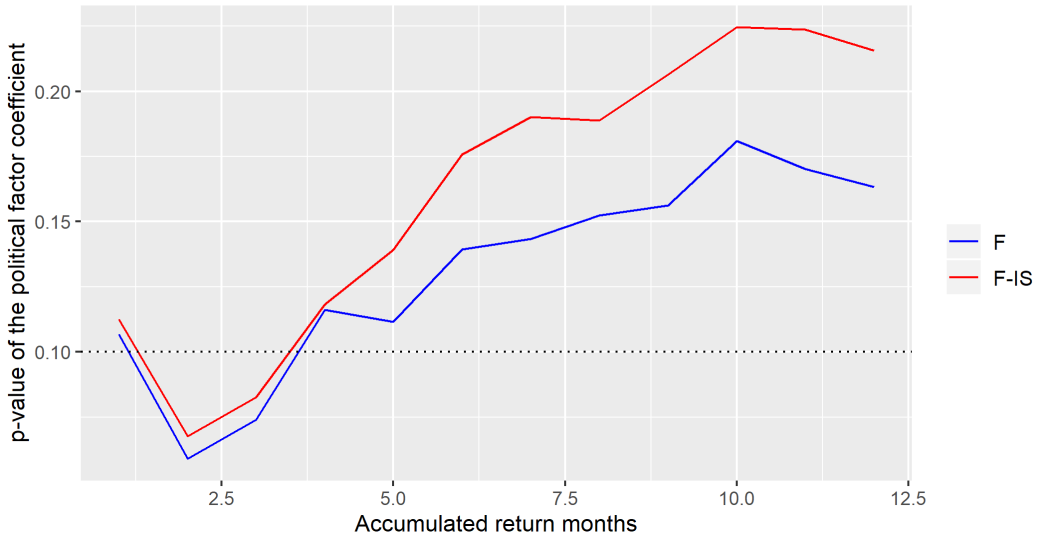
Table B.4: Presidential Approval 6 months ahead - Alternative Fs
This table presents US Presidential Approval forecast regressions (6 months ahead). The dependent variables are: lagged presidential approval; return of the last 3 months of the Winner Political Factor (F). Descriptions of the different versions of F are in tables A.1 and A.2. These models contain all elections since the 1948 election. The table shows bootstrapped standard deviations and bootstrapped significance calculated according to Welch and Goyal (2008). $*$, $**$,$***$ indicate significance at the 10, 5 and 1 percent levels, respectively.

	Presidential Approval 6 months ahead							
	F-500	F-IS-500	F-EW33	F-VW33	F-MR	F-MR-AR	F-MR-RA	F-MR-RR
Lagged P.A	0.794***	0.792***	0.792***	0.793***	0.794***	0.799***	0.795***	0.797***
	(0.022)	(0.022)	(0.022)	(0.022)	(0.022)	(0.022)	(0.022)	(0.022)
Political Factor	19.368	25.434	22.892	26.255*	23.265*	9.293	−7.679	6.471
	(15.287)	(24.301)	(16.527)	(14.306)	(14.033)	(15.712)	(14.842)	(12.956)
Constant	9.989***	10.114***	10.016***	10.073***	10.009***	9.727***	9.927***	9.816***
	(1.181)	(1.187)	(1.179)	(1.175)	(1.176)	(1.189)	(1.186)	(1.185)
Observations	777	777	777	777	777	777	777	777
R^2	0.634	0.633	0.635	0.638	0.637	0.632	0.632	0.632
Adjusted R^2	0.633	0.632	0.634	0.637	0.636	0.631	0.631	0.631

Table B.5: Presidential Approval 6 months ahead - Alternative Fs - only elections followed by strong market movements
This table presents US Presidential Approval forecast regressions (6 months ahead). The dependent variables are: lagged presidential approval; return of the last 3 months of the Winner Political Factor (F). Descriptions of the different versions of F are in tables A.1 and A.2. These models contain only elections followed by strong market movements since the 1948 election. The table shows bootstrapped standard deviations and bootstrapped significance calculated according to Welch and Goyal (2008). $*$, $**$,$***$ indicate significance at the 10, 5 and 1 percent levels, respectively.

