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*The effect of economic reforms on re-election probability
in gubernatorial elections 1985-2010*

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Abstract

Economic literature offers several theories of resistance towards reforms among politicians. Yet, recent empirical cross-country studies suggest that voters reward governments pursuing structural reforms. This paper tests this hypothesis on gubernatorial elections in the U.S. over the period 1985-2010, using probit regressions and increases in an index measuring the degree of economic freedom as a proxy for economic reforms. Results clearly indicate that American voters indeed reward governors that have increased the degree of economic freedom. This effect is driven by decreases in the size of government, particularly decreases in subsidies and transfers. Furthermore, anecdotal evidence and empirical studies suggest that economic reforms are easier implemented from left-wing governments. This logic is explained by a theoretical model and tested empirically on gubernatorial elections, and results in the conclusion that Democratic governors are disproportionally rewarded relative to Republican governors. Results are robust when altering the specification of the model or the model itself, however the magnitudes of the effects are questionable.

Keywords: Economic Reform, Electoral Competition, Gubernatorial Elections, Voting Behavior

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1 Introduction

Over the past decades, several theories have been presented to explain reform resistance among policymakers. Uncertainty about the distribution of the gains and losses, effective lobbying from special interest groups and fear of the consequences of the reform are frequent explanations. These theories have been applied to explain, for instance, the rigidity of reforming regulations such as trade restrictions or agricultural subsidies, but also the lack of market-oriented pro-growth reforms, as formulated in the *The Economist* (2007):

Both the IMF and the OECD have been urging further liberalisation as the only sure route to better economic performance. Even Europe’s political leaders understand this, though they are also swift to spot political obstacles to reform. As Luxembourg’s Mr Juncker once said, “we all know what to do, we just don’t know how to get re-elected after we’ve done it.”

In recent years, the alleged tension between implementing structural economic reforms and being re-elected has been questioned. In a paper by Buti et al. (2008), the authors argue that structural reforms are in fact rewarded, not punished, by the voters, given that financial markets work well. In a recent non-academic book, Fölster and Sanandaji (2014) draw the same conclusion, albeit with a different empirical approach. By regressing an index score of economic freedom on a dichotomous re-election variable, the authors find that an increased degree of economic freedom results in a higher probability of re-election, at least for left-wing governments.

The main purpose of this paper is to analyze and empirically test the findings of Fölster and Sanandaji (2014) in a different setting, viz. on gubernatorial elections in the U.S. There are several reasons for focusing on the subnational level. Since the states within the U.S. are more homogenous than different nations, results are less sensitive to outside factors. Also, data availability on the U.S. state level is superior in this case, since there exists a subnational index of economic freedom including far more historic data than does the international index. Furthermore, the results of Fölster and Sanandaji (2014) are derived from a very simplistic model, therefore there is a point in testing their hypotheses with a more comprehensive econometric setup.

Another important purpose of the paper is to analyze the finding that left-wing policymakers are disproportionally rewarded for reforms associated with right-wing policies (such as increasing the degree of economic freedom). Previous researchers have noted that, in many countries, market-oriented reforms have been implemented by policymakers from the left of the center of the political spectrum. Therefore, this paper presents a model that offers a potential explanation to these phenomena and tests the hypothesis that Democratic governors are

disproportionally rewarded for increasing economic freedom, defining Democratic governors as left-wing and Republican governors as right-wing according to conventional conceptions.

Employing probit regressions, the results from the empirical analysis clearly show that American voters indeed reward governors in states where the degree of freedom has increased over the term of office, though the magnitude of the effect might not be very large. This effect is driven by decreases in government size, particularly by decreases in subsidies and transfers. Furthermore, the hypothesis that left-wing governors are disproportionately rewarded for increases in economic freedom is confirmed.

The paper contributes to the current state of knowledge in several ways. Firstly, by developing the method of Fölster and Sanandaji (2014) and by finding that their results are consistent in another setting and with a more comprehensive econometric setup, it contributes to the scarce literature on empirical studies of economic reforms and re-elections. Secondly, it additionally corroborates findings from earlier studies on economic factors and re-elections and brings new insights to the knowledge about the mechanisms behind re-election. Several authors have found that American voters punish expansions of the size of government in gubernatorial elections, but in the present paper this effect is narrowed down to an even more detailed level, concluding that it is decreases in transfers and subsidies that play a particularly big role. Thirdly, in this paper the predictions of a theoretical model, explaining why a right-wing policy is easier implemented by a left-wing policymaker, is empirically tested and confirmed.

The remainder of the paper is structured as follows. Section 2 presents a literature review of previous research. It is primarily focused on theories of reform resistance and of important empirical papers from the economics and political science literature dealing with the effect of different economic and political factors of re-election. Section 3 highlights the research focus clearly by stating research questions and proposing hypotheses. Section 4 introduces a modified version of a theoretical model explaining why a right-wing policy is easier introduced from a left-wing policymaker. Section 5 is a description of the data and the method of the empirical analysis. This section also includes a description of the variables used in the regressions, as well as some descriptive statistics. Section 6 presents the results from the probit regressions, commenting upon the hypotheses. It also contains a sensitivity analysis where, i.e., the hypotheses are tested in a linear model. Section 7 discusses the results, their implications and their relation to the model introduced in section 4. Section 8 concludes the paper.

2 Previous Research

This section summarizes important papers from the literature related to reforms and re-election probability. It covers theories about reform resistance and empirical evidence of the effect of different political and economic factors on re-election, as well as the difference between left-wing and right-wing policymakers when coming to reform implementation. The literature review underpins both the justification of the research questions and the choice of variables for the empirical analysis.

2.1 Reform resistance

It is often claimed that there is a resistance towards reforms among politicians. Several theories within the literature of political economy have been developed to explain this phenomenon. Reform resistance is sometimes attributed to technical uncertainty, i.e., it is difficult to know in what way markets should be reformed. Different interest groups can also have different opinions about the technicalities of the reform (European Commission, 2005). According to Olson (1971), resistance towards reforms is explained by individuals or groups not acting in common interest but rather in self-interest. Reforms, although generally benefiting the public, may hurt special interest groups, who therefore will resist reforms. Since special interest groups are often better organized than the public, they are able to influence policies and hinder reforms. Santesson (2012) develops this theory, arguing that people are more concerned about losses than they are about gains. Due to this cognitive phenomenon, it is not enough for a reform to provide more gains than losses for society as a whole in order to get a positive response.

Fernandez and Rodrik (1991) argue, by creating a theoretical model, that resistance towards reforms could be explained by the ex-ante uncertainty of the distribution of gains and losses from the reform. A reform that would be beneficial for the public ex-post could still be blocked if individual actors were uncertain about whether they would gain or lose from the reform. The authors use trade liberalization as an example. Though heavily supported by economists, trade liberalization is hard to carry out and has in some cases (e.g. in South Korea, Chile, and Turkey) been “imposed by authoritarian regimes and against the wishes of business, even though business emerged as the staunchest defender of outward orientation once the policies were in place” (Fernandez and Rodrik (1991:1147). Because of the ex-ante uncertainty about which sectors and entrepreneurs that would benefit and which would lose from trade liberalization, reforms were opposed.

In a similar line of argument, Alesina and Drazen (1991) develop a theoretical model that explains why delays in fiscal stabilization (i.e., a type of economic reform) can be explained

by the heterogeneity in the population. When it is uncertain how the costs of the stabilization will be distributed among different socioeconomic groups, each group tries to shift the burden onto other groups, causing the reform to be delayed until the conflict is solved.

Alesina and Tabellini (1990) create yet another theoretical model to explain why it is hard to agree on reforms that would reduce budget deficits. The current political majority, if uncertain about which policies the future political majority desires, may run budget deficits that are not optimal for society as a whole. That is, “the expected marginal disutility of having to reduce spending in the future, to repay the debt incurred today, is not sufficiently high” in order for the political majority not to run deficits (Alesina and Tabellini, 1990:38).

2.2 Re-election determinants on the cross-country level

Only a few empirical studies test the impact of structural reforms on re-election probability. However, the literature on the impact of political and economic factors on re-election is richer, albeit largely stemming from the 20th century. Powell and Whitten (1993) investigate how inflation, unemployment, and GDP growth affect electoral support by conducting regression analyses on a data set comprising 102 elections in 19 countries over the period 1969-88. In the baseline model, results are insignificant. However, when categorizing the governments on the left-right scale, controlling for type of parliamentary structure, the relationships become clearer. In countries where policymaking responsibility is clear, the economic effects are strong and consistent. GDP growth affects re-election prospects positively, inflation and unemployment do not.

Alesina et al. (1998) investigate how reducing budget deficits affect re-election probabilities in 19 OECD countries over the period 1965-95, using probit regressions where unemployment, GDP growth and inflation are included as additional economic explanatory variables. They conclude that deficit cuts have no significant effect on re-election probability, nor has GDP growth or unemployment. Even in earlier cross-country studies, such as Paldam (1991) and Lewis-Beck (1988), no significant effect of growth and unemployment on re-election probability has been observed.

In one of the more recent studies, Brender and Drazen (2008) investigate how economic growth affects re-election probability. Unlike previous studies, they find that an increased GDP per capita between the current and the previous election raises the probability of re-election for less developed countries but not for developed countries. The authors argue that this contrast is due to the fact that the earlier studies do not distinguish developed from less developed countries. Furthermore, the authors also investigate how increased deficits, during an election year as well as over a term of office, affect re-election probabilities for various governments,

using a sample of 74 developed and non-developed countries over the period 1960-2003. They find that voters tend to punish, not reward, governments that increase deficits during the election year or over a term of office. In other words, voters reward surpluses and fiscal stability. These results are significant for both developed and non-developed countries.

Buti et al. (2008) use a similar empirical research setup as Brender and Drazen (2008), though adding reform variables to the explanatory variables and looking only at 21 OECD countries over the period 1985-2004¹. Running multivariate probit regressions, their results show that reforms increase the probability of re-election, given that financial markets are well developed². If financial markets are not well developed, however, reforms do not have a statistically significant effect on re-election³. The theoretical explanation for this is that “financial market and financial intermediation allow agents to share in the future gains brought about by growth-enhancing reforms” (Buti et al., 2008:16). Thus, they conclude that structural reforms ought to go hand in hand with financial market liberalization.

In a recent non-academic book, the above-mentioned Fölster and Sanandaji (2014), the authors study the effect of changes in economic freedom, using the “index of economic freedom” published by the Wall Street Journal and the Heritage Foundation⁴, on re-election probability for 93 governments in 29 OECD countries that completed their term of office during the period 1998-2012. Using a simplistic probit regression model, the authors find that left-wing governments enjoy a significantly higher probability of being re-elected if increasing the degree of economic freedom. For right-wing governments, on the other hand, the results are insignificant. Defining economic reforms by using an index of economic freedom is an innovative approach that has not been used in any previous study. At the same time, the only control variable in the study is the level of unemployment, which raises some doubts over the results. Therefore, this paper aims to test these hypotheses with a more extensive econometric model on gubernatorial elections in the U.S.

¹The structural reform variable is a dummy variable where “a bold reform is called if in a given country, in a given year, a significant change took place in at least one of the structural indicators summarising the policy stance in the following policy areas: unemployment benefit system, labour taxes, employment protection legislation, product market regulations, retirement schemes” (Buti et al., 2008:10).

²Financial markets are evaluated based on the degree of financial freedom, which is measured by the indicators of financial freedom in the Economic Freedom of the World report published by the Fraser Institute. “The indicator measures, on an inverse scale, the degree of anti-competitive regulations in four areas: bank ownership, foreign bank competition, private sector credit, interest rate controls” (Buti et al., 2008:24).

³Interacting the reform variable with the financial freedom variable, the effect becomes significant.

⁴See <http://www.heritage.org/index/> for more information about this index.

