

THREE ESSAYS IN POLITICAL ECONOMY

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Abstract

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Three Essays in Political Economy

Thesis directed by Professor Murat Iyigun

Chapter 1. The Effects of Political Competition on the Feasibility of Economic Reform

This chapter shows that democracies may fail to enact desirable economic reforms even when such reforms Pareto dominate the status quo and there are no informational asymmetries. The key insight is that, even when reforms entail economic gains for all agents, electoral political losses cannot be compensated politically. Consequently, when the majority party has strong electoral support, minority parties pursue both low-gain reforms and high-gain reforms. Intermediate-gain reforms are harder to enact, since the electoral costs dominate welfare gains. In highly contested environments, only high-gain reforms succeed.

Chapter 2. Effect of Internal and External Conflict on Democratization

Incentives

While internal threats help democratization (Acemoglu and Robinson 2000), external threats produce ambiguous effects. Wars may force concessions from elites in exchange for military support from the citizenry (Ticchi and Vindigni 2008). Alternatively, elites may use wars to consolidate power domestically (Powell 2006).

I combine internal and external threats and show the conditions under which external threats promote or dissuade democratization. Three central results arise: i) externally initiated wars may force elites to democratize; ii) elites may consolidate power by instigating wars; and iii) externally initiated wars may prevent unstable autocracies from democratizing.

Chapter 3. Are Voters Really Ambivalent about Economic Performance? A

Reassessment of Brender and Drazen's 2008 AER Paper

Brender and Drazen (2008) claim that "voters, especially in developed countries and established democracies, do not like deficits, particularly in election years." and that "higher growth rates...raise the probability of reelections only in the less developed countries and in new democracies". In this chapter, I revisit and extend their exploration by making three modifications: I define an alternative measure of electoral success. I expand upon Brender and Drazen's original sample, Finally, I employ cyclically-adjusted deficits instead of unadjusted deficits.

I find that voters definitely reward growth in developing countries. There is some weaker evidence that voters reward growth in developed countries, although the effects are smaller.

Voters in old democracies also reward growth. The finding that voters reward fiscal prudence is not conclusive.

Dedication

Dedico con amor esta obra

A mis hijos, Alexandra, Ariel y Zander

A mi esposa, Alita

A mis papás, Raúl y Lety

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The Effects of Political Competition on the Feasibility of Economic Reform

1.1 Introduction

Explanations for failure to implement desirable reform, and for inefficient policy making in general, focus either on informational or redistributive issues. This paper shows that desirable reforms may fail even in the absence of these. In particular, I consider a costless reform which raises overall productivity and show conditions under which reform gets blocked when there is political competition.

1.1.1 Motivation

During the 1980s and early 1990s, Mexico pursued an aggressive economic liberalization agenda. Major state owned enterprises, such as banks, TV stations and the telephone company were privatized. Trade was also liberalized: tariffs were substantially lowered and the country joined GATT and signed NAFTA with the U.S. and Canada.

During this time, the PRI was the major political party. It maintained a Congressional majority sufficient to pursue a liberalization agenda unopposed. In addition, these reforms found support from the right-wing PAN. In 1997, the PRI lost congressional majority as a consequence of a major financial crisis which took place in 1995 and of electoral independence brought about by major political reforms. As president Zedillo tried to continue the reform process, the PAN began blocking reforms. Why would the PAN block reforms which were both consistent with its ideology and beneficial to its constituents?

As opposition parties saw the first real possibility of winning the Presidential election in over six decades, they had incentives to block the PRI's reforms and reduce incentives for voters to reelect the PRI. In 2000, Vicente Fox from the PAN was elected. It was payback time for the PRI. As the PAN attempted to pursue a very similar reform agenda as the PRI, only to find opposition from the PRI. In 2006 Felipe Calderon of the PAN barely won the presidential election. The PAN has faced several defeats in Governorial, Municipal and Congressional elections. Meanwhile, the PRI has been gaining electoral ground in gubernatorial and

legislative elections and holds a fourfold lead over its closest competitor for the 2012 presidential election. Over a decade has passed since elections became competitive in Mexico. Parties have been reluctant to support major energy, labor and fiscal reforms.

In contrast, liberalization experiences of Chile and Spain have shown that it may be easier to reform economic institutions prior to political reform. China, Vietnam, Singapore and Korea offer examples where important economic reforms have led to accelerated growth in the context of non-democratic regimes.

Now, there have been cases where Democratic rule did lead to improved conditions like India, which eventually managed to produce impressive economic growth, after being a basket case for decades; or like some Post-Soviet countries like Poland, but in many of these cases, democratization was accompanied by independence from a foreign power. Furthermore, this paper does not intend to argue that autocracy is better than democracy, but rather to point out to a source of inefficiency that can arise in Democratic regimes.¹

The model is also consistent with the United States' political history, especially as it relates to the theory of political realignment. At least since Key (1955), it has been argued that there are some elections which change the mainstream political view and therefore establish a long-term advantage in favor of one political party. In that context, the elections of Abraham Lincoln, Franklin Roosevelt and Ronald Reagan have been studied as decisive. In all these examples, leaders presided over important changes to the economic structure: in the case of Lincoln, emancipation led to a change in economic power from the agricultural South to the industrializing North; Roosevelt's New Deal transformed the role of government into an active player needed to stabilize, regulate and in some cases direct economic activity. Finally the Reagan revolution reversed these policies and reduced the role of government through tax reductions and deregulation. In all these cases reforms were also preceded by major crises: in Lincoln's case the crisis was political as South Carolina and six other states attempted to separate from the Union, in Roosevelt and Reagan's case the crises were economic: the Great Depression and the Energy Crisis and Stagflation.

In contrast to these leaders that changed the political landscape and established their political parties as

¹This is an ongoing discussion with mixed results. Limongi and Przeworski (1993) present a survey of this empirical question. Furthermore, an advantage of democracies with respect to autocracies is that they impose constraints, which may prevent undesirable reforms.

the majoritarian political force, William Clinton was unable to do so. After he won the election following a minor economic recession, he was unable to pursue major health reform. Clinton then led a successful presidency by sticking to reforms that were desirable for Conservative Republicans such as Welfare Reform. Republicans remained the dominant party and won the Presidential election in 2000 and 2004.

This chapter studies the effects of democratic conditions on the feasibility of desirable reforms. Even if there are economic gains for all actors from enacting reform, electoral gains are a zero sum game: When reform improves voters' conditions, political actors associated with reform get rewarded electorally. If competing political agents have veto power over reform, one of the parties may block reform when reform leads to electoral gains for its opponent.

1.1.2 Outline of the Model

This chapter presents a game-theoretic model in which a Pareto improving reform can get enacted. There are two parties who share veto power over the decision to enact the reform, but face asymmetric electoral benefits from its enactment. From the perspective of voters, reform should be undertaken. For parties, the decision to enact a Pareto improving is not trivial; if electoral gains from reform are accrued by the competing party, then the decision to support reform depends on the tradeoff between the economic gains and electoral costs.

The model is specified in the following way. Voters are separated into two social classes: a rich minority and a poor majority. Each constituency is represented by a party.² Parties share control of the legislative branch. There is the possibility to enact an institutional reform which increases the overall productivity of the economy. While the reform is costless to implement, it only gets enacted if both parties support it. Although this sounds like a stark assumption, it captures the idea that in functioning democracies, opposition parties have a degree of veto power over decision making. Constitutional amendments, for example, require a two-thirds approval to succeed. The filibuster can also act as a de facto tool to veto policy.³

²The use of social classes in general, and the assumption of a rich minority are in no way crucial to the results of this chapter. The main reason for this assumption is to generate an ex ante electoral asymmetry, in order to showcase the most interesting scenario. Social classes are only employed to provide a justification as to why this asymmetry could exist. Furthermore, when electoral asymmetries from class advantage are removed, the main result still holds.

³For a model that deals with the effects of changing the proportion of votes required to veto policy see Aghion, Alesina, and Trebbi (2004). In their model, too much unchecked power leads to abuse, while too little leads to excessive blocking of legislative action. In their model, blocking occurs due to uncertainty, whereas in this model, blocking occurs due to a deliberate

Finally, parties differ in their degree of implementation efficiency, which in turn determines the value of reform. There can be several reasons for one party to have greater implementation efficiency. Leadership may be one reason.⁴ Leadership may be manifested as competence or honesty, and may be crucial in times of institutional transformation and political change. Knowledgeably about the reform, perhaps from previous experience implementing the reform at a local or state level or from technical competence, could also explain efficiency differentials. Alternatively, a party may be more credibly committed to a given reform because of ideological or political ties. Incumbency advantage could also lead to differing degrees of implementation efficiency if the incumbent has experience dealing with the bureaucracy in charge of implementation.

As voters observe whether a reform was enacted or not, they vote for the party that maximizes their expected utility. Two considerations can affect voters' preferences: class identity, in which voters elect the party that represents them, since the party chooses the voters' preferred fiscal policies; and implementation efficiency, in which voters may support the high efficiency party if the benefits from reform are sufficient to offset the costs from relinquishing their desired fiscal policy. Different efficiencies can therefore generate electoral asymmetries from reform.

Some readers may be troubled with the timing of events, in which reform takes place after the election. There can be several ways to justify this assumption. The first is that in competitive democracies there is always an election taking place in the near future. The second is that important reforms take time to implement: sometimes years, if not decades, which means that they have consequences for future elections.⁵

Finally, while in this model efficiency differentials generate electoral asymmetries, there may be several reasons why reforms may generate electoral asymmetries. For example, reforms may be employed as signal devices for ability or commitment of the current leader or its party, especially if the party has made campaign promises to implement these reforms in prior elections. Alternatively, an asymmetric distribution of economic gains from reform may affect the distribution of party constituencies (e.g. Jain and Mukand 2003, Besley and Coate 1998).

electoral calculation.

⁴Jones and Olken (2005) have shown empirically that leadership plays a huge role in shaping the development of a country.

⁵A more detailed discussion of this point is presented in section 3.

1.1.3 Related Literature

Papers that study why inefficient policy making takes place, have focused on economic transfers and informational issues. Economic transfer explanations can be of two types: a) rent preservation, in which a proportion of pivotal decision makers block a reform which reduces their economic rents,⁶ and b) special interest groups, in which a small group of agents solve the collective action problem and employ resources to achieve their desired set of policies (either through block voting or bribes). Informational explanations argue that in the presence of private information, undesirable policies may be pursued opportunistically for pecuniary or electoral motives.⁷ Alternatively, uncertainty and informational asymmetries may deter incumbents from implementing desirable reform.⁸ Finally, uncertainty about a competitor's resolve may lead to inefficient policies.⁹

This paper contrasts those models by assuming perfect information. Additionally, the reform raises overall welfare. I make this stark assumption to show that there may be reasons other than informational asymmetries or an unequal distribution of economic costs, which can cause desirable reforms to fail. While in practice, we live in an uncertain world and all reforms have redistributive consequences, it is easy to think of examples where it is possible for this normalization to arise. Consider the case of reforms favored by a supermajority. In that case, as Jain and Mukand (2003) argue, the reform is ex-ante welfare improving for all individuals: the benefits offset the probabilities of being an economic loser, and thus everyone should

⁶Rajan (2009) proposes a model where initial endowment inequalities divide voters into constituencies with competing interests in different reforms. This can lead to reform paralysis as each constituency protects their own rents.

In Fernandez and Rodrik (1991), uncertainty about the incidence of benefits and costs prevents reform from taking place.

Jain and Mukand (2003) revisit Fernandez and Rodrik (1991) and argue that even when redistribution is available as an alternative to compensate economic losers, new economic conditions change the distribution of voters making future redistribution schemes electorally impossible. Only projects that benefit small minorities (who may be taxed) or supermajorities (for which the chances of being both an economic and political loser are small) are successful.

In Besley and Coate (1998) a citizen-candidate refuses to pursue projects that change the future identity of the median voter in a way that is detrimental to her.

In Acemoglu and Robinson (2000a) the decision to introduce a new technology depends on how the introduction of the new technology affects the elite's ability to retain political power and capture the rents from the technological improvement.

⁷In Coate and Morris (1995) a politician may benefit a special interest group through a project of low value since it is less visible than a direct transfer, even when the direct transfer is less costly to taxpayers. In Majumdar, Mani, and Mukand (2004), the value of a project to a politician is distorted by the fact that some projects might be more visible than others to voters. In Majumdar and Mukand (2004) a project whose value fell short of expectations is continued to delay its political costs. In Rogoff and Sibert (1988) political business cycles emerge as incumbents use costly fiscal policy to delay economic deceleration to ensure reelection. In Hess and Orphanides (1995, 2001) inefficient wars are started to show the incumbents military skills if economic performance is weak.

⁸In Mukand and Rodrik (2005), incumbents implement proven, yet inadequate policies instead of experimenting with potentially optimal policies to avoid charges of corruption. In Coate and Morris (1999) a subsidy to a firm might be the correct industrial policy, as suggested by endogenous growth theory, fears of facing corruption charges prevent the incumbent from offering the subsidy.

⁹In Alesina and Drazen (1991) factions start a "war of attrition" over the burden of a costly stabilization program. In Fearon (1995) countries get into costly wars with one another for similar reasons.

support reform. Alternatively, if reform benefits a minority, losers from reform may tax winners as suggested by Jain and Mukand (2003), Besley and Coate (1998) and Acemoglu and Robinson (2000a).

Other papers study the effects of political competition on policy making efficiency and focus on problems of commitment: in these models, the incumbent may choose inefficient policies to tie her successor's hands.¹⁰ In contrast to those models, the inefficiency arises as parties block desirable reform to prevent the opposing party from winning rather than to limit its field of action once it takes control of government.

The rest of the chapter proceeds as follows: the next section presents and solves the benchmark specification. In section 3, the main assumptions of the model are justified or relaxed. In section 4 the main findings of the model and its extensions are summarized and concluding remarks are presented.

1.2 Model

1.2.1 Agents

There are two types of agents in this economy, voters and parties.

Voters There are $N > 2$ voters of two types who differ only in their productive endowment: rich, r and poor, p . Rich voters have a larger endowment, k_r , and make up $\beta < \frac{1}{2}$ of the population; poor voters have smaller productive endowment, $k_p = \phi k_r$ for $\phi \in (0, 1)$ and make up $1 - \beta$ of total population. Total productive endowment of the economy is normalized to 1:

$$N[\beta k_r + (1 - \beta)k_p] = 1 \tag{1}$$

Voters are risk neutral, rational and forward looking. The utility of voters depends on the consumption of a public good and a private good. Voters have the following utility function:

$$u(g, y_i) = 4\left(\frac{1}{2}g^{\frac{1}{2}} + \frac{1}{2}y_i^{\frac{1}{2}}\right)^2 \tag{2}$$

where g denotes the production of a public good and y_i denotes consumption of a private good by a voter

¹⁰In Moe (1990) inefficient regulatory institutions may be placed to restrict future actions. In Alesina and Tabellini (1990a) and Milesi-Ferretti and Spolaore (1994) deficits are run to prevent successors from employing fiscal policy.

belonging to social class $i \in \{p, r\}$.¹¹

Parties There are two parties, who share control of the legislative and compete for control of the executive. Parties are risk neutral, rational and forward looking. One party represents the rich while the other represents the poor. The party of the rich has a higher reform implementation efficiency than the party of the poor.¹² Parties care about their respective constituencies' utilities and about capturing power. Parties have the following utility function:

$$u(g, y_i) + r \quad (3)$$

where r denotes exogenous political rents from capturing the executive branch. Exogenous political rents have a value of 0 when the party loses the election and $R > 0$ when it wins the election.

1.2.2 Technology

Each voter of class i inelastically supplies their endowment to a competitive firm producing the private good with technology Z . Private production by a voter of class i is thus:

$$Y_i = Zk_i. \quad (4)$$

It follows from equation (1) that total private production is normalized to Z , the production technology of the firm.

Institutional Development There is a legislative proposal to implement an institutional reform that improves productivity. Parties choose whether to support or effectively block reform. When both parties support reform, it gets enacted, otherwise it gets blocked. If the reform is enacted, its effects on the economy

¹¹The elasticity of substitution, σ , and the preference weights, ϖ , are set equal to $\frac{1}{2}$ only to simplify exposition. The model only requires that $\sigma, \varpi \in (0, 1)$. If either $\sigma = 0$ or $\varpi = \{0, 1\}$, all voters have the same fiscal preferences and thus class advantage disappears for the party of the poor. The first extension of the model shows that the main results are strengthened when class advantage disappears. At the other extreme, if $\sigma = 1$, utility becomes linear. The party of the rich chooses a tax rate of 0 while the party of the poor chooses a tax rate of 1.

¹²I make this assumption to help the reader focus on the interesting case, which is the one where the majority party is the low efficiency party. If the majority party is the high efficiency party then the results are trivial. Since there is no incentive to block reform by either party, reform always succeeds. This is the result in Claim 8.

depend on the implementation efficiency of the party that wins the election and implements the reform. The technology of the economy therefore becomes:

$$Z = \begin{cases} \Theta_H & \text{if reform is enacted and the high efficiency party is elected} \\ \Theta_L & \text{if reform is enacted and the low efficiency party is elected} \\ 1 & \text{when either party blocks reform} \end{cases} \quad (5)$$

where $\Theta_H > \Theta_L > 1$. It is assumed that the party of the rich is the high efficiency party.

1.2.3 Taxation and Public Sector Production

A proportion of private production is employed in the production of a public good. The production of the public good is financed solely by a linear tax on private production. Let τ denote the tax rate faced by voters. A voter of class i pays τY_i and consumes the rest. $y_i = (1 - \tau)Y_i$. Public sector production equals total public revenue. That is,

$$g = \tau N[\beta Y_r + (1 - \beta)Y_p] = \tau Z \quad (6)$$

The tax rate is determined by the party that wins the election.

1.2.4 Timing of Events

1. Party implementation efficiency levels are revealed to all agents. Parties simultaneously choose whether to support or block the reform.
2. Rational forward-looking voters simultaneously vote to elect the party that maximizes their expected utility. Voting is costless and mandatory. If both parties offer the same level of utility to a given social class of voters, then voters split their vote evenly. If the poor split their vote in half then rich individuals act as tie-breakers. If both parties offer the same utility levels to both social classes, then the election is decided by a fair coin toss.
3. The winning party chooses its optimal tax policy, τ_j^* where j denotes the class identity of the winning

party.¹³

1.2.5 Solving the Model

Reexpressing Utility Functions The voter's utility function (Equation 2) is reexpressed as an indirect utility function in terms of τ , Z and τ_i .

$$U(\tau, k_i, Z) = \{(Z\tau)^{\frac{1}{2}} + [(1 - \tau)Zk_i]^{\frac{1}{2}}\}^2 \quad (7)$$

Claim 1 *The utility function is homogeneous of degree one on the level of institutional development, Z .*

Proof. $\frac{\partial U}{\partial Z} = \frac{U}{Z} \iff U = Z \frac{\partial U}{\partial Z}$. ■

The utility can be reexpressed as:

$$U(\tau, k_i, Z) = Z\{\tau^{\frac{1}{2}} + [(1 - \tau)k_i]^{\frac{1}{2}}\}^2 \quad (8)$$

This formulation is convenient because it explicitly shows the reform is strictly welfare improving: taxation decision is independent from institutional development and $\frac{\partial U}{\partial Z} = \frac{U}{Z} > 0 \forall k_i$.

The parties' utility functions (equation 3) are therefore:

$$U(\tau, k_i, Z) + r \quad (9)$$

The model is a subgame perfect Nash equilibrium. It is solved by backward induction. In the last stage of the game, the winning party chooses the tax rate that maximizes the utility of its constituents.

Stage 4. Selecting the Optimal Tax Policy. The winning party solves:

$$\max_{\tau} U(\tau, y_i, Z) + r \quad (10)$$

Claim 2 *The solution to the maximization problem is $\tau_i^* = \frac{1}{1+k_i}$.*

¹³See section 3 for a discussion on the timing of events.

Proof. Necessity: The first order condition is set equal to 0: $\frac{\partial U}{\partial \tau} = Z\{\tau^{\frac{1}{2}} + [(1-\tau)k_i]^{\frac{1}{2}}\}[\tau^{-\frac{1}{2}} - (1-\tau)^{-\frac{1}{2}}k_i^{\frac{1}{2}}] = 0$.

Solving for τ we get: $\tau^*(k_i) \equiv \tau_i^* = \frac{1}{1+k_i}$.

Sufficiency: $\frac{\partial^2 U}{\partial \tau^2} = -\frac{Zk_i^{1/2}}{2}[2\tau^{-1/2}(1-\tau)^{-1/2} + \tau^{1/2}(1-\tau)^{-3/2} + \tau^{-3/2}(1-\tau)^{1/2}] < 0$. ■

It is clear from this claim that tax policy is independent from the level of institutional development and from political rents, as the optimal tax rate depends only on (and is inversely related to) productive endowments, k_i .

Claim 3 *The rich always prefer lower taxes than the poor.*

Proof. $\frac{\partial \tau_i^*}{\partial k_i} = -\frac{1}{(1+k_i)^2} < 0 \forall k_i$. ■

Remark 1 *Given the level of institutional development, Z , i) When the party of the rich is elected, the utility levels to rich and poor voters are $Z(1+k_r)$ and $Z\frac{(1+\phi^{\frac{1}{2}}k_r)^2}{1+k_r}$ respectively, and ii) when the party of the poor is elected, the utility levels to rich and poor voters are $Z\frac{(1+\phi^{\frac{1}{2}}k_r)^2}{1+\phi k_r}$ and $Z(1+\phi k_r)$ respectively.*

Stage 3. Electing a Party At this point, voters have observed whether the reform was enacted, the implementation efficiency levels and the class identities of both parties. Therefore, voters can perfectly infer their expected utility from election either party. They elect the party that maximizes their expected utility.¹⁴

Let

$$Z^{elect} \equiv \frac{(1+\phi k_r)(1+k_r)}{(1+\phi^{\frac{1}{2}}k_r)^2} \Theta_L \quad (11)$$

Claim 4 $\frac{(1+\phi k_r)(1+k_r)}{(1+\phi^{\frac{1}{2}}k_r)^2} > 1$.

Proof. $\frac{(1+\phi k_r)(1+k_r)}{(1+\phi^{\frac{1}{2}}k_r)^2} > 1 \Leftrightarrow (1+\phi k_r)(1+k_r) > (1+\phi^{\frac{1}{2}}k_r)^2 \Leftrightarrow 1 + (1+\phi)k_r + \phi k_r^2 > 1 + 2\phi^{\frac{1}{2}}k_r + \phi k_r^2$
 $\Leftrightarrow 1 - 2\phi^{\frac{1}{2}} + \phi > 0 \Leftrightarrow (1 - \phi^{\frac{1}{2}})^2 > 0$ which holds and is non-empty for the range $\phi \in [0, 1)$. ■

It follows from the previous claim that $Z^{elect} > \Theta_L$.

Claim 5 *The party of the rich is elected if and only if reform is enacted and $\Theta_H \geq Z^{elect}$.*

¹⁴As stated in the timing of events, since the poor are majority, the party that can offer the highest utility level to the poor wins. If they both offer the same level, then the party that maximizes the utility to the rich gets elected.

Proof. Notice that support from the poor is a necessary and sufficient condition for the party of the rich to get elected. Suppose first that no reform is enacted. The poor elect the party of the rich if and only if $\frac{(1+\phi^{\frac{1}{2}}k_r)^2}{1+k_r} > (1+\phi k_r) \Leftrightarrow 1 > \frac{(1+\phi k_r)(1+k_r)}{(1+\phi^{\frac{1}{2}}k_r)^2}$. It follows from the previous claim that this is a contradiction. Now suppose that the reform is enacted. The poor elect the party of the rich if and only if $\Theta_H \frac{(1+\phi^{\frac{1}{2}}k_r)^2}{1+k_r} \geq \Theta_L(1+\phi k_r) \Leftrightarrow \Theta_H \geq \frac{(1+\phi k_r)(1+k_r)}{(1+\phi^{\frac{1}{2}}k_r)^2} \Theta_L = Z^{elect}$. ■

Since $Z^{elect} > \Theta_L$, having higher implementation efficiency is not a sufficient condition for the party of the rich to get elected when a reform has been enacted. The party of the rich requires a substantial efficiency differential in order to get elected by poor voters. In other words, the electoral benefits of being a majority party for the party of the poor are sufficient to ensure victory, as long as the efficiency differentials between the two parties are low.