	Presidential Approval 6 months ahead							
	F-500	F-IS-500	F-EW33	F-VW33	F-MR	F-MR-AR	F-MR-RA	F-MR-RR
Lagged P.A.	0.879***	0.880***	0.888***	0.889***	0.887***	0.901***	0.896***	0.894***
	(0.023)	(0.023)	(0.024)	(0.023)	(0.023)	(0.024)	(0.024)	(0.024)
Political Factor	52.320**	69.497**	42.286**	38.073**	38.834**	8.405	14.233	25.980
	(23.224)	(30.574)	(21.401)	(17.770)	(18.146)	(23.702)	(20.243)	(20.486)
Constant	6.368***	6.387***	5.661***	5.702***	5.827***	4.692***	4.875***	5.154***
	(1.302)	(1.305)	(1.299)	(1.286)	(1.292)	(1.334)	(1.328)	(1.319)
Observations	333	333	333	333	333	333	333	333
R^2	0.823	0.822	0.819	0.822	0.821	0.806	0.807	0.811
Adjusted R^2	0.822	0.821	0.817	0.821	0.820	0.805	0.806	0.810

Figure B.1: How the significance of the Winner Political Factor coefficient varies with the number of months used to accumulate its return
This figure presents the p-value of the Winner Political Factor return coefficient of the Presidential Approval regression model using the return of the Winner Political Factor and the lagged presidential approval as explanatory variables. It shows what happens to the p-value as we change the number of months used to accumulate the return of the political factor. In the main model, we use 63 business days (three months). The accumulation is always done until the last day of the month (t) and we want to predict the presidential approval of the month (t+6).



C
Presidential Election

Table C.1: Incumbent Party Victory Probit Regression - Alternative Fs
This table presents Incumbent Party Victory probit regressions. The dependent variables are: the last 3-month return of the Winner Political Factor (F); incumbent dummy. Descriptions of the different versions of F are in tables A.1 and A.2. ∗, ∗∗,∗ ∗ ∗ indicate significance at the 10, 5 and 1 percent levels, respectively.

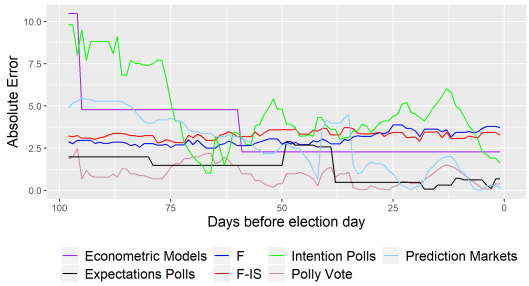
	Incumbent Party Victory					
	F-AR	F-IS-AR	F-RA	F-IS-RA	F-RR	F-IS-RR
Political Factor	5.361	−5.370	−0.413	0.153	6.510	8.149
	(11.406)	(22.846)	(8.600)	(17.311)	(9.729)	(16.330)
Incumbent Dummy	1.770***	1.740***	1.720**	1.723***	1.853***	1.780***
	(0.673)	(0.666)	(0.669)	(0.667)	(0.699)	(0.682)
Constant	−0.539	−0.512	−0.498	−0.503	−0.560	−0.545
	(0.375)	(0.368)	(0.375)	(0.371)	(0.380)	(0.375)
Observations	22	22	22	22	22	22
Log Likelihood	−11.055	−11.138	−11.162	−11.164	−10.942	−11.037

Table C.2: Incumbent Party Victory Probit Regression - Alternative Fs
This table presents Incumbent Party Victory probit regressions. The dependent variables are: the last 3-month return of the Winner Political Factor (F); incumbent dummy. Descriptions of the different versions of F are in tables A.1 and A.2. ∗, ∗∗,∗ ∗ ∗ indicate significance at the 10, 5 and 1 percent levels, respectively.