2.3 Re-election determinants in the U.S.

A relatively large literature exists on which political and economic factors affect election outcome in the U.S.⁵ In a frequently cited paper, Peltzman (1992) uses a sample over the period 1950-88 and finds that voters penalize expansions of state welfare spending in gubernatorial elections, thus concluding that voters are “fiscal conservatives” in those elections. The author cannot but speculate about why the public sector spending has increased throughout the nearly forty years covered by the data despite voter opposition towards government expansion. In an earlier study, Peltzman (1987) also finds that voters punish governors for expanding the state budget. Apart from the management of the state budget, voters are however found to be more concerned about national economic conditions than they are about state economic conditions, even in the gubernatorial elections⁶.

Lowry et al. (1998) perform an empirical assessment about fiscal variables on electoral performance in gubernatorial and state legislative elections for 41 American states over the period 1968-92, employing regression models. Unlike Peltzman (1992), the authors analyze Democratic and Republican governors separately, concluding that Republicans, but not Democrats, gain if revenue or spending is below expectations. The authors therefore reject Peltzman’s conclusion of uniform fiscal conservatism. In line with several prior studies (see e.g. Chubb, 1988; Kone and Winters, 1993; Niemi et al., 1995; and Peltzman, 1987), the authors also find that growth in the gross state product (GSP) affect state elections, where a higher GSP growth leads to a higher vote share. The authors are, however, puzzled by the result that the fiscal balance has no effect on gubernatorial election outcome. They speculate that voters penalize the governor’s party in the state legislative election if the budget is mismanaged.

In a more recent study, Cummins and Holyoke (2012:3) “examine electoral accountability of governors and legislatures for fiscal policy outcomes in the U.S. states”⁷ over the period 1990-2008 through regression analyses. For gubernatorial elections, the authors find that growth in spending and revenue, in absolute terms, increase votes received in the next election, whereas increases in government size, which is measured as a percentage of the GSP, have the opposite effect⁸: “it appears to be the classic electoral paradox, that voters want government services for themselves but do not want big government that serves everyone” (Cummins and Holyoke,

⁵For an in-depth discussion and a rigorous summary on the topic, see Leal (2006).

⁶Peltzman speculates that voters use gubernatorial elections, which often are held simultaneously as midterm Congressional elections, to send a signal to the White House about what political changes they would like to see for the presidential election.

⁷The only excluded state is Nebraska.

⁸Spending is measured as increases in state real general fund expenditures since the last election in absolute terms, whereas government size is measured as a percentage of the GSP.

2012:24). Incumbent governors who preside over a state deficit are also found to be punished by the voters.

2.4 Left-wing vs. right-wing policymakers

As mentioned, Fölster and Sanandaji (2014) observe the interesting phenomenon that left-wing governments, but not right-wing governments, have a significantly higher chance of being re-elected when increasing the degree of economic freedom. The authors speculate that this has partially to do with triangulation: “the opportunities for centre-right governments to broaden their electoral support by market reforms is limited, while left-leaning parties who choose to deregulate and lower taxes may by doing so attract the attention of the typical centre-right voter” (Fölster and Sanandaji, 2014:40). An alternative explanation is presented in section 4 of this paper, which is based on the possibility that the left-wing policymakers possess more credibility when introducing policies considered to be right-wing.

The phenomenon that market-oriented reforms are often introduced from the left has been observed plenty of times before. Rodrik (1993, 1996) presents “paradoxical” cases from Latin American countries in the late 1980s and early 1990s where market-oriented reforms were implemented by formally protectionist or leftist presidents. Similarly, Williamson and Haggard (1994) summarize thirteen cases of market-oriented reforms over the period 1979-90, finding that only three of them were implemented by governments right of the center. Out of those, two (in Chile 1983 and Korea 1979) were examples of military dictatorships. Based on these findings, Cukierman and Tommasi (1998:331) conclude that “[t]his tenancy would suggest that, under fairly democratic conditions, market-oriented reforms are more likely to be implemented by governments coming from the left, or center-left, of the political spectrum”. Fölster and Sanandaji (2014) provide examples from Australia, Canada and the United Kingdom where the center-left parties in the respective countries have successfully implemented market-oriented reforms over the past decades.

It is however not completely clear whether this phenomenon is observable on the U.S. state level. Democratic and Republican candidates are rarely researched separately. Therefore, we will test whether changes in the degree of economic freedom affect re-election prospects differently for Democratic (left-wing) than for Republican (right-wing) governors.

3 Research Focus

The literature review in the previous section showed that although there are many theoretical explanations of reform resistance, there is little empirical evidence that voters punish reformist governments. The few studies empirically dealing with the relationship between structural economic reforms argue that reformist governments are rewarded by voters. This paper aims to extend the research of one of these studies, viz. Fölster and Sanandaji (2014), by analyzing the effects of economic reforms on re-election probability. Instead of a cross-country study, this paper is focused on gubernatorial elections in the U.S. Using data for these elections has several advantages. The American states share a number of characteristics that different countries do not share; the different states are practically obeying under the same political, judicial, financial, and monetary system. Thus, there is less need to account for some political variables that studies such as Powell and Whitten (1993) and Brender and Drazen (2008) have pointed out as important to include in cross-country analyses. Also, data availability for American states is superior to data availability for nations.

There are also some challenges looking at gubernatorial elections. American elections are both frequent and conducted at several levels, as Brown (2010:605) points out: “In California [...], each voter in 2006 had to evaluate thirteen proposed initiatives in addition to candidates for seven statewide offices, two Congressional offices, two state legislative offices, and various judgeships”. Since the gubernatorial election is just one election out of many, it is not completely clear on what basis voters elect their governor. Some studies (see e.g. Atkeson and Partin, 1995; and Niemi et al., 1995) find that governors are evaluated based on state economic factors, whereas other studies argue that national economic factors are more important (see e.g. Chubb, 1988; and Peltzman, 1987). Svoboda (1995) and Tompkins (1988) found that state-specific economic factors became more important as many gubernatorial elections were moved to non-presidential election years. Brown (2010:607), using data from exit polls and surveys, claims that voters blame the governor or president for policy outcomes in a partisan manner, based on party identification: “Voters will tend to blame whichever level of government that is not controlled by their own party”. Hence, to what extent governors are held accountable for economic performance is a somewhat complex issue. Nonetheless, the governor has a great influence over the state budget and consequently over state spending and taxation.

Unlike Fölster and Sanandaji (2014), who use the index of economic freedom from the Wall Street Journal and the Heritage Foundation, this paper uses the Economic Freedom of North America index (henceforth Economic Freedom Index, EFI) from the Fraser Institute. This is a similar index measuring the degree of economic freedom over time in all of the U.S. states

(see section 5.1 for a closer description of this index). By using changes in the EFI as a proxy for economic reforms, we are able to test the effect of such reforms on re-election probability. Further, by disaggregating the EFI into its available subindexes and subcomponents, we are able to get a much more detailed picture of what specific parts of the data constituting the EFI actually affect re-election probability. We also want to empirically test the hypothesis that this type of economic reform is easier implemented by left-wing policymakers.

Therefore, this study aims to address the following questions:

- *Do economic reforms, defined as increases in the overall index of the Economic Freedom Index (EFI), affect the probability of re-election in gubernatorial elections in the U.S.?*
- *Are there any specific parts of the data constituting the EFI that affect re-election probability significantly more than other parts of the data?*
- *Is the probability of re-election of governors due to economic reforms dependent on the party of the incumbent governor?*

Since Fölster and Sanandaji (2014) also use an index of economic freedom as a proxy for reforms and find that voters reward governments increasing the degree of economic freedom, it is reasonable to expect the same effect on the U.S. level. The other empirical study of reforms on re-election probability, Buti et al. (2008), define “structural reforms” in another way, but also reach the conclusion that voters reward, not punish, reforms. Furthermore, several studies that study the effect of different economic factors on re-election in the U.S. find that increases in the size of government have a negative impact on re-election prospects. Therefore, it is expected that the components constituting the Government Size subindex of the EFI are better explanators of re-election probability than are the other components. Also, as the results of Fölster and Sanandaji (2014), as well as anecdotal evidence, suggest, Democratic (left-wing) governors are expected to be disproportionally rewarded for increasing the degree of economic freedom.

Therefore, the following hypotheses can be proposed:

- **Hypothesis 1:** *Economic reforms, defined as increases in the Economic Freedom Index (EFI), significantly increase the probability of re-election for governors.*
- **Hypothesis 2:** *Decreases in government size, as defined in the EFI, increase the probability of re-election for governors more than decreases of the components constituting the other two subindexes.*
- **Hypothesis 3:** *Democratic (left-wing) governors are significantly more rewarded for economic reforms than Republican (right-wing) governors.*

Hypothesis 1 is fairly straight-forward to test, since the coefficient of the variable of the overall EFI determines whether we reject or accept it. As for Hypothesis 2, we will be able to compare the different subindexes to test it. The EFI can be disaggregated even further, but we do not hypothesize beforehand about which subcomponents will play the biggest part, since this is not examined before and we do not find any suggestions in the literature. To test Hypothesis 3, we also run the regressions separately for Democratic and Republican governors, respectively.

Before going into the empirical analysis of the thesis, it is useful to present a theoretical model that is able to explain the logic behind Hypothesis 3, which might appear counter-intuitive at a first glance.

4 Theory

This section presents a theoretical model created by Cukierman and Tommasi (1998) that explains under what conditions, and why, a right-wing policy can be implemented only by a left-wing policymaker, and vice versa. The basic idea of the model is that there are informational asymmetries between the incumbent policymaker and the electorate, where the former is better informed about socially optimal policies⁹. However, since the government also has partisan preferences, the public cannot be certain whether a proposed policy is motivated by concerns over social welfare or by the government's desire to implement its own partisan preferences. Therefore, a right-wing government that proposes a right-wing policy cannot credibly communicate the superiority of the policy. However, a left-wing government that proposes a right-wing policy possesses the credibility to do so, since the public is convinced that the government would only propose a policy against its partisan preferences because of concerns over social welfare. Hence, according to the model, only a left-wing politician can implement a right-wing policy without being severely politically punished, i.e., losing the next election.

4.1 The model

The model considers an economy composed of three agents: voters, a left-wing (L) and a right-wing (R) policymaker¹⁰. For the sake of simplicity, the policymakers only have preferences over a single policy issue. For any of the three agents, the utility is given by

$$U^j = -|z - (\tilde{\pi}^j + \gamma)|, \quad (1)$$

⁹According to the authors, such an asymmetry is recognized in several studies.

¹⁰To simplify the reading, voters are given a female pronoun and policymakers are given a male pronoun.

where z is the policy implemented¹¹, $\tilde{\pi}^j$ is agent j 's most preferred policy position, and γ is a stochastic variable that captures unidirectional shifts in the preferred positions of *all* agents that arise because of external circumstances (i.e., γ denotes shifts in the “state of the world”). It is assumed, without loss of generality, that $\tilde{\pi}^L = -K$, $\tilde{\pi}^R = K$ for $K > 0$ and that the preferred position of the medium voter $\tilde{\pi}^M = 0$.

Only the incumbent policymaker, L or R , can observe γ . After having done so, he decides which policy to propose for the next term, namely $\pi^j \in \{-\pi, 0, \pi\}$ for $\pi > 0$ with $-\pi$ interpreted as left-wing policy and, 0 as a status quo policy, and π as a right-wing policy. The voters decide whether to accept ($v = 1$) or reject ($v = 0$) the proposed policy. Since the status quo policy is normalized to zero, the proposed policy is $z = v\pi^j$. From (1), it can be concluded that voters have single-peaked preferences; hence, the election outcome is decided by the median voter¹².