Now let us focus on the decision to support by the parties.

Stage 2. Supporting or Blocking Reform Let us first study the decision to support reform by the party of the rich.

Claim 6 *The party of the rich always supports reform (i.e. supporting reform always weakly dominates blocking reform for the party of the rich).*

Proof. It follows from the previous claim that if both parties support reform and $\Theta_H \in (\Theta_L, Z^{elect})$, then the party of the poor wins and the payoffs for the party of the rich are $\Theta_L \frac{(1+\phi^{\frac{1}{2}}k_r)^2}{1+\phi k_r}$. If both support and $\Theta_H \geq Z^{elect}$, then the party of the poor wins and payoffs for the party of the rich are $\Theta_H(1+k_r) + R$ and if either party blocks reform, payoffs to the party of the rich are $\frac{(1+\phi^{\frac{1}{2}}k_r)^2}{1+\phi k_r}$. Since $\frac{(1+\phi^{\frac{1}{2}}k_r)^2}{1+\phi k_r} < \Theta_L \frac{(1+\phi^{\frac{1}{2}}k_r)^2}{1+\phi k_r} < \Theta_H(1+k_r) + R$ it follows that the party of the rich always supports reform. ■

The intuition is simple: the party of the rich can never win the election if there is no reform. Since reform is strictly welfare improving, the party of the rich always wants reform. The interesting question then becomes: when does the party of the poor support or block reform?

Let

$$Z^{enact} \equiv \frac{(1+\phi k_r + R)(1+k_r)}{(1+\phi^{\frac{1}{2}}k_r)^2} \quad (12)$$

Claim 7 *The party of the poor blocks reform whenever $\Theta_H \in [Z^{elect}, Z^{enact})$ and supports reform otherwise.*

Proof. It follows from the previous claim that the party of the rich always supports reform. Suppose that $\Theta_H < Z^{elect}$ it follows from claim 6 that the party of the poor wins the election regardless of whether reform is undertaken. Since $\Theta_L(1 - \phi k_r) + R > (1 - \phi k_r) + R$ the party of the poor supports reform. Now suppose that $\Theta_H \geq Z^{elect}$. In this case, it follows from claim 6 that the party of the rich wins the election if reform is enacted and the party of the poor wins the election if reform is blocked. The party of the poor therefore supports reform if and only if the utility from supporting reform and losing the election is greater or equal to the utility from blocking reform and winning the election. The poor therefore support reform if and only if $\Theta_H \frac{(1+\phi^{\frac{1}{2}}k_r)^2}{1+k_r} \geq 1 + \phi k_r + R \Leftrightarrow \Theta_H \geq \frac{(1+\phi k_r+R)(1+k_r)}{(1+\phi^{\frac{1}{2}}k_r)^2} = Z^{enact}$ and block otherwise. ■

Remark 2 *The range $[Z^{elect}, Z^{enact})$ is empty when $(Z_p - 1)(1 + \phi k_r) \geq R$.*

This remark follows from setting $Z^{enact} \geq Z^{elect}$ and solving for R . From this remark it becomes clear that the low efficiency party only blocks reform whenever the implementation efficiency of the party of the poor is sufficiently low and political rents are sufficiently high. Let \underline{R} denote the minimum level of political rents under which there is opportunistic behavior by the party of the poor.

$$\underline{R} = (Z_p - 1)(1 + \phi k_r) \quad (13)$$

Now for completion let us focus on the least interesting case and suppose that the party of the poor is the high efficiency party.

Claim 8 *If the party of the poor is the high efficiency party, then reform always succeeds and the party of the poor is always elected.*

Proof. It follows from claim 4 that $\Theta_H(1 + \phi k_r) > \Theta_L \frac{(1+\phi^{\frac{1}{2}}k_r)^2}{1+k_r}$ and $(1 + \phi k_r) > \frac{(1+\phi^{\frac{1}{2}}k_r)^2}{1+k_r}$ therefore, the poor never vote for the party of the rich. The party of the poor therefore supports reform if $\Theta_H(1 + \phi k_r) + R > 1 + \phi k_r + R$ and the party of the rich support reform if $\Theta_H \frac{(1+\phi^{\frac{1}{2}}k_r)^2}{1+\phi k_r} > \frac{(1+\phi^{\frac{1}{2}}k_r)^2}{1+\phi k_r}$. Clearly, since $\Theta_H > 1$ both parties always support reform. ■

Both parties choose whether to support or block the reform. For the high efficiency party, the decision is trivial. Reform raises the overall welfare of voters. It also increases its opportunities of getting elected, which

benefits it both directly through political rents and indirectly through its influence on fiscal policy. For the low efficiency party, the decision involves a tradeoff: reform can improve welfare of its constituents but it can make constituents vote for the high efficiency party if the benefits from reform are greater than fiscal costs. When the electoral costs of supporting reform are less or equal to economic gains, parties support reform. From the previous discussion, the central proposition of the paper is constructed.

Equilibria of the Model

Proposition 1 *The following equilibria can emerge:*

A) If the party of the poor is the high efficiency party, reform is always enacted and the party of the poor wins.

B) If the party of the rich is the high efficiency party and if $R > \underline{R}$ there can be up to three different outcomes:

Ba.i) Whenever $\Theta_H \in (\Theta_L, Z^{elect})$, the party of the poor wins the election, as efficiency differential are insufficient to offset fiscal policy differentials. The reform gets implemented by the low efficiency party.

Ba.ii) Whenever $\Theta_H \geq Z^{enact}$ the party of the rich wins the election as efficiency differentials are sufficient to entice the poor to vote for the party of the rich and efficiency gains are sufficient to offset electoral and fiscal losses for the party of the poor.

Ba.iii) Whenever $\Theta_H \in [Z^{elect}, Z^{enact})$ the party of the poor opportunistically blocks a reform that would allow the rich to get elected. Consequently, reform gets blocked and the party of the poor wins the election.

Bb) If $R \leq \underline{R}$ two different outcomes may occur:

Bb.i) Whenever $\Theta_H \in (\Theta_L, Z^{elect})$, the party of the poor wins the election, as efficiency differential are insufficient to offset fiscal policy differentials. The reform gets implemented by the low efficiency party.

Bb.ii) Whenever $\Theta_H \geq Z^{elect}$ the party of the rich wins the election as efficiency differentials are sufficient to entice the poor to vote for the party of the rich and efficiency gains are sufficient to offset political and fiscal losses for the party of the poor.

Proof. Omitted. A) follows from claim 8. B) Follows from direct application of claims 5, 6 and 7 and remark 2. ■

It is important to understand how different parameters affect the feasibility of reform. When $\Theta_H < Z^{elect}$ there is no incentive to block reform, as there are no electoral costs attached to reform.

The interesting solutions arise when $\Theta_H \geq Z^{elect}$. What determines whether a party opportunistically blocks reform? By simple manipulation of equation (13) it can be shown that holding the high efficiency level, Θ_H , and political rents, R , constant, a smaller differential in efficiency levels (i.e. a higher Θ_L) reduces the area over which reform is blocked. The intuition is that increasing Θ_L increases the area over which the efficiency differentials are insufficient to offset fiscal costs. Conversely, increases in either income, k_r , or reductions of inequality (increases in ϕ) reduce the area over which reform is blocked: increasing ϕ or k_r raises the marginal economic benefit from reform for the party of the poor.

1.3 Discussion and Extensions

The crucial assumption in the model is the existence of efficiency differentials between parties in implementing reform. It acts as the mechanism through which electoral asymmetries arise from reform.

1.3.1 Implementation Efficiency and Political Asymmetries

There can be many justifications for differences in implementation efficiency. The party may have experience pushing similar reforms. Consider the case where the leader of the party comes from a background of implementing a similar policy at a local level. Alternatively we could consider an incumbency advantage. In this case, the party might have better knowledge as to how to operate the bureaucracy. Or it might have appointed some of the bureaucrats that would stay once reform gets implemented even after the term expires. Monetary authorities are an example of bureaucrats who may stay long after the term of their appointer expires if their expertise and reputation brings market reassurance and stability. Implementation efficiency advantage can also arise if a party has done extensive research concerning the expected value of the reform. Finally, the profile of the party leadership or the party ideology might be more appropriate for the implementation of a given reform.

There is another interesting explanation which focuses on reputation rather than efficiency or experience as sources of asymmetric electoral gains when reform is implemented. After that party captures executive

control, voters assess its performance on whether reforms were successfully enacted and implemented. If the opposition is able to block these policies or render them either ineffective or costly, voters' perception of the incumbent's performance may be affected. Successful implementation translates into high political gains for the incumbent. This generates incentives for the opposition to block reform. This behavior can explain the reform paralysis Mexico has faced since 1997 when the party in power lost majority control of Congress. President Clinton experienced a similar situation when failure to implement his ambitious health reform program led Democrats to a loss of Congressional majority in the midterm elections of his first term.

There are also issues with respect to the timing of event in the model. Having an economic benefit that materializes after the election has taken place forces voters to reward a party for reform. While this assumption might be debatable, it allows us to deal with a complex dynamic problem in a static framework, much akin to the often employed assumption about political parties that act in the interest of voters in the last stage of a finite-stage model. We should also ask whether it is reasonable to believe that reform proposals are pushed right before an election takes place? In reality, the timing might be more nuanced, but in competitive political regimes there is always an election in sight. Furthermore, many reforms, especially major ones (e.g. education, energy, fiscal, labor, etc.) take some time to implement and survive the administrations that first enact and implement them.

The timing of events, however, raises interesting empirical questions about the timing of policy reforms which lies outside of the scope of this paper: is it harder to push for reform in countries with more frequent elections? What are the implications for reforms at different stages of a political term? Is it easier to push for reform earlier in the term, during the so-called "Honeymoon period"? Does successful policy implementation lead to early election recalls by parliamentary leaders wishing to attain higher independence from coalition parties?

Another issue is the assumption that fiscal policy is decided solely by the winner of the election.

1.3.2 Fiscal Policy

Allowing the winner of the election to decide the fiscal policy enriches the model by allowing voters to make decisions based on a tradeoff between class advantage and implementation efficiency (i.e. between fiscal costs

and economic gains). Some readers, however, may raise the following concern: in democracies with strong legislative branches, fiscal policy is subject to approval by the legislative. A counter argument is that even within the restrictions of a legislature-imposed budget, there might be differences in fiscal policy. For instance, a party representing the poor might use tax proceeds for projects that benefit the poor disproportionately, like in building elementary schools in poor neighborhoods. The party of the rich, on the other hand, might reduce social programs to finance the introduction of technological infrastructure which might increase the productivity of capital or to subsidize programs targeted towards the rich like investments in tertiary education (e.g. Fernandez and Rogerson 1995) or export subsidy programs. Alternatively, executive leaders from different parties may enforce fiscal law selectively. A party representing the rich may prosecute black markets more vigorously while a party representing the poor might address corporate evasion with candor. So even under the most restrictive scenario, the actual value of fiscal policies can differ across parties. A second reason why parties may deviate from a Downsian equilibrium fiscal policy is the existence of multiple policy issues (e.g. Grossman and Helpman 2001). Furthermore, the choice of off-center political or fiscal stances might be justified as strategic deterrents of new entry into the political arena. Even then, it is interesting to see how relaxing the assumption of fiscal divergence affects the results. Fiscal convergence can be achieved in the model in several ways: utility functions may be set to lead to convergence (e.g. a Cobb-Douglas specification), both parties may be chosen to represent the same constituency or the tax rate may be set institutionally.

Extension 1: Fixed Fiscal Policy Without loss of generality it is assumed that the tax rate is fixed institutionally, $\tau = \hat{\tau} \in [\tau_r^*, \tau_p^*]$.¹⁵ Parties only compete on implementation efficiency.

A small change in notation is used to ease exposition. Let k_L and k_H denote the earning ability of the social class that the low and high efficiency parties represent (e.g. if the party of the poor is the high efficiency party, then $k_L = k_r$ and $k_H = \phi k_r$).

The timing of events is as follows:

¹⁵These are all multiple points of equilibria for taxation if changes to the tax policy require agreement from both the party of the rich and the party of the poor: Since voters have single peaked preferences with respect to taxation, if the status quo rate was below (above) the range $[\tau_r^*, \tau_p^*]$, then, increases (decreases) in taxation to point τ_r^* (τ_p^*) would represent Pareto improvements. If alternatively, taxation is within the range $[\tau_r^*, \tau_p^*]$, then the party of the rich (poor) would not agree to any increases (decreases).

In period 1, nature determines the tax rate, $\hat{\tau}$, as well as the implementation efficiencies and class identities of the parties. In period 2, parties simultaneously decide whether to enact or block reform. In period 3, the election takes place. In period 4 the winner implements reform if it was enacted in period 2.

Claim 9 *When no reform takes place, voters elect each party with probability $\frac{1}{2}$. When reform takes place, the high efficiency party gets elected.*

Proof. Since the tax rate is fixed, $U(\hat{\tau}, k_i, Z) = ZU(\hat{\tau} + (1 - \hat{\tau})k_i)$ for $i = \{p, r\}$ regardless of the class identity of the party. Since $Z = 1$ under each party when reform is blocked which makes all voters indifferent, and Z equals Θ_H and Θ_L under the high efficiency and low efficiency parties, respectively. Since $\Theta_H > \Theta_L$, voters prefer, and thus vote for the party with high efficiency. ■

This claim is analogous to claim 5 in the benchmark and studies voters' behavior. Since class advantage has disappeared, each party can get elected with equal probabilities in the absence of reform. Reform enactment tilts electoral outcomes in favor of the high efficiency party. The decision to support reform by the low efficiency party depends on whether the utility from supporting reform is sufficient to offset electoral losses.

The low efficiency party supports reform if and only if

$$\Theta_H U(\hat{\tau} + (1 - \hat{\tau})k_L) \geq U(\hat{\tau} + (1 - \hat{\tau})k_L) + \frac{R}{2} \quad (14)$$

This equation is analogous to claim 7 in the benchmark. The main difference is that now the identity of the party willing to block reform is no longer limited to the party of the poor. Since there is no longer a class advantage, the low efficiency party has electoral incentives to block reform regardless of its class identity.

Claim 10 *The high efficiency party always supports reform.*

Proof. If the best response for the low efficiency party is to support reform, then the payoff for the high efficiency party when it supports reform is $\Theta_H U(\hat{\tau} + (1 - \hat{\tau})k_H) + R > U(\hat{\tau} + (1 - \hat{\tau})k_H) + \frac{R}{2}$. When the best response for the low efficiency party is to block reform, the high efficiency party weakly prefers supporting reform to blocking it (the high efficiency party is indifferent since the low efficiency party is going to block in any case). ■

This claim is analogous to claim 6. The decision for the high efficiency party is trivial. Since it can only benefit from reform, both electorally and in terms of economic efficiency, it always supports reform.

From the previous claims, a central proposition can be constructed.

Equilibria Under a Fixed Tax Rate

Proposition 2 *When class advantage is suppressed, the following political equilibria can emerge:*

A. If the party of the poor has a higher degree of efficiency than the party of the rich, there can be two outcomes:

A.i) When $R \leq 2\Theta_H(\hat{\tau} + (1 - \hat{\tau})k_r)$, the party of the poor gets elected and reform is implemented by the party of the poor, who has the high level of efficiency.

A.ii) When $R > 2\Theta_H(\hat{\tau} + (1 - \hat{\tau})k_r)$, each party gets elected with probability $\frac{1}{2}$, and reform is blocked by the party of the rich.

B. If the party of the rich has a higher degree of efficiency than the party of the poor, there can be two outcomes:

B.i) When $R \leq 2\Theta_H(\hat{\tau} + (1 - \hat{\tau})\phi k_r)$, the party of the rich gets elected and reform is implemented by the party of the rich, who has the high level of efficiency.

B.ii) When $R > 2\Theta_H(\hat{\tau} + (1 - \hat{\tau})\phi k_r)$, each party gets elected with probability $\frac{1}{2}$, and reform is blocked by the party of the poor.

Proof. Omitted. It follows from direct application of claims 9 and 10, and equation (14). ■

There are two main differences with respect to the benchmark. 1) When the party of the poor has a low level of implementation efficiency, it cannot support reform and win the election, since there are no longer fiscal costs for poor voters from election the party of the rich. 2) The party of the rich can still win the election even if it is a low efficiency party by blocking reform. For that reason, the party of the rich may opportunistically block reform. Curiously enough, the party of the poor is still more likely to act opportunistically, since a higher proportion of its utility depends on political rents.¹⁶ In general terms,

¹⁶A reason why this may be is that leaders from left-wing parties may have arisen from modest, grassroots backgrounds and may have lower reservation wages outside of the government than right-wing leaders.

closer competition between the two parties reduces reform feasibility by increasing the weight that efficiency differentials has in determining electoral outcomes.

This analysis leads to an interesting question: How is political behavior affected if reform support can be negotiated in exchange for changes in tax policy?

Extension 2: Institutional Reform, Fiscal Reform and Logrolling In order to keep the analysis simple, I employ the same assumptions as in extension 1 with the difference that now, the status quo fiscal policy may be changed if both parties agree to it. The mechanism works in the following way: the high efficiency party proposes an institutional reform to which the low efficiency party responds by proposing a change the fiscal policy from $\hat{\tau}$ to τ° which the high efficiency party can accept or reject.

The timing of events is as follows:

In period 1, nature decides the status quo fiscal policy, $\hat{\tau}$, the class identities and implementation efficiencies of the parties. In period 2, the high efficiency party proposes an institutional reform to the low efficiency party. In period 3, the low efficiency party can either condition to support institutional reform in exchange for a new fiscal policy or it can block the institutional reform. In period 4 the high efficiency party decides whether to accept or reject the offer. In period 5 voters observe whether reform was enacted and vote. In period 6 if reform was enacted it gets implemented by the winner of the election.

The game is solved by backward induction.

Although fiscal policy can be changed, both parties are still constitutionally constrained in their fiscal choice once they win the election. Consequently, claim 12 still holds: if reform is enacted, voters elect the high efficiency party. When there is no reform, the voters are indifferent and each party has a $\frac{1}{2}$ probability of getting elected.

In period 4, the high efficiency party has observed whether the low efficiency party has proposed a fiscal policy, τ° , in exchange for support for the institutional reform. If the low efficiency party has blocked reform, the election takes place and payoffs are realized. When the low efficiency party has proposed a fiscal reform, it follows from claim 9 that if the high efficiency party accepts the offer, it wins the election. For that reason, the high efficiency party compares the political and efficiency benefits of reform to the fiscal concessions it has to make in order to ensure reform. That is, it compares its expected utility levels under each alternative

and accepts the low efficiency party's offer when

$$V(\tau^\circ, k_H, \Theta_H, R) \geq U(\hat{\tau}, k_H, 1) + \frac{R}{2} \quad (15)$$

In period 3, the decision for the low efficiency party depends on whether it can find a fiscal policy which maximizes its utility, subject to the high efficiency party still accepting the fiscal reform. The low efficiency party, therefore solves the following program:

$$\begin{aligned} & \max_{\tau^\circ} U(\tau^\circ, k_L, \Theta_H) \\ & \text{subject to } U(\tau^\circ, k_H, \Theta_H) + \frac{R}{2} \geq U(\hat{\tau}, k_H, 1) \text{ (constraint 1)} \\ & \text{and } U(\tau^\circ, k_L, \Theta_H) \geq U(\hat{\tau}, k_L, 1) + \frac{R}{2} \text{ (constraint 2)} \end{aligned} \quad (16)$$

where the first constraint is a reexpression of equation (15) and states that the offer must be acceptable for the high efficiency and the second constraint states that the fiscal benefits, along with the efficiency gains from reform must at least offset the electoral loss from supporting reform.

In order to understand the mechanics of this program it helps to recall how changing taxation affects utility.

Remark 3 Notice that each party represents one social class and any equilibrium fiscal policy lies between $[\tau_r^*, \tau_p^*]$. It follows from claims 1 and 2 that if $\frac{\partial U(\tau, k_L, Z)}{\partial \tau} \geq 0 \iff \frac{\partial U(\tau, k_H, Z)}{\partial \tau} \leq 0$. For that reason, when the low efficiency party represents the rich (poor), it reduces (increases) taxation until the point where either constraint 1 binds or the tax rate is the one preferred by the rich (poor) party.

From the following remark and the constraints one can construct the solution to the program.

Solution 1 i) Whenever the low efficiency party represents the rich, it reduces τ until the point where either $\tau^\circ = \tau_r^*$ or where constraint 1 binds, whichever occurs first. If at that level, constraint 2 holds, then a solution is found, if constraint 2 does not hold, then there is no solution to the problem and the party simply blocks reform. ii) Whenever the low efficiency party represents the poor, it increases τ until the point where either $\tau^\circ = \tau_p^*$ or constraint 3 binds, whichever occurs first. If at that level, constraint 2 still holds, then a

solution is found, if constraint 2 does not hold, then there is no solution to the problem and the party simply blocks reform.

From the previous remark and solution, a central proposition can be constructed.

Equilibria Under Fiscal and Institutional Logrolling

Proposition 3 *When there is fiscal and institutional logrolling, the following political equilibria can emerge:*

A. If the party of the poor has higher efficiency, there can be two outcomes:

A.i) When \exists a τ such that both constraints 1 and 2 hold, then a) if at τ_r^ constraint 1 still holds, the party of the rich offers support for reform in exchange for a tax rate of $\tau^\circ = \tau_r^*$, b) if at τ_r^* constraint 1 fails, the party of the rich select a tax rate $\tau^\circ = \tau^{**}$ such that τ^{**} solves $U(\tau^{**}, \phi k_r, \Theta_H) + \frac{R}{2} = U(\hat{\tau}, \phi k_r, 1)$. The party of the poor always accepts the fiscal logrolling offer, wins the election and implements reform efficiently.*

A.ii) When \nexists a τ such that constraints 1 and 2 hold, the reform is opportunistically blocked by the party of the rich, each party wins the election with a $\frac{1}{2}$ probability.

B. If the party of the rich has higher efficiency, there can be two outcomes:

B.i) When \exists a τ such that both constraints 1 and 2 hold, then a) if at τ_p^ constraint 1 still holds, the party of the poor offers support for reform in exchange for a tax rate of $\tau^\circ = \tau_p^*$, b) if at τ_p^* constraint 1 fails, the party of the poor selects tax rate $\tau^\circ = \tau^{**}$ such that τ^{**} solves $U(\tau^{**}, k_r, \Theta_H) + \frac{R}{2} = U(\hat{\tau}, k_r, 1)$. The party of the rich always accepts the fiscal logrolling offer, wins the election and implements reform efficiently.*

B.ii) When \nexists a τ such that constraints 1 and 2 hold, the reform is blocked and each party wins the election with a $\frac{1}{2}$ probability.

Proof. Omitted, it follows directly from claim 9 and solution 1. ■

While these results seem very similar to those in the previous extension, there are two important differences. Logrolling allows the low efficiency to be compensated economically for its electoral losses in some cases and thus raises the feasibility of reform, therefore improving efficiency. The undesirable aspect of logrolling is that it may lead to opportunistic behavior by the high efficiency party, which may agree to fiscal policies that lead to a worse net effect for their constituencies if electoral incentives to do so are sufficiently high.

Proposition 4 *a) When logrolling occurs and constraint 1 binds, the high efficiency party opportunistically supports a logrolling offer that hurts its constituents. Alternatively when logrolling occurs, and constraint 1 does not bind, the high efficiency party may or may not be opportunistically supporting an offer that hurts its constituents.*

Proof. a) When constraint 1 binds, $U(\tau^\circ, k_H, \Theta_H) + \frac{R}{2} = U(\hat{\tau}, k_H, 1) \implies U(\tau^\circ, k_H, \Theta_H) < U(\hat{\tau}, k_H, 1)$ which is the utility that the constituents would get in the absence of reforms. ii) When constraint 1 is not binding, (i.e. when $\tau^\circ = \tau_r^*$ when the party of the poor is high efficiency and $\tau^\circ = \tau_p^*$ when the party of the rich is high efficiency) then $U(\tau^\circ, k_H, \Theta_H) + \frac{R}{2} > U(\hat{\tau}, k_H, 1)$, which may occur either when $U(\tau^\circ, k_H, \Theta_H) \in [U(\hat{\tau}, k_H, 1) - \frac{R}{2}, U(\hat{\tau}, k_H, 1))$ in which case the constituents are hurt by logrolling or when $U(\tau^\circ, k_H, \Theta_H) \geq U(\hat{\tau}, k_H, 1)$ in which case they benefit from logrolling. ■

The interesting difference with respect to the benchmark is that if logrolling is present, the high efficiency party may be induced into opportunistic behavior by agreeing to an undesirable fiscal policy in exchange for the electoral benefits from reform.