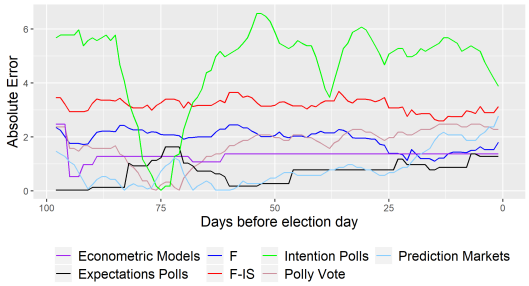
	Incumbent Party Victory							
	F-500	F-IS-500	F-EW33	F-VW33	F-MR	F-MR-AR	F-MR-RA	F-MR-RR
Political Factor	16.274	26.553	17.728*	30.079**	19.666*	5.562	−1.201	−2.371
	(11.031)	(17.384)	(9.876)	(14.296)	(10.999)	(8.509)	(7.321)	(6.387)
Incumbent Dummy	2.399**	2.472**	2.362***	4.147**	3.094**	1.899***	1.690**	1.678**
	(0.945)	(0.999)	(0.878)	(1.722)	(1.227)	(0.723)	(0.683)	(0.666)
Constant	−0.516	−0.477	−0.422	−0.654	−0.663	−0.620	−0.485	−0.475
	(0.383)	(0.389)	(0.401)	(0.429)	(0.411)	(0.416)	(0.380)	(0.373)
Observations	22	22	22	22	22	22	22	22
Log Likelihood	−9.848	−9.647	−9.128	−7.523	−8.911	−10.943	−11.150	−11.096
Akaike Inf. Crit.	25.696	25.295	24.257	21.046	23.822	27.886	28.301	28.192

Figure C.1: Absolute Error of vote predictability models (Last 7 elections) This figure presents the absolute error (% of useful votes) for vote predictability models taken into account by PollyVote and also for models with F(blue) and F-IS(red) before the election day. The Winner Political Factor model takes into account the return of 3 months before the day analyzed plus the incumbent dummy.