As mentioned, only the incumbent can observe γ . The prior distribution of γ , which is common knowledge, is given by

$$\gamma = \begin{cases} -a & \text{with probability } p, \\ 0 & \text{with probability } 1 - 2p, \\ a & \text{with probability } p, \end{cases} \quad (2)$$

where $a > 0$. That is, if $\gamma = a$, the state of the world is right of the center and right-wing policies become more desirable for everyone. Similarly, if $\gamma = -a$, left-wing policies become more desirable for everyone. Depending on parameter values, the game can yield different equilibria. In order to yield the result that only a left-wing policymaker can implement a right-wing policy, the following three assumptions about the parameters must be made:

$$\begin{aligned} \text{(a)} \quad & a > K + \pi/2, \\ \text{(b)} \quad & K > \pi/2, \\ \text{(c)} \quad & p < 1/3, \end{aligned} \quad (3)$$

Assumption (3a) implies that the state of the world shock must be large enough for the left-wing policymaker to propose a right-wing policy¹³. Assumption (3b) implies that each policymaker proposes his preferred policy when $\gamma = 0$. Assumption (3c) means that the

¹¹If $z > 0$, a right-wing policy is implemented. If $z < 0$, a left-wing policy is implemented.

¹²Single-peaked preferences imply that, for every voter, utility decreases with distance from the preferred position. Hence, the aggregated utility is maximized when the median voter decides the election outcome.

¹³If, for example, the state-of-the world shock that makes the right-wing policy more desirable for everyone is smaller than the absolute value of the incumbent left-wing policymaker's leftist preference, he will still propose a left-wing policy.

probability of a policymaker proposing a policy against his partisan preference is relatively low.

The two latter assumptions constitute a policymaker's credibility problem in convincing the voters that his ideologically preferred policy is the socially optimal one. Since the voters expect a ring-wing policymaker to propose a right-wing policy not only when there is a rightish state of the world (i.e., when $\gamma > 0$), but also when the state of the world is neutral (i.e., when $\gamma = 0$), a ring-wing policymaker cannot credibly convince the median voter that there is an actual rightish state of the world shock. The median voter will therefore (since she prefers the status quo option) vote against a right-wing policymaker proposing a right-wing policy. If a left-wing policymaker, however, proposes a right-wing policy, the median voter would interpret that as a credible signal that there is an actual state of the world shock to the right and therefore vote in favor of the policy. For that reason, only the left-wing policymaker could implement the right-wing policy, and, symmetrically, only the right-wing policymaker could implement the left-wing policy.

4.1.1 Equilibrium

To see why we reach this equilibrium given (1), (2) and (3), we consider, in turn, both the policymaker and the median voter. Suppose that the incumbent policymaker is left-wing, L . If he observes $\gamma = -a$, he is expected to propose $\pi^L = -\pi$, which the median voter will reject, leaving the policymaker with $-K - a$ in payoff. Deviating by proposing $\pi^L = 0$ gives him the same payoff. Deviating to $\pi^L = \pi$ will be accepted by the median voter, but decreases his payoff to $-\pi - K - a$. If he instead observes $\gamma = 0$, he is also expected to propose $\pi^L = -\pi$, which will be rejected and give him the payoff $-K$. Deviating to $\pi^L = 0$ gives him the same payoff. Proposing $\pi^L = \pi$ will be accepted by the median voter, but decreases his payoff to $-\pi - K$. If he observes $\gamma = a$, however, he is expected to propose $\pi^L = \pi$, which the median voter would accept and leave the policymaker with $\pi + K - a$ in payoff. Proposing $\pi^L = -\pi$ or $\pi^L = 0$ would change L 's payoff to $K - a$, which is a decrease given that assumption (3a) holds and that $\pi > 0$.

Next, consider the voter. If the policymaker has proposed $\pi^L = \pi$, the voter's payoff for accepting the proposal would be $\pi - K$, which would exceed the payoff of rejecting the proposal, $-K$. If, on the other hand, the voter observes that the governor has proposed $\pi^L = -\pi$, she concludes that the state of the world is either $-a$ or 0 . Using Bayesian updating of (2), she assumes that $Pr(\gamma = -a | \pi^D = -\pi) = p/(1-p)$ and that $Pr(\gamma = 0 | \pi^D = -\pi) = (1-2p)/(1-p)^{14}$. If $p < 1/3$, i.e., if assumption (3c) holds, it is optimal for the voter

¹⁴This is easily calculated using Baye's formula, which stipulates that $Pr(A|B) = [(P(A) * P(B|A)]/P(B)$.

to reject the policy proposal (since the updated probability of $\gamma = -a$, in which case it would be reasonable to accept the proposal, is less than 0.5 when (3c) holds). Hence, the median voter does not want to deviate from the proposed equilibrium.

Hence, we obtain an equilibrium where the strategies for L and the median voter (s^L and s^M) are:

$$\begin{aligned} s^L : (\pi^L | \gamma = -a) &= (\pi^L | \gamma = 0) = -\pi, (\pi^L | \gamma = a) = \pi \\ s^M : (v | \pi^L = \pi) &= 1, (v | \pi^L = -\pi) = 0 \end{aligned} \quad (4)$$

with the following set of beliefs for the median voter:

$$\begin{aligned} Pr(\gamma = -a | \pi^L = -\pi) &= p/(1-p), & Pr(\gamma = -a | \pi^L = \pi) &= 0 \\ Pr(\gamma = 0 | \pi^L = -\pi) &= (1-2p)/(1-p), & Pr(\gamma = 0 | \pi^L = \pi) &= 0 \\ Pr(\gamma = a | \pi^L = -\pi) &= 0, & Pr(\gamma = a | \pi^L = \pi) &= 1 \end{aligned} \quad (5)$$

This constitutes a Perfect Bayesian Equilibrium (PBE), since 1) the strategy of L is optimal given the voter's strategies and beliefs; 2) the voter's strategy is optimal given her beliefs and L 's strategy; and 3) the beliefs are derived from Bayesian updating where possible (in this case after the policy has been proposed). Of course, an analogous PBE can be derived for the case where R is the incumbent policymaker¹⁵.

4.2 Prospective and retrospective voting

The above model by Cukierman and Tommasi (1998) considers voters to be prospective, i.e., they base their vote decision on what they expect politicians to do in the future. In this paper, we look at how politicians are rewarded for past behavior. If voters base their decision solely on past performance of the incumbent, they are said to be retrospective. The effects of prospective and retrospective voting, as well as their intermutual relationship, are well examined in the political science and economics literature.

Key (1966) argues that voters are purely retrospective and base their votes on whether they like the performance of the current government. Downs (1957), on the other hand, argues that voters evaluate the performances of a party in the past in order to form an expectation about what the party will do in the future, i.e., voters are prospective by being retrospective. Since it is hard to know what a party will do in the future, evaluating what a party has done in the past is a low-cost and reliable indicator what it will do in the future, the author argues. Fiorina (1981) tests these theories empirically, and concludes that expectations about the future are indeed important for American voters, but that these expectations are grounded in

¹⁵This PBE would be the mirror image of (4) and (5).

retrospective evaluations about parties and candidates. These findings are later corroborated in a cross-national study by Lewis-Beck (1988). Campbell et al. (2011) find that retrospective voting is conditional on whether the incumbent policymaker is personally running for re-election or if it is an open seat election where two un-experienced candidates are competing for office¹⁶. If the incumbent governor is running for another term, the authors find that retrospective voting is far more important than if it is an open seat election.

Hence, since several empirical studies find that voters base their expectations of the future on the past, the model by Cukierman and Tommasi (1998) is relevant also in this study. In the empirical section of this paper, the prediction of the model is tested on gubernatorial elections in the U.S. over the last three decades.

5 Data and Method

Before presenting the results of the empirical analysis, the data and the method will be commented upon. This section also contains a description of the variables included in the regressions and some descriptive statistics.

5.1 Data

As previously mentioned, this paper uses increases in the Economic Freedom of North America index as a proxy for economic reform. This index is published yearly¹⁷ by the Canadian think tank Fraser Institute and rates the degree of economic freedom in all U.S. states, Canadian provinces, and Mexican states¹⁸ on a scale from 0 to 10, where a higher score denotes a higher degree of economic freedom. The index employs ten components, which are divided into three subindexes: 1. Size of Government¹⁹; 2. Takings and Discriminatory Taxation²⁰; and 3. Labor Market Freedom²¹ (see Appendix for a more detailed description of the components).

¹⁶For example, in the 2008 open seat presidential election, the Republican candidate (John McCain) would have been further behind the Democratic candidate (Barack Obama) in the polls if he would have been evaluated based on the perceived performance of the incumbent Republican president (George W. Bush).

¹⁷This paper uses data from the 2013 edition.

¹⁸This study only use data for the U.S. states. Including Canadian provinces or Mexican states in the analysis would complicate it, since they belong to different political and economic systems.

¹⁹The Government Size subindex comprises the following components: 1. General consumption expenditures by government as a percentage of GDP; 2. Transfers and subsidies as a percentage of GDP; 3. Social security payments as a percentage of GDP.

²⁰The Takings and Discriminatory Taxation subindex comprises the following components: 1. Total tax revenue as a percentage of GDP; 2. Top marginal income tax rate and the income threshold at which it applies; Indirect tax revenue as a percentage of GDP; 4. Sales taxes collected as a percentage of GDP.

²¹The Labor Market Freedom subindex comprises the following components: 1. Minimum wage income as a percentage of GDP; 2. Government employment as a percentage of total state employment; 3. Union density, defined as the percentage of unionized workers of the total workforce.

The first edition of the index was published in 2005, but thanks to retrospective data collection, index scores stretch back to 1981. The index is based on statistics collected solely from third-party sources such as the US Census Bureau, the Bureau of Economic Analysis, or the Bureau of Labor Statistics (Stansel and McMahon, 2013). Therefore, it is unbiased and widely used in academic research.

Data for the political and economic control variables are collected from the “Klarnet politics” databases from the Indiana State University²², the only exception being the data for the Gini coefficient, which is taken from the Sam Houston State University²³.

5.2 Method

The paper aims to investigate how economic reforms affect re-election probability by regressing the change in the degree of economic freedom over a term of office on a dichotomous dependent variable indicating whether a re-election occurred or not. Using a dummy variable as the dependent variable is an approach followed by Fölster and Sanandaji (2014), Buti et al. (2008) and Brender and Drazen (2008). Cummins and Holyoke (2012) and Lowry et al. (1998), on the other hand, use a continuous variable, where the dependent variable is defined as the share of votes. This paper aims to develop the model by Fölster and Sanandaji (2014), therefore a dummy variable is chosen as the dependent variable. However, in the sensitivity analysis the dependent dummy variable is swapped for a continuous variable in order to test the hypotheses with a linear model.

The chosen econometric model for this analysis is the probit model, which is a standard choice in the economic literature when the dependent variable consists of a dummy variable. In this section, the econometric theory behind the probit model is briefly explained (see e.g. Wooldridge (2006) for a more comprehensive description of the model) before formulating the model specification that will be used.

Having a dummy variable Y as the dependent variable, we want to estimate the probability of $Y = 1$, i.e. $P(Y = 1|X)$ where $X = \{x_1, x_2, \dots, x_k\}$ is a set of explanatory variables that determines whether Y equals 1 or 0. In a linear probability model, the expected value of Y would be

$$E(Y|X) = P(Y = 1|X) = \beta_0 + \beta_1 x_1 + \dots \beta_k x_k = \beta_0 + \beta X \quad (6)$$

where β_j is the effect of a one unit change in x_j on the probability of observing $Y = 1$. Since β_j can be greater than one and less than zero, and since this partial effect is constant, a

²²The databases can be found here: <http://www.indstate.edu/polisci/klarnetpolitics.htm>

²³The data can be found here: http://www.shsu.edu/eco_mwf/inequality.html

linear probability model has substantial drawbacks and the more sophisticated probit model is preferred.

The probit model transforms (6) into a probability such that

$$P(Y = 1|X) = G(\beta_0 + \beta_1 x_1 + \dots \beta_k x_k) = G(\beta_0 + \beta X) \quad (7)$$

where G is the standard normal cumulative distribution function, which takes on values strictly between zero and one, $0 < G(z) < 1$, for all real numbers z and is defined as an integral:

$$G(z) = \phi(z) \equiv \int_{-\infty}^z \phi(v) dv \quad (8)$$

where ϕ is the standard normal density.