Another point to discuss is the effect of informational asymmetries.

1.3.3 Informational Issues

It has been shown that the model does not require informational asymmetries for inefficient policies to emerge. Assuming asymmetric information and uncertainty gives credence to the story. Suppose that parties have conducted research on the potential benefits and costs of a given reform. If voters believe that one party has better chances of successfully implementing reform, asymmetric political gains arise. Since information is private, the low efficiency party might understate the benefits of reform, while the high efficiency party might overstate them.

In order to study the effects of uncertainty and informational asymmetry, a simple extension is presented in which uncertainty and informational asymmetries are added to a fixed tax specification. In this extension I allow exogenous probabilities to exist for the two different parties and make those probabilities private information. The standard approach would be to make the probabilities an endogenous process dependent on a policy choice by the parties, but those are complications that do not add to the explanation.

Extension 3: Informational Asymmetries The tax rate is fixed as in the first extension of the model. There is an institutional reform with uncertain outcomes: if reform is adequately implemented then the level of institutional efficiency increases to $Z_S > 1$. If it is inadequately implemented, then the level of institutional efficiency becomes $Z_F < 1$. The probability of adequate implementation depends on the implementation efficiency of the party which gets elected. The high efficiency party has a probability of adequately implementing reform equal to q_H while the low efficiency party has a probability q_L . Voters are risk neutral. Voters can correctly observe which party is the high efficiency party, but not the actual values of q_H and q_L .

The timing of events is as follows:

1) Nature determines the identities and abilities of parties. Parties observe q_H , q_L , Z_S and Z_F . Voters observe Z_S and Z_F and know that $q_H > q_L$. 2) Parties support or block reform, reform gets enacted if both parties support it. 3) Voters observe whether reform is enacted and elect a party to government. 4) The winner implements reform if it was enacted.

Since there is no class advantage, claim 12 holds: successful enactment of reform leads to electoral success for the high efficiency party.

In terms of efficiency, reform should be enacted if

$$E[Z] \equiv q_H Z_S + (1 - q_H) Z_F \geq 1 \quad (17)$$

Parties compare their expected utility when reform is enacted and when it is blocked in order to decide whether to support or block reform. The expected value of an enacted reform for the high efficiency is $E[Z]U(\hat{\tau}, k_H, 1) + R$ versus $U(\hat{\tau}, k_H, 1) + \frac{R}{2}$ when reform is not enacted, in which case it wins the election with a probability $\frac{1}{2}$. For the low efficiency party, when reform is enacted, expected utility is $E[Z]U(\hat{\tau}, k_L, 1)$ versus $U(\hat{\tau}, k_L, 1) + \frac{R}{2}$ when it is not.

As a result, the high efficiency party supports reform when

$$2(E[Z] - 1)U(\hat{\tau}, k_H, 1) \geq -R \quad (18)$$

and the low efficiency party supports reform when

$$2(E[Z] - 1)U(\hat{\tau}, k_L, 1) \geq R \quad (19)$$

Remark 4 *It follows from equations (17), (18) and (19) that support for reform by the high efficiency party is a necessary but not sufficient condition for reform to be desirable. Reform desirability is a necessary but not sufficient condition for the low efficiency party to support it. Support from the low efficiency is a sufficient condition for the reform to be desirable and enacted.*

Consequently, the solution set can be constructed from equation (19).

Equilibria Under Informational Asymmetries

Proposition 5 *When class advantage is suppressed and informational asymmetries arise, there can emerge the following political equilibria:*

A. If the party of the poor has higher efficiency, there can be two outcomes:

A.i) When $2(E[Z] - 1)U(\hat{\tau}, k_r, 1) \geq R$ the party of the poor gets elected and reform is implemented by the party of the poor, who is the high efficiency party.

A.ii) When $2(E[Z] - 1)U(\hat{\tau}, k_r, 1) < R$, each party gets elected with probability $\frac{1}{2}$, and reform is blocked by the party of the rich.

B. If the party of the rich has higher efficiency, there can be two outcomes:

B.i) When $2(E[Z] - 1)U(\hat{\tau}, \phi k_r, 1) \geq R$, the party of the rich gets elected and reform is implemented by the party of the rich, who has the high level of efficiency.

A.ii) When $2(E[Z] - 1)U(\hat{\tau}, \phi k_r, 1) < R$ each party gets elected with probability $\frac{1}{2}$, and reform is blocked by the party of the rich.

Proof. Omitted: It follows from claim 9 and remark 4. ■

The low efficiency party tends to over-block reform, while the high efficiency party tends to over-support. It is important to understand when the outcomes are inefficient.

Remark 5 *The high efficiency party unsuccessfully tries to opportunistically support bad reforms when $E[Z] - 1 \in [\frac{R}{2U(\hat{\tau}, k_L, 1)}, 0]$ but it is preempted by the low efficiency party from doing so. The low efficiency*

party, can successfully act opportunistically and block desirable reforms when $E[Z] - 1 \in [0 > \frac{-R}{2U(\hat{\tau}, k_H, 1)})$.

This is an unexpected consequence of checks and balances.¹⁷

This extension uncovers another source of opportunistic behavior. The main difference with the benchmark is that voters cannot tell whether the high efficiency party opportunistically supporting an undesirable reform or whether the low efficiency party is opportunistically blocking a desirable reform from being enacted. Uncertainty and informational asymmetries present a justification why parties may get away with blocking beneficial reforms without getting punished by constituents in a repetitive game.

Unpunished opportunistic blockage of reform may also be due to political power, which is implicitly assumed in this model. When high costs of entry limited the number of political actors, voters face limited options. If voters have preferences that depend on both the "moral character" of a party or candidate and its policies, voters are forced into accepting "character flaws" as long as the policies are sufficiently close to their preferences.

Other factors through which political competition and reform inefficiencies have been linked are rent expropriation and special interest groups.

1.3.4 Rent Preservation and Special Interest Groups

Rent preservation is perhaps the most popular explanation for reform failure. When reform leads to economic losses by some groups in society, these may oppose reform. An example of a reform leading to asymmetric economic gains and losses is the reduction of trade barriers (e.g. Fernandez and Rodrik 1991, Jain and Mukand 2003). In that case the protected sector may vote against reform due to potential losses.

In the context of this model, one could think of many reforms that benefit the rich at the expense of the poor. For example, the adoption of new technologies may create a skill bias which hurts unskilled labor. Alternatively, liberalization of the labor market through immigration reform could reduce unskilled labor's real wages by increasing supply. Other reforms benefit the poor at the expense of the rich. For example if oligopolistic profits arise due to regulatory and institutional rules that discourage competition

¹⁷Aghion, Alesina, and Trebbi (2004) discuss the issue of optimal checks and balances by focusing on the tradeoff between granting the incumbents sufficient power to ensure reform and restraining them to prevent expropriative abuse. This model shows that electoral considerations exacerbate that tension.

and innovation, then changes in regulation would benefit consumers at the expense of the oligopolist. Many of the privatization of the 1990's led to the establishment of rich oligopolists in developing countries in sectors such as telecommunications, energy and construction materials. Rules to limit the power of oligarchs in strategic sectors could potentially benefit consumers.

Two sources of inefficiencies arising from rent preservation have been identified in the literature: potentially beneficial reforms may be blocked if they hurt the pivotal decision-maker (either directly as in Fernandez and Rodrik 1991, or indirectly by affecting voter's distribution as in Jain and Mukand 2003, and Besley and Coate 1998). Alternatively, reform may be blocked if it hurts small groups that face different organizational incentives than large constituencies. Small, homogeneous groups are more efficient at solving collective action problems than large heterogeneous groups: small size makes enforceability easier while homogeneity leads to converging incentives and large concentration of benefits (Olson 1965, 1982). Consequently special interest groups, may utilize their organizational abilities to grant either pecuniary or political benefits to political parties. These types of explanations have been studied in the context of trade protection (Grossman and Helpman 1994, 1996) and the undertaking of inefficient public projects (Coate and Morris 1995).

Extension 4: Rent Preservation and Special Interest Groups In contrast with the previous extensions, class identity matters, so the tax rates, are decided by each party to cater to their respective constituencies. The benchmark specification is thus employed with two minor changes: 1) Reforms are now costly and costs are borne by one of the social classes and 2) rich voters are allowed to form special interest groups which may bribe either party in order to get their desired policy enacted.

In order to study the effects of rent preservation, reform has costs that are borne by one of the groups. The interesting results arise when the costs are explicitly larger than any efficiency or fiscal gains the group might obtain. For that reason it is assumed that:

$$c_i > \Theta_H U(\tau_i, k_i, 1) - U(\tau_p^*, k_i, 1) \quad (20)$$

where i denotes the identity of the social class that bears the costs and is subtracted from the utility for

the group and the party of identity i . The other group bears no costs from reform.¹⁸

The model is studied in the context of no special interest groups and under the possibility of the rich forming a special interest group.¹⁹ Whenever rich voters can organize to form a special interest group, they can decide on a level b_j to be subtracted from their utility level to increase the utility level of party j by $\beta N \gamma(b_j)$ such that $\gamma'(\cdot) > 0$.²⁰

Timing of events is as follows: 1) Class identity and implementation efficiency levels are realized and observed by all agents in the economy. The identity of the cost bearers from reform is realized and observed, as well as whether rich voters can organize and offer a bribe to one of the parties in order to affect its decision concerning reform. 2) When the rich are able to organize, the rich may offer a bribe to one of the parties in order to induce support or opposition to reform. 3) Both parties simultaneously choose whether to support or block reform. If the party that is offered the bribe decides to accept the bribe offer, it simultaneously accepts the bribe and chooses the policy that rich voters prefer.²¹ 4) Voters observe whether the reform was enacted and elect the party that maximizes their expected utility. 5) The winner of the election implements the reform if it was enacted.

This game is solved by backward induction.

There are three main parameters over which cases differ: the class identity of the high efficiency party, the class identity of the social group that bears the costs and whether there are special interest groups (i.e. whether the rich can organize effectively to bribe the parties).

For clarity of exposition, each combination of class identity of the high efficiency party and class identity of the cost bearing constituency is studied individually. Additionally, the effects of the existence of a special interest group are discussed at the end of each of the four cases. After all cases have been presented, a general statement discusses all the possible equilibria.

¹⁸Costs of reform enter the utility function directly in an additive, reduced-form way. This is the simplest way of showing the effects of rent preservation issues in the model.

¹⁹Two comments: 1) The special interest group offers a bribe to one of the parties. As it will become clear, only one party needs to be bribed. 2) While in reality, it could be possible that a subset of poor voters could form a special interest group, I stick to the simplest case, in which only the rich can form a special interest group.

²⁰This is the simplest way to study this problem. Alternatively, a proportion of the untaxed private good could be employed to finance the bribe. Ultimately, since γ has a flexible functional form, this reduced form treatment of the bribe is not without generality: in either case, there would be a reduction in the utility of rich voters to finance an increase in utility for one of the parties. βN denotes only aggregation amongst rich voters and is irrelevant in terms of results.

²¹It is assumed that the bribe is paid simultaneously to the institutional reform decision in order to avoid credibility issues about the payment of the bribe.

Case 1: The High Efficiency Party Represents the Rich, The Rich are Hurt by Reform It follows from equation (20), that rich voters always oppose reform, so if they form a special interest group, it is employed to block reform. Let us focus on the last stage of the game.

Claim 11 *When no reform takes place, the party of the poor gets elected, when reform takes place, the party of the rich gets elected.*

Proof. It follows from comparing the utility of poor voters under each party, $U(\tau_p^*, k_p, 1) > U(\tau_r^*, k_p, 1)$. The second part of the statement follows from equation (20): Since $U(\tau_p^*, k_r, 1) > U(\tau_r^*, k_r, \Theta_H) - c_r > U(\tau_p^*, k_r, \Theta_L) - c_r$, the party of the rich only supports reform when it leads to its electoral success i.e. $U(\tau_r^*, k_p, \Theta_H) > U(\tau_p^*, k_p, \Theta_L)$. ■

The difference with the benchmark at this stage is that the solution where the low efficiency party implements reform is no longer an option. Since reform hurts the rich, the party of the rich may only accept reform if it leads to electoral gains which offset reform costs. For that reason, if efficiency differentials are insufficient to make poor voters elect the party of the rich, it has no incentives to ever support reform.

Claim 12 *A necessary condition for reform to be enacted is for*
i) $U(\tau_r^, k_p, \Theta_H) - U(\tau_p^*, k_p, 1) \geq R \geq U(\tau_p^*, k_r, 1) - U(\tau_r^*, k_r, \Theta_H) - c_r$ and ii) $U(\tau_r^*, k_p, \Theta_H) \geq U(\tau_p^*, k_p, \Theta_L)$*
to hold.

Proof. ii) By contradiction, assume equation ii) does not hold. In that case, the party of the poor gets elected when reform takes place. Using equation (20) it can be shown that $U(\tau_p^*, k_r, \Theta_L) - c_r < U(\tau_p^*, k_r, \Theta_L) - c_r < U(\tau_p^*, k_r, 1)$, thus the party of the rich blocks reform. Electoral success for the party of the rich is therefore a necessary condition for reform feasibility. Assuming reform gets the party of the rich elected, reform gets enacted only when the expected utility from supporting reform is greater than the expected utility from blocking for both parties. The left part of equation i) is directly derived from the utility comparisons for the party of the poor of supporting reform and losing election blocking reform and winning election whereas the right part is directly derived from the utility comparisons for the party of the rich of supporting the costly reform and winning the election versus blocking reform and losing the election. ■

The first part of the statement argues that the economic benefits from reform for the party of the poor need to outweigh the electoral costs while the electoral benefits to the party of the rich must offset the economic costs from reform, the second part of the statement argues that the poor must prefer the party of the rich in order for the reform to take place.

Claim 13 *If there are special interest groups, reform may be blocked whenever $\exists a b < U(\tau_p^*, k_r, 1) - U(\tau_r^*, k_r, \Theta_H) + c_r$ such that $\beta N \gamma(b) = \min\{U(\tau_r^*, k_p, \Theta_H) - U(\tau_p^*, k_p, 1) - R, U(\tau_r^*, k_r, \Theta_H) - c_r + R - U(\tau_p^*, k_r, 1)\}$. Furthermore, when such b exists, the rich bribe the party of the poor if $U(\tau_r^*, k_p, \Theta_H) - U(\tau_p^*, k_p, 1) - R < U(\tau_r^*, k_r, \Theta_H) - c_r + R - U(\tau_p^*, k_r, 1)$ and the party of the rich otherwise.*

Proof. A bribe is possible whenever it is costlier to bear the costs of reform than to bribe a party into blocking reform. It follows from claim 11 that whenever reform is blocked the party of the poor wins, therefore, the rich know that they can block reform if there is a bribe under which either party is indifferent between blocking and supporting such that the payoffs to the rich are greater than allowing reform to take place. ■

Remark 6 *If a bribe is possible, then the rich choose to bribe the party of the poor if $U(\tau_r^*, k_p, \Theta_H) - U(\tau_p^*, k_p, 1) - R < U(\tau_r^*, k_r, \Theta_H) - c_r + R - U(\tau_p^*, k_r, 1)$ and the party of the rich otherwise.*

The rich want to minimize their bribe burden, so they choose the cheapest party to bribe. The solution set for this case can be constructed from claims 11, 12, 13 and remark 6.

This extension differs from the benchmark in three ways: 1) the party of the rich may opportunistically support a reform that hurts its constituents in order to get elected. 2) Rich voters may either have to bribe their own party or make an alliance with the party of the poor to prevent reform. 3) When the party of the poor accepts the bribe and blocks reform, it is hurting its own constituents.

Case 2: The High Efficiency Party Represents the Rich, The Poor Are Hurt by Reform

In this case, it follows from equation (20) that the party of the poor always wants to block reform since $U(\tau_p^*, k_p, 1) + R > \max\{U(\tau_p^*, k_p, \Theta_L) + R - c_p, U(\tau_r^*, k_p, \Theta_H) - c_p\}$. It is also clear that both the rich and the party of the rich want reform since $U(\tau_r^*, k_r, \Theta_H) > U(\tau_p^*, k_r, \Theta_L) > U(\tau_p^*, k_r, 1)$.

Claim 14 *In the absence of special interest groups, reform is always blocked.*

Proof. It follows from equation (20) that $U(\tau_p^*, k_p, 1) + R > U(\tau_p^*, k_p, 1) > \max\{U(\tau_p^*, k_p, \Theta_L) - c_p, U(\tau_r^*, k_p, \Theta_H) - c_p\}$. Therefore, the party of the poor always blocks reform. ■

Claim 15 *When special interest groups arise:*

a) if $U(\tau_p^, k_p, \Theta_L) > U(\tau_r^*, k_p, \Theta_H)$, rich voters can bribe the party of the poor into supporting reform if there is a $b < U(\tau_p^*, k_r, \Theta_L) - U(\tau_p^*, k_r, 1)$ such that $N\beta\gamma(b) = U(\tau_p^*, k_p, 1) + c_p - U(\tau_p^*, k_p, \Theta_L)$, b) if $U(\tau_p^*, k_p, \Theta_L) \leq U(\tau_p^*, k_r, \Theta_H)$, rich voters can bribe the party of the poor into supporting reform if there is a $b < U(\tau_r^*, k_r, \Theta_H) - U(\tau_p^*, k_r, 1)$ such that $N\beta\gamma(b) = U(\tau_p^*, k_p, 1) + R + c_p - U(\tau_r^*, k_p, \Theta_H)$.*

Proof. It follows from equation (20) that reform is always blocked in the absence of bribes to the party of the poor. Rich voters must therefore compensate the party of the poor into being indifferent between blocking reform and supporting it. In stage 4 of the game, the party of the poor gets elected when $U(\tau_p^*, k_p, \Theta_L) > U(\tau_r^*, k_r, \Theta_H)$. For that reason, the party of the poor faces a loss of rich voters bribe the party of the poor into supporting if reform is sufficiently valuable to make them better off after compensating the party of the poor for its costs of implementing reform. When $U(\tau_p^*, k_p, \Theta_L) \leq U(\tau_r^*, k_r, \Theta_H)$ rich voters can bribe the party of the poor if the utility differentials are sufficient to compensate the party of the poor for fiscal and electoral losses as well as implementation costs. ■

In the absence of bribes, the incentives for both parties are perfectly aligned with those of their constituencies. The incorporation of bribes by compensating the party of the poor into supporting the reforms that are desirable to the rich.

Case 3: The High Efficiency Party Represents the Poor, The Rich are Hurt by Reform

Claim 16 *Reform always fails and the party of the poor always wins the election.*

Proof. The party of the poor always wins the election since $Z_p U(\tau_p^*, k_p, 1) > Z_r U(\tau_r^*, k_p, 1) \forall Z_p \geq Z_r$. From equation (20) $U(\tau_p^*, k_r, 1) > U(\tau_r^*, k_r, \Theta_H) - c_r > U(\tau_p^*, k_r, \Theta_H) - c_r$ so the party of the rich always blocks reform. ■

In this case, the incentives of rich voters and their party are perfectly aligned. Since the party of the rich can prevent reform from occurring, reform gets blocked.

Case 4: The High Efficiency Party Represents the Poor, The Poor are Hurt by Reform

Claim 17 *In the absence of special interest groups, reform is blocked.*

Proof. The rich can never win the election: $Z_p U(\tau_p^*, k_p, 1) > Z_r U(\tau_p^*, k_r, 1) \forall Z_p \geq Z_r$. It follows from (20) that $U(\tau_p^*, k_p, 1) + R > U(\tau_p^*, k_r, \Theta_H) - c_r + R$ so the party of the poor always blocks reform. ■

Remark 7 *When special interest groups arise, reform is enacted and implemented by the party of the poor if there is $b < U(\tau_p^*, k_r, \Theta_H) - U(\tau_p^*, k_r, 1)$ such that $N\beta\gamma(b) = U(\tau_p^*, k_p, 1) + c_p - U(\tau_p^*, k_p, \Theta_H)$.*

It follows from the previous claim that the party of the rich can never win the election. Both the party of the rich and rich voters want reform since $U(\tau_p^*, k_p, \Theta_H) > U(\tau_p^*, k_p, 1)$. Reform can be achieved if rich voters compensate the party of the poor into supporting reform.

Incorporating special interests biases outcomes in favor of the rich's preferred policies. Asymmetric distribution of costs of reform may induce opportunistic support for reform by the party of the rich.

Equilibria in the Context of Rent Preservation and Special Interest Groups

Proposition 6 *In the presence of asymmetric economic costs from reform and the absence of special interest groups, the following equilibria can emerge:*

A) When costs are borne by the rich and the party of the rich is the high efficiency party, there can be the following equilibria:

A.i) When $U(\tau_r^, k_p, \Theta_H) - U(\tau_p^*, k_p, 1) \geq R \geq U(\tau_p^*, k_r, 1) - U(\tau_r^*, k_r, \Theta_H) + c_r$ and $U(\tau_r^*, k_p, \Theta_H) \geq U(\tau_p^*, k_p, \Theta_L)$ there can be several outcomes:*

A.i.i) In the absence of special interest groups or if $\beta N\gamma(U(\tau_p^, k_r, 1) - U(\tau_r^*, k_r, \Theta_H)) < \min\{U(\tau_r^*, k_p, \Theta_H) - U(\tau_p^*, k_p, 1) - R, U(\tau_r^*, k_r, \Theta_H) - c_r + R - U(\tau_p^*, k_r, 1)\}$, the party of the rich opportunistically supports reform, wins the election and implements reform at the highest level of efficiency.*

A.i.ii) If there are special interest groups and $U(\tau_r^, k_p, \Theta_H) - U(\tau_p^*, k_p, 1) - R < \min\{\beta N\gamma(U(\tau_p^*, k_r, 1) - U(\tau_r^*, k_r, \Theta_H)), U(\tau_r^*, k_r, \Theta_H) - c_r + R - U(\tau_p^*, k_r, 1)\}$, rich voters bribe the party of the poor into blocking reform. The party of the poor wins the election.*

A.i.iii) If there are special interest groups and $U(\tau_r^, k_r, \Theta_H) - c_r + R - U(\tau_p^*, k_r, 1) < \min\{\beta N\gamma(U(\tau_p^*, k_r, 1) - U(\tau_r^*, k_r, \Theta_H)), U(\tau_r^*, k_p, \Theta_H) - U(\tau_p^*, k_p, 1) - R\}$*

rich voters bribe the party of the rich into blocking reform. The party of the poor wins the election.

A.ii) When either $U(\tau_r^*, k_p, \Theta_H) - U(\tau_p^*, k_p, 1) \geq R \geq$

$U(\tau_p^*, k_r, 1) - U(\tau_r^*, k_r, \Theta_H) + c_r$ fails or $U(\tau_r^*, k_p, \Theta_H) < U(\tau_p^*, k_p, \Theta_L)$,

reform is blocked without the need for bribes, and the party of the poor wins the election.

B. When costs are borne by the poor and the party of the rich is the high efficiency party, the following equilibria can emerge.

B.i) When either a) special interest groups are absent or b) $U(\tau_r^*, k_p, \Theta_H) < U(\tau_p^*, k_p, \Theta_L)$ and

$\beta N \gamma (U(\tau_p^*, k_r, \Theta_L) - U(\tau_p^*, k_r, 1)) < U(\tau_p^*, k_p, 1) - U(\tau_p^*, k_p, \Theta_L) + c_p$,

or c) $U(\tau_r^*, k_p, \Theta_H) \geq U(\tau_p^*, k_p, \Theta_L)$

and $\beta N \gamma (U(\tau_r^*, k_r, \Theta_H) - U(\tau_p^*, k_r, 1)) < U(\tau_p^*, k_p, 1) + R - U(\tau_r^*, k_p, \Theta_H) + c_p$,

the party of the poor blocks reform and wins the election.