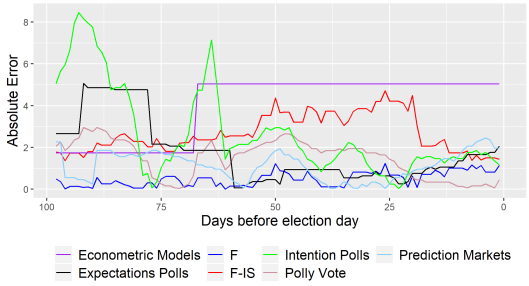
(a) 1992 US Presidential Election



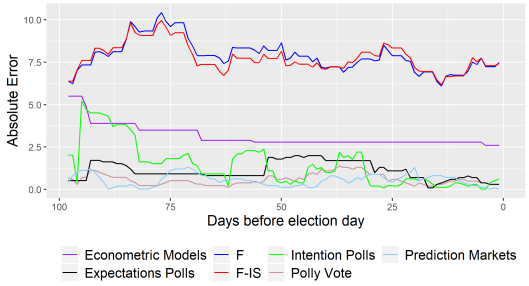
(b) 1996 US Presidential Election



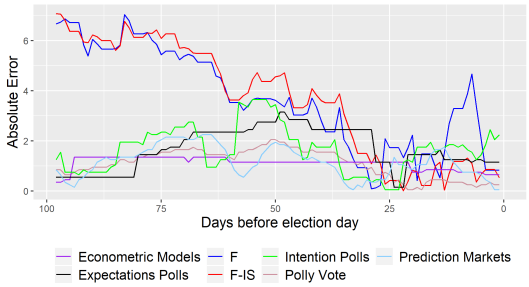
(c) 2000 US Presidential Election



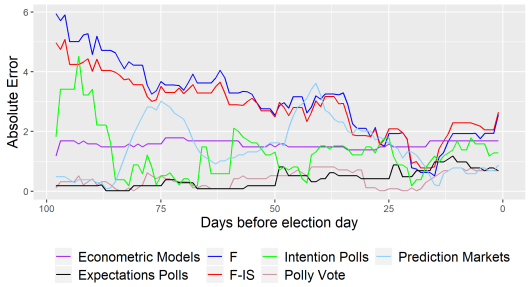
(d) 2004 US Presidential Election



(e) 2008 US Presidential Election



(h) 2012 US Presidential Election



(g) 2016 US Presidential Election

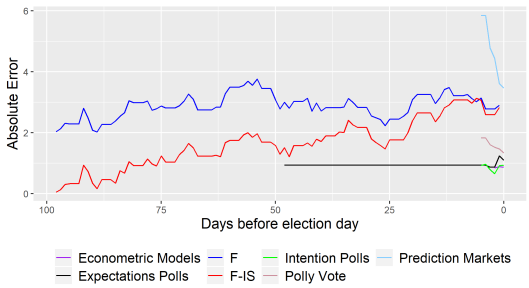


Table C.3: Incumbent Party Victory Probit Regression - Alternative Asset Pricing Models

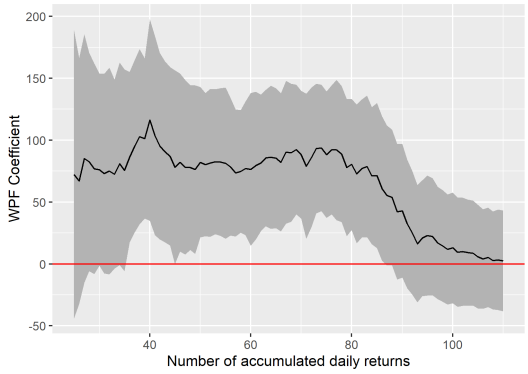
This table presents Incumbent Party Victory probit regressions. The dependent variables are: the last 3-month return of the Winner Political Factor (F); incumbent dummy. In this table, 2 Asset Pricing models are used to construct the political factor: Carhart four-factor model; Short-Term Reversal Factor + Carhart four-factor model. Descriptions of the different versions of F are in tables A.1 and A.2. $*$, $**$,$***$ indicate significance at the 10, 5 and 1 percent levels, respectively.

	Dependent variable:					
	Asset Pricing Model:					
	Carhart four-factor			Carhart four-factor + short-term reversal		
	F	F-IS	F-VW3	F	F-IS	F-VW33
Political Factor	13.942	22.794*	28.918**	23.055*	27.630*	31.919**
	(8.996)	(12.776)	(14.456)	(12.663)	(16.558)	(14.173)
Incumbent Dummy	2.138***	2.218***	4.099**	2.785**	2.443**	4.524**
	(0.781)	(0.849)	(1.869)	(1.106)	(1.012)	(1.900)
Constant	−0.456	−0.385	−0.700	−0.711	−0.438	−0.844
	(0.419)	(0.408)	(0.465)	(0.470)	(0.398)	(0.513)
Observations	22	22	22	22	22	22
Log Likelihood	−8.886	−8.990	−6.659	−7.549	−9.116	−6.155

Figure C.2: How the Winner Political Factor coefficient varies with the number of days used to accumulate its return

This figure presents the Winner Political Factor return coefficient of the incumbent party advantage regression model using the return of the F and the incumbent dummy as explanatory variables. It shows what happens to the coefficient as we change the number of days used to accumulate the return of the political factor before the election. In the model presented above, we use the last 63 days (three months) before the election. The first reference day is always the election day. Only business days are counted. The shaded interval refers to the 90% confidence interval of the analyzed coefficient according to its standard deviation.

(a) F



(b) F-IS

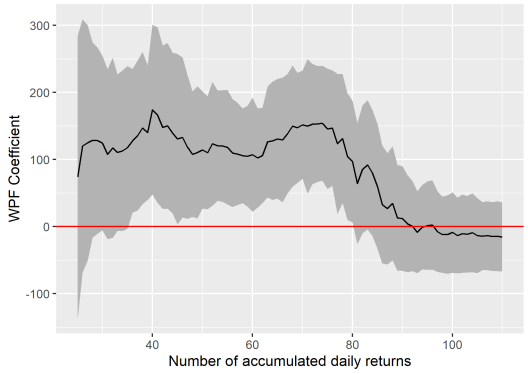


Table C.4: Incumbent Party Victory Probit Regression (Alternative Approach) This table presents Incumbent Party Victory probit regressions. The dependent variables are: the last 3-month return of the Winner Political Factor (F); presidential approval one month before the election; the last 3-month return of the stock market; variation in industrial production in the election year; incumbent dummy; midterm dummy. Descriptions of the different versions of F are in tables A.1 and A.2. $*$, $**$,$***$ indicate significance at the 10, 5 and 1 percent levels, respectively.