However, unlike the case when a linear regression model is used, the coefficients of the probit model cannot be interpreted as partial effects on $P(Y = 1|X)$. Instead, they denote partial effects on the standard normal distribution, which is non-linear. Thus, they are primarily useful for determining the direction and the significance of the effects. However, for an economic interpretation we are normally interested in the partial effects. The marginal effect of each x_j on $P(Y = 1|X)$ is obtained from the partial derivative:

$$\frac{\partial P(Y = 1|X)}{\partial x_j} = g(\beta_0 + \beta X) \beta_j \quad (9)$$

where $g(z) \equiv \frac{\partial G}{\partial z}(z)$.

Equation (9) tells us that the partial effect of x_j on the probability of observing $Y = 1$ is dependent not only x_j itself, but also on all other values of the explanatory variables. This distinguishes the probit model from a linear model, where the marginal effects of the explanatory variables are constant and independent of the other explanatory variables. In the following table outputs, the coefficients of the probit regressions are presented as marginal probability effects when all other variables are set to their mean values, which is a standard way of showing marginal probability effects in probit models.

In this paper, the primary research focus is to analyze how changes in the EFI scores over a term of office affect re-election probability. Therefore, in the baseline regression, we want to estimate:

$$P(REELECTED_{st} = 1|\Delta EFI_{st}; X_{st}) = G(\beta_0 + \beta_1 \Delta EFI_{st} + \beta X_{st}) \quad (10)$$

where *REELECTED* is the dependent dummy variable indicating whether the candidate of the incumbent’s party wins the election in state s at election year t , ΔEFI is the change in the degree of economic freedom since the previous election four years ago and X is a vector of political and economic explanatory variables (see section 5.3 for a description of those). G is, as mentioned, the standard normal cumulative distribution function. The marginal probability effects, as presented in the table outputs, are calculated as in (9). Assuming estimates are unbiased, we can confirm the hypothesis that economic freedom increases are rewarded if β_1 is significantly larger than zero.

To account for potential heteroscedasticity and within panel correlation, standard errors are robust and clustered on the state level (47 clusters). This is an approach recommended by e.g. Primo et al. (2007) when conducting research on effects of state policies on election outcomes. By allowing for different intercepts across states, we account for the fact that we have multiple panels within each state where the values on the outcomes within each panel might be correlated.

An alternative to the probit model would be to use the logit model, which is based on the logistic cumulative distribution function and yields very similar results as the probit model. In this thesis the probit model is chosen as it is more common in similar studies. Economists tend to favor the probit model; the normality assumption mitigates several specification problems (Wooldridge, 2006).

5.3 Variables

This section describes the variables used in the baseline probit regression. The dependent variable in the probit regressions takes the value 1 if the governor that wins the election represents the same party as the governor before the election, and 0 otherwise. That is, according to this definition, a re-election occurs if the incumbent governor is re-elected or if he or she leaves office and the candidate that wins the subsequent election represents the same party as the former governor. This means that a re-election can occur even if it is an open seat election.

The *Economic Freedom Index change* is our main explanatory variable of interest. It denotes the change in the overall EFI from the election year four years earlier to the current election year. Since the score change over a length of office is rather small (the average absolute score change being 0.28 on the 0–10 scale), the variable’s coefficient size would be somewhat complicated to interpret. Thus, the variable is standardized to have a zero mean and a unit

standard deviation²⁴. This makes the interpretation easier, since the size of the coefficient then represents the increased probability of re-election when the score increases by one standard deviation rather than by one score unit (a one unit increase would be a very large, although not unrealistic, increase). At a later stage, the overall EFI is disaggregated into its subindexes and subcomponents and included in the probit regressions in order to investigate on a more detailed level which factors of the EFI that affect re-election.

A number of political controls are included in the regressions. The *Incumbent* variable is a dummy variable taking the value 1 if the current governor is running for re-election, and 0 otherwise. This is included since incumbent governors have a substantially higher chance of being re-elected than being voted out of office, as shown in e.g. Cummins and Holyoke (2012).

Like Fölster and Sanandaji (2014) and Lowry et al. (1998), left-wing and right-wing candidates are analyzed separately. Hence, we include the *Democrat* variable, which is a dummy variable taking the value 1 if, at the time of the election, the incumbent governor is a Democrat (left-wing), and 0 if he or she is a Republican (right-wing). The variable is included to account for the possibility that Democratic governors are generally more or less likely to be re-elected than are Republican governors.

As Cummins and Holyoke (2012) and Lowry et al. (1998) also point out, election outcomes might be affected by results in other elections. Therefore, a variable for the percentage share of seats for the governor's party in the state house of representatives in the last election is included²⁵. This catches underlying sympathies for the governor's party, as well as the degree of power over the lower chamber of the state legislature. If the governor's party controls the state house of representatives, he or she might be more likely to become re-elected because of a stronger preference for that party. On the other hand, the governor and his or her party may also be more likely to be blamed for bad policies and therefore punished by the voters.

Similarly, a variable for the percentage of votes for the presidential candidate of the incumbent governor's party in the last presidential election is included²⁶. This is not ideal, since that support may change considerably over the years within in a length of office. Preferably, like Cummins and Holyoke (2012), a presidential approval variable should be included. However, I have not managed to obtain such data on the state level. The dummy variable *Presidential*

²⁴This is done by subtracting the mean of the variable from every observation and thereafter dividing all observations with the variable's standard deviation.

²⁵If this election takes place the same year as the governor election, the last election counts as the election that year.

²⁶If this election takes place the same year as the governor election, the last election counts as the election that year.

election year is included to control for the so-called coattail effect, i.e., a lower level election might be affected by an election for a higher office that takes place simultaneously²⁷.

Some authors have found that economic growth affect state election outcomes, whereas others have not. Like Brender and Drazen (2008) and Lowry et al. (2012), I have decided to look at economic growth as income per capita and thus include the *Per capita income change* variable in the regressions. This denotes the change of income per capita in real terms from the election year four years earlier to the present election year, and is measured in thousands of U.S. dollars.

Several authors also find that voters reward budget surpluses. Following Brender and Drazen (2008), two budget balance variables are included: *Surplus over term*, which is the change in the average central government balance in the two years preceding the elections (not including the election year) compared to the previous two years, and *Election year surplus*, which is the change in the balance in the election year relative to the previous year. These are measured in percentage points. Since other studies have found positive effects of surpluses on re-election, we expect their coefficients to be positive.

Finally, unlike other papers, the *Gini coefficient change* variable is included. This denotes how the Gini coefficient²⁸ has changed from the election year four years earlier to the present election year. It is measured on a scale from 0 to 100. This is included to account for changes in income inequality, which voters might take into account when deciding whom to vote for. Also, since equality-enhancing reforms are associated with left-wing politics, it is interesting to see if this variable's coefficient depends on the party of the incumbent governor.

Some potential control variables have deliberately been left out. For example, a variable for the change in the tax to GSP ratio is not included, even though governors have influence over taxes. The reason for this is that these statistics are already incorporated in the EFI. Several studies, such as Fölster and Sanandaji (2014), Powell and Whitten (1993) and Alesina et al. (1998), include unemployment in their regressions. Though most studies find this variable insignificant, it is easy to see its relevance in relation to elections. However, due to its high correlation with the change in the economic freedom index (-0.67), it is left out of the regressions and included instead (together with other potential control variables such as GSP growth) in a sensitivity analysis at a later stage. Including highly correlated variables might

²⁷A presidential election should boost voter turnout, which in turn should help incumbent governors “since they may have greater name recognition with voters who do not normally vote” (Cummins and Holyoke, 2012:16).

²⁸The Gini coefficient is an index measuring income inequality. A higher index value translates into a higher income inequality.

give rise to multicollinearity problems, which could lead to miss-specified coefficients for the explanatory variables. Table 1 displays the correlations between the explanatory variables that are included in the regressions.

Table 1. Correlation matrix.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Economic Freedom Index change (1)	1.00									
Incumbent (2)	0.12	1.00								
Democrat (3)	-0.12	-0.05	1.00							
State House vote share (4)	0.02	-0.02	0.28	1.00						
Presidential candidate support (5)	0.05	0.07	-0.21	0.32	1.00					
Presidential election year (6)	0.07	0.00	0.02	0.02	0.16	1.00				
Per capita income change (7)	0.57	0.08	-0.03	0.02	-0.13	0.02	1.00			
Surplus over term (8)	0.23	0.20	-0.09	0.02	0.13	-0.06	0.17	1.00		
Election year surplus (9)	-0.14	-0.04	-0.02	-0.06	-0.15	0.06	-0.09	-0.37	1.00	
Gini coefficient change (10)	0.07	0.11	-0.04	-0.01	-0.01	-0.02	0.06	0.03	0.07	1.00

Note: correlation coefficients are rounded to two decimals.

As seen in the table, the correlations are generally weak. The correlation between the change in the EFI and the change in income per capita, 0.57, is the strongest one and potentially worrisome. However, this correlation coefficient is still fairly moderate and since other variables similar to it already have been excluded from the model, it will be kept in the ordinary regressions. When conducting a VIF test with the selected specification, the *Economic Freedom Index change* variable proves to have the highest VIF value of 1.57²⁹. This low value indicates that multicollinearity should not be a concern with this specification.

²⁹Variance Inflation Factor (VIF) tests cannot be run after probit regressions, since the probit model does not produce an R^2 estimate, which is a crucial component in the formula for the VIF value: $1/(1-R^2)$. However, it is still possible to run an ordinary least square (OLS) regression with the same specification as in the probit model and thereafter to conduct a VIF test. Hence, the VIF value of 1.57 referred to in the text comes from a VIF test that was run after an OLS regression.

5.4 Descriptive statistics

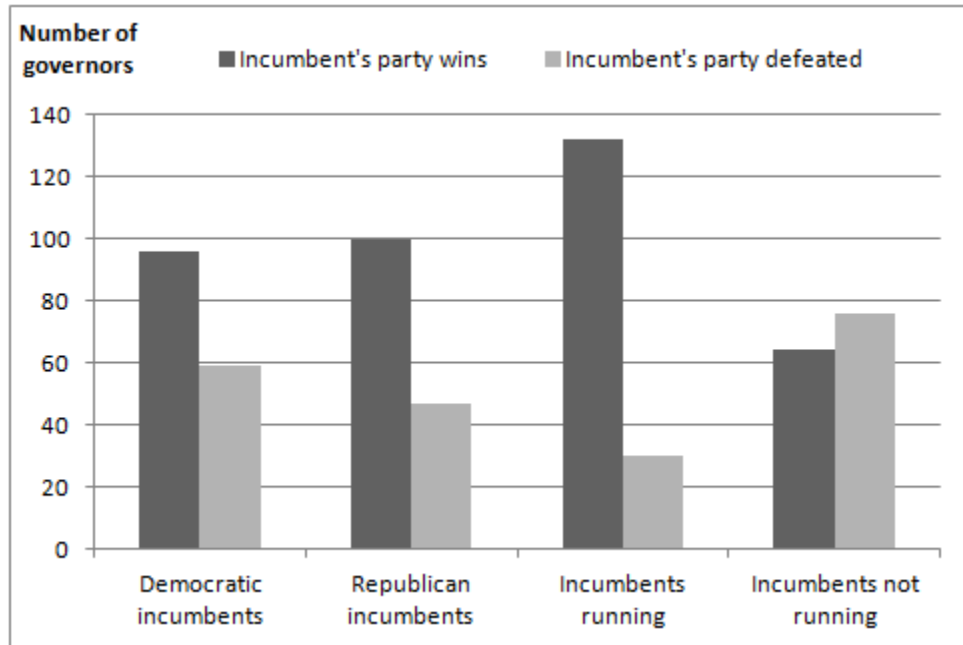
In total, there are 302 gubernatorial elections from 47 states over the the period 1985-2010 included in the regression analyses. Since most of the variables are measured as changes over a four year period, New Hampshire and Vermont are excluded as theses states have two-year gubernatorial cycles. Nebraska is also excluded because of its nonpartisan state legislature³⁰; there is no data for the *State House vote share* variable for this state. Rhode Island had two-year gubernatorial terms until 1994, therefore those elections are included from 1998 and onwards. Further, if the incumbent governor is from an independent party, or if a candidate from an independent party wins an election, that election is excluded³¹, since these special circumstances complicate the analysis of the difference between left-wing and right-wing policymakers. Finally, the recall gubernatorial election in California in 2003 is not included, nor is the subsequent 2006 election (since this election took place only three years after the recall election).