B.ii.i) When the rich form a special interest group and $U(\tau_r^*, k_p, \Theta_H) < U(\tau_p^*, k_p, \Theta_L)$

and $\beta N \gamma (U(\tau_p^*, k_r, \Theta_L) - U(\tau_p^*, k_r, 1)) \geq$

$U(\tau_p^*, k_p, 1) - U(\tau_p^*, k_p, \Theta_L) + c_p$, The rich bribe the party of the poor into supporting reform. The party of the poor wins the election and implements reform.

B.ii.ii) When the rich form a special interest group and $U(\tau_r^*, k_p, \Theta_H) \geq U(\tau_p^*, k_p, \Theta_L)$ and $\beta N \gamma (U(\tau_r^*, k_r, \Theta_H) - U(\tau_p^*, k_r, 1)) \geq U(\tau_p^*, k_p, 1) + R - U(\tau_r^*, k_p, \Theta_H) + c_p$, The rich bribe the party of the poor into supporting reform. The party of the rich wins the election and implements reform.

C. When costs are borne by the rich and the party of the poor is the high efficiency, reform is blocked by the party of the rich.

D. When costs are borne by the poor and the party of the poor is the high efficiency

D.i) in the absence of special interest groups or if $\beta N \gamma (U(\tau_p^*, k_r, \Theta_H) - U(\tau_p^*, k_r, 1)) < U(\tau_p^*, k_p, 1) - U(\tau_p^*, k_p, \Theta_H) + c_p$, the reform is blocked by the party of the poor and the party of the poor wins the election.

D.ii) When the rich form a special interest group and $\beta N \gamma (U(\tau_p^*, k_r, \Theta_H) - U(\tau_p^*, k_r, 1)) \geq U(\tau_p^*, k_p, 1) - U(\tau_p^*, k_p, \Theta_H) + c_p$, rich voters bribe the party of the poor into supporting reform. The party of the poor wins the election and implements reform at the high efficiency level.

Proof. Omitted. It follows from claims 11, 12, 13, 14, 15, 16, 17 and Remarks 6 and 7. ■

Several interesting results emerge. While the introduction of rent preservation reduces feasibility of reform, the introduction of special interest groups somewhat mitigates the problem by allowing rich voters to compensate the party of the poor. Alternatively, special interest groups can lead to opportunistic behavior in which reforms which hurt the majority can get enacted or in which reforms that benefit the majority are blocked. Another source of opportunism emerges because electoral gains generate a wedge between the interest of rich voters and the party of the rich. When reform is costly for the rich, but electorally advantageous for the party of the rich, it may choose to support a reform that hurts its constituency. Consequently, it is possible to observe a strategic alliance between rich voters and the party of the poor, who block a reform which benefits its constituents in exchange for a bribe from rich voters.

1.4 Summary of Results and Concluding Remarks

The main result of the paper is introduced in the benchmark: political competition can have a negative effect on reform feasibility. As reform generates asymmetric electoral gains, electoral losers face incentives to block reform for electoral reasons. This result is shown under highly optimistic conditions for reform feasibility: in the absence of informational frictions or economic costs.

Several extensions are presented in order to show the robustness of results and to link the theory to the standard explanations for failures to implement desirable reform. As further restrictions are introduced into the model, the main result is strengthened. Additionally, different mechanisms also affect reform feasibility. The first extension relaxes the assumption of class advantage. As a result, political competition becomes more intense, and that makes the opportunistic blocking of reform for electoral considerations a more pervasive problem. In the second extension, logrolling is employed as a mechanism to mitigate electoral inefficiencies by compensating electoral losers through fiscal benefits: Logrolling reduces electoral inefficiencies to some extent but cause a different problem. Potential electoral winners are tempted to exchange reform for fiscal concessions which may in turn negatively affect their constituents, if these concessions ensure electoral success.

A third extension deals with informational asymmetries and shows that informational asymmetries be-

tween voters and parties can cause parties to either overstate or understate the expected benefits of reform, depending on which is electorally beneficial for the party. This makes it difficult for voters to recognize opportunistic behavior. The last extension deals with rent preservation and the existence of special interests. While rent preservation reduces the likelihood of reform, the existence of special interests groups biases allows the rich to bias the reform process in favor of reforms that benefit them disproportionately.

The combination of these factors explains why democratic transition in some Latin American have led to disappointing institutional advances. In particular, it shows that important institutional reforms may be substantially hard to achieve. The results presented in the model are consistent with the recent literature in which democratization does not lead to important changes as elites make important investments in de facto power to retain control even as democratization takes place (Acemoglu and Robinson 2008), through the establishment of inefficient fiscal institutions when democratization is imminent (Acemoglu, Ticchi and Vindigni 2006, Besley and Persson 2008). This model shows that investments need not be large, as the combination of democratic checks and balances and political competition has a strong institutional status quo bias.

Another important contribution of the model its methodological emphasis. The literature which studies the political economy of reform and policy-making has made large process, in large part due to the usage of a pivotal decision-maker, whose motivations affect policy. By using the median voter theorem, this analysis has been applied to democratic regimes. Even when the median voter is not explicitly invoked, the threat of political competition affects the policies chosen by an incumbent and thus generates predictions from the actions of a single player (e.g. Mukand and Rodrik 2005, Coate and Morris 1999). This way of studying policy-making in democratic regimes can be unsatisfactory, however. Division of power and frequent electoral competition are the two bastions of modern democracy. Sensible models focusing on policy-making in democratic settings must incorporate how these active interactions affect the incentives of competing agents. This model breaks away from the tradition of a single political actor in order to study these interactions.

The Effects of Internal and External Conflict on Democratization Incentives

"It was possible, no doubt, to imagine a society in which wealth, in the sense of personal possessions and luxuries, should be evenly distributed, while power remained in the hands of a small privileged caste. But in practice such a society could not long remain stable....[T]he only way of [increasing production without redistribution] was by continuous warfare. . . [War] eats up the surplus of consumable goods, and it helps to preserve the special mental atmosphere that a hierarchical society needs. . . The war is waged by each ruling group against its own subjects, and the object of the war is not to make or prevent conquests of territory, but to keep the structure of society intact. . . War is Peace."

—from George Orwell's "1984"

2.1 Introduction

How do internal and external threats affect the choice of political systems? This paper explores the joint effects of internal and external threats on the decisions by an autocratic elite to democratize. While there is consensus that internal threats generate pressures to democratize, the effects of external threats on democratization are less clear: recent work by Ticchi and Vindigni (2008) and Acemoglu, Ticchi, and Vindigni (2010) suggests that external threats may foster democratization; in contrast Powell (2006) argues that the group in power may invade another country in order to consolidate its position domestically.

This paper presents a simple model in which there may be internal and external threats and studies how these interactions affect democratization decisions. Inequality, costs of conflict and costs of invasion determine whether external threats lead to autocratic consolidation or towards democratization. In addition, the paper contributes to the ongoing discussion on the causes for democratic peace by arguing that unstable autocracies have incentives to incur in costly wars in order to protect their position domestically.

Finally, this chapter shows that external conflict may prevent democratization even if it was the preferred policy for the autocratic elites, suggesting that the external environment may prevent democratization.

2.1.1 Brief Description of the Model

There is a domestic country with of two types of individuals: rich and poor. The rich control political power and oppose redistribution. There can be two threats to the position and existence of the ruling class.

External threats, in which the domestic country faces a foreign enemy which attempts to invade it, and internal threats in which the poor may revolt against the rich. External wars can be started voluntarily by the rich. Alternatively, involuntary wars may begin if a foreign country decides to invade, an event which occurs with a given probability. Although both types of war have the same consequences, they are quite different in nature: as it will be shown, an involuntary war may either force democratization on an otherwise stable autocracy, as suggested by Ticchi and Vindigni (2008) or may strengthen an otherwise unstable autocracy, by redistributing resources in such a way that the poor no longer find it feasible or desirable to revolt. In contrast, a voluntary war is merely employed to consolidate unstable autocracies.²² As in Ticchi and Vindigni (2008), the war is won when the poor join the war effort and is lost otherwise. Internally, the poor can choose to revolt against the rich. It is assumed that the poor can revolt only either after a war has taken place or in periods of peace.²³

The model has the following time structure: there is an initial distribution of resources. The rich, who have control of government, choose whether to start a war; otherwise a war may begin exogenously with a given probability. The rich then decide whether to democratize. If there is a war and the rich have not democratized, then the rich choose an offer as to how to share the costs of war, to which the poor decide whether to accept or not. If the poor accept, the country successfully fends off the external threat; otherwise the country gets invaded, in which case, the rich are killed and the poor enslaved. If the country has no foreign threat or once the war has been won, the poor have the option of starting a costly revolution. The social class with the larger proportion of aggregate resources wins the revolt. If the poor win, the rich are killed.

Since war is costly, the rich have no incentive to ever start a war in stable non-democracies, as the two effects of war work against the rich: war reduces the resources available to the rich and may also be destabilizing.²⁴ Since the rich and the poor face different costs from invasion, it is possible that the rich may

²²Since the model assumes that the net benefit to war for the domestic country is negative, rationales to enter a war other than political survival are omitted. In practice, the decision to start a war may be closely related to positive expected gains from war. The net value of starting a war would differ in this case, but the main idea does not. Wars, whether costly or profitable affect the domestic distribution of resources, which in turn affects the distribution of de facto domestic power.

²³Given the assumptions of the model, if the poor revolted prior to the war, the end result would be invasion, as division facing the foreign threat would lead to failure. In any case, the poor have the option of joining the war effort or not, which would also lead to invasion. This assumption simplifies the model but is not without loss of generality. Furthermore, it is not uncommon to see individuals "wrap themselves around the flag" and support the government in times of war.

²⁴As explained in a previous footnote, the assumption of a costly war is without generality.

have to employ more resources than the poor to face the foreign threat. This may in turn reduce the power differential domestically and reduce the stability of non-democracy. When a non-democracy is unstable, the story is different. Although there are cases when a non-democracy is unsustainable, it is also possible that a war may strengthen a non-democracy. Again, depending on the costs of invasion for the poor, war may affect the distribution of resources in such a way that future revolution is either unfeasible (i.e. when the poor are substantially weakened by the costs of war) or undesirable (i.e. when the distribution of resources is such that resource differentials no longer offset the costs of revolution). For that reason, the rich may indeed have incentives to start an otherwise avoidable, costly war.

2.1.2 Related Literature

This chapter is related to three strands of literature: models of conflict technology, theories of democratization and international relations.

Political Economy of Conflict The use of violence to appropriate resources is an alternative economic activity to production. This literature goes back at least to Haavelmo (1954). This theoretical framework was later developed by Hirshleifer (1991), Grossman (1994), Grossman and Kim (1995), Grossman and Iyigun (1995, 1997), Skaperdas (1992), Rosendorff (2001), Alesina and Spolaore (2007) and Hafer (2006). In these models, conflict is modeled through a contest function (e.g. Tullock 1981) between two players in which the expected gains for player A from conflict are increasing in the amount of effective resources devoted to fighting by player A and decreasing on the effective resources employed by player B. This expected gain is usually interpreted as the share of contested resources earned by each player if they are divisible or as the probability of winning in a winner-take-all framework. There is an implicit cost: resources devoted to military contests are diverted from productive uses.

For simplicity, I take a reduced form approach in which the two contests in my model: external war and revolution, take very simple forms. Both revolutions and wars are winner-take-all events with explicit costs. Finally, the conflict functions' outcomes take a simple criteria: revolutions are won by the poor if and only if they have more resources in aggregate than the rich, wars are only won if and only if there is participation

by both the rich and the poor.²⁵

The Political Economy of Democratization There is a long tradition of economic theories of democratization. For example, Lipset (1959) argued that democratization is part of a development process which includes increased economic growth and industrialization.

Recent theories have focused on inter-class conflict. Acemoglu and Robinson (2000b), argue that elites use redistribution to prevent revolutions. The ability of the poor to revolt is an independent probabilistic event. The rich may offer redistribution to the poor in order to prevent a revolution. Since the poor may be unable to revolt in the future, the rich may be unable to credibly commit to future redistribution. This commitment problem can make the poor willing to revolt even as the rich redistributes. To avoid this situation, the rich may preemptively extend the franchise.

Boix (2003) presents a similar model in which the elite sustain the oligarchy through repressive means. The costs of repression are random and exogenous. When repression costs are large with respect to the degree of inequality, the elite have incentives to democratize. Similarly in Rosendorff (2001), democratization arises when it becomes too costly to combat the poor. In contrast to Acemoglu and Robinson (2000b), and to Boix (2003), Rosendorff (2001) endogenizes repression costs by using a Tullock (1981) type contest function. In Feng and Zak (1999) political freedoms are a normal good. Increases in income raise protests in favor of political freedoms. Once a certain threshold is reached, the dictator has no alternative but to democratize.

Cervellati, Fortunato and Sunde (2007, 2008) focus on the conditions under which a social contract can emerge between the rich and the poor in which both group endogenously agree not to arm. Like in Boix (2003), a low level of inequality helps democratization, by reducing the costs of redistribution for the rich. In contrast, while high levels of inequality also lead to preservation of the oligarchy, intermediate levels lead to a state of nature (i.e. an anarchic state in which each individual fend for themselves and social order ceases to exist). There is some consensus that transitions lead to inefficient outcomes²⁶

²⁵Simple, reduced-form contest functions are standard: for example, in Feng and Zak (1999) democratization is forced once a certain threshold of civil unrest is reached. In Cervellati, Fortunato and Sunde (2007, 2008), predation (and protection) is a binary decision with a fixed cost and its outcome depends on pairwise binary decisions. Boix (2003) presents a model where autocracy is preserved through repression, a policy with a random cost. Finally, in Acemoglu and Robinson (2000b, 2001, 2006) the poor have de facto power with a fixed probability. If the poor have de facto power in a given period, then the poor can choose to successfully revolt, although at the cost of a fixed proportion of total wealth.

²⁶At intermediate levels of inequality, the rich find it more desirable to arm themselves to fend off threats than to democratize. This generates inefficiencies. In that aspect both oligarchies and democracies lead to efficient outcomes and transitions are

A second line of work argues that democratization is the result of intra-elite interactions. For example, Lizzeri and Persico (2004) develop a model in which gradual franchise extension reduces intra-elite conflict by diffusing expenditure from private projects into projects poised to benefit a wider base. Llavador and Oxoby (2005) develop a model in which a faction of an divided elite promotes franchise extension to achieve its desired policy.

Weingast (1979) argues that democratization is the result of the elite working together to protect each another from abuses by the state. The logic mimics that of a repeated game "Prisoner's Dilemma". By working together, competing faction within the elite establish institutional rules which protect each other when they are not in power. In North, Wallis, and Weingast (2009), this idea is expanded in order to establish that impersonal protection of rights for all members of the elite is a prerequisite for "open societies" (i.e. societies in which all members are entitled to protection and to compete in the political and economic arena).

While the role of intra-elite interactions is important and leads to interesting explanations, I ignore these explanations and focus on inter-class conflict for the remainder of the chapter.

External conflict also contributes to democratization. In Ticchi and Vindigni (2008), wars are probabilistic events. War outcomes depend on whether the poor support the war efforts.²⁷ The rich make redistribution promises in order to entice the poor to support the efforts. There is a problem of credibility. If near future external threats are high, democratization does not occur as the rich have little incentive to renege on their promises and fall to a foreign power in the near future. Alternatively, if the threats are low, there is little incentive to commit to any redistribution scheme. At intermediate levels of threat, the rich may not be able to credibly commit to a redistributive policy, so they democratize to credibly commit to redistribution and entice support for the war effort.

Wars may also contribute to democratization by preserving the institutional need for a military in democratic transitions. In Acemoglu, Ticchi, and Vindigni (2010), the rich establish a military that protects

inefficient. Acemoglu, Ticchi, and Vindigni (2006) and Besley and Persson (2008) reach similar conclusions through different arguments. In Acemoglu, Ticchi and Vindigni (2006) elites in emerging democracies establish inefficient, corruptible bureaucracies in order to prevent redistribution. In Besley and Persson (2008) uncertainty about the distribution of future gains from public investment leads to underinvestment in emerging democracies. Finally, McGuire and Olson (1996) and Olson (2000) make similar comments with respect to the fate of unstable autocracies.

²⁷More precisely, in Ticchi and Vindigni (2008) elites require support from a given proportion of the poor in order to ensure war victory. Partial participation by the poor is an off-equilibrium event: there is either full participation or no participation. I take a shortcut in this model by assuming that there is a representative agent and no collective action problems.

the rich from the poor. To prevent the military from revolting, the rich offer an "efficiency wage" which is above the market wage of the soldiers. In the absence of external threats, the preservation of the military is at risk if there is a transition to democracy. For that reason, military agents have incentives to revolt and establish a military dictatorship if democratization is attempted. External threats justify the presence of a military and thus reduce the risks of a military revolt in the case of democratization.

The Political Economy of Military Conflict A related strand of literature focuses on how political institutions inform decisions to go to war. Fearon (1995) proposes that when there is a conflict between two countries, private information with respect to the enemy's resolve may lead to escalation. If backing down affects leaders domestically, there are stronger incentives to fight, once escalation has taken place. Since leaders in democracies have higher domestic political costs from backing down, they may show more resolve in times of conflict but may try to avoid conflict when possible. Bueno De Mesquita and Siverson (1995) make a similar argument: war failure may have a greater impact on the possibilities of political survival for democracies than non-democracies.

As a result, democracies may show more resolve for winning a conflict but a lower willingness to start one.²⁸ Hess and Orphanides (1995, 2001) present a model in which democratic leaders use wars to inform the public of their leadership abilities when current economic performance is poor. Blomberg and Hess (2002) present statistical links between poor domestic economic performance and subsequent conflict.

In Glaeser (2006) capable military leaders start wars in order to make their military experience a relevant electoral consideration and increase replacement costs. Additionally, in Glaeser (2006), leaders use informational structures to affect the public opinion with respect to the enemy and justify the invasion. This may suggest that culture plays an important role. It can also suggest that autocracies, with greater control of the information apparatus may be more prone to war.

This insight by Glaeser (2006) along with the aforementioned insight by Bueno de Mesquita and Siverson (1995) provide some justifications to the idea of Democratic Peace, which was proposed by Immanuel Kant and argues that democratic countries are less prone to going to war with each another than authoritarian

²⁸ A weakness with these arguments is that while political survival may be more responsive in democracies, the cost of political survival should be substantially larger in autocracies, since physical and economic integrity may also be at risk.

regimes.

Other explanations for democratic peace include Doyle (1986) who argues along the lines of Immanuel Kant, that institutional constraints and a democratic culture are more conducive to peaceful resolution of conflicts and Rummel (1983) who argues that exchange societies generate "overlapping groups and multiple centers of power", thus reducing the likelihood of military conflict.

I contribute to the literature on democratic peace by showing that if autocrats face a substantial domestic threat, they may be more willing to begin even a costly war, in order to consolidate power domestically. This explanation may rationalize the behavior of leaders who incur in costly wars with their neighbors without a clear positive benefit from war (e.g. Saddam Hussein's invasion of Kuwait and war with Iran). It is also consistent with the finding by Bueno De Mesquita and Siverson (1995) that autocrats more likely to start costly wars, yet less committed to success. Finally, it is also consistent with Powell (2006) who argues that war should be modeled as a commitment problem.²⁹ Powell (2006) also suggests that if there are factions competing for power domestically, then the faction in power may invade a foreign country to gather resources to defeat its domestic opponent: if there is no credible way to ensure deterrence from the domestic challenge, a foreign war may be ensured.

Additionally, I contribute to the literature by showing that external threats may also prevent autocracies from emerging even if autocrats were willing to democratize in the absence of external threats. This also sheds some light on the idea of "Democratic Peace" and geographic clusters of democracies and autocracies, since a more violent regional environment may prevent democratizations from taking place.

My model is similar to Powell (2006), except that I place stronger restrictions on the leader's ability to fight a war. In particular, I explicitly assume that the war is costly and that support from the domestic challenger, (which in my case is the poor) is needed to face the foreign military challenge successfully. Furthermore, in my model, the decision by the challenger (i.e. the poor) to support the war and bear some of its costs is made rationally.

My model combines some of the elements found in Ticchi and Vindigni (2008) in which external conflict

²⁹For Powell (2006) commitment issues are the most plausible explanation for wars. In a static framework, war could be prevented through redistribution from the potential loser. In dynamic framework, war is unavoidable because concessions only strengthen the threat.

contributes to democratization with elements from Powell (2006) in which external conflict strengthens a domestic faction and shows how different conditions such as the costs of conflict and the degree of inequality determine whether external conflict contributes or harms democratization.

The chapter is structured in the following way: Section 2 structures the model and presents the results. Section 3 discusses the implications of the model and links them to the current literature on conflict and democratization. Section 4 concludes.

2.2 Model

2.2.1 Agents

A proportion $\beta < \frac{1}{2}$ of the individuals in a domestic country consists of the rich. Each one has an identical claim to a proportion $\lambda > \beta$ of all the resources available in the domestic country, which are normalized to 1. The remaining proportion of individuals, $1 - \beta$ are poor and have an identical claim to the remainder of resources. The total amount of resources available to a representative rich and a representative poor are $\frac{\lambda}{\beta} > 1$ and $\frac{1-\lambda}{1-\beta} < 1$ respectively. Finally, there is no free rider problem, and thus each group acts like a representative agent.³⁰

2.2.2 Conflict Technology

Wars (External Conflict) When a war takes place between the domestic country and a foreign country the domestic country wins if and only if both the rich and the poor join the effort together. War is costly. The total resources available in the domestic country after a war has taken place are $1 - c > 0$. Alternatively, if the war is lost, the rich get killed and the poor get enslaved. Total resources available to the poor if the domestic country loses the war (i.e. under slavery) are $s \in [0, 1 - \lambda]$.³¹

³⁰This simplifying assumption is employed in Acemoglu and Robinson (2000b, 2001) with one caveat. In their model, transitive de facto power depends on whether the poor can solve the collective action problem and mobilize against the rich, and assume that to be a probabilistic event. In this chapter, there is no collective action problem and revolt feasibility is non-stochastic.

³¹As mentioned previously, the war conflict function is reduced form and similar to that used by Ticchi and Vindigni (2008). The interpretation of s is varied. It could be interpreted as slavery, in which foreign slaves are treated worse than domestic serfs. Additionally, the imposition of foreign cultural or religious customs on the invaded country may reduce the welfare of the people. As a final comment, notice that while in principle there is no reason to argue that it is not possible for $s > 1 - \lambda$, making this assumption does not add to the analysis.