	Incumbent Party Victory					
		F	F-IS		F	F-IS
Political Factor		10.430*	17.258**		6.978	17.051
		(5.467)	(8.727)		(9.213)	(14.868)
Pres. Approval				0.126***	0.130***	0.133***
				(0.043)	(0.045)	(0.046)
Stock Market	4.324*	2.641	3.086	6.839*	6.400	6.375
	(2.619)	(3.238)	(3.257)	(3.864)	(3.955)	(3.915)
Industrial Prod.		1.118	1.546	11.604	13.080*	15.014*
		(4.175)	(4.282)	(7.487)	(7.834)	(8.186)
Incumbent Dummy	1.485**	2.044**	2.105**	2.416**	2.913*	3.302*
	(0.672)	(0.796)	(0.829)	(1.222)	(1.597)	(1.818)
Midterm Dummy	0.479	0.465	0.291	0.995	0.852	0.595
	(0.462)	(0.499)	(0.501)	(0.691)	(0.705)	(0.744)
Constant	−0.487	−0.505	−0.436	−7.498***	−7.715***	−7.781***
	(0.373)	(0.406)	(0.408)	(2.420)	(2.497)	(2.522)
Observations	45	45	45	36	36	36
Log Likelihood	−25.607	−23.389	−23.174	−12.354	−12.055	−11.637

Table C.5: Incumbent Party Victory Probit Regression (Alternative Approach) - Alternative Fs

This table presents Incumbent Party Victory probit regressions. The dependent variables are: the last 3-month return of the Winner Political Factor (F); the last 3-month return of the stock market; variation in industrial production in the election year; incumbent dummy; midterm dummy. F $*$, $**$,$***$ indicate significance at the 10, 5 and 1 percent levels, respectively.

	Incumbent Party Victory					
	F-AR	F-IS-AR	F-RA	F-IS-RA	F-RR	F-IS-RR
Political Factor	18.336**	19.758	4.756	14.822	11.426*	21.049*
	(8.997)	(13.745)	(6.751)	(12.835)	(6.238)	(11.162)
Stock Market	4.903	4.979*	3.749	3.306	3.903	4.266
	(3.035)	(2.861)	(2.748)	(2.781)	(2.974)	(2.972)
Industrial Prod.	3.375	3.695	2.734	2.969	2.488	3.220
	(4.196)	(4.182)	(3.884)	(4.094)	(4.064)	(4.197)
Incumbent Dummy	1.611**	1.429**	1.561**	1.583**	1.739**	1.693**
	(0.714)	(0.686)	(0.695)	(0.696)	(0.712)	(0.710)
Midterm Dummy	0.628	0.371	0.498	0.491	0.556	0.508
	(0.515)	(0.484)	(0.491)	(0.485)	(0.500)	(0.497)
Constant	−0.635	−0.505	−0.568	−0.606	−0.609	−0.650
	(0.417)	(0.391)	(0.395)	(0.401)	(0.400)	(0.412)
Observations	45	45	45	45	45	45
Log Likelihood	−23.047	−24.291	−25.138	−24.687	−23.621	−23.468

Table C.6: Incumbent Party Victory Probit Regression (Alternative Approach) - Alternative Fs

This table presents Incumbent Party Victory probit regressions. The dependent variables are: the last 3-month return of the Winner Political Factor (F); the last 3-month return of the stock market; variation in industrial production in the election year; incumbent dummy; midterm dummy. Descriptions of the different versions of F are in tables A.1 and A.2. $*$, $**$,$***$ indicate significance at the 10, 5 and 1 percent levels, respectively.