The governors are almost completely evenly distributed between the two parties. Out of 302 governor offices, 155 were held by Democrats and 147 were held by Republicans. In 196 of the elections (65 percent), a candidate from the same party as the incumbent governor is elected. As seen Figure 1, in the 155 cases when the incumbent governor was a Democrat, 96 Democrats were elected and 59 were defeated. In the 147 cases when the incumbent was a Republican, 100 Republicans were elected and 47 were defeated. However, it is extremely apparent that the most important factor is whether the incumbent governor is personally running for re-election or not. When that is the case, 132 out of 162 incumbents are re-elected. For the 140 open seat elections where the incumbent is not running (because of a term limit, retirement or some other reason), only 64 of the winning candidates represent the same party as the incumbent governor. Therefore, the *Incumbent* variable is expected to yield large and highly significant coefficients in the regressions. The incumbents running are fairly evenly distributed between the two parties, with 78 being Democrats and 64 Republicans.

³⁰Members of Nebraska's state legislature normally belong to either the Democratic or the Republican party, but there are no formal party alignments or groups.

³¹Seven elections are excluded from the sample for either of these reasons.

Figure 1. Election win frequency based on incumbents' party affiliation and status.



Compared to presidential elections, party preference is not as static in gubernatorial elections. Only three of the 47 states have elected a governor from the same party in every gubernatorial election over the time period (Washington has only elected Democratic governors, whereas South Dakota and Utah have only elected Republican governors), compared with 15 states that have elected a president of the same party in every presidential election over the same time period. This increases the probability that governors are evaluated based on factors other than culture, such as economic performance.

Increases in the EFI, which are driven by decreases in the size of government, reduced taxes, and loosened labor regulation, are rather associated with right-wing, or Republican, policies, whereas Democratic policies tend to be more supportive towards the role of government, a higher tax rate, and a more expansive labor regulation. Therefore, we expect states governed by Republicans to have higher EFI scores than states governed by Democrats. Line 1 in Table 2 confirms that this is indeed the case. The average EFI score is higher, although marginally, for states with Republican governors.

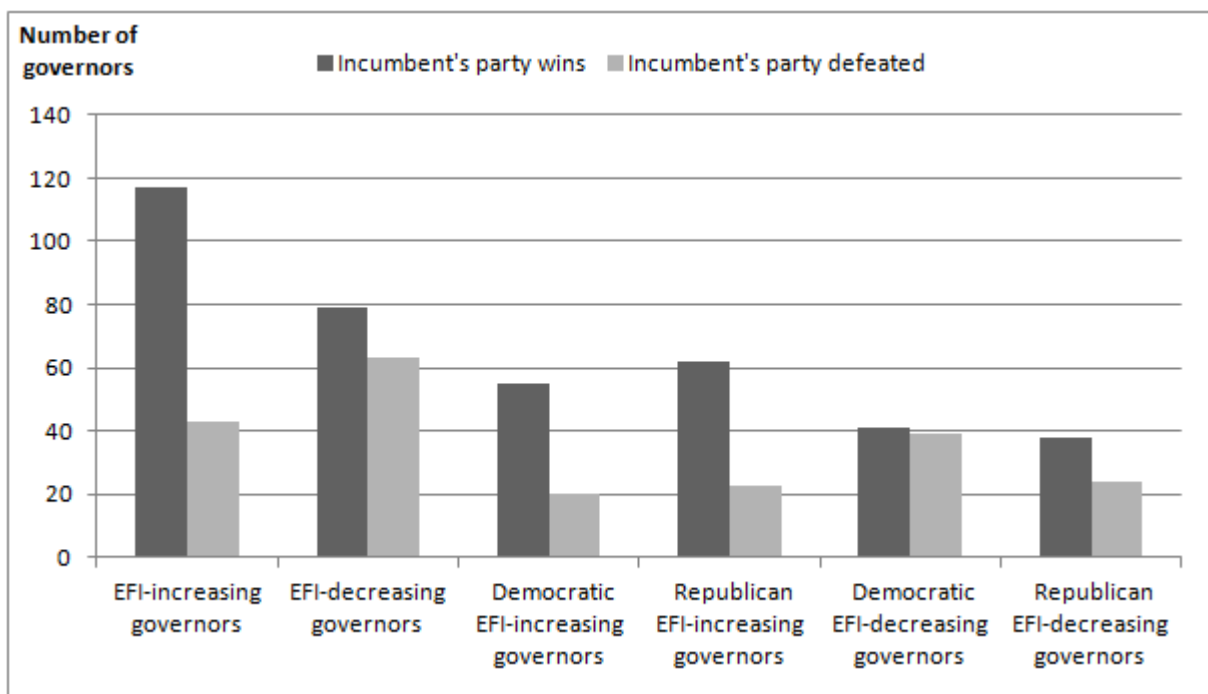
We also see that both the maximum and the minimum EFI score for a state with a Republican governor is higher than the maximum and the minimum EFI score for a state with a Democratic governor. Perhaps more importantly, we also see that the EFI score on average increases when Republicans hold office and decreases when Democrats hold office. Also, more Republican governors (85) increase the EFI score during their term of office compared with Democratic ones (75), and fewer Republicans (62) decrease it compared to Democrats (80). Hence, the assumption that increases in the EFI score are associated with Republican policies appears to be correct, since all of these statistics speak in favor of it.

Table 2. Various EFI statistics, divided by party.

	Democratic governors	Republican governors
Average EFI	6.776	6.871
Maximum EFI	8.153	8.236
Minimum EFI	4.882	5.262
Average EFI change	-0.037	+0.053
Number of EFI increases	75	85
Number of EFI decreases	80	62

However, that EFI scores are higher and increase more when the governor is a Republican tells us nothing as regards the voters' desires regarding economic freedom increases. Figure 2 explores this question further. As seen in the two bars to the left in the figure, candidates of the incumbent's party are elected relatively more (less) when the EFI score has increased (decreased) over the term. The difference is quite substantial: 73 percent against 56 percent. The third and the forth bar display these statistics based on party. The relationships are almost identical: 73 percent of the candidates from each of the parties are elected when the incumbent (belonging to the same party) has increased the EFI score over a term. However, when looking at the two bars to the right, which display to what extent candidates from the two parties are elected when the incumbent (of the same party) has decreased the EFI score, we see that Democratic candidates are punished to a larger extent (51 percent) than Republican candidates (39 percent). This finding is interesting, since it suggests that Democratic governors are disproportionally punished for implementing policies in line with their preference, as the model in section 4 predicts. In the next section, this will be tested econometrically.

Figure 2. Election win frequency based on incumbents' EFI changes and party affiliation.



6 Results

In this section, the results from various probit regressions will be presented and commented upon in order to answer the hypotheses proposed in section 3. To see how robust these results are, a sensitivity analysis is also provided where the the specification of the model as well as the model itself is changed.

6.1 Results from probit regressions

The primary research focus is to see how changes in the EFI affect re-election probability. In Table 3, the overall index of the EFI is used. Column 1 shows the effects of the coefficients on re-election probability, according to the baseline specification. Each coefficient is interpreted as the marginal change on re-election probability when all other coefficients are set to their means. Indeed, this variable has a significant coefficient. Its value of approximately 0.1 means that an increase in the EFI by one standard deviation from its mean results in about ten percent higher probability of re-election, holding all other variables constant at their means. This suggests that voters tend to reward governors pursuing economic reforms associated with increases in this index.

**Table 3. Overall Economic Freedom Index and re-election probability.
Evidence from probit regressions.**

Dependent: 1 if the post-election governor represents the same party as the pre-election governor.	(1) All governors governors	(2) All governors, adding interaction	(3) Democrats only	(4) Republicans only
Economic Freedom Index change	0.0990** (0.0428)	0.0543 (0.0444)	0.1594** (0.0749)	0.0639 (0.0425)
Democrat	-0.0569 (0.0723)	-0.0485 (0.0717)		
EFI*Democrat		0.0760 (0.0547)		
Incumbent running	0.3379*** (0.0610)	0.3384*** (0.0601)	0.1832** (0.0915)	0.5203*** (0.0850)
State House vote share	0.0039 (0.0024)	0.0037 (0.0024)	0.0001 (0.0031)	0.0107*** (0.0034)
Presidential candidate support	-0.0010 (0.0041)	-0.0008 (0.0041)	0.0087 (0.0058)	-0.0100** (0.0051)
Presidential election year	0.1252* (0.0759)	0.1257* (0.0747)	0.2342*** (0.0818)	-0.0926 (0.1422)
Per capita income change	-0.0325* (0.0185)	-0.0336* (0.0192)	-0.0494 (0.0405)	-0.0060 (0.0235)
Surplus over term	0.1304*** (0.0353)	0.1289*** (0.0344)	0.1857*** (0.0540)	0.0496 (0.0464)
Election year surplus	0.2021*** (0.0518)	0.2038*** (0.0533)	0.2738*** (0.0820)	0.1819** (0.0855)
Gini coefficient change	-0.0046 (0.0064)	-0.0034 (0.0063)	0.0085 (0.0093)	-0.0156* (0.0086)
Observations	302	302	155	147
Pseudo R-squared	0.191	0.195	0.213	0.323

Note: Coefficients are marginal probability effects.

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Worth noting is also that budget surpluses are highly rewarded, with positive and significant coefficients for both the variable measuring the surplus over the term and for the variable measuring the surplus between the election year and the year before. The size of the coefficient is somewhat larger for the latter variable, where a one percent surplus increase leads to about 0.2 higher re-election probability, all other variables constant at their means. These results also confirm earlier findings by, e.g., Cummins and Holyoke (2012) and Peltzman (1992) that American voters reward surpluses in gubernatorial elections.

Also, from the regression output it is very clear that the single most reliant predictor of re-election, as defined in this setup, is the incumbent governor's personal status in the election: running for re-election or not? If the former is the case, the probability of re-election increases

by almost 34 percent compared to open seat elections, all other variables constant at their means. This was expected as it was very clear already in the descriptive section that incumbency plays a substantial role. Besides, it has already been confirmed in other studies, such as Cummins and Holyoke (2012).

While there seems to be a general effect of economic reforms on re-election probability, we still do not know whether this effect differs depending on the party of the governor. In column 2, an interaction variable between the *Economic Freedom index change* and the *Democrat* variables is added. This variable has a positive coefficient, implying that Democrats are rewarded for economic reforms to a larger extent than Republicans. However, the high correlation between the interaction variable and the EFI variable, 0.75, means that this coefficient should be interpreted with caution. The high correlation might also explain the lack of significance.

Due to this high correlation, it is hard to get the full picture of the difference between Democratic and Republican governors through the use of interaction variables. Therefore, we split the sample into two subgroups, where the subsample of only Democratic governors is shown in column 3 and the subsample of only Republican governors is shown in column 4. As seen, the EFI variable's coefficient is significant for the Democratic but not for the Republican group. It thus seems to be a difference depending on party, where Democratic but not Republican candidates are rewarded for increases in the EFI.

Another interesting difference is that the coattail affect, as seen in the *Presidential election year* variable, is significant only for Democrats. If a gubernatorial election takes place simultaneously with a presidential election, Democratic governors have a significantly higher chance of being re-elected. This effect is quite substantial: a Democratic governor has more than 23 percent higher chance of being re-elected if the gubernatorial election takes place the same year as a presidential election, compared to a non-presidential election year, all other variables constant at their means. A potential explanation is that a presidential election increases voter turnout also in the gubernatorial election if held simultaneously, mobilizing Democratic voters disproportionately.