Revolutions (Internal Conflict) The poor can revolt against the rich. The poor can only revolt against the rich if there is no external threat (i.e. during times of peace or once an external threat has been defeated). The outcome of the revolution outcome depends on resource availability: The poor successfully revolts if and only if they hold more aggregate resources than the rich.³² If the revolt succeeds, the poor eliminate the rich and expropriate all of their resources. Alternatively if the rich win, they eliminate the poor and the resources of the poor are lost. Additionally, revolutions are inefficient, so there is a cost $\rho < 1$ to the surviving party.³³

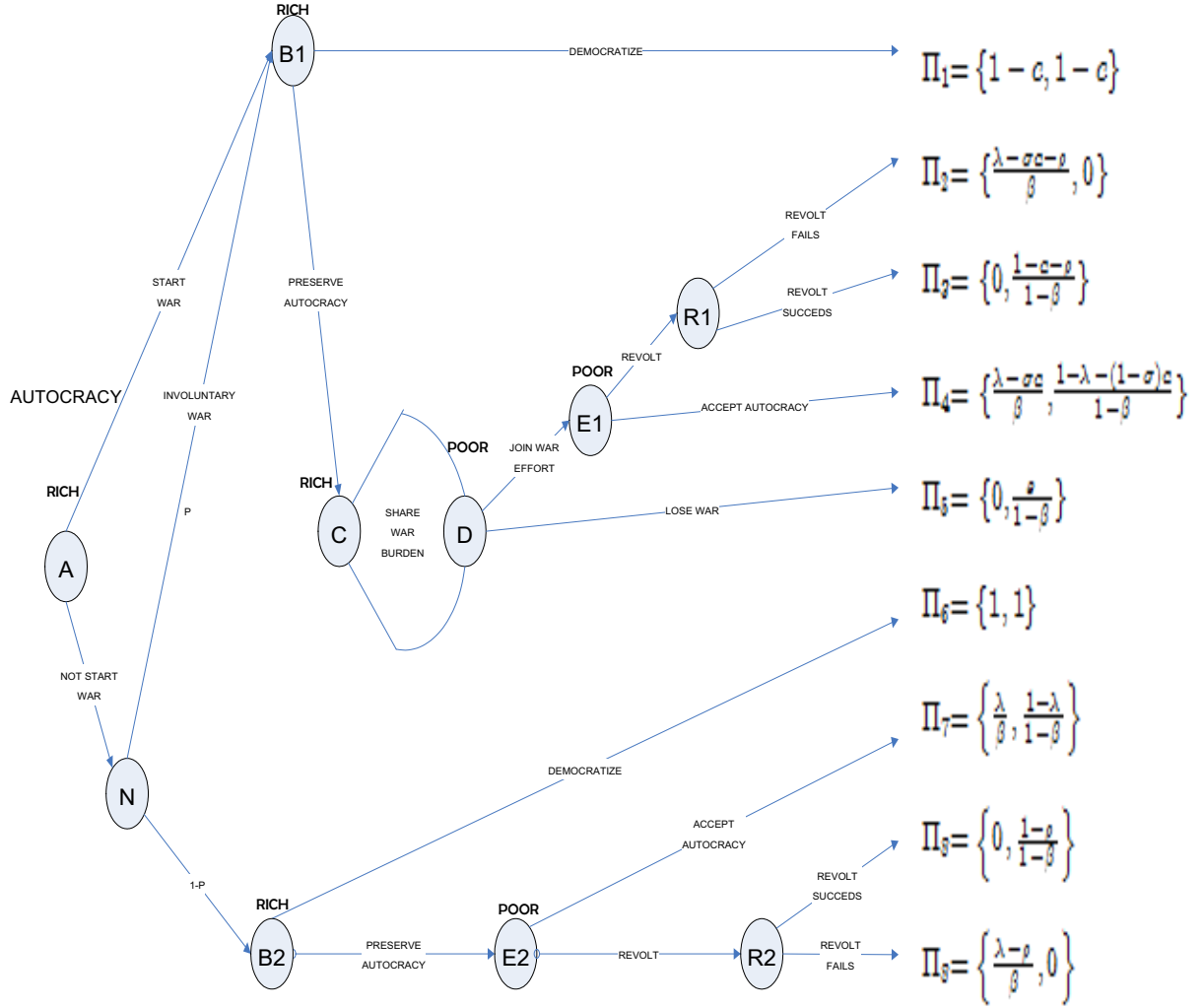
The game is summarized in Figure 1 and follows the following structure, where $\pi_j = \{\pi_j^r, \pi_j^p\}$ denotes the payoffs to the rich and poor, respectively, at endnode $j = \{1, \dots, 9\}$.

³²As previously explained, the contest function is reduced form in which the group with most aggregate resources wins. The intuition is that having more resources means translates into higher fighting capacity. Finally, without loss of generality when both groups have the same amount of resources, the rich win.

³³This is a simplifying assumption but the idea is that most of the resources of the rich may be expropriable (e.g. land, capital or governmental posts) whereas the income of the poor may primarily come from labor.

The assumption that the rich kills off the poor in case of a failed revolt is not necessary. It is only required for the poor to bear some costs or punishment from the failed attempt in order to deter them from pursuing unfeasible revolts.

Figure 1. Extensive Form Game



2.2.3 Timing of Events

1. War or Peace. Node A: The rich decide whether or not to start a war against a foreign power. If the rich start a war, the game advances to node B1, otherwise, the game advances to node N.
2. Node N: nature decides with probability $p < 1$ whether a war begins, in which case the game advances to node B1 (times of war). Otherwise, the game advances to node B2 (times of peace).
3. Democracy or Autocracy. Node B1: The rich decide whether to democratize or preserve the autoc-

racy. If the rich democratize, then all of the resources and the costs of war are equally shared by all individuals. The rich and the poor fight side by side and defeat the enemy. The game reaches endnode 1, with payoffs $\{1 - c, 1 - c\}$. If the rich do not democratize the game advances to node C . Node $B2$: If the rich democratize in times of peace, then all resources are equally shared and the game reaches endnode 6 with payoffs $\{1, 1\}$. If the rich do not democratize, the game advances to node $E2$.³⁴

4. Offer by the Rich. Node C : The rich decide how to share the burden of war. The rich choose the share of the war costs, $\sigma \in [0, 1]$, which is borne by the rich. The game moves to node D .
5. The Decision to Join the War Effort. Node D : The poor decide whether to accept the proposal by the rich. If the poor accept the proposal, they bear a proportion $(1 - \sigma)$ of the costs of war, c , and join the war effort. The war is won, and the game advances to node $E1$. If the poor refuse to join the war effort, the war is lost. The game reaches endnode 5 with payoffs $\{0, \frac{s}{1-\beta}\}$.
6. Revolt or Keep Non-democratic Regime. Node $E1$: The poor decide whether to start a revolution or keep the regime. If the poor start a revolution, then the game advances into node $R1$, otherwise the game reaches endnode 4 with payoffs $\{\frac{\lambda-\sigma c}{\beta}, \frac{1-\lambda-(1-\sigma)c}{1-\beta}\}$. Node $E2$: The poor decide whether to start a revolution or keep the regime. If the poor start a revolution, then the game advances into node $R2$, otherwise the game reaches endnode 7 with payoffs $\{\frac{\lambda}{\beta}, \frac{1-\lambda}{1-\beta}\}$.
7. Revolution Outcomes. Node $R1$: If the rich have more after-war aggregate resources than the poor, the revolution fails. The game reaches endnode 2 with payoffs $\{\frac{\lambda-\sigma c-\rho}{\beta}, 0\}$. If the poor have more after-war aggregate resources than the rich, the revolution succeeds and the game reaches endnode 3 with payoffs $\{0, \frac{1-c-\rho}{1-\beta}\}$. Node $R2$: If the rich have more aggregate resources than the poor, the revolution fails. The game reaches endnode 9 with payoffs $\{\frac{\lambda-\rho}{\beta}, 0\}$. If the poor have more aggregate resources than the rich, the revolution succeeds and the game reaches endnode 8 with payoffs $\{0, \frac{1-\lambda}{1-\beta}\}$.

³⁴The implicit assumption is that there are no costs of taxation and that resources are redistributed as equal lump sums. The preferred policy to the poor majority is to tax and equally redistribute all resources.

2.2.4 Solving the Model

The model is a subgame perfect Nash equilibrium and can thus be solved by backward induction. Let us first focus on the actions by the poor.

The Decision to Revolt in Times of Peace In order for the poor to choose to revolt, it is necessary for a) the revolt to succeed and b) the revolt to be desirable. Assuming that the revolt succeeds, the poor revolt if the payoffs are desirable, that is only if:

$$\frac{1 - \lambda}{1 - \beta} < \frac{1 - \rho}{1 - \beta}$$

or in other words, if $\lambda > \rho$.

The revolt is successful only if the aggregate resources of the poor are greater than those of the rich, that is, if $\lambda < 1 - \lambda$, which can be re-expressed as $\lambda < \frac{1}{2}$.

This analysis can be summarized in the following lemma:

Lemma 1 *In times of peace, the poor revolts against the rich if and only if $\rho < \lambda < \frac{1}{2}$ and allow the autocracy to be preserved otherwise.*

Proof. If the poor do not revolt, their payoff is $\frac{1-\lambda}{1-\beta}$. If $\lambda \geq \frac{1}{2}$ revolt fails. The payoff to the poor are: $0 < \frac{1-\lambda}{1-\beta}$. If $\lambda < \frac{1}{2}$ the payoff would be $\frac{1-\rho}{1-\beta} \geq \frac{1-\lambda}{1-\beta} \iff \lambda \geq \rho$. ■

The Post-War Decision to Revolt We compare the payoffs to the poor from a successful revolution to those under autocracy after a war has taken place.

Revolt is desirable in an after-war period only if:

$$1 - c - \rho > 1 - \lambda - (1 - \sigma)c$$

which may be re-expressed as:

$$\frac{\lambda - \rho}{c} > \sigma \tag{RDC}$$

Let σ^* define the minimum level of σ under which revolt remains undesirable, then,

$$\sigma^* = \begin{cases} 0 & \text{when } \rho \geq \lambda \text{ (RD1)} \\ \frac{\lambda - \rho}{c} & \text{when } \lambda \in (\rho, \rho + c] \text{ (RD2)} \end{cases}.$$

Finally, \nexists a σ^* which makes revolt undesirable when $\lambda > \rho + c$ (RD3)³⁵

In order to see if revolt is feasible, we compare the after-war resources of the rich to those of the poor.

Revolt is feasible in an after-war period only if:

$$1 - \lambda - (1 - \sigma)c > \lambda - \sigma c$$

which may be re-expressed as:

$$\sigma > \frac{2\lambda + c - 1}{2c} \quad (\text{RFC})$$

Let σ^{**} define the maximum level that σ can take under which revolt remains unfeasible, then

$$\sigma^{**} = \begin{cases} 1 & \text{when } \lambda > \frac{1+c}{2} \text{ (RF1)} \\ \frac{2\lambda + c - 1}{2c} & \text{when } \lambda \in [\frac{1-c}{2}, \frac{1+c}{2}] \text{ (RF2)} \end{cases}.$$

Finally, \nexists σ^{**} which makes revolt unfeasible when $\lambda < \frac{1-c}{2}$ (RF3)³⁶

From these conditions we can determine when the poor allows the autocracy and when they revolt.

Lemma 2 *After winning a war, the poor preserve the autocracy if either $\sigma \geq \sigma^*$ or if $\sigma < \sigma^{**}$.*

Proof. $\sigma \in [0, 1]$. Assuming that revolt is feasible, it is desirable if and only if $\frac{1-c-\rho}{1-\beta} > \frac{1-\lambda-(1-\sigma)c}{1-\beta} \iff \lambda > \rho + \sigma c$. If $\lambda \leq \rho$ then no value of σ can make $\lambda > \rho + \sigma c$ hold. If $\lambda \in (\rho, \rho + c]$ then $\lambda > \rho + \sigma c$ if and only $\sigma < \frac{\lambda - \rho}{c}$. Finally, if $\lambda > \rho + c$ then $\lambda > \rho + \sigma c$. Clearly if revolt is not feasible, the poor do not revolt as the payoff of a failed revolt is 0 versus a value $\frac{1-\lambda-(1-\sigma)c}{1-\beta} > 1$ of preserving the autocracy. Revolt is feasible if and only if $1 - \lambda - (1 - \sigma)c > \lambda - \sigma c \iff \lambda < \frac{1-c+2\sigma c}{2}$. If $\lambda > \frac{1+c}{2}$ then $\lambda < \frac{1-c+2\sigma c}{2}$ even if $\sigma = 1$, If $\lambda < \frac{1-c}{2}$ then the value holds even if $\sigma = 0$, finally, when $\lambda \in [\frac{1-c}{2}, \frac{1+c}{2}]$ then $\lambda < \frac{1-c+2\sigma c}{2}$ if and only if $\sigma > \frac{2\lambda - c - 1}{2c}$, or in other words, revolt is unfeasible as long as $\sigma = \frac{2\lambda - c - 1}{2c}$.³⁷ ■

³⁵RD1 implies that revolt is always undesirable. RD2 implies that the rich can prevent revolt by choosing any value of σ greater or equal to $\frac{\lambda - \rho}{c}$. Finally, RD3 implies that revolt is always desirable regardless of the value of σ .

³⁶RF1 implies that revolt never takes place. RF2 implies that revolt may be prevented by choosing any value of σ less or equal to $\frac{2\lambda + c - 1}{2c}$ and RF3 implies that revolt is always feasible.

³⁷A more precise statement is that after winning a war, the poor revolt when either *i.* $\sigma^{**} \leq \sigma < \sigma^*$ or *ii.* RF3 holds and $\sigma < \sigma^*$ or *iii.* RD3 holds and $\sigma^{**} \leq \sigma$ or *iv.* RF3 and RD3 hold and preserve the autocracy otherwise.

Corollary 1 *If $\sigma^* \leq \sigma^{**}$ revolt threats are not credible.*

Proof. If $\sigma \leq \sigma^* \implies \sigma \leq \sigma^{**}$ and it follows from lemma 2 that revolt is not feasible. If $\sigma \geq \sigma^{**} \implies \sigma \geq \sigma^*$ revolt is not desirable. ■

Joining the War Effort Assuming that the poor do not revolt after the war, the poor join the war effort if and only if the payoff from joining is equal or greater than the payoff from getting enslaved, that is, the poor join the war effort if and only if

$$\frac{s}{1-\beta} \leq \frac{1-\lambda-(1-\sigma)c}{1-\beta}$$

Which can be re-expressed as:

$$\sigma \geq \frac{s+\lambda+c-1}{c} \tag{WJC}$$

Let σ^{***} denote the minimum value of σ under which the poor would join the war effort, then

$$\sigma^{***} = \left\{ \begin{array}{ll} 0 & \text{when } s \leq 1-\lambda-c \text{ (WJ1)} \\ \frac{s+\lambda+c-1}{c} & \text{when } s > 1-\lambda-c \text{ (WJ2)} \end{array} \right\}^{38}$$

From combining these three conditions, the minimum level of σ required for the poor to join the war effort and not revolt after the war can be found.

Finding $\hat{\sigma}_{poor}$ The rich require three conditions to be willing to preserve the autocracy when war has begun: they require to come up with a the lowest value of σ which ensures that a) the poor are willing to join the war effort and b) the poor will not revolt afterwards. In addition, they require the rents from autocracy to remain higher than the rents from democratizing.

Let $\hat{\sigma}_{poor}(s, c, \lambda, \rho)$ denote the minimum value of σ which ensures war participation and no revolt.

Claim 18 *When either $\rho \geq \lambda$ or $\lambda \geq \frac{1+c}{2}$ then $\hat{\sigma}_{poor} = 0$ if $s \leq 1-c-\lambda$ and $\hat{\sigma}_{poor} = \frac{s+\lambda+c-1}{c}$ otherwise.*

Proof. It follows from lemma 2 that the poor would not revolt if either $\rho \geq \lambda$ or $\lambda \geq \frac{1+c}{2}$. The rich must

³⁸If $s \leq 1-\lambda-c \implies \frac{2+\lambda+c-1}{c} < 0$, so the poor always join the war effort.

offer the minimum value that ensures war participation. It follows from inequality WJ1 that this value is $\hat{\sigma}_{poor} = 0$ if $s \leq 1 - \lambda - c$ and from WJ2 that it is $\hat{\sigma}_{poor} = \frac{s+\lambda+c-1}{c}$ otherwise. ■

Under these conditions, the poor do not pose a revolutionary threat to the rich. For that reason, it is only necessary to offer a value of σ sufficient to ensure war participation. When $\rho \geq \lambda$ the rich are immune to revolts because revolts are never desirable. When $\lambda \geq \frac{1+c}{2}$, the rich are immune to revolts because revolts are never feasible. If the cost of invasion is sufficiently high, then the rich can pass all the burden of war onto the poor. Otherwise, they need to share a proportion as to make the poor indifferent between invasion and support for war.

Claim 19 *If $\lambda \in [\frac{1-c}{2}, \frac{1+c}{2}]$ and $s \leq 1 - c - \lambda$ then $\hat{\sigma}_{poor} = 0$.*

Proof. It follows from WJ1 that if $s \leq 1 - \lambda - c$, $\sigma^{***} = 0$ and it follows from applying RF2 to lemma 2 that $\sigma^{***} = 0 \leq \sigma^{**}$ and therefore, as long as the rich offer $\hat{\sigma}_{poor} = \sigma^{***} = 0$ the poor join war and do not revolt. ■

Under these conditions, the poor are willing to participate in war even if they bear all the costs. This allows the rich to select a value of $\hat{\sigma}_{poor} = 0$, under which the poor do not pose a revolutionary threat after a war has taken place.

Claim 20 *When $\lambda \in (\rho, \rho + c]$ and $\lambda \in [\frac{1-c}{2}, \frac{1+c}{2}]$ and $s > 1 - c - \lambda$, then, $\hat{\sigma}_{poor} = \frac{\lambda-\rho}{c}$ if and only if $\frac{1-c}{2} < s < 1 - c - \rho$ and $\hat{\sigma}_{poor} = \frac{s+\lambda+c-1}{c}$ otherwise.*

Proof. It follows from $\lambda \in (\rho, \rho + c]$ and $\lambda \in [\frac{1-c}{2}, \frac{1+c}{2}]$ and $s > 1 - \lambda - c$, that $\sigma^* = \frac{\lambda-\rho}{c}$, $\sigma^{**} = \frac{2\lambda+c-1}{2c}$ and $\sigma^{***} = \frac{s+c+\lambda-1}{c}$ are interior values as RD2, RF2 and WJ2 hold. Revolt is feasible and desirable at $\hat{\sigma}_{poor} = \sigma^{***}$ if and only if $\sigma^{**} < \sigma^{***} < \sigma^*$ which holds if and only if $\frac{2\lambda+c-1}{2c} < \frac{s+c+\lambda-1}{c} < \frac{\lambda-\rho}{c}$ which holds if and only if $\frac{1-c}{2} < s < 1 - c - \rho$. When these conditions are met, the rich cannot make revolt non-feasible. For that reason, they must offer $\hat{\sigma}_{poor} = \sigma^* = \frac{\lambda-\rho}{c}$ to make revolt non-desirable. If $\frac{1-c}{2} < s < 1 - c - \rho$ then the minimum value required to entice war participation by the poor, σ^{***} is sufficiently low to make revolt unfeasible ($\frac{1-c}{2} \geq s$) or sufficiently high to make revolt undesirable ($s \geq 1 - c - \rho$) or both ($\sigma^{**} \geq \sigma^{***} \geq \sigma^*$). ■

This is the most interesting case: If $\sigma^{***} \leq \sigma^{**}$ then the proportion of the war costs that the rich must

bear is sufficiently low to make a postwar unfeasible. If $\sigma^{**} < \sigma^{***} < \sigma^*$, revolt is both feasible and desirable at the minimum level required to induce participation, which forces the rich to bear an even larger share of the costs in order to make revolt undesirable. Finally, when $\sigma^* < \sigma^{***}$, the cost of invasion is sufficiently small that the cost the rich must bear is sufficiently high to make revolt undesirable.

Claim 21 *When $\lambda \in (\rho, \rho + c]$ and $\frac{1-c}{2} > \lambda$, $\hat{\sigma}_{poor} = \frac{\lambda-\rho}{c}$ if and only if $s < 1 - c - \rho$, otherwise $\hat{\sigma}_{poor} = \frac{s+\lambda+c-1}{c}$.*

Proof. It follows from $\frac{1-c}{2} > \lambda$ that RF3 holds so there is no value of σ which can make revolt unfeasible. The only way to prevent revolt is to make it undesirable. The rich therefore require to make sure that a) revolt is undesirable and b) the poor are willing to join. That is, they need to choose $\hat{\sigma}_{poor} = \max\{\sigma^{***}, \sigma^*\}$. Since $\lambda \in (\rho, \rho + c]$ it follows from RD2 that $\sigma^* = \frac{\lambda-\rho}{c}$. Notice that if WJ1 holds, then clearly $\sigma^* \geq \sigma^{***} = 0$ as WJ1 and $\lambda > \rho$ imply that $s < 1 - c - \rho$. So the interesting case arises if WJ2 holds, in which case, $\hat{\sigma}_{poor} = \sigma^{***} = \frac{s+\lambda+c-1}{c}$ if and only if $\sigma^{***} \geq \sigma^*$ if and only if $s \geq 1 - c - \rho$. ■

Under these conditions, revolt is always feasible. The only way to prevent revolt is to make it undesirable by choosing a large value of σ . If $s < 1 - c - \rho$ then the rich must offer σ^* to prevent revolt. If $s \geq 1 - c - \rho$, σ^{***} is sufficiently high to make revolt undesirable.

Claim 22 *When $\lambda > \rho + c$, $\lambda \in [\frac{1-c}{2}, \frac{1+c}{2}]$ and $s > 1 - c - \lambda$, $\hat{\sigma}_{poor} = \frac{s+\lambda+c-1}{c}$ if and only if $s \leq \frac{1-c}{2}$, otherwise, there is no value which prevents reform from taking place.*

Under these conditions, revolt is always desirable. This means that revolt may only be prevented if the value of σ required to ensure war participation is sufficiently low, so as to ensure that revolt is unfeasible.

Proof. It follows from $\lambda > \rho + c$ that RD3 holds so there is no value of σ which makes revolt undesirable. The only way to prevent revolt is by making it unfeasible. Since $\lambda \in [\frac{1-c}{2}, \frac{1+c}{2}]$, it follows from RF2 that $\sigma^{**} = \frac{2\lambda+c-1}{2c}$. It follows from WJ2 that since $s \geq 1 - c - \lambda$, the rich must offer at least $\sigma^{***} = \frac{s+\lambda+c-1}{c}$ to ensure war participation from the poor. At this level, the poor preserve the autocracy if and only if revolt is unfeasible, that is if and only if $\sigma^{***} \leq \sigma^{**}$ which holds if and only if $\frac{s+\lambda+c-1}{c} \leq \frac{2\lambda+c-1}{2c}$ which holds if and only if $s < \frac{1-c}{2}$. ■

Claim 23 *When $\rho + c < \lambda < \frac{1-c}{2}$ then there is no value of σ which may prevent revolt.*

Proof. It follows from $\frac{1-c}{2} > \lambda \geq \rho + c$ that RF3 and RD3 holds which means that no value of σ can make revolt either undesirable or unfeasible so the poor always revolt. ■

In this case revolt is always feasible and desirable, as the value of λ is so high with respect to revolutionary costs that there is no way to make it undesirable. In addition, the aggregate resources of the rich are so little with respect to total resources that there is no way to prevent revolt from taking place.

From all these claims, we can construct the value of σ required to ensure both war participation and deterrence from revolt.

Proposition 7 (Acceptable Offers to the Poor) *The value of $\hat{\sigma}_{poor}(s, c, \rho, \lambda)$ takes the following values:*

I. $\hat{\sigma}_{poor}(s, c, \rho, \lambda) = 0$: When $s \leq 1 - c - \lambda$ and either

A) $\rho \geq \lambda$

or B) $\lambda \geq \frac{1-c}{2}$.

II. $\hat{\sigma}_{poor}(s, c, \rho, \lambda) = \frac{s+\lambda+c-1}{c}$: When either $s > 1 - c - \lambda$ and either

A) $\rho \geq \lambda$ or B) $\lambda > \frac{1+c}{2}$

or C) $s \leq \frac{1-c}{2} \leq \lambda \leq \frac{1+c}{2}$ and $\lambda > \rho$

or D) $s > 1 - c - \rho$ and $\rho < \lambda < \rho + c$ and $\lambda \leq \frac{1+c}{2}$.

III. $\hat{\sigma}_{poor}(s, c, \rho, \lambda) = \frac{\lambda-\rho}{c}$ When $\rho < \lambda < \rho + c$ and $s < 1 - c - \rho$ and either

A) $\frac{1-c}{2} \leq \lambda \leq \frac{1+c}{2}$ and $\frac{1-c}{2} < s$.

or B) $\lambda < \frac{1-c}{2}$.

IV. $\nexists \hat{\sigma}_{poor}(s, c, \rho, \lambda)$ which can prevent a revolt when $\lambda > \rho + c$ and either

A) $\lambda < \frac{1-c}{2}$

or B) $\lambda \in [\frac{1-c}{2}, \frac{1+c}{2}]$ and $s > \frac{1-c}{2}$.