	Incumbent Party Victory							
	F-500	F-IS-500	F-EW33	F-VW33	F-MR	F-MR-AR	F-MR-RA	F-MR-RR
Political Factor	16.644**	23.656*	15.262**	22.070***	19.301***	17.106**	8.165	5.039
	(7.963)	(13.241)	(7.226)	(7.994)	(7.300)	(7.676)	(5.221)	(4.516)
Stock Market	3.532	3.748	2.901	4.227	4.264	6.371**	4.907*	4.802*
	(3.087)	(2.977)	(3.287)	(3.120)	(3.294)	(3.196)	(2.707)	(2.742)
Industrial Prod.	2.689	2.907	1.170	2.803	3.348	3.656	4.193	3.275
	(4.248)	(4.267)	(4.258)	(4.569)	(4.634)	(4.404)	(4.344)	(4.015)
Incumbent Dummy	2.211**	2.183**	2.109**	3.082***	2.777***	1.882**	1.647**	1.551**
	(0.879)	(0.883)	(0.819)	(1.145)	(1.021)	(0.779)	(0.713)	(0.698)
Midterm Dummy	0.500	0.317	0.439	0.579	0.660	0.883	0.552	0.522
	(0.498)	(0.496)	(0.504)	(0.534)	(0.531)	(0.548)	(0.495)	(0.489)
Constant	−0.552	−0.548	−0.463	−0.606	−0.634	−0.778*	−0.598	−0.549
	(0.407)	(0.415)	(0.411)	(0.431)	(0.418)	(0.420)	(0.395)	(0.385)
Observations	45	45	45	45	45	45	45	45
Log Likelihood	−22.851	−23.559	−22.857	−20.397	−20.715	−22.553	−24.093	−24.773

Table C.7: Incumbent Party Advantage Regression - Alternative Fs
This table presents Incumbent Party Advantage regressions. The dependent variables are: the last 3-month return of the Winner Political Factor (F); incumbent dummy. Descriptions of the different versions of F are in tables A.1 and A.2. ∗, ∗∗,∗ ∗ ∗ indicate significance at the 10, 5 and 1 percent levels, respectively.

	Incumbent Party Advantage					
	F-AR	F-IS-AR	F-RA	F-IS-RA	F-RR	F-IS-RR
Political Factor	76.758	69.185	4.044	87.340	70.155	139.162
	(84.076)	(166.116)	(64.713)	(125.219)	(71.891)	(115.544)
Incumbent Dummy	13.848***	13.241***	13.361***	13.713***	14.620***	14.470***
	(4.320)	(4.357)	(4.433)	(4.356)	(4.472)	(4.323)
Constant	−1.497	−0.931	−1.097	−1.404	−1.546	−1.575
	(2.780)	(2.800)	(2.883)	(2.807)	(2.776)	(2.731)
Observations	22	22	22	22	22	22
R^2	0.356	0.334	0.328	0.345	0.360	0.376
Adjusted R^2	0.288	0.264	0.257	0.276	0.293	0.310

Table C.8: Incumbent Party Advantage Regression - Alternative Fs
This table presents Incumbent Party Advantage regressions. The dependent variables are: the last 3-month return of the Winner Political Factor (F); incumbent dummy. Descriptions of the different versions of F are in tables A.1 and A.2. ∗, ∗∗,∗ ∗ ∗ indicate significance at the 10, 5 and 1 percent levels, respectively.

	Incumbent Party Advantage							
	F-500	F-IS-500	F-EW33	F-VW33	F-MR	F-MR-AR	F-MR-RA	F-MR-RR
Political Factor	90.272	127.231	112.078**	79.122	67.021	22.844	−18.950	0.266
	(54.522)	(75.694)	(45.929)	(50.957)	(49.990)	(59.430)	(52.407)	(44.397)
Incumbent Dummy	14.987***	14.815***	14.778***	16.099***	15.841***	13.804***	12.831**	13.321***
	(4.211)	(4.177)	(3.863)	(4.493)	(4.585)	(4.537)	(4.560)	(4.450)
Constant	−0.861	−0.275	0.175	−0.971	−1.369	−1.523	−0.756	−1.057
	(2.617)	(2.651)	(2.492)	(2.635)	(2.684)	(3.042)	(2.907)	(2.873)
Observations	22	22	22	22	22	22	22	22
R^2	0.413	0.415	0.488	0.404	0.386	0.333	0.333	0.328
Adjusted R^2	0.351	0.353	0.434	0.341	0.321	0.263	0.262	0.257