Republican governors, on the other hand, have significant coefficients for the variable measuring the share of seats in the state house of representatives, and for the variable measuring the share of votes for the candidate of the same party in the last presidential election, respectively. Interestingly, these coefficients have the opposite signs. An increased share of seats in the state house of representatives increases the probability of a Republican governor being re-elected, whereas a higher support for the Republican candidate in the last presidential election decreases the probability of re-election.

Using the overall EFI, it is not clear, however, what exact components in the index yield these results. In Table 4, therefore, the overall index is disaggregated into its subcategories, shown in column 1–3, and the subcategories are further split into their subcomponents, shown in column 4–6. Looking at column 1, we see that increases in the Government Size subindex³² are rewarded by voters. Increasing this index by one standard deviation leads to approximately 17 percent higher chance of being re-elected, all other variables at their means. This is in line with previous research that finds that voters are wary of expenditure increases. The effect is stronger and more reliable for Democratic governors, as seen when comparing column 2 to column 3.

The subcomponents in column 4–6 are, unlike the subindex variables, not standardized but measured as their raw data. Since the changes are no longer measured as an index score change, they are easier to interpret without being standardized. Looking at the complete group in column 4, we see that reductions in transfers and subsidies are rewarded more than anything else: a one percent reduction leads to an almost one percent higher chance of being re-elected, all other variables at their means. The coefficient for the *Social security payments change* variable is also significant and negative, but only at the 10 % level, and the effect is small in comparison. The *Consumption expenditure change* variable is insignificant.

These findings are interesting, since previous research has not disaggregated their measurements of government size this far. Apparently, American voters do punish governors when transfers and subsidies such as welfare payments, grants, agricultural assistance, food-stamp payments, and housing assistance expenditures increase. Splitting the sample based on party, we note that this coefficient is significant for both Republican and Democratic candidates.

³²An increase in this index means that the actual size of the government has *decreased*.

Table 4. Economic Freedom subindexes and subcomponents and re-election probability. Evidence from probit regressions.

Dependent: 1 if the post-election governor represents the same party as the pre-election governor.	(1) All governors	(2) Democrats only	(3) Republicans only	(4) All governors	(5) Democrats only	(6) Republicans only
Government size index change	0.1654*** (0.0554)	0.2103*** (0.0748)	0.1276* (0.0748)			
Discriminatory Taxation index change	0.0073 (0.0321)	-0.0178 (0.0455)	0.0179 (0.0449)			
Labor Regulation index change	-0.0323 (0.0331)	0.0342 (0.0563)	-0.0360 (0.0462)			
Consumption Expenditure change				-0.0121 (0.0544)	-0.0301 (0.0689)	0.0085 (0.0766)
Transfers and Subsidies change				-0.0094*** (0.0035)	-0.0098** (0.0048)	-0.0081* (0.0042)
Social Security Payments change				-0.0019 (0.0012)	-0.0035** (0.0017)	-0.0000 (0.0020)
Government Revenue change				-0.0754 (0.0753)	0.0194 (0.1277)	-0.0982 (0.1080)
Top Marginal Income Tax Rate change				0.0120 (0.0229)	-0.0151 (0.0313)	0.0492 (0.0317)
Indirect Tax Revenue change				0.0451 (0.1077)	0.0187 (0.1333)	-0.0823 (0.1693)
Collected Sales Taxes change				0.0654 (0.2027)	0.1103 (0.3553)	0.0336 (0.2051)
Minimum Wage change				0.0000 (0.0042)	-0.0120 (0.0081)	0.0039 (0.0057)
Government Employment change				0.0161 (0.0741)	0.1024 (0.1019)	-0.0547 (0.1018)
Union Density change				0.0022 (0.0018)	0.0026 (0.0030)	0.0014 (0.0025)
Democrat	-0.0445 (0.0727)			-0.0380 (0.0729)		
Incumbent running	0.3470*** (0.0623)	0.1991** (0.0931)	0.5273*** (0.0901)	0.3560*** (0.0641)	0.1905** (0.0937)	0.5340*** (0.0883)
State House vote share	0.0044* (0.0024)	0.0003 (0.0034)	0.0103*** (0.0036)	0.0043* (0.0025)	-0.0000 (0.0033)	0.0094*** (0.0034)
Presidential candidate support	-0.0013 (0.0042)	0.0109* (0.0064)	-0.0089* (0.0052)	-0.0008 (0.0041)	0.0131** (0.0062)	-0.0071 (0.0048)
Presidential election year	0.1237* (0.0727)	0.1969** (0.0887)	-0.0673 (0.1444)	0.1326* (0.0695)	0.1868** (0.0930)	-0.0084 (0.1106)
Per capita income change	-0.0524*** (0.0194)	-0.0745* (0.0414)	-0.0239 (0.0283)	-0.0408** (0.0207)	-0.0579 (0.0381)	-0.0103 (0.0354)
Surplus over term	0.1055*** (0.0404)	0.1541*** (0.0532)	0.0109 (0.0499)	0.1439*** (0.0509)	0.2130*** (0.0759)	0.0691 (0.0852)
Election year surplus	0.1856*** (0.0533)	0.2579*** (0.0866)	0.1559* (0.0855)	0.2100*** (0.0578)	0.3298*** (0.1018)	0.1593* (0.0961)
Gini coefficient change	-0.0050 (0.0067)	0.0067 (0.0095)	-0.0174* (0.0097)	-0.0052 (0.0065)	0.0060 (0.0093)	-0.0141 (0.0092)
Observations	302	155	147	302	155	147
Pseudo R-squared	0.211	0.239	0.338	0.220	0.261	0.367

Note: Coefficients are marginal probability effects.

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

So far, we have found that decreases in government size, particularly decreases in subsidies and transfers, are rewarded by American voters at the ballot box. However, changes in the EFI have been treated equally regardless of the initial degree of economic freedom. Could it be that the effect of reforms differs depending on the starting value of the EFI? One could hypothesize that the effect of increases in the EFI on re-election probability is greater when the initial level of economic freedom is low and the need of reform correspondingly high. Thus, in Table 5, the sample is split into two groups: one with the the 151 lowest starting values and one with the 151 highest starting values. As usual, the governors are analyzed both independent of party (column 1 and 2) and dependent of party (column 3–6).

Table 5. Overall Economic Freedom Index and re-election probability, different starting values. Evidence from probit regressions.

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent: 1 if the post-election governor represents the same party as the pre-election governor.	All governors, low starting values	All governors, high starting values	Democrats only, low starting values	Republicans only, low starting values	Democrats only, high starting values	Republicans only, high starting values
Economic Freedom Index change	0.1091* (0.0584)	0.0967 (0.0890)	0.1602** (0.0806)	0.0474 (0.0533)	0.0861 (0.1689)	0.1187 (0.0777)
Democrat	-0.0524 (0.0829)	-0.0226 (0.1088)				
Incumbent running	0.3334*** (0.0803)	0.3426*** (0.0909)	0.1274 (0.1292)	0.5291*** (0.1058)	0.1853 (0.1343)	0.5189*** (0.1264)
State House vote share	0.0066** (0.0029)	0.0022 (0.0028)	0.0014 (0.0049)	0.0119*** (0.0043)	-0.0005 (0.0035)	0.0089** (0.0041)
Presidential candidate support	-0.0086** (0.0043)	0.0063 (0.0062)	0.0089 (0.0075)	-0.0141** (0.0060)	0.0168** (0.0078)	-0.0071 (0.0076)
Presidential election year	0.1298 (0.1273)	0.1216 (0.0861)	0.1813 (0.1120)	-0.0912 (0.2859)	0.2772** (0.1092)	-0.1105 (0.1399)
Per capita income change	-0.0125 (0.0310)	-0.0592** (0.0250)	0.0223 (0.0530)	0.0155 (0.0428)	-0.1011 (0.0661)	-0.0269 (0.0317)
Surplus over term	0.1695** (0.0688)	0.0728 (0.0589)	0.1596*** (0.0616)	0.1104* (0.0668)	0.3004* (0.1535)	-0.0607 (0.0768)
Election year surplus	0.1479** (0.0682)	0.2786*** (0.0932)	0.1959* (0.1020)	0.1654* (0.0959)	0.4069*** (0.1246)	0.2154 (0.1720)
Gini coefficient change	0.0002 (0.0108)	-0.0070 (0.0080)	0.0138 (0.0133)	-0.0135 (0.0105)	0.0042 (0.0141)	-0.0152 (0.0128)
Observations	151	151	79	72	76	75
Pseudo R-squared	0.238	0.202	0.272	0.387	0.250	0.299

Note: Coefficients are marginal probability effects.

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

As seen in the table, the coefficient of the EFI variable for the complete group is significant only in column 1. The sign and magnitude of the coefficient of the EFI variable is approximately the same for both groups of governors, but significant only for the governors whose initial degree of economic freedom is on the lower half. Apparently, rewards are higher when the initial degree of economic freedom is low. Looking at the subsamples in column 3–6, the only significant coefficient for the EFI variable is for Democratic governors with low starting values of economic freedom. However, there are quite few observations in these subsamples, which might explain the general lack of significance. The coefficients of the EFI variable are positive in all specifications.

6.2 Hypotheses

Given the results from the probit regressions, the hypotheses proposed in section 3 can all be confirmed. According to the first hypothesis, increases in the overall EFI affects re-election probability positively, which indeed was the case. The coefficient was positive and significant on the 5 % level. According to the second hypothesis, decreases in government size increase re-election probability more than do the other two subindexes, which clearly was the case as seen in Table 4. We did, however, not propose any hypothesis as to which subcomponent would play the biggest role, and so it was somewhat surprising that reductions in transfers and subsidies was by far the most important explanator. According to Hypothesis 3, Democratic governors are disproportionally rewarded for economic freedom increases. Indeed, the Democratic but not the Republican group had both a positive and significant coefficient for the EFI variable.

Section 7 further discusses the results, their implications and their relation to the model presented in section 4 further. Before that, we will check how robust the results are when the model or its specifications are changed.

6.3 Sensitivity analysis

In order to analyze and compare the results obtained with the probit model, we also run the regressions with a linear OLS model. Furthermore, we also run the regressions with additional controls to see how robust they are to adjustments of the model specification.

6.3.1 Linear model

Using a linear model means that the dependent variable must be altered, from a dichotomous dummy variable to a continuous one. This could be done in several ways, but I choose to follow the approach by Cummins and Holyoke (2012), where the dependent variable is the percentage of the incumbent party’s share of all votes. The independent variables are the same as in the probit regressions. As with the probit model, the standard errors are robust

and clustered on the state level. An alternative proceeding would be to use a fixed effects model, as Lowry et al. (1998) do. However, the Hausman test rejects the fixed effects model and the Breusch-Pagan test rejects the random effects model³³.

Table 6 displays the results where the independent variables are equal to those included in Table 3. Results are similar; the coefficients are generally significant on the same level, irrespective of the choice of dependent variable. Increasing the EFI with one standard deviation results in about 1.6 percentage points more votes. The effect is far larger, and highly significant for Democratic candidates, whereas insignificant for Republicans. As expected, the single most important factor for predicting re-election is whether the incumbent governor is running for re-election.

In contrast to the results accounted for in Table 3, only the *Surplus over term* variable, but not the *Election year surplus* variable, is significant. This is a little surprising, since the latter had a larger coefficient in the probit regression and was highly significant. The coefficient for the *Gini coefficient change* variable is now significant also in the baseline regression for the complete group, and, as column 5 and 6 reveal, it is the Republican group that drives this effect.

³³The Hausman test, which tests the fixed effects model against the random effects model, yields a p-value of 0.1388. This means that we cannot reject the null hypothesis that the random effects model is valid (and more efficient). The Breusch-Pagan Lagrange multiplier test, which tests the random effects model against the pooled OLS model, yields a p-value of 0.2233. This means that we cannot reject the null hypothesis that the variance for the individual-specific effects is equal to zero. Hence, we proceed with the pooled OLS model.