Proof. I.A) follows from claim 18, I.B) follows from combining claim 18 and claim 19. II.A and II.B) follows from claim 18. II.C) follows from combining claims 20 and 22 II.D) follows from combining claim 20 for the case where $s < 1 - c - \rho$ fails and claim 21. The difference is that in claim 20 $s > 1 - c - \lambda$ is redundant, since $s > 1 - c - \rho > 1 - c - \lambda$. III.A) follows from claim 20. The only difference between the two is that since $\frac{1-c}{2} \leq \lambda \leq \frac{1+c}{2}$ and $s > \frac{1-c}{2}$, $s > 1 - c - \lambda$ becomes redundant since $\frac{1-c}{2} \geq 1 - c - \lambda$ for $\frac{1-c}{2} \leq \lambda \leq \frac{1+c}{2}$. III.B) follows from claim 4. IV.A) follows from claim 23 and IV.) follows from claim 22, the

difference is that we can see that $s > 1 - c - \lambda$ is redundant since $\lambda \geq \frac{1-c}{2}$ and implies that $\frac{1-c}{2} \geq 1 - c - \lambda$, so $s > \frac{1-c}{2} \geq 1 - c - \lambda$. ■

In I. the cost of invasion is so high (i.e. s is sufficiently small) for the poor that they are always willing to participate in the war effort. In I.A) revolt is never desirable and in I.B) it is never feasible. In II.A) and B) revolt is either unfeasible (B) or undesirable (A), but the costs of invasion are sufficiently low (i.e. s is sufficiently high) that the rich must bear part of the costs in order to ensure participation by the poor. In II.C) the costs of invasion are sufficiently high. For that reason, the rich can choose a share of the costs which makes revolt non-feasible. In II.D) The share required for the poor to join the war effort is so large that revolt becomes undesirable. In III.A, the costs of invasion are moderate. The share of burden required to make the poor participate is an intermediate value between the minimum level required to make revolt feasible and the maximum level which makes revolt desirable. For that reason, the rich must bear a larger share of the war effort in order to make revolts undesirable. In III.B, the autocracy is unsustainable. War allows the rich to bear most of the costs and thus make revolt undesirable. Finally, in IV.A) the revolt is always both feasible and desirable; in IV.B) revolt is always desirable. Since the cost of invasion is sufficiently low, the rich must bear a substantial proportion of the costs of war, a situation that makes them ex post vulnerable to a successful revolt by the poor.

Now let us focus on the decisions by the rich.

The Decision by the Rich to Preserve Autocracy In times of war, the rich prefers to preserve the autocracy only if

$$\frac{\lambda - \hat{\sigma}_{poor}c}{\beta} \geq 1 - c \quad (\text{AW})$$

and democratizes otherwise.

In times of peace, the rich knows that the poor revolt if and only if $\rho < \lambda < \frac{1}{2}$ and preserve the autocracy otherwise. Since the rich is better off under autocracy, the rich would democratize only if $\rho < \lambda < \frac{1}{2}$.

The Decision to Start a War If revolt is imminent in times of peace, then the rich may preemptively start a war if that will lead to consolidation of power in a postwar period. The rich start a war if and only

if the rich are vulnerable to a revolt if no war begins, the rich can preserve the autocracy after a war has taken place, and the payoffs from an after-war autocracy are greater than the payoffs from democratizing in times of peace.

In other words, the rich start a war if and only if $\rho < \lambda < \frac{1}{2}$ and

$$\frac{\lambda - \hat{\sigma}_{poor}c}{\beta} \geq 1 \quad (\text{WAR})$$

Notice that inequality (WAR) makes inequality (AW) redundant.

Let us study how the different values of s , λ , ρ and c determine the decisions of the rich to start wars, democratize and/or offer to share the costs of war:

First we focus on the cases where $\hat{\sigma}_{poor} = 0$.

Clearly, since $\hat{\sigma}_{poor} = 0$, $\frac{\lambda}{\beta} = \frac{\lambda - \hat{\sigma}_{poor}c}{\beta} > 1 > 1 - c$, so AW and WAR always hold.

Claim 24 *When $s \leq 1 - c - \lambda$:*

If A) $\rho \geq \lambda$ or if B) $\rho < \lambda$ and $\lambda \geq \frac{1}{2}$, then the rich preserves autocracy in both peace and war, proposes $\sigma = 0$ and never starts a war. If C) $\rho < \lambda$ and $\frac{1-c}{2} \leq \lambda < \frac{1}{2}$, then the rich starts a war, preserves autocracy and proposes $\sigma = 0$.

Proof. A and B) When $\lambda \leq \rho$, or when $\lambda > \rho$ and $\frac{1}{2} \leq \lambda$, it follows from lemma 1 that the poor do not revolt in times of peace. It follows from Proposition 7.I that since $s \leq 1 - c - \lambda$, and either A) $\lambda \leq \rho$ or B) $\lambda \geq \frac{1}{2} > \frac{1-c}{2}$, $\hat{\sigma}_{poor} = 0$. Since the poor do not revolt in times of peace, the rich never start a war. C) since $\frac{\lambda}{\beta} = \frac{\lambda - \hat{\sigma}_{poor}c}{\beta} > 1 > 1 - c$ the rich never democratizes. If $\lambda > \rho$ and $\frac{1}{2} \leq \lambda$ then the poor would revolt in times of peace, so the rich would have to democratize. Since $s \leq 1 - c - \lambda$, and $\lambda \geq \frac{1-c}{2}$ it follows from claim 18 that $\hat{\sigma}_{poor} = 0$. This means that in times of war, the rich gets $\frac{\lambda}{\beta} = \frac{\lambda - \hat{\sigma}_{poor}c}{\beta} > 1$, in times of peace, the rich has to democratize and thus gets 1, for that reason, the rich always starts a war (i.e. war always holds). ■

It follows from $s \leq 1 - c - \lambda$ that the poor would join the war effort even if $\hat{\sigma}_{poor} = 0$. In A) revolt either too costly and in B revolt is unfeasible. In C) the poor would revolt in times of peace. Since the rich can transfer all the war costs to the poor it can strengthen its domestic position by starting a war.

Now let us consider the cases where $\hat{\sigma}_{poor} = \frac{s+\lambda+c-1}{c}$. In this case, AW holds if and only if

$$\frac{\lambda - (\frac{s+\lambda+c-1}{c})c}{\beta} \geq 1 - c$$

which may be re-expressed as

$$s \leq (1 - \beta)(1 - c) \quad (\text{AW}^{***})$$

and WAR holds if and only if

$$\frac{\lambda - (\frac{s+\lambda+c-1}{c})c}{\beta} \geq 1$$

which may be re-expressed as

$$s \leq 1 - c - \beta \quad (\text{WAR}^{***})$$

Notice that $1 - c - \beta < (1 - c)(1 - \beta)$.

Claim 25 *When $s > 1 - c - \lambda$:*

If $(1 - \beta)(1 - c) \geq s$ and A) $\rho \geq \lambda$ or B) $\lambda \geq \frac{1+c}{2}$ the rich preserves autocracy in both peace and war, proposes $\sigma = \frac{s+\lambda+c-1}{c}$, finally, the rich never start a war.

If $s > (1 - \beta)(1 - c)$ and C) $\rho \geq \lambda$ or D) $\lambda \geq \frac{1+c}{2}$, the rich preserves autocracy in times of peace and democratizes in times of war, evidently, the rich never starts a war.

Proof. It follows from lemma 1 and from Proposition 7.II.A-B) that if $s > 1 - c - \lambda$ and either $\lambda \leq \rho$ or B) $\lambda \geq \frac{1+c}{2}$ the poor do not revolt in either times of war or peace, and that $\hat{\sigma}_{poor} = \frac{s+\lambda+c-1}{c}$. This means that in times of peace the rich do not start a war and preserve the autocracy. In times of war, the rich democratize if and only if AW*** fails, that is, if and only if $s < (1 - \beta)(1 - c)$. ■

In A) and C) revolt is undesirable in times of peace and in cases B) and D) it is unfeasible. As a war starts, the rich requires to share a proportion $\frac{s+\lambda+c-1}{c}$ of the costs, which makes it too costly for the rich to preserve the autocracy.

Claim 26 When $\frac{1-c}{2} \geq s > 1 - c - \lambda$ and $\rho < \lambda$:

If A) $\frac{1}{2} \leq \lambda \leq \frac{1+c}{2}$, then the rich preserve autocracy in both peace and war, and propose $\sigma = \frac{s+\lambda+c-1}{c}$.

The rich never start a war.

If B) $\frac{1-c}{2} \leq \lambda < \frac{1}{2}$ and $1 - c - \beta < s$ the rich democratize in times of peace and preserve autocracy in times of war by offering $\frac{s+\lambda+c-1}{c}$, finally, the rich do not start a war.

If C) $\frac{1-c}{2} \leq \lambda < \frac{1}{2}$ and $1 - c - \beta \geq s$ the rich opportunistically start a war, and preserve autocracy by offering $\frac{s+\lambda+c-1}{c}$.

Proof. It follows from Proposition 7.II.C) that if $\frac{1-c}{2} \geq s > 1 - c - \lambda$, $\rho < \lambda$ and $\frac{1-c}{2} \leq \lambda \leq \frac{1+c}{2}$, $\hat{\sigma}_{poor} = \frac{s+c+\lambda-1}{c}$. In times of war, the rich democratize if and only if $s > (1 - \beta)(1 - c)$ but since $\beta < \frac{1}{2}$ then $(1 - \beta)(1 - c) > \frac{1-c}{2} > s$, so the rich never democratize. A) if $\frac{1}{2} \leq \lambda \leq \frac{1+c}{2}$, then it follows from lemma 1 that the poor do not revolt in times of peace and therefore the rich do not start war, nor do they democratize. B and C) If $\frac{1}{2} \leq \lambda \leq \frac{1+c}{2}$, then it follows from lemma 1 that the poor revolt in times of peace. Since in times of war, the poor do not revolt, the rich must decide whether to democratize in times of peace or start a war. If the rich democratize they earn 1, if they start a war, they earn $\frac{s+c-1}{\beta}$, so the rich democratize if and only if $\frac{1-s-c}{\beta} < 1 \iff s > 1 - c - \beta$ and start a war otherwise. ■

In A) since $\frac{1}{2} \leq \lambda$ revolt is unfeasible in times of peace now, since $s \leq \frac{1-c}{2}$ the value of $\frac{s+\lambda+c-1}{c}$ is low so autocracy is preferred by the rich to democracy in times of war. In B) and C) since $\frac{1-c}{2} \leq \lambda < \frac{1}{2}$ revolt is feasible in times of peace, so autocracy cannot be a solution in times of peace. Since $s \leq \frac{1-c}{2} < \frac{(1-\beta)(1-c)}{2}$ the value of $\frac{s+\lambda+c-1}{c}$ is low, so autocracy is preferred by the rich to democracy in times of war. The decision to start a war for the rich depends on whether the value of democracy and peace is greater than the value of autocracy and war, that is whether $1 - c - \beta \geq s$.

Claim 27 When $s \geq 1 - c - \rho$ and $\rho < \lambda \leq \rho + c$:

If A) $\frac{1}{2} \leq \lambda \leq \frac{1+c}{2}$ and $(1 - \beta)(1 - c) \geq s$, autocracy is preserved both in war and peace, and the rich offer $\frac{s+\lambda+c-1}{c}$ to the poor.

If B) $\frac{1}{2} \leq \lambda \leq \frac{1+c}{2}$ and $(1 - \beta)(1 - c) < s$, autocracy is preserved in times of peace and the rich democratizes in times of war.

If C) $\frac{1-c}{2} \leq \lambda < \frac{1}{2}$ and $1 - c - \beta \geq s$, the rich start a war and preserve autocracy by offering $\frac{s+\lambda+c-1}{c}$ to the poor.

If D) $\frac{1-c}{2} \leq \lambda < \frac{1}{2}$ and $1 - c - \beta < s \leq (1 - c)(1 - \beta)$, the rich democratize in times of peace and preserve the autocracy in times of war by offering $\frac{s+\lambda+c-1}{c}$ to the poor but do not start war.

If E) $\frac{1-c}{2} \leq \lambda < \frac{1}{2}$ and $s > (1 - c)(1 - \beta)$ the rich democratize both in times of war and peace.

Proof. It follows from Proposition 7.II.D that when $s \geq 1 - c - \rho$ and $\rho < \lambda \leq \rho + c$ and $\frac{1-c}{2} \leq \lambda \leq \frac{1+c}{2}$, $\hat{\sigma}_{poor} = \frac{s+c+\lambda-1}{c}$. A-B) If $\lambda \geq \frac{1}{2}$, it follows from lemma 1 that the poor do not revolt in times of peace, for that reason, the rich never start a war. If a war has taken place, then the rich prefer $\hat{\sigma}_{poor} = \frac{s+c+\lambda-1}{c}$ to democratization if and only if AW*** holds which holds if and only if $s \leq (1 - \beta)(1 - c)$. C-E) In times of war, autocracy is preserved if and only if $s \leq (1 - \beta)(1 - c)$. In times of peace, it follows from lemma 1 that when $\frac{1-c}{2} \leq \lambda < \frac{1}{2}$, since $\rho < \lambda$, it follows that the rich cannot preserve the revolt in times of peace. The rich therefore decide between democratizing and starting a war. The rich start a war if WAR*** holds, that is, if $s \leq 1 - c - \beta$. Now clearly, since $1 - c - \beta < (1 - c)(1 - \beta)$, it follows that there can be three possibilities: if $s > (1 - c)(1 - \beta)$, the rich prefers to democratize both in times of peace and in times of war. If $1 - c - \beta < s \leq (1 - c)(1 - \beta)$, then once a war has started the rich prefers to preserve the autocracy and offer $\hat{\sigma}_{poor} = \frac{s+c+\lambda-1}{c}$, but war is too costly for the rich that they prefer to democratize in times of peace. Finally, if $s \leq 1 - c - \beta$, the rich prefer to start a war in times of peace and preserve the autocracy by offering $\hat{\sigma}_{poor} = \frac{s+c+\lambda-1}{c}$. ■

In A) and B) autocracy is secure in times of peace but can only be preserved in times of war if s is sufficiently low. In C), D) and E) autocracy is not secured in times of peace. If s is sufficiently low then the rich can use war to preserve autocracy (C), if s is of an intermediate range, the actually makes the rich worse off but preserves autocracy by making the poor bear the majority of the costs (E). Finally, if s is sufficiently high then the rich has to democratize in either case.

A similar analysis can be made for those cases in which $\hat{\sigma}_{poor} = \frac{\lambda-\rho}{c}$.

Now the rich preserve the autocracy in times of war if and only if

$$\frac{\lambda - (\frac{\lambda-\rho}{c})c}{\beta} \geq 1 - c$$

which can be re-expressed as

$$\rho \geq \beta(1 - c) \quad (\text{AW}^*)$$

and when revolt cannot be prevented in times of peace, the rich start a war if and only if

$$\frac{\lambda - (\frac{\lambda - \rho}{c})c}{\beta} \geq 1$$

which can be re-expressed as

$$\rho \geq \beta \quad (\text{WAR}^*)$$

The following analysis can be constructed:

Claim 28 When $\frac{1-c}{2} < s < 1 - c - \rho$ and $\rho < \lambda \leq \rho + c$

If A) $\frac{1}{2} \leq \lambda \leq \frac{1+c}{2}$ and $\rho \geq \beta(1 - c)$ then autocracy is preserved both in war and peace, and the rich offer $\frac{\lambda - \rho}{c}$ to the poor.

If B) $\frac{1}{2} \leq \lambda \leq \frac{1+c}{2}$ and $\rho < \beta(1 - c)$ then autocracy is preserved in times of peace and the rich democratizes in times of war.

If C) $\frac{1-c}{2} \leq \lambda < \frac{1}{2}$ and $\beta \leq \rho$, then the rich start a war and preserve autocracy by offering $\frac{\lambda - \rho}{c}$ to the poor.

If D) $\frac{1-c}{2} \leq \lambda < \frac{1}{2}$ and $\beta(1 - c) \leq \rho < \beta$, then the rich democratize in times of peace and preserves the autocracy in times of war by offering $\frac{\lambda - \rho}{c}$ to the poor.

If E) $\frac{1-c}{2} \leq \lambda < \frac{1}{2}$ and $\rho < \beta(1 - c)$ the rich democratize both in times or peace and war.

Proof. If $\frac{1-c}{2} < s < 1 - c - \rho$ and $\rho < \lambda \leq \rho + c$ it follows from Proposition 7.III.B that $\hat{\sigma}_{\text{poor}} = \frac{\lambda - \rho}{c}$. A-B)

When $\frac{1}{2} \leq \lambda \leq \frac{1+c}{2}$, it follows from lemma 1 that there is no revolt in times of peace. If a war starts, then the rich preserve the autocracy and revolt if and only if AW* holds, that is if $\rho \geq \beta(1 - c)$ and democratizes otherwise. C-E) If $\frac{1-c}{2} \leq \lambda < \frac{1}{2}$, then since $\rho < \lambda$, it follows from lemma 1 that in times of peace, the poor revolt. It follows from WAR* that if and only if $\rho \geq \beta$ the rich prefer to start a war and offer $\hat{\sigma}_{\text{poor}} = \frac{\lambda - \rho}{c}$

than to democratize. When $\rho < \beta$ the rich prefer to democratize in times of peace but it follows from AW* that if a war starts sporadically, they still offer $\hat{\sigma}_{poor} = \frac{\lambda - \rho}{c}$ to the poor if $\rho \geq \beta(1 - c)$. Finally, if $\rho < \beta(1 - c)$ then the rich prefer to democratize both in times of peace and war. ■

The analysis is similar to the previous claim, the main difference is that now the rich is trying to make revolt undesirable by offering $\sigma = \frac{\lambda - \rho}{c}$.

Claim 29 When $s \geq 1 - c - \rho$ and $\rho < \lambda \leq \rho + c$ and $\lambda < \frac{1-c}{2}$:

If A) $\beta \leq \rho$ the rich start a war to preserve autocracy and offer $\frac{\lambda - \rho}{c}$ to the poor.

If B) $\beta(1 - c) \leq \rho < \beta$ the rich democratize in times of peace and preserve the autocracy by offering $\frac{\lambda - \rho}{c}$ to the poor in times of war

If C) $\rho < \beta(1 - c)$ the rich democratize both in times of peace and war.

Proof. If $s < 1 - c - \rho$ and $\rho < \lambda \leq \rho + c$ and $\lambda < \frac{1-c}{2}$, it follows from Proposition 7.III.A) that if a war takes place, $\hat{\sigma}_{poor} = \frac{\lambda - \rho}{c}$. Since $\lambda < \frac{1-c}{2} < \frac{1}{2}$ and $\rho < \lambda$ it follows from lemma 1 that the poor always revolt in times of peace. It follows from WAR* that the rich prefer to start a war if and only if $\rho \geq \beta$ and democratize otherwise. Now if the rich democratize in times of peace (i.e. if $\rho < \beta$), but a war starts sporadically, the rich may prefer to preserve the autocracy and offer $\hat{\sigma}_{poor} = \frac{\lambda - \rho}{c}$ if and only if $\rho \geq \beta(1 - c)$ and democratize otherwise. ■

Now let us focus on the analysis for the case where $\hat{\sigma}_{poor} \in \{\emptyset\}$.

Claim 30 When $\rho + c < \lambda$

If A) $\frac{1-c}{2} > \lambda$ or if B) $\frac{1-c}{2} \leq \lambda < \frac{1}{2}$ and $s > \frac{1-c}{2}$, the rich democratizes both in times of peace and war.

If C) $\frac{1}{2} \leq \lambda \leq \frac{1+c}{2}$ and $s > \frac{1-c}{2}$, then autocracy is preserved in times of peace and the rich democratize in times of war.

Proof. A) Since $\rho < \rho + c < \lambda < \frac{1-c}{2} < \frac{1}{2}$ it follows from lemma 1 that the poor always revolt in times of peace and from Proposition 7.IV.A) that the poor always revolt in times of war, so the rich must democratize in order to prevent revolt. B) Since $\rho < \rho + c < \lambda$ and $\lambda < \frac{1}{2}$ it follows from lemma 1 that the poor always revolt in times of peace. Since $\rho + c < \lambda$ and $\frac{1-c}{2} \leq \lambda \leq \frac{1}{2} < \frac{1+c}{2}$ and $s > \frac{1-c}{2}$, It follows from Proposition

7.IVB) that if there is no value to ensure war participation and prevent revolt in times of peace, so the rich is forced to democratize. C) Since $\frac{1}{2} \leq \lambda \leq \frac{1+c}{2}$ the poor do not revolt in times of peace. Finally, since $\frac{1-c}{2} < \frac{1}{2} \leq \lambda \leq \frac{1+c}{2}$ and $\rho + c < \lambda$ and $s > \frac{1-c}{2}$, It follows from Proposition 1.IVB) that if there is no value to ensure war participation and prevent revolt in times of peace, so the rich is forced to democratize. ■

In all of these cases, revolt is always desirable. In cases A) and B) revolt is always feasible. The difference between A) and B) is that in case B) if the costs of invasion, s , had been lower, the rich would have been able to prevent war by making an offer that would make revolt unfeasible. In case C) revolt is unfeasible in times of peace but the costs of invasion are so low (s is so high) that the rich would have to make such a commitment to the war that it would become prey to the poor once the war was over.

Main Propositions From this analysis, the solution set can be presented as five propositions which consider the total space of possibilities.

Proposition 8 (Imminent Democratization) *If either of the following conditions are met, democratization is imminent and the results are unaffected by the presence of war:*

- If A) $\frac{1-c}{2} \leq \lambda < \frac{1}{2}$ and $\rho < \lambda \leq \rho + c$ and $s > \max\{(1-c)(1-\beta), 1-c-\rho\}$ or*
- if B) $\frac{1-c}{2} \leq \lambda < \frac{1}{2}$ and $\rho < \lambda \leq \rho + c$ and $\rho < \beta(1-c)$ and $\frac{1-c}{2} < s < 1-c-\rho$ or*
- if C) $\frac{1-c}{2} \leq \lambda < \frac{1}{2}$ and $\lambda > \rho + c$ and $s > \frac{1-c}{2}$ or*
- if D) $\lambda < \frac{1-c}{2}$ and $\rho < \lambda \leq \rho + c$ and $\rho < \beta(1-c)$ and $s < 1-c-\rho$ or*
- if E) $\frac{1-c}{2} > \lambda > \rho + c$.*

Proof. A) follows from Claim 27.E), B) follows from Claim 28.E), C) follows from Claim 30.B). D) follows from Claim 29.C) and E) follows from Claim 30.A). ■

In all of these cases, the poor would find it both feasible and desirable to revolt in times of peace, which forces the rich to democratize. In times of peace, the rich democratize for different reasons.

Case E) is trivial. In this case, revolt is always feasible and desirable, so the only way to prevent a revolt is to democratize.

In case C), revolt is always desirable. In addition, since the cost of invasion for the poor is small, the rich are forced to undertake such a burden of the war that they do not have sufficient post-war resources to

make revolt unfeasible. For that reason, the rich know that they are unable to preserve the autocracy.

For cases A), B) and D), the costs of preserving the autocracy are sufficiently high, that the rich are better off democratizing. In the case of A), the rich have to offer $\hat{\sigma}_{poor} = \frac{s+c+\lambda-1}{c}$, but at that level, the value of preserving the autocracy for the rich is lower than the value of democratizing. In cases B) and D), the rich cannot offer $\hat{\sigma}_{poor} = \frac{s-c-\lambda-1}{c}$, since at that level, not only is revolt is feasible, but the poor also find it desirable to revolt. For that reason the rich are required to offer $\hat{\sigma}_{poor} = \frac{\lambda-\rho}{c}$ in order to prevent the poor from revolting after the war is over, but at this level, the rich are better off democratizing.