Table C.9: Incumbent Party Advantage Regression - Alternative Asset Pricing Models

This table presents Incumbent Party Advantage regressions. The dependent variables are: the last 3-month return of the Winner Political Factor (F); incumbent dummy. In this table, 2 Asset Pricing models are used to construct the political factor: Carhart four-factor model; Short-Term Reversal Factor + Carhart four-factor model. Descriptions of the different versions of F are in tables A.1 and A.2. $*$, $**$,$***$ indicate significance at the 10, 5 and 1 percent levels, respectively.

	Incumbent Party Advantage					
	Asset Pricing Model:					
	Carhart four-factor			Carhart four-factor + short-term reversal		
	F	F-IS	F-VW3	F	F-IS	F-VW33
Political Factor	78.499**	140.728***	82.365**	31.913**	45.716**	48.641**
	(30.378)	(48.503)	(35.954)	(11.894)	(19.328)	(17.400)
Incumbent Dummy	14.261***	13.469***	15.123***	12.348***	12.151***	13.024***
	(3.780)	(3.641)	(3.951)	(3.742)	(3.875)	(3.683)
Constant	−0.620	0.784	−0.911	0.405	0.705	0.517
	(2.412)	(2.413)	(2.477)	(2.443)	(2.568)	(2.421)
Observations	22	22	22	22	22	22
R^2	0.503	0.534	0.473	0.513	0.481	0.524
Adjusted R^2	0.450	0.485	0.418	0.461	0.426	0.474

Table C.10: Bootstrap Robustness for Probit and Advantage regressions
This table presents Incumbent Party Victory probit regressions and Incumbent Party Advantage regressions. The dependent variables are: the last 3-month return of the Winner Political Factor (F); incumbent dummy. The table shows bootstrapped standard deviations and bootstrapped significance calculated under the null hypothesis of non-predictability. We draw with replacement N pairs (y_i, x_j) using the entire sample (22 data), that is, a draw for y_i and another for x_j each time, and ran the regression. We do this 10,000 times and estimate the standard deviation and p-value of the coefficients using the sampled distribution. Descriptions of the different versions of Winner Political Factor (F) are in tables A.1 and A.2. $*$, $**$,$***$ indicate significance at the 10, 5 and 1 percent levels, respectively.

	Dependent variable:					
	Incumbent Party Victory			Incumbent Party Advantage		
	Probit			*OLS*		
	F	F-IS	F-VW33	F	F-IS	F-VW33
Political Factor	12.429*	21.587*	30.079**	85.332*	130.124*	79.122
	(7.593)	(11.394)	(10.845)	(49.760)	(76.063)	(68.338)
Incumbent Dummy	2.282**	2.438**	4.147**	14.862***	14.528***	16.099***
	(0.999)	(0.996)	(1.105)	(5.321)	(5.277)	(5.777)
Constant	−0.477	−0.382	−0.654	−0.138	0.695	−0.971
	(0.505)	(0.468)	(0.439)	(3.381)	(3.415)	(3.273)
Observations	22	22	22	22	22	22
R^2				0.501	0.499	0.404
Adjusted R^2				0.448	0.446	0.341
Log Likelihood	−9.342	−9.209	−7.523			

Table C.11: Probability of the incumbent party candidate winning - National Elections

This table presents the incumbent party candidate's winning probabilities calculated with the probit model. The two variables of the model are the 3-month Winner Political Factor return and a dummy for the incumbent. We mark with X the victory of the incumbent party candidate. In the case of "false real-time", we do the regression using all previous elections and calculate the out of sample result. In the case of "in sample", we use all elections to regress and calculate the probability according to the variables for each election. Descriptions of the different versions of F are in tables A.1 and A.2. The number of errors is the number of elections that the model wrongly predicted.