**Table 6. Overall Economic Freedom Index and re-election probability.
Evidence from pooled OLS model.**

Dependent: percentage share of votes for the party of the pre-election governor.	(1) All governors governors	(2) All governors, adding interaction	(3) Democrats only	(4) Republicans only
Economic Freedom Index change	1.5960** (0.6101)	0.6790 (0.8457)	2.7023*** (0.8340)	0.7069 (0.8807)
Democrat	-1.1401 (1.2843)	-1.1529 (1.2844)		
EFI*Democrat		1.5725 (0.9692)		
Incumbent running	8.6819*** (1.0653)	8.6671*** (1.0549)	6.8780*** (1.6217)	10.3317*** (1.1313)
State House vote share	0.0717* (0.0414)	0.0720* (0.0412)	-0.0081 (0.0541)	0.1734*** (0.0559)
Presidential candidate support	-0.0742 (0.0805)	-0.0706 (0.0817)	-0.0379 (0.1333)	-0.1094 (0.0983)
Presidential election year	3.8080*** (1.0953)	3.8662*** (1.1298)	4.4961*** (1.6531)	1.8055 (1.8561)
Per capita income change	0.1892 (0.3301)	0.1741 (0.3225)	-0.1126 (0.7173)	0.4121 (0.4139)
Surplus over term	0.7596* (0.4160)	0.7928* (0.3974)	1.2843* (0.6965)	0.2595 (0.5902)
Election year surplus	0.4167 (0.7954)	0.5386 (0.8521)	0.9479 (1.2567)	-0.1652 (1.2753)
Gini coefficient change	-0.2127** (0.0978)	-0.1909* (0.1005)	0.0486 (0.1471)	-0.4466*** (0.1443)
Constant	47.3942*** (3.8983)	47.2920*** (3.9688)	50.1609*** (7.6935)	43.9943*** (3.7700)
Observations	302	302	155	147
R-squared	0.2879	0.2936	0.2841	0.3857

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 7 shows how the EFI subindexes and their subcomponents affect the share of the incumbent party's votes. Results are not as conclusive as in Table 4. The coefficient of the *Government Size change* variable is significant at the 5 % level for the complete sample, but only at the 10 % level for the group of Democratic candidates. Though not compatible with the probit model, the Democratic group has a significant coefficient for the *Labor Regulation index change*. Increasing this index³⁴ by one standard deviation results in approximately two percentage points additional votes in the gubernatorial election.

The coefficient for the *Transfers and Subsidies change* variable, which yielded large and highly significant effects with the probit model, is now significant only for the complete group (column 4) and only at the 10 % level. The signs are as expected, but the standard errors relative to the coefficients are much larger compared to the corresponding relationships derived in Table 4.

³⁴An increase in this index means that the labor market has become *less* regulated.

Table 7. Economic Freedom subindexes and subcomponents and re-election probability. Evidence from pooled OLS model.

Dependent: percentage share of votes for the party of the pre-election governor.	(1) All governors	(2) Democrats only	(3) Republicans only	(4) All governors	(5) Democrats only	(6) Republicans only
Government size index change	1.5722** (0.7938)	1.8725* (1.0925)	1.3672 (1.1143)			
Discriminatory Taxation index change	-0.1461 (0.4811)	-0.0753 (0.7327)	-0.2255 (0.8727)			
Labor Regulation index change	0.6432 (0.6112)	2.0401* (1.0968)	-0.0366 (0.5486)			
Consumption Expenditure change				-0.6901 (0.6620)	-0.9659 (0.9996)	-0.4374 (1.0285)
Transfers and Subsidies change				-0.0840* (0.0463)	-0.1018 (0.0747)	-0.0925 (0.0618)
Social Security Payments change				-0.0171 (0.0190)	-0.0380 (0.0278)	0.0225 (0.0263)
Government Revenue change				-0.3272 (1.3206)	-0.3666 (2.3931)	0.6035 (1.4567)
Top Marginal Income Tax Rate change				0.6152 (0.3895)	0.6697 (0.4926)	0.4810 (0.5966)
Indirect Tax Revenue change				0.4110 (1.8464)	1.5686 (3.4175)	-1.3403 (1.9116)
Collected Sales Taxes change				0.3322 (3.0749)	-0.4245 (5.4811)	1.1472 (2.8017)
Minimum Wage change				-0.0853 (0.0745)	-0.3626** (0.1595)	-0.0011 (0.0590)
Government Employment change				-0.0292 (1.5871)	1.7441 (2.0734)	-1.1281 (1.7149)
Union Density change				-0.0045 (0.0326)	0.0066 (0.0495)	-0.0091 (0.0443)
Democrat	-1.2585 (1.2650)			-1.2343 (1.3594)		
Incumbent running	8.9481*** (1.0888)	6.9032*** (1.6222)	10.4222*** (1.1706)	8.8783*** (1.0743)	6.5882*** (1.5563)	10.1759*** (1.2146)
State House vote share	0.0716* (0.0421)	-0.0242 (0.0533)	0.1809*** (0.0589)	0.0826* (0.0431)	-0.0160 (0.0527)	0.1724*** (0.0575)
Presidential candidate support	-0.0730 (0.0799)	0.0193 (0.1490)	-0.1125 (0.1032)	-0.0787 (0.0818)	0.0371 (0.1355)	-0.1021 (0.1053)
Presidential election year	3.8594*** (1.1437)	4.2089*** (1.5449)	2.0848 (1.8298)	4.0698*** (1.2228)	3.7708** (1.7735)	2.9000 (1.9688)
Per capita income change	-0.0080 (0.3548)	-0.2809 (0.7111)	0.1759 (0.5361)	0.0867 (0.3761)	-0.0161 (0.7660)	0.3737 (0.5925)
Surplus over term	0.4951 (0.3365)	0.8728 (0.5545)	-0.1766 (0.5396)	0.5028 (0.3896)	1.5991** (0.6398)	-0.0998 (0.5586)
Election year surplus	0.2352 (0.7814)	0.6551 (1.2168)	-0.4920 (1.2431)	0.1781 (0.7779)	1.5418 (1.0108)	-0.9708 (1.5377)
Gini coefficient change	-0.2486** (0.1017)	-0.0041 (0.1441)	-0.4712*** (0.1579)	-0.2364** (0.1047)	-0.0094 (0.1387)	-0.4537*** (0.1588)
Constant	47.5971*** (3.8591)	48.7603*** (8.2931)	44.1180*** (3.9171)	47.5636*** (3.8307)	47.7121*** (7.1196)	43.5160*** (4.1536)
Observations	302	155	147	302	155	147
R-squared		0.2998	0.3903	0.3007	0.3316	0.4049

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

6.3.2 Fixed effects, random effects and additional controls

Though rejected by the Hausman test and the Breusch-Pagan test, respectively, the fixed effects and the random effects models are run with the baseline specification, as shown in column 1 and 2 of Table 8. Results are similar to the pooled OLS specification, implying that the results are not very sensitive to the model specification.

Column 3 and 4 add variables that were excluded in the other regressions due to high collinearity with other independent variables. These additional variables include the unemployment change from the previous election four years earlier to the current election year, as well as a set of growth variables: the total GSP growth over a length of office, the growth from the year before the election to the current election year, and the output gap, i.e., the deviation from the potential GSP³⁵. These factors are incorporated into the analyses of several studies, such as Fölster and Sanandaji (2008), Buti et al. (2008), Alesina et al. (1998), and Powell and Whitten (1993), albeit they rarely turn out to play a big role. Including these variables decreases to some extent the magnitude and weakens the significance of the EFI variable in the pooled OLS model, but increases the magnitude and strengthens the significance of the EFI variable in the probit model. The general picture that economic reforms increase re-election probability is robust to the specification alterations.

³⁵Potential GSP was calculated using the Hodrick-Prescott filter.

**Table 8. Overall Economic Freedom Index and re-election probability.
Evidence from various models and specifications.**

	(1) Pooled OLS, fixed effects	(2) Pooled OLS, random effects	(3) Pooled OLS, additional controls	(4) Probit model, additional controls
Economic Freedom Index change	1.4956** (0.6387)	1.5460** (0.6120)	1.4186* (0.7271)	0.1254*** (0.0393)
Democrat	-0.9978 (1.2204)	-1.1442 (1.1109)	-1.5860 (1.3404)	-0.0789 (0.0734)
Incumbent running	9.1792*** (1.0817)	8.8294*** (1.0179)	8.7599*** (1.0182)	0.3452*** (0.0613)
State House vote share	0.0459 (0.0364)	0.0663** (0.0332)	0.0672 (0.0409)	0.0037 (0.0023)
Presidential candidate support	-0.0700 (0.0654)	-0.0737 (0.0620)	-0.0841 (0.0814)	-0.0012 (0.0042)
Presidential election year		3.8816** (1.5072)	4.0134*** (1.0499)	0.1454** (0.0649)
Per capita income change	0.1257 (0.3741)	0.1810 (0.3581)	-0.1860 (0.4571)	-0.0469* (0.0277)
Surplus over term	1.0425 (0.6667)	0.8277 (0.6441)	0.9596** (0.4685)	0.1652*** (0.0385)
Election year surplus	0.7163 (1.0364)	0.4801 (0.8834)	0.4923 (0.7877)	0.2327*** (0.0559)
Gini coefficient change	-0.2403** (0.1054)	-0.2213** (0.1045)	-0.1962* (0.1064)	-0.0032 (0.0068)
Real GSP growth			0.2840*** (0.0960)	0.0160*** (0.0062)
Real GSP growth last year			-0.3659** (0.1511)	-0.0335*** (0.0107)
GSP output gap			-0.1370 (0.1710)	-0.0011 (0.0085)
Unemployment change			0.2090 (0.3967)	0.0360 (0.0222)
Constant	49.0053*** (3.3513)	47.5319*** (3.0707)	46.7752*** (4.0954)	
Observations	302	302	302	302
R-squared	0.4304	0.2877 ¹	0.3055	
Pseudo R-squared				0.216

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
¹Overall R-squared.

7 Discussion

This section discusses the results, their implications and their relationship to the model introduced in section 4. Also, the validity of the estimates, limitations of the study and suggestions for further research are discussed.

Though often claimed that reforms hinder re-elections, both Fölster and Sanandaji (2014) and Buti et al. (2008) argue, based on empirical studies on the international level, that voters reward governments initiating structural economic reforms. The empirical section of this thesis tested this argument on gubernatorial elections in the U.S. and found convincing evidence of such a behavior. Defining economic reforms as increases in the Fraser Institute's Economic Freedom of North America index, the probit regressions clearly showed that such reforms increased the probability of re-election for the candidate of the incumbent governor's party. Using a linear model instead of the probit model did not change this conclusion: increasing the degree of economic freedom proved to increase the share of votes received in the next election, regardless whether a pooled OLS model, a random effects model or a fixed effects model was used. Including additional controls in the regression specifications affected the magnitude and the significance of the coefficients only marginally. The effect was found to be larger if the initial degree of economic freedom was low, which is natural since reforms are more likely to be needed then.

While the effect of these reforms on re-election probability proved to be positive, significant, and robust, it should be noted that this effect is marginal compared to the effect of incumbency. It is striking that incumbency is, by far, the single most important factor of winning an election. Both the probit model and the pooled OLS model yielded coefficients for the incumbency variable that were many times larger than all the other coefficients. This circumstance also became evident in the descriptive section, where it was noted that 132 out of 162 incumbents were re-elected. This demonstrates that economic reforms are *not* the key explanation of re-election in these personality-based gubernatorial elections. Nevertheless, apart from the incumbency status, increases in the degree of economic freedom proved to be one of the most reliable predictors of re-election.