Proposition 9 (Secure Autocracy) *If either of the following conditions are met, autocracy is secure from both internal and external threats:*

if A) $s \leq 1 - c - \lambda$ and $\rho \geq \lambda$ in which case the rich offers $\sigma = 0$ or

if B) $s \leq 1 - c - \lambda$ and $\rho < \lambda$ and $\lambda \geq \frac{1}{2}$ in which case the rich offers $\sigma = 0$

If C) $(1 - \beta)(1 - c) \geq s \geq 1 - c - \lambda$ and $\rho \geq \lambda$, in which case, the rich offer $\sigma = \frac{s+c+\lambda-1}{c}$ or

if D) $(1 - \beta)(1 - c) \geq s \geq 1 - c - \lambda$ and $\lambda \geq \frac{1+c}{2}$, in which case, the rich offer $\sigma = \frac{s+c+\lambda-1}{c}$ or

if E) $\frac{1-c}{2} \geq s > 1 - c - \lambda$ and $\lambda > \rho$ and $\frac{1}{2} < \lambda \leq \frac{1+c}{2}$, in which case the rich offer $\sigma = \frac{s+c+\lambda-1}{c}$ or

if F) $(1 - c)(1 - \beta) \geq s > 1 - c - \rho$ and $\rho < \lambda < \rho + c$ and $\frac{1}{2} < \lambda \leq \frac{1+c}{2}$, in which case the rich offer $\sigma = \frac{s+c+\lambda-1}{c}$ or

if G) $\beta(1 - c) \leq \rho < \lambda < \rho + c$ and $\frac{1}{2} < \lambda \leq \frac{1+c}{2}$ and $\frac{1-c}{2} < s < 1 - c - \rho$, in which case the rich offer $\sigma = \frac{\lambda-\rho}{c}$.

Proof. A) and B) follows directly from Claim 24.A) and B) respectively. C) and D) follow from Claim 25.A) and B) respectively. E) follows from claim 16.A). F) follows from Claim 27.A) and G) follows from Claim 28.A). ■

Case A) is trivial. Since $\rho \geq \lambda$ revolt is never desirable. Also, since $s \leq 1 - c - \lambda$, the rich can bestow all the costs of war upon the poor and the poor still prefer to fight than to face invasion. Case B) is similar in the sense that revolt is never desirable. The difference is that now, since the costs of invasion to the poor are lower than in case A), the rich must bear part of the costs so as to make the poor indifferent between fighting the threat or being invaded.

For cases B), D) and E) revolt is never feasible: In case B), as in case A) the cost of invasion is sufficiently high for the poor and this allows the rich to force all the burden of fighting the war upon the poor. While in case D) the rich has to share some of the burden in order to entice participation, the rich has such a large proportion of the productive resources that revolt can never be successful regardless of the value of σ . In the case of E), the cost of invasion is still sufficiently high for the poor, that the offer that the rich requires to make, allows the rich to make revolt unfeasible.

In the case of G), revolt is unfeasible in times of peace but could become feasible in times of war. The reason is that the cost of invasion is intermediate. At the minimum offer that the rich must make to the poor in order to entice participation is sufficiently high, revolt would become feasible. For that reason, the rich is forced to increase the offer, so as to make post-war revolt undesirable.

In the case of F), revolt is also unfeasible in times of peace. Now since the cost of invasion is sufficiently low for the poor, the rich have to make an offer in which they undertake a large proportion of the burden of war. This value becomes so high that the poor no longer find it desirable to revolt.

How can there exist offers which make it undesirable for the poor to revolt but desirable for the rich to preserve the autocracy?

The reason lies in the relationship between β and ρ : a high cost of revolution reduces the incentives for the poor to revolt; a high value of β implies that the aggregate income of the rich is distributed among many agents, so the wealth dilution effect from democratization is less significant for higher values of β .

Now let us consider the interesting cases:

Proposition 10 (Ticchi-Vindigni: War Leads to Democratization) *If either of the following conditions are met, autocracy is preserved in times of peace but war forces the rich to democratize:*

if A) $s > (1 - \beta)(1 - c)$ and $\rho \geq \lambda$ or

if B) $s > (1 - \beta)(1 - c)$ and $\lambda > \frac{1+c}{2}$ or

if C) $s > \max\{(1 - \beta)(1 - c), 1 - c - \rho\}$ and $\rho < \lambda < \rho + c$ and $\frac{1}{2} \leq \lambda \leq \frac{1+c}{2}$ or

if D) $\frac{1-c}{2} < s < 1 - c - \rho$ and $\rho < \lambda < \rho + c$ and $\frac{1}{2} \leq \lambda \leq \frac{1+c}{2}$ and $\rho < \beta(1 - c)$ or

if E) $s > \frac{1-c}{2}$ and $\lambda > \rho + c$ and $\frac{1-c}{2} \leq \lambda < \frac{1}{2}$.

Proof. A) and B) follow from Claim 25.C) and D) respectively. C) follows from claim 27.B). D) follows from Claim 28.B). E) follows from Claim 30.C). ■

In the Ticchi and Vindigni (2008) model, democratization comes from redistribution commitment issues. Since my model is a static one, the issues in not of commitment for the rich but rather either of impossibility of the poor to commit to not revolting or of an increased cost of preserving autocracy in the presence of high costs from war.

First note that in times of peace, revolt is undesirable in case A) and unfeasible in cases B-E).

Now let us analyze the case of an involuntary war.

In cases A), B) and C) revolt would not take place because it is not desirable in case A) and not feasible in case B). In case C), the share of the war burden that the rich must undertake to gather support for the war effort is sufficiently high that the poor no longer finds it desirable to revolt. In all of these cases, however, the cost of invasion is very small for the poor (i.e. s is too high), which makes preserving the autocracy too expensive for the rich when compared to democratizing.

In case D) s is at an intermediate level, so that the offer required by the rich is insufficient to prevent a revolution. This forces the rich to offer $\sigma = \frac{\lambda - \rho}{c}$. Now, this time, in contrast to Proposition 3.G), the value of β is sufficiently large with respect to ρ , that although it may be possible to preserve the autocracy, it is no longer desirable for the rich, and so they democratize.

In case E), notice that revolt is always desirable in the after-war scenario. Since the cost of invasion is sufficiently low for the poor, the minimum offer which ensures war participation by the poor makes revolt feasible. For that reason, the rich have no choice but to democratize (In other words, the problem here is that $\sigma^{**} < \sigma^{***} \leq 1 < \sigma^*$).³⁹

Proposition 11 (Undesired War Prevents Democratization) *If either of the following conditions are met, the rich do not start a war. In times of peace, the rich democratize, in times of war, the rich preserve the autocracy:*

if A) $1 - c - \beta < s \leq \frac{1-c}{2} \leq \lambda < \frac{1}{2}$ and $\rho < \lambda$, in which case $\sigma = \frac{s+c+\lambda-1}{c}$ or

³⁹Technically, by allowing the rich to commit to redistribution of resources in autocracy (i.e. to allow $\sigma > 1$) it may become possible to eliminate case 3.E. Even then, we still have Proposition 3.C, so Proposition 3 does not disappear with the introduction of broader redistribution possibilities. Furthermore, in a dynamic setting, and following the point made by Powell (2006), empowering the poor makes autocracy even less tenable in the long run.

if B) $(1 - c)(1 - \beta) \geq s > \max\{1 - c - \beta, 1 - c - \rho\}$ and $\rho < \lambda < \rho + c$ and $\frac{1-c}{2} \leq \lambda < \frac{1}{2}$, in which case $\sigma = \frac{s+c+\lambda-1}{c}$ or

if C) $\frac{1-c}{2} < s < 1 - c - \rho$ and $\frac{1-c}{2} \leq \lambda < \frac{1}{2}$ and $\beta(1 - c) \leq \rho < \beta < \lambda < \rho + c$, in which case $\sigma = \frac{\lambda-\rho}{c}$ or

if D) $s < 1 - c - \rho$ and $\frac{1-c}{2} > \lambda$ and $\beta(1 - c) \leq \rho < \beta < \lambda < \rho + c$, in which case $\sigma = \frac{\lambda-\rho}{c}$.

Proof. A) follows from claim 26.B) (it follows from $\lambda > \beta$ and $s > 1 - c - \beta$, that $s > 1 - c - \lambda$ becomes redundant). B) follows from Claim 27.D). C) follows from Claim 28.D). D) follows from Claim 29.B). ■

First, notice that in all these cases, autocracy is unsustainable in times of peace, as revolt is both feasible and desirable. Regardless, the cost of war is so large that the rich would prefer to democratize than to start a war. As war is bestowed upon the country, the war costs become sunk and now the decision to preserve the autocracy becomes independent from war. For that reason, the rich are able to preserve the autocracy.

In case A), the costs of invasion are sufficiently high for the poor. This allows the rich to make such an offer that the poor bear most of the costs of war and no longer find it feasible to revolt.

In cases C) and D) the costs of invasion are intermediate, for that reason, the minimum level required to entice war participation is lower than the minimum level required to make revolt undesirable. The rich are forced to offer the minimum level required to make revolt undesirable and prevent revolts in such a way. The main difference between cases C) and D) is that in case D) revolt is always feasible, whereas in case C) revolt is feasible for the given level of s . Finally, in case B), the cost of invasion to the poor is sufficiently small. For that reason, the offer that the rich must make in order to ensure participation is higher than the offer required to make revolt undesirable.

Proposition 5 is an interesting and unexplored case in the literature with important implications for foreign policy. Clearly, there is a shock which affects the distribution of income (or power) and therefore affects revolt possibilities. In contrast to the standard models, this shock strengthens rather than debilitates the status quo. An example where this may have occurred is Saddam's war against Iran. In that instance, Saddam's invasion in 1980 may have strengthened the emerging Khomeini regime.

In case A) we see that while both the poor and the rich are debilitated by the foreign war, the burden of war is greater on the poor and thus the position of the rich is strengthened domestically in relative terms. For cases B-D), the rich face such a high war burden that the benefits from revolting are now insufficient to

offset the costs of revolt..

Proposition 12 (Orwell-Powell: Opportunistic War) *If either of the following conditions are met, the rich opportunistically start a war to prevent democratization*

- if A) $1 - c - \beta \geq s > 1 - c - \lambda$ and $s \leq \frac{1-c}{2} \leq \lambda < \frac{1}{2}$ and $\rho < \lambda$, in which case $\sigma = \frac{s+c+\lambda-1}{c}$ or*
- if B) $1 - c - \beta \geq s \geq 1 - c - \rho$ and $\rho < \lambda \leq \rho + c$ and $\frac{1-c}{2} \leq \lambda < \frac{1}{2}$, in which case $\sigma = \frac{s+c+\lambda-1}{c}$ or*
- if C) $\frac{1-c}{2} < s < 1 - c - \rho$ and $\beta \leq \rho < \lambda \leq \rho + c$ and $\frac{1-c}{2} \leq \lambda < \frac{1}{2}$, in which case $\sigma = \frac{\lambda-\rho}{c}$ or*
- if D) $\beta \leq \rho < \lambda \leq \rho + c$ and $s < 1 - c - \rho$ and $\lambda < \frac{1-c}{2}$, in which case $\sigma = \frac{\lambda-\rho}{c}$ or*
- if E) $s \leq 1 - c - \lambda$ and $\rho < \lambda$ and $\frac{1-c}{2} \leq \lambda < \frac{1}{2}$, in which case $\sigma = 0$.*

Proof. A) follows from Claim 26.C). B) follows from Claim 27.C). C) follows from Claim 28.C. D) follows from Claim 29.A). E) follows from Claim 24.C). ■

This time, war is started by an otherwise unstable regime. Notice that revolts are always feasible and desirable in times of peace.

In cases A) and E), invasion is so costly for the poor that the rich start the war and pass such a high burden of war upon the poor, that revolt is no longer feasible in the post-war setting. The difference between A) and E) is that since in E) the costs of invasion are high for the poor, the rich is able to transfer all the burden of war to the poor.

In contrast, in cases B-D), the rich bear a high burden of war and the poor no longer find it desirable to revolt. The main difference between case B) with respect to C) and D), is that the minimum offer that the rich must make in order to entice participation is higher than the offer required to make revolt undesirable. In cases C) and D), the minimum value required to entice participation are lower than the minimum value required to make revolt undesirable. Cases C) and D) are analogous to Proposition 5.C and 5.D respectively, with the difference that the costs of revolt, ρ , are so high that now the cost of preserving the autocracy is sufficiently low to offset the costs of war, c , after taking the wealth dilution effect into account (where dilution is larger the smaller β is).

2.3 Conclusions

This paper presents a model which studies the link between internal conflict, external conflict and democratization. In contrast to the standard view which suggests that conflict in general contributes to democratization, this paper studies the conditions under which external threats contribute to democratization.

An involuntary external war may either debilitate or strengthen the domestic regime leading to either democratization or consolidation of the autocracy. There are two possibilities:

As suggested by Ticchi and Vindigni (2008), war may destroy an otherwise stable autocracy by making it unfeasible (Proposition 10.D-E) or undesirable (Proposition 10.A-C) for the rich to sustain the autocracy.

In contrast, if war is bestowed upon autocrats, then the costs of fighting it become sunk and to the extent that the rich can share the war burden with the poor in such a way as to make revolt either undesirable, by reducing inequality to a point where revolutionary costs are greater than the benefits from expropriation (Proposition 11.B-D) or unfeasible, by debilitating the poor through war (Proposition 11.A).

An additional possibility is that elites may voluntarily start external wars to consolidate their position domestically. They may do so by passing on the burden of war upon the poor so as to make revolt unfeasible (Proposition 12.A and E) or by sharing such a proportion of the burden of war that the costs of revolution are greater than the benefits from expropriation (Proposition 12.B-D).

This result is interesting, because it sheds insight as to why autocratic regimes may be more prone to war. While Powell (2006) has already proposed a similar idea, this model endogenizes the payoffs from joining the war effort for the losing domestic party and shows how the decision to join the war effort is affected. This idea that autocrats may start wars to prevent democratization links interestingly with the work by Hess and Orphanides (1999, 2001) on democracies, and Glaeser (2006) on both democracies and non-democracies, in which leaders may enter unprofitable wars. A second and perhaps more important contribution is that it offers a different rationale as to the empirical regularity suggested in Bueno De Mesquita and Siverson (1995) that non-democracies may be more likely to enter into conflicts that they can lose than democracies. Furthermore, it provides a more feasible explanation for this phenomenon:⁴⁰

⁴⁰Bueno De Mesquita and Siverson (1995) argue that political accountability for military losses may be higher in democracies and this can make autocracies more willing to start wars and less committed to winning. This argument misses the point that even if this is true, the costs of losing political power in non-democracies may be substantially higher (as it may affect the physical and economic integrity of the autocratic elite) than in democracies, casting doubt as to whether the overall expected

Also, since political survival is endogenous to the distribution of de facto power in non-democracies, then it is likely that the internal effects of wars on the distribution of power may have been a more important consideration on the decisions to start a war. This point raises an empirical discussion: are stable or unstable autocracies more likely to start wars? If stable autocrats are more likely to start wars, this would provide evidence in favor of Bueno De Mesquita and Siverson (1995), whereas the opposite would provide evidence in favor of the view espoused in this paper and in Powell (2006).

Finally, the cost of invasion (which is inversely related to s) has very important implications in this model. A high s implies little preference for domestic rule versus foreign rule. One reason why the people may have a preference for the domestic government versus the foreign invader, may have to do with cultural or religious differences. For example, Richardson (1960) shows that differences between Islam and Christianity and within Christianity led to wars. Wilkinson (1980) shows that general cultural, ethnic, religious and language differences increase conflict. Iyigun (2008a) has shown that the threat of Islam reduced internal conflict within the Roman and Protestant strands of Christianity, as well as within neighboring European kingdoms, as these foes decided to face a common enemy. In Iyigun (2008b) military technology depends on cultural differences, as increased differences increase the motivation to fight fiercely.

A second consideration is that the cost of invasion for the poor is linked to the foreign invader's objectives, where more sanguine invaders may be fought more enthusiastically; and international institutional settings, where international prohibitions on the enslavement of enemies, or on military brutality or rules as those established in the Geneva Convention may reduce incentives for the people to fight effectively against a foreign enemy. A further analysis of how cultural and institutional factors affect domestic participation in wars is also an interesting area of research.

cost of military failure is higher in democracies than non-democracies.

Are Voters Really Ambivalent about Economic Performance? A Reassessment of Brender and Drazen's 2008 AER Paper

[It's t]he Economy, Stupid! - James Carville. Posted inside Bill Clinton's 1992 Presidential Campaign Headquarters and employed as a central theme for the campaign.

3.1 Introduction

A recent panel study by Adi Brender and Allan Drazen (2008), (henceforth BD08) has concluded that a) voters in developed countries are ambivalent to economic performance and b) highly responsive to fiscal prudence. In particular, they find that while voters in general respond positively to fiscal prudence during the leader's term in office, voters in developed countries reward fiscal prudence in the electoral year. In their own words: *"voters, especially in developed countries and established democracies, do not like deficits, particularly in election years."* and *"higher growth rates...raise the probability of reelections only in the less developed countries and in new democracies"*.

In this paper, I subject their results to scrutiny: I increase the sample size and redo their tests under different definitions of electoral success. In addition, I test whether their results are affected when looking at cyclically adjusted fiscal deficits. The rationale is that if voters in developed countries are really ambivalent with respect to economic growth, as suggested by BD08, then rational voters should only punish fiscal performance that is not due to automatic stabilizers. For that reason, it may be better to measure the effects of the cyclically adjusted deficits on electoral outcomes.

With those three modifications, I find evidence that while economic growth definitely increases reelection chances in developing countries and there is some evidence that it also increases reelection chances in developed countries, although the effect seems to be smaller and is not conclusive. In contrast, while there is some evidence that fiscal prudence increases reelection chances, it only works in developed countries and the evidence is less conclusive than the authors suggest.

Finally, I find strong evidence that voters do reward economic growth in both old and new democracies, but again, the effect is smaller for older democracies. The evidence in favor of voters rewarding fiscal prudence

is again weak for old democracies and non-existent for new democracies.

The remaining of the chapter is organized as follows: section 2 reviews the literature linking elections, fiscal and monetary policies and macroeconomic outcomes. Section 3 discusses the BD08 article, it also discusses main methodological differences between their work and this chapter. Section 4 presents a summary of the data employed in this paper, as well as the main results. Section 5 presents some further robustness tests and section 6 concludes.

3.2 Literature Review

Elections can serve many purposes, such as defining and framing voters' preferences, conciliating between constituencies with conflicting objectives and evaluating and disciplining incumbents' performance. If voters can only imperfectly observe the incumbent's performance both in terms of diligence and competence, then economic performance could act as an indicator, therefore influencing the decision to reelect or replace incumbents.⁴¹ If politicians do have an informational advantage over voters and if economic outcomes depend on incumbents' performance, then incumbents may attempt to synchronize economic expansions with the electoral calendar in order to improve their reelection chances.⁴² The subject of the interactions between electoral outcomes and economic performance has been a topic of interest to politicians, political scientists and economists for some time.⁴³

3.2.1 Opportunistic Political Business Cycles

Political Business Cycles (henceforth PBCs), became a hot topic in economics following the seminal work by William Nordhaus (1975) and it focuses on how elections affect the timing of macroeconomic decisions. In Nordhaus' model, the incumbent exploits the Phillips curve by expanding money supply prior to elections. Expansions and contractions are timed with the electoral calendar to take advantage of retrospective voting.⁴⁴

Cukierman and Meltzer (1986), Rogoff and Sibert (1988), Rogoff (1990), Persson and Tabellini (1990),

⁴¹This is consistent with the Kramer (1971) view that voters' decisions are retrospective in the sense that voters reelect the incumbent if her performance, as reflected by economic growth is satisfactory.

⁴²Alternatively, elections may be endogenously timed with economic expansions. See for example Chowdhury (1993) and Ito (1990).

⁴³For example, Schumpeter (1939) acknowledged politics as a potential source of business cycles on his treaty on the subject of cycles. Kalecki (1943) presented an early model on the subject.

⁴⁴Almost at the same time, Lindbeck (1976) and McRae (1977) presented similar models.

Lohmann (1998) and Stein and Streb (1998) presented refinements to account for rational, but imperfectly informed voters. In these models, political agents employ inefficient expansionary policies in order to signal competence to an imperfectly informed constituency.

While most of these models are build upon a monetary policy framework à la Barro and Gordon (1983), Allan Drazen (2000, 2001), presents a model in which leaders generate fiscally induced cycles. Monetary cycles arise only as accommodation for fiscal policy. There is some evidence to support this claim.⁴⁵

There are some important differences in the predictions of the Nordhaus "naïve" opportunistic model and rational opportunistic models like Rogoff. The first is that in Nordhaus, voting is retrospective.

A second difference is that in Nordhaus, political business cycles have a high magnitude and duration and occur over macroeconomic outcomes, whereas in rational models, cycles are of a lesser magnitude and duration and are observed primarily over policy variables such as money growth and fiscal deficits.

There are two main empirical questions that emerge from this analysis: 1) Do macroeconomic variables affect election outcomes? and 2) Are macroeconomic variables affected by elections?

Effects of Macroeconomic Variables on Reelection Chances Gerard Kramer (1971) regresses vote share of the party of the incumbent for U.S. Presidential and Congressional elections over the period 1896-1964. He finds a significant effect of real GDP per capita growth. Inflation and changes in unemployment are not significant once real GDP per capita growth is accounted for. Finally, the effects are stronger in Congressional elections than in Presidential ones.

Ray Fair (1978) focuses on U.S. presidential elections and finds evidence consistent with Kramer. In particular, Fair finds that GDP growth is the variable that better determines presidential outcomes, especially, as they approach the election date. Furthermore, Fair tests whether voters value past information regarding parties performance, as suggested by Stigler's 1973 rationalist critique of Kramer (1971). He finds that voters only look at contemporaneous information, as predicted by the Nordhaus opportunistic PBC model with naïve voters.

⁴⁵For example Beck (1987) finds that elections may affect money and inflation but not reserves or the Fed Funds Rate. Beck argues that central bankers lay low during elections and moderately accomodate fiscal policy. Drazen argues that since the objective of central bankers, at least in developed countries, is price stability, research analyzing the actions by incumbents should focus on fiscal rather than monetary policy.

Edward Tufte (1975) shows that presidential approval ratings and changes in real GDP per capita explain 91% of the variation of losses by the party of the incumbent president in midterm elections. Tufte argues that midterm elections constitute a referendum on presidential performance. While losses are expected, the magnitude of the loss indicates how voters evaluate the performance of incumbent presidents. An interesting implication is that if a certain degree of electoral loss is expected in midterm elections and weak economic growth is a leading cause of electoral losses, this should at least suggest that electoral losses are synchronized with midterms and upturns are synchronized with presidential elections. A problem in the early studies, especially those focusing on a single country is the sample size.

Several studies on presidential popularity and voting outcomes in the U.S. strongly suggest that voters focus on macroeconomic performance. Single studies with respect to other countries have yielded similar results.⁴⁶ There is also some evidence that voting is sociotropic.⁴⁷

In contrast, multi-country studies yield mixed results with respect to growth. For example, Lewis-Beck and Mitchell (1990) look at 27 elections over 5 Western European countries and find evidence that rising unemployment and inflation reduced ruling coalition seats, whereas Martin Paldam's (1991) study of 17 advanced nations finds little evidence that GDP growth increases reelection chances.

In general, it seems that voters do reward electoral year economic performance to some degree. Furthermore, there is some evidence of sociotropic and retrospective voting, which may constitute evidence in favor of the Nordhaus naïve version of opportunistic cycles. Finally, Brender and Drazen (2008) look at average GDP growth over the term and control for fiscal performance and other variables and find that economic performance is rewarded only in developing countries and new democracies.

Effects of Elections on Macroeconomic Variables and Policy Instruments If voters reward good economic performance towards the end of an administration, then incumbents successful at manipulating

⁴⁶Lewis-Beck and Stegmaier (2000) present a detailed survey. Economic growth and current macroeconomic performance are key determinants of electoral outcomes in the U. S. as well as in other countries such as Britain, France and Denmark. Michael Lewis-Beck (1988) finds similar results for several Western European countries and Douglas Madsen (1980) for Nordic countries.

⁴⁷D. Roderick Kiewiet (1983) shows that voters are not only retrospective but also that sociotropic voting is much more important than pocketbook voting. Alvarez and Nagler (1995) provide further evidence of sociotropic voting on economic issues using individual survey data. In contrast, Golden and Poterba (1980) challenge the idea that macroeconomic expansions help incumbents by arguing that although the effect is statistically significant, the coefficient of changes in disposable income on presidential popularity is so small that "buying off" voters with expansionary policies would be prohibitively expensive. Lewis-Beck and Stegmaier (2000) argue that some aspects of voting such as sociotropic versus pocketbook, retrospective versus prospective vary across countries.

variables to induce expansionary cycles as elections approach, would be inclined to do so. We should thus expect fiscal policies such as government spending, transfers and money supply and macroeconomic variables such as output growth and the employment rate to increase prior to elections and fall afterwards.