Election Year	Incumbent victory	False Real-Time			In Sample		
		F	F-IS	F-VW33	F	F-IS	F-VW33
1930					5%	4%	8%
1932					6%	1%	39%
1934	X				48%	36%	84%
1936	X				92%	93%	96%
1938					48%	40%	11%
1940	X				92%	80%	89%
1942					16%	21%	10%
1944	X				47%	40%	65%
1946					32%	43%	14%
1948	X				35%	37%	41%
1950	X				35%	24%	36%
1952					33%	33%	42%
1954	X				49%	59%	57%
1956	X				97%	97%	100%
1958					40%	46%	38%
1960					54%	53%	29%
1962	X				60%	58%	68%
1964	X				96%	98%	95%
1966					48%	47%	50%
1968					57%	65%	80%
1970	X	41%	44%	52%	42%	42%	55%
1972	X	100%	100%	100%	97%	98%	100%
1974		57%	57%	74%	51%	55%	69%
1976		46%	49%	55%	46%	51%	60%
1978	X	72%	65%	38%	70%	78%	48%
1980		100%	100%	100%	75%	75%	49%
1982	X	98%	92%	43%	85%	90%	50%
1984	X	45%	36%	52%	79%	66%	75%
1986	X	29%	39%	32%	35%	39%	38%
1988	X	32%	39%	45%	34%	35%	45%
1990	X	51%	61%	31%	44%	56%	31%
1992		58%	46%	37%	48%	38%	32%
1994		53%	45%	24%	46%	39%	23%
1996	X	90%	95%	100%	92%	97%	100%
1998	X	89%	86%	85%	79%	84%	79%
2000		73%	31%	24%	62%	28%	25%
2002	X	24%	47%	27%	26%	43%	28%
2004	X	99%	100%	100%	98%	99%	100%
2006		60%	71%	15%	57%	63%	18%
2008		3%	5%	38%	5%	10%	39%
2010		71%	74%	80%	69%	69%	74%
2012	X	78%	80%	94%	82%	84%	94%
2014	X	48%	44%	42%	49%	44%	42%
2016		26%	22%	5%	23%	18%	5%
2018		27%	33%	66%	25%	32%	63%
Number of errors		13	10	12	18	16	15

D
Ruling Party House Seats

Table D.1: Ruling Party House Seats Regression

This table presents Ruling Party House Seats regressions. The dependent variables are: the last 3-month return of the stock market; the last 3-month return of the Winner Political Factor (F); variation in industrial production in the election year; presidential approval one month before the election; midterm dummy; democratic dummy. Descriptions of the different versions of F are in tables A.1 and A.2. $*$, $**$,$***$ indicate significance at the 10, 5 and 1 percent levels, respectively.

	Ruling Party House Seats					
			F	F-IS	F-IS	F-IS
Lagged House Seats	0.724***	0.724***	0.745***	0.773***	0.747***	0.774***
	(0.117)	(0.118)	(0.117)	(0.115)	(0.118)	(0.116)
Stock Market	70.493	64.280			37.039	31.595
	(45.685)	(46.309)			(50.183)	(47.642)
Political Factor			142.134*	282.026**	116.064	252.576*
			(78.936)	(119.039)	(86.903)	(127.863)
Industrial Prod.		66.757	51.415	33.111	48.216	30.699
		(74.074)	(74.081)	(73.137)	(74.643)	(73.757)
Midterm Dummy	−22.974**	−24.131***	−26.872***	−31.078***	−26.597***	−30.577***
	(8.619)	(8.734)	(8.783)	(8.940)	(8.843)	(9.036)
Democratic Dummy	17.533*	14.381	12.684	12.901	12.468	12.536
	(10.118)	(10.728)	(10.651)	(10.303)	(10.718)	(10.392)
Constant	49.835**	50.994**	50.915**	47.250**	49.726**	46.455**
	(22.538)	(22.627)	(22.235)	(21.760)	(22.423)	(21.950)
Observations	45	45	45	45	45	45
R^2	0.696	0.703	0.712	0.727	0.716	0.730
Adjusted R^2	0.666	0.664	0.675	0.692	0.671	0.688