Of course, economic reforms can be defined in several ways as it is not obvious what constitutes such a reform. This might be a reason why there exist only a few empirical studies with the outspoken focus on the effect of reforms on re-election (most studies are simply concerned with the importance of economic factors on re-election without referring to these factors as reforms). Buti et al. (2008) define reforms in another way than Fölster and Sanandaji (2014), whose definition of reform is attemptedly utilized in this study by incorporating a similar kind

of index into the econometric setup. In the paper by Buti et al. (2008), the reform variable takes the form of a dummy variable, the value of which depends on whether a structural reform took place in at least one of five areas or not. Had economic reforms been defined differently in this paper, the findings might very well have been as well. Future research on these hypotheses with other definitions of reform is, then, to be desired.

Since the EFI can be disaggregated into subindexes and subcomponents, it is possible, and desirable, to analyze what parts of the index that cause these effects. The empirical section clearly showed that decreases in the size of government were highly rewarded by the voters. This corroborates results of earlier studies on gubernatorial elections in the U.S. such as Peltzman (1992) and Cummins and Holyoke (2012). The analysis could stop there, concluding that results are consistent with earlier research. However, since the subindexes are further divided into several subcomponents, an even more detailed analysis could be conducted. Such an analysis resulted in the finding that reductions in transfers and subsidies are rewarded more than anything else in American gubernatorial elections. The transfers and subsidies included in these data are “transfers to persons and businesses such as welfare payments, grants, agricultural assistance, food-stamp payments [...], housing assistance, and so on” (Stansel and McMahon, 2013:55). Interestingly, social security payments, consisting of “Payments by Employment Insurance, Workers Compensation, and various pension plans” (Stansel and McMahon, 2013:56) did not have a significant effect on re-election probability, nor did the general consumption expenditures. Earlier studies have not disaggregated the data this far, therefore this result was not anticipated. Unfortunately, the empirical results obtained in this thesis do not provide an explanation why transfers and subsidies are more important than the other components making up the Government Size subindex.

One of the main aims of the thesis was to analyze the effect of economic reforms on re-election probability with regard to the party of the incumbent governor. Several researchers have pointed out that market-oriented reforms are often introduced from the left of the political spectrum. This finding is also confirmed in the empirical analysis of Fölster and Sanandaji (2014). Therefore, the empirical part of this thesis always looked at both the complete sample of governors as well as the subsamples where the governors were divided into a Democratic (left-wing) and a Republican (right-wing) group. The descriptive analysis confirmed the assumption that Republican, or right-wing, governors generally are more interested in increasing the degree of economic freedom than are Democratic governors. The average Republican governor increased the degree of economic freedom over a term of office, whereas the average Democratic governor decreased it. Furthermore, Republican governors had a higher mean EFI score than Democratic governors.

Although Republican governors tend to favor an increased degree of economic freedom, the opposite being true for Democratic governors, this does not correspond to the way they are rewarded by the voters. The empirical investigation results in a similar finding as in Fölster and Sanandaji, i.e., left-wing (Democratic) governors are significantly rewarded for increases of economic freedom, whereas the effect is less significant for the right-wing (Republican) group. Alternatively, the results could also be interpreted as that Democratic but not Republican governors are punished by the voters for decreases in economic freedom. In fact, the descriptive analysis suggests that the latter effect predominates; when the EFI score has increased over a term, Democratic and Republican governors are re-elected to the same extent, but when the EFI score has decreased, Democratic governors are punished to a larger extent than Republicans.

A hypothetical explanation of this finding could be that Republican governors generally start off in a position with a relatively higher EFI score, and that increases in this index are therefore less needed, which in turn makes them less sensitive for punishment if decreasing the degree of economic freedom. Table 5, however, does not support such an explanation. While column 1 in Table 5 suggests that economic reforms are more likely to be rewarded when the initial level of economic freedom is low, columns 3 and 4 reveal that this effect is significantly stronger for Democratic governors who started off with a low degree of economic freedom compared to the equivalent group of Republican governors. Hence, it is unlikely that the significant effect for the complete group of Democratic governors is explained by their, on average, lower initial EFI scores.

As mentioned, empirical evidence suggests that market-oriented reforms are often introduced from the left. Chapter 4 presented a simple model that, under certain assumptions, explained why a right-wing policy only can be introduced by a left-wing policymaker. The principle idea behind the model was that voters were less informed about the “state of the world” than policymakers, who, therefore, only could overcome their credibility problem by introducing a policy against their partisan preference. Therefore, the model predicted that Democratic (Republican) governors should be disproportionally rewarded for increases (decreases) in the degree of economic freedom. As mentioned, this was indeed the case since the coefficient of the EFI variable was positive, larger and of higher significance for the Democratic group of governors. The fact that Republican but not Democratic governors had a negative and significant coefficient for the Gini coefficient variable also speaks in favor of the model’s predictions.

Of course, the model is not able to predict the outcome in every election. There are plenty of exceptions from the “rule” that a policymaker only can implement a policy against its

partisan preferences. For instance, some Democratic governors are defeated despite having increased the degree of economic freedom, just as some Republican governors that have decreased the degree of economic freedom are re-elected. The model assumes several necessary simplifications, such as voters only caring about one policy. In reality, this is obviously not the case. There is a set of factors that determine election outcome, many of them not captured in these regressions (since they are far from a perfect fit). Also, as mentioned in section 4, the model can result in different equilibria depending on parameter values. In order to yield the “paradoxical” equilibrium, some conditions had to be met. The state of the world shock had to be sufficiently large, and voters needed to assign a probability small enough that this shock would be against the policymaker’s partisan preference. In reality, these conditions might not have applied in plenty of elections. If we further consider the apparent importance of the governor’s personal appeal, it becomes evident that plenty of “exceptions” were to be expected. Hence, focus should primarily lie on the concept of the model in relation to the general result that Democratic but not Republican governors had a significant effect of economic reforms on re-election probability.

According to the model, the median voter is ideologically neutral in the sense that she prefers a status quo policy if there is no state of the world shock in either direction. However, the empirical analysis clearly shows that economic reforms are rewarded by the voters. If the average state of the world shock would have been neutral over the time period examined, and the median voter also would have been neutral, then we would expect the Republican group of governors to have a corresponding negative and significant coefficient for the EFI variable, instead of a positive and insignificant as was the case now. That leaves us with two possibilities: either the average median voter is *not* ideologically neutral but leaning towards preferring a higher degree of economic freedom than has been the case, or the average median voter is indeed ideologically neutral but there have been disproportionately many perceived state of the world shocks to the right, i.e., the perceived socially optimal policy has changed to a higher degree of economic freedom than has been the case before. Based on the findings of this paper, it is not possible to determine which role each of the potential explanations plays. The reason *why* economic reforms are generally rewarded is left to be answered by others. In future research, the model used in this paper, or another modified version of the original model by Cukierman and Tommasi (1998), could also be used to test the effects of other types of policies in order to further investigate the idea that a certain policy is easier introduced by a policymaker whose partisan preferences are against the policy.

Finally, a few notes on the validity of the estimates ought to be addressed. The effect of the EFI variable proved to be robust, as it only changed marginally when the specification of the model or the model itself was changed. Therefore, the direction of the effect is most probably

estimated correctly. The causality condition is, in this case, contingent on the assumption that voters are, to some extent, retrospective, which according to many studies on American voters is a reasonable assumption (as explained in section 4.2). However, the magnitude of the effect is, for several reasons, more difficult to estimate. Firstly, the nonlinear nature of the probit model means that the magnitude is dependent on the values of all the other variables. In the table outputs, the magnitudes are presented when all other coefficients are set to their means, but this is of course rarely the case. Therefore, the coefficients are complicated to interpret. The coefficients in the linear model are easier to interpret but they do, on the other hand, not represent a change in re-election *probability*, which was an important aim of this study. Secondly, since the degree of economic freedom is measured as an index score, it becomes even more complicated to interpret the coefficients. The standardization of the coefficients is one way to try to make the coefficient magnitudes somewhat more useful, but this facilitates the interpretation only to a certain extent. Hence, as far as the direction of the effect is concerned, the internal validity is likely high, but too much focus should not be put on the magnitudes of the coefficients.

The external validity should however be considered to be very low. The U.S. political system is unique in its structure and the gubernatorial elections is just one out of several types of elections in the country. In other parts of the world – with different political and economic systems, traditions and institutions – results could potentially be very different. Therefore, it would be interesting to see other subnational studies where these hypotheses are tested in other countries. Similar subnational indexes³⁶ in different countries could be useful for future research. As years pass by, so does the number of data points. Therefore, this research can be updated and extended in future, both on the subnational and on the cross-country level.

³⁶See for instance www.foretagsklimat.se for a similar index over Sweden's municipalities.

8 Conclusion

This paper has studied the effects of economic reforms, defined as increases in the index score of the Economic Freedom of North America index from the Fraser Institute, on re-election probability in gubernatorial elections in the U.S. over the period 1985-2010. Prior research on the cross country level offer several theories of reform resistance, however the few empirical studies conducted on structural economic reforms on re-election probability suggest that voter in fact reward reforms once implemented. Previous research also suggests that right-wing policies, such as market-oriented reforms, are easier introduced from policymakers with a left-wing ideology. This logic was explained through a theoretical model, arguing that policymakers possess a greater credibility when introducing a policy against their partisan preference, and tested econometrically.

Employing probit regression models, the paper tested these hypotheses and found that voters indeed reward increases in the degree of economic freedom. This effect was driven by decreases in the size of government, confirming earlier studies on American gubernatorial elections. Furthermore, the effect could be narrowed down to decreases of transfers and subsidies, which was not known from prior research. Meanwhile, changing the degree of discriminatory taxation or altering the degree of labor regulation proved not to have a significant effect. Additionally, left-wing (Democratic) governors were found to enjoy a positive and significant effect of economic freedom increases on re-election probability, whereas this effect was not found to be significant for right-wing (Republican) governors. This confirms earlier results of previous research on the cross-country level as well as the predictions of the model presented in this paper; right-wing policies might be easier implemented by left-wing policymakers due to credibility mechanisms. The results proved to be robust in terms of direction of the effects, however the magnitudes of the effects were more uncertain.

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Appendix

The Economic Freedom of North America index used in this paper includes the following set of variables. Their content is described below. See Stansel and McMahon (2013) for further information about the variables and their original data sources.

Area 1: Size of Government

Component 1A: General Consumption Expenditures by Government as a Percentage of GDP

Total expenditures minus transfers to persons, transfers to businesses, transfers to other governments, and interest on public debt.

Component 1B: Transfers and Subsidies as a Percentage of GDP

Transfers to persons and businesses such as welfare payments, grants, agricultural assistance, food-stamp payments (US), housing assistance, and so on. Foreign aid is excluded.

Component 1C: Social Security Payments as a Percentage of GDP

Payments by employment insurance, workers compensation, and various pension plans.

Area 2: Takings and Discriminatory Taxation

Component 2A: Total Tax Revenue as a Percentage of GDP

A sum of income taxes, consumption taxes, property and sales taxes, contributions to social security plans, and various other taxes. Natural resource royalties are not included.

Component 2B: Top Marginal Income Tax Rate and the Income Threshold at Which It Applies

Note: only the top marginal tax income rate (measured in percentage points) is included in the regression analysis. Including the threshold at which it applies would not provide any useful information.

Component 2C: Indirect Tax Revenue as a Percentage of GDP

Property taxes, contributions to social security insurance (employment insurance, workers compensation, and various pension plans), and various other taxes. Income-tax revenue, sales-tax revenue, and natural resource royalties are not included in this component.

Component 2D: Sales Taxes Collected as a Percentage of GDP

Revenue from general sales tax as well as revenue from liquor and tobacco taxes.

Area 3: Labor Market Regulation

Component 3A: Minimum Wage Legislation

Minimum wage multiplied by 2,080, which is the full-time equivalent measure of work hours per year (52 weeks multiplied by 40 hours per week) as a percentage of per capita GDP.

Component 3B: Government Employment as a Percentage of Total State Employment

Public servants as well as those employed by government business enterprises. Military employment is excluded.

Component 3C: Union Density

Estimated percentage of unionized workers, excluding government employment (which is captured in component 3B).