A problem with fiscal and monetary manipulation, especially as presented by Nordhaus is policy ineffectiveness: rational expectations generate a reaction to attempts at manipulation which render effects on real variables useless.⁴⁸ Both Bennett McCallum (1978) and Nathaniel Beck (1982a) reject manipulation of the unemployment rate during electoral years in the United States. Alesina and Roubini (1992) find that electoral dummy variables in 18 OECD countries have a significant effect on inflation but not on the growth rate. Alt and Chrystal (1993) and Golden and Poterba (1980) find little evidence of systematic manipulation of the economy during elections. Alesina, Cohen, and Roubini (1992) find that while fiscal and monetary policies are loose around elections, these policies only lead to inflation increases and not to growth increases or unemployment reductions.

Luckett and Potts (1980) and Havrileski (1987) find no evidence of monetary induced PBCs. Paldam (1979) looks at GDP growth in 17 OECD countries with stable governments and finds that while there is evidence in favor of a cycle, it does not follow Nordhaus predictions. Government spending increases in the second year leading to inflation in the third year and tax increases little during year one. Paldam suggests that incumbents may be fulfilling their campaign promises. Alesina, Roubini, and Cohen (1997) find some evidence in favor of transfers. Alesina *et al.* argue that there may be some evidence in favor of a Rogoff-type PBC but not so for the Nordhaus flavor.

In contrast, Haynes and Stone (1987, 1989) do find evidence of a PBC with respect to GDP growth. Frey and Schneider (1978) show evidence that in the U. S., government spending increases as elections approach regardless of party ideology. Surprisingly, there is little evidence of new government jobs or transfers to families. Laney and Willett (1983) show that there was evidence of a fiscal deficit political cycle in the U.S. over the period 1960-1976, which was ultimately monetized. This can be seen as evidence at least in favor of the Rogoff version of the PBC. In Grier (2007) economic growth does exhibit a cycle once partisan effects are controlled for.

⁴⁸See for example, Robert E. Lucas (1972). and Sargent and Wallace (1975).

Nathaniel Beck (1987) finds that while there is evidence of a monetary cycle, it only appears in money supply and not in other monetary instruments. In addition, he finds that 40% of the variation in monetary policy corresponds to fiscal accommodation. This suggests that while the Fed may not actively induce PBCs, it may accommodate them and choose to lay low during electoral periods, which is consistent with Drazen (2000, 2001). In Abrams and Iossifov (2006), a monetary-induced PBC does appear when the Fed chairman and the president belong to the same party. Alpanda and Honig (2009) show that monetary cycles only appear in developing countries with central banks lacking independence.

Evidence of manipulation is prevalent in developing countries. In Block (2002) there is evidence of stop-and-go cycles in inflation as elections approach in African countries: increases in foreign debt stimulate the economy prior to elections. This debt monetized after the elections, just as predicted by Stein and Streb (1998). Cermeño, Grier, and Grier (2009) show similar evidence for Latin American countries, but also shows that these types of cycles have faded away as liberalization has taken place.

In summary, there is no consensus as to whether incumbents can successfully induce fiscal or monetary business cycles in order to stimulate the economy around elections. There is some evidence in favor of fiscal manipulation, less so for monetary manipulation. It also seems that manipulation is more prevalent in developing countries. Incumbents may indeed use fiscal and monetary tools to increase their reelection chances. It is not clear whether they do so to fool voters (Nordhaus) or to signal their abilities (Rogoff). Alternative theories linking political and economic variables are presented below.

3.2.2 Other Explanations: Partisan Business Cycles

There is a second important line of research called Partisan Business Cycles, which argues that macroeconomic cycles emerge in politics as incumbents with different political ideologies implement their desired policies. Douglas Hibbs (1977) presented a model in which business cycles are the result of partisan politics in which right-wing parties cater to high income constituencies and thus pursue policies leading to lower inflation rates and higher unemployment rates, whereas left-wing parties cater to lower income constituencies who in turn, prefer a lower unemployment rate at the expense of a higher rate of inflation.⁴⁹

⁴⁹Partisan policy divergence is inconsistent with the median voter theorem (Hotelling 1929, Black 1948, Downs 1957). Regardless, there are many good justifications for divergence, For examples see: Wittman (1977), Alesina (1988), Murphy and

Alberto Alesina (1987), Alesina and Sachs (1988) and Ellis and Thoma (1993) present rational versions of the partisan model. In these models, differences in output and inflation arise as a result of differences in parties ideologies and of an electoral surprise. Short-term stickiness of wages allows the winner of the election to exploit the Phillips curve immediately after an election takes place.⁵⁰ Rational models prediction cycles of smaller duration and magnitude. Finally, there are some models which combine elements from opportunistic and partisan business cycles.⁵¹

Drazen (1999) has the following critique for rational partisan models: if parties use electoral uncertainty to manipulate the economy, shouldn't rational economic agents make decisions right after this electoral uncertainty has been resolved? Garfinkel and Glazer (1994) shows that wage negotiations are usually postponed until after elections.

Empirically, the main question of interest is whether policies and macroeconomic outcomes differ when parties of contrary ideology are in power.

Evidence for Partisan Business Cycles Hibbs (1977) presented evidence for 12 developed countries that unemployment is more likely to fall and inflations is more likely to rise with left wing governments. Alesina and Sachs (1988) test for partisan PBCs in the U.S. and find evidence in favor of a rational partisan PBC on output and money supply. Alesina and Roubini (1992) extend the analysis to 18 OECD countries and find evidence of temporary partisan differences in output and employment. Beck (1982b) finds political parties that in the U.S. pursue different policies.

Grier (2007) finds evidence in favor of both opportunistic and partisan cycles. Frey and Schneider (1978) find that while parties tend to act opportunistic, they do so as long as there is not an election. If there is an election at hand, incumbents try to stimulate the economy, regardless of party ideology. In Alt (1985a) left-wing parties in the U.S. and Britain do try to curb unemployment if they promised to do so during electoral campaign and if they are a majority, after accounting for world demand effects. Similar results hold

Shleifer (2004), Chappell and Keech (1986), Rubinchik and Weber (2005), Glaeser, Ponzetto, and Shapiro (2004), Alesina and Rosenthal (1995) and Fiorina (1999).

⁵⁰In Alesina (1987) and Alesina and Sachs (1988) electoral uncertainty allows incumbents to generate short-term cycles following election periods.

⁵¹In Blomberg and Hess (2003), uncertainty about policies and efficiency generate cycles in a CGE model. Frey and Schneider (1978) show empirically that partisan goals are pursued towards the beginning of a political term while growth enhancing policies in the latter part of the term.

for 14 developed countries (Alt 1985b).

An issue in these studies is reverse causality: voters may prefer right wing parties if inflation is large and left-wing parties when unemployment is high (Faust and Irons 1999).

3.2.3 Other Explanations: Targeted Redistribution

Finally, there are other political or electoral reasons for inter-temporal or group redistribution of resources, which may also affect macroeconomic and fiscal policy. For example, Grossman and Helpman (1994, 1996) focus on targeted redistribution to special interest groups (Mancur Olson 1965, 1982), and Coate and Morris (1995) study the mechanisms through which these transfers occur.

Lizzeri and Persico (2001, 2005) argue that electoral competition can lead to narrowly targeted redistribution as opposed to broadly defined public spending. Persson, Roland, and Tabellini (2007) show that coalition governments tend to outspend majoritarian governments. Persson and Tabellini (2003) show that proportional electoral systems lead to larger fiscal deficits than majoritarian systems. Finally Brender and Drazen (2008) suggest that while macro level expansions are ineffective for improving reelection chances, targeted redistribution may work. Drazen and Eslava (2010) find evidence supporting this claim.

Alternatively, fiscal outcomes may be the consequence of conflicting constituencies. For example, in Alesina and Drazen (1991), stabilizations are delayed as competing groups attempt to bestow the costs of reform on each other. In Alesina and Tabellini (1990b) disagreement between present and future constituencies, as well as polarization can lead to fiscal deficits, a point that is corollary to Besley and Coate (1998).

3.3 The Brender-Drazen Model

The basic equation in BD08 is a logit with the following specification:

$$\Pr[Reelect_{it} = 1|(X, Z)]$$

where X is a vector consisting of the explanatory variables: 1) average growth in GDP over the leader's term, 2) change in the ratio of the government surplus to GDP in the two years prior to the election versus

that of the two previous years, and 3) change in the ratio of the government surplus to GDP in the election year prior to the election versus that of the previous year; and Z is a vector of dummy controls consisting of 1) whether the electoral system is proportional or majoritarian, 2) whether the country has been a stable democracy for quite some time and 3) whether the country is a developed or developing.⁵² They run their regressions 1) both as a pooled regression (using Huber-White robust errors) and controlling for country fixed effects, 2) as a full sample and also as a developed and developing country sub-sample. Their main results are presented in Table 1.⁵³

Table 1. Benchmark Specification for Brender and Drazen (2008)

	(1) reelect3	(2) reelect3	(3) reelect3	(4) reelect3	(5) reelect3	(6) reelect3
	Full	Developed	Developing	Full	Developed	Developing
	Logit			Fixed Effects		
Term GDP Growth	21.36*** (0.000216)	-0.755 (0.937)	34.47*** (0.0000)	21.82*** (0.00453)	13.60 (0.229)	29.52** (0.0189)
Elec. Yr, Bal. Ch.	11.78* (0.0979)	35.19*** (0.00143)	1.210 (0.902)	16.06** (0.0419)	29.74** (0.0157)	9.172 (0.391)
Term Bal. Ch.	10.58** (0.0361)	13.23* (0.0957)	13.48* (0.0601)	11.60** (0.0410)	10.70 (0.176)	15.63 (0.100)
Developed	0.705** (0.0140)					
Majoritarian	0.715*** (0.00638)	0.586 (0.142)	0.703* (0.0590)	0.173 (0.868)	1.266 (0.265)	-15.54 (0.991)
Old Democracy	-0.341 (0.261)	-1.266** (0.0331)	-0.191 (0.591)	-2.174*** (0.00380)	-2.580* (0.0697)	-2.727** (0.0198)
Constant	-1.114*** (0.0000)	1.083* (0.0834)	-1.548*** (0.0000)			
Observations	347	180	167	301	173	128
Pseudp R Squared	0.0753	0.0707	0.112	0.103	0.0985	0.169
Likelihood Ratio	31.61	15.35	21.22	27.61	16.27	17.40
Log Likelihood	-218.7 -236.5	-115.9 -124.7	-96.33 -108.5	-120.2 -134.0	-74.47 -82.60	-42.72 -51.42
Number of Countries				53	22	31
Avg obs per country				5.679	7.864	4.129
Min obs per country				2	5	2
Max obs per country				14	14	9

Term GDP growth is significant in the full sample, the results disappear when the regression is run over the sample of developed countries. In addition, fiscal prudence is rewarded: increase in the election year surplus is significant both for the full sample and for the developed country sample. Fiscal surplus

⁵²Please see the appendix for a description of the data in Brender and Drazen (2008) as well as the data employed in this paper.

⁵³All regression tables have p-values displayed in parenthesis underneath of the regression coefficients. One, two and three asterisks represent significance at the 10%, 5% and 1% levels, respectively.

over the term is significant for the pooled regression, significant in the full sample fixed effects model and borderline significant at the 10% in the developing sample. This suggests that voters reward economic and fiscal performance differently in developed versus developing countries.

Brender and Drazen employ a Hausman test to show that the results from the pooled specification and the country fixed effects specifications are not statistically different from one another.

Brender and Drazen then run some robustness tests over the pooled logit specification. In order to do so, they use interaction terms between developed versus developing with the macroeconomic and fiscal variables. They control for the size of the budget deficit, as well as from the deviation of electoral year GDP growth from the long term trend and find similar results.

Brender and Drazen also control for the effects of inflation, political strength and world economic growth and find that electoral year fiscal balance change helps reelection in developed countries and economic growth helps reelection in developing countries.

Additionally, they run regressions interacting the economic and fiscal variables with age of democracy. They find evidence that growth helps reelection in less developed countries and in new democracies. In contrast, fiscal prudence is rewarded in developed countries with old democracies.

3.3.1 Alternative Approach

I replicate the results in Brender and Drazen and subject them to further tests for robustness. In general, I show that there is some evidence that economic growth increases reelection chances even in developed countries, although the effect is smaller than in developing countries. Additionally, the evidence that fiscal prudence is rewarded is weaker than suggested in BD08.

There are three main alterations that I make to their benchmark specification: 1) increase the sample size, 2) try alternative definitions of electoral success and 3) replace fiscal balances with cyclically adjusted fiscal balances.

Increasing the Sample Size I expand the number of elections by following BD08 electoral rules. In order to do so, I expand the data in the following way. I start with those observations available in Brender and Drazen and supplement electoral outcomes following the criteria established by the authors. In addition,

I need to expand the data for the independent variables. Appendix 1 explains how the alternative data is constructed and how it relates to the original data.

Unfortunately, I had to collect the data required to construct for the fiscal variables from secondary sources and merge it together.⁵⁴ While this method may be questionable, and may induce noise into the variables, there is little reason to believe that the primary data is free of these concerns. The fiscal data gets collected by the IMF through questionnaires filled out in a discretionary way by officers at domestic finance secretariats or central banks. There must be sufficient inter-country noise due to different accounting methods as well as differing degrees of data reliability that it is not clear that the quality of my consolidated fiscal data may be substantially worse than the primary data.

Using Different Electoral Definitions I test whether the BD08 results hold under a different definition of electoral regime. The new electoral variable that I propose as an alternative for reelection has a more liberal view at what constitutes reelection. While BD08 require the incumbent to be in power two years prior to the election for the observation to be considered, my definition does not require so.

In addition, and perhaps the largest difference between the BD08 definition and mine is that Brender and Drazen require the incumbent leader to actually get reelected for them to code a success, whereas I only look at whether the party is reelected. BD08 consider that an incumbent can only be replaced if she either a) dies or if b) term limits prevent her from running. Each election has its own specifics which makes it unclear whether an incumbent's decision to step down or not run should be considered an electoral loss.

This makes discretion necessary to establish a criteria for coding electoral outcomes as successes or failures. My rationale for focusing on parties rather than people is that when the party remains in power, many of the political operators of the incumbent remain in key positions and therefore, the incumbent has a say in politics.

⁵⁴Unfortunately, the data that Brender and Drazen employ in BD05 and BD08 and that Persson and Tabellini employ in PT02 to construct their fiscal surplus variable, the IMF's Central Government Total Revenue and Grants *minus* Total Expenditures, is not available online, either at the IFS or the GFS. There are two reasons for this: some of the data has been published in the GFS paper versions and the IMF changed their definition variables in 2001. Furthermore, many of the actual observations which are available online are not consistent across countries, for example, the data available for country A is from the central government account, for country B is from the Budgetary Account and for country C is from the general government account. Aggregating across these results in data that is not useful for this paper (I tried this first). Since I do not have the resources to manually collect the central government budget dataset, I was forced to merge data from different sources to generate my consolidated fiscal definitions data.

In addition, the successor may most likely be either hand-picked or at least more likely to be preferable for the leader than an opposition leader. Furthermore, it is quite common for incumbents in parliamentary regimes to resign some time prior to elections, and there may be strategic reasons for it. Having the incumbent step down prior in favor of her hand-picked successor to the election may be a way to establish an incumbency advantage for the successor by signalling a continuation of policies.

The opposite may be true, however. Incumbents may be forced to resign due to intra-party struggle and/or popular discontent with the incumbent. Even if incumbent leaders are forced out, it is not clear that we should code these as losses. When an incumbent party is able to succeed despite reduced popularity of its former leader, it may suggest that voters are still satisfied with the party's policies. This may be especially true if the fall in popularity is due to a scandal unrelated to fiscal or economic performance, which is a quite common occurrence.

There are also issues with the causes for resignation. For example, leaders may state that they are resigning due to health issues: while these may be legitimate claims in some cases, in others they may just act as excuses or may work in tandem. For example, aging leaders may be less inclined to remain in power or run for reelection if they face increasing opposition. Also, health declines of the current leader may be accelerated in a hostile or competitive political environment.

There are also a few cases in which leaders had to resign in order to take positions of importance in international organizations such as the presidency of the European Union. It is not clear that these should be considered losses.

Finally, another problem which works against both definitions is that premiership in large coalition governments are fickle: a leader may be able to retain power because of her ability to build coalitions rather than because of the performance of her party. The opposite may also be also true: a party may generate seat gains but lose support from coalition parties or may see coalition parties suffer electoral losses which may not be offset by the incumbent party's gains.

In summary, each electoral definition is flawed in its own way and it seems unfeasible to construct a coherent definition, especially for parliamentary regimes. In general, my electoral definition leads to a higher reelection rate than BD08.

The new electoral definition also led to an increase in sample size which forced me to generate alternative measures of the fiscal variables as well as economic variables and other controls.

BD08 Using Cyclically Adjusted Fiscal Deficits Looking at the results in BD08, one could easily conclude that since running electoral year deficits and term deficits hurts reelection chances, especially in developed economies, politicians should avoid fiscal opportunism.

On the one hand, a rationalist view with respect to these findings would suggest that voters in developed countries are sufficiently sophisticated that they can see through incumbents' manipulation, or at the very least, that voters presume opportunistic behavior when deficits arise and punish incumbents accordingly.

On the other hand, if voters are sufficiently sophisticated, then they should only punish discretionary fiscal policy. In contrast, variations in fiscal policy that are due to economic fluctuations should already be considered in the effects of economic performance on electoral outcomes.

There are two main sources for data on the Structural Budget Balance. The first is the IMF's World Economic Outlook. The second is the OECD. The main problem with using data from the WEO is that it is constructed from the general government fiscal balance, which is a variable that performs poorly for the analysis presented in this paper: since this paper is concerned with the performance of the executive at the national level, using aggregated data which includes fiscal performance from local actors not within the control of the executive is not appropriate.

The main problem using OECD data is sample size. Since the OECD only has data from member and associate countries, the data consists of less than 20 countries, most of which are developed. I look at the methodology that the IMF and the OECD follow to determine structural deficits, and try a similar, stripped down version in order to increase sample size.⁵⁵

The basic construction of structural deficits consists of two steps. The first step consists of determining the potential output of an economy. The second step consists of determining the elasticities of different fiscal components with respect to changes in output.

Finally, these elasticities are applied to the potential output estimates. These estimates are therefore net

⁵⁵Hagemann (1999) presents and describes the methodology employed by the IMF whereas Giorno, Richardson, Roseveare, and van den Noord (1995) presents the methodology employed by the OECD.

of cyclical fluctuations and more closely display fiscal policy. From a conceptual standpoint, the structural balance can be constructed as:

$$B^* = T^* - G^* \quad (\text{SBB})$$

where B^* is the structural balance, T^* is the structural tax revenue and G^* is the structural government expenditures. The structural tax revenue and government expenditures are related to total output in the following way:

$$X^* = X \left[\frac{Y^*}{Y} \right]^{\alpha_X} \quad (\text{Components})$$

for $X = \{T, G\}$ where Y is actual output and Y^* is potential output. Finally, $\alpha_T > 0$ and $\alpha_G < 0$.

I thus take the following strategy. I employ the Hodrick-Prescott filter to get the potential output. I get:

$$Y^* = HP(Y)$$

and remove a proportion of the earlier and most recent observations to keep only those in the middle.⁵⁶

I then proceed to get the elasticities for tax revenues and government expenditures. Notice that since a method of calculating the elasticities is a simple regression of X on Y :

$$X = \widehat{\alpha_X} Y \text{ for } X = \{T, G\} \quad (\text{Elasticities})$$

I use those coefficients as the elasticities in equation Components to get:

$$X^* = X \left[\frac{Y^*}{Y} \right]^{\widehat{\alpha_X}} \text{ for } X = \{T, G\} \quad (\text{Components})$$

Finally, I use equation SBB to get the structural balance.⁵⁷ I then divide over output to get the balance

⁵⁶Time-series smoothing methods are criticized for being too mechanistic. In particular, there are two main sources of criticism with respect to the HP filter: its inability to detect structural breaks and the so called endpoint problem. In order to deal with these issues, I remove the earlier and later observations and only keep those observations in the middle period of the time series.

⁵⁷The method that I employ could be considered a stripped down version of the methodology employed by the OECD. The main differences lie in that 1) they employ a production function rather than a time-series smoothing technique and that 2) I

over output and then proceed to get the electoral year balance change and the term balance change as explained in the appendix.

3.4 Data and Modifications to the Brender-Drazen Model

The sources of data and construction of variables are explained in the appendix. Most of the data employed is either the same employed by Brender and Drazen (2008) or alternative variables for these. The summary statistics are presented in Table 2.

do not disaggregate tax revenues into components but rather work with only one revenue elasticity.

Table 2. Summary Statistics

Variable	Name	Observations	Mean	Standard Deviation	Minimum	Maximum	Characteristics	Correlation with BD08
Electoral Definitions								
Reelection - BD08	reelect3	347	0.423631	0.4948469	0	1	Dichotomous	NA
Reelection a la BD08, Extended	reelect3lg	391	0.434783	0.4963636	0	1	Dichotomous	NA
Reelection, Alternative	dpelect	396	0.510101	0.5005303	0	1	Dichotomous	0.8358
Reelection, Consensus	reelectcons	349	0.467049	0.4996293	0	1	Dichotomous	NA
Economic Growth								
Term Growth - BD08	gdppc_gr3	347	0.023174	0.0210604	-0.0476	0.0883	Continuous	NA
Term Growth - PWT	termgdpgpr	402	0.023263	0.025066	-0.082806	0.115353	Continuous	0.7932
Electoral Year Fiscal Balance Change								
BD08	ddef1	347	-0.00338	0.0188328	-0.091663	0.049928	Continuous	NA
Expanded Variable - BD08, BD05, PT02	consbalch0	396	-0.00244	0.0238143	-0.153915	0.1857127	Continuous	NA
Cyclically Adjusted Variable - BD05	cycadjmebalch0	277	-0.00066	0.031412	-0.113117	0.2981986	Continuous	0.7997
Term Fiscal Balance Change								
BD08	ddef3_n	347	0.000174	0.0237232	-0.133047	0.0743984	Continuous	NA
Expanded Variable - BD08, BD05, PT02	consbalch1	396	0.000506	0.0236174	-0.133047	0.0743984	Continuous	NA
Cyclically Adjusted Variable - BD05	cycadjmebalch1	255	0.001002	0.0268951	-0.158304	0.0885423	Continuous	0.8737
Degree of Economic Development								
BD08 Dummy for Developed Countries	developedbd	405	0.518519	0.500275	0	1	Dichotomous	NA
Natural Log of GDP per Capita, 1995 USD - PWT	loggdpusd	402	9.324778	0.8501684	6.866316	10.8177	Continuous	0.7278
Degree of Political Development								
Old Democracy Dummy - BD08	old	347	0.694525	0.4612737	0	1	Dichotomous	NA
Old Democracy Dummy - Constructed using Polity IV	oldcons	405	0.622222	0.4854313	0	1	Dichotomous	0.7974
Polity Score, normalized to lie between (-1,1)	polity2norm	369	0.847697	0.2744587	-0.8	1	Discrete	0.5953
Continuous Years with a Positive Polity Score, Starting in 1946	p_yrsdemo46	396	26.43182	16.90997	0	60	Discrete	0.6406
Electoral Rules Majoritarian/Plural vs. Proportional System								
Majoritarian Dummy - BD08	maj	347	0.256484	0.4373227	0	1	Dichotomous	NA
Plurality Dummy using DPI	plural2	387	0.382429	0.4866096	0	1	Dichotomous	0.7455
Other								
Average Years of Schooling for Population 25 and older - Barro-Lee	yr_sch	398	7.835342	2.528315	0.9669	12.7056	Continuous	NA
Civil Liberties from Freedom House normalized between (0,1)	fh_cl	348	0.825192	0.1906747	0.333333	1	Discrete	NA

There are a few comments from these summary statistics. For the reelection variable, since my definition is more liberal and considers party success an electoral success, the average number of successes is larger than in the Brender-Drazen definition. The "consensus" definition forces us to drop around 10% of the sample with respect to the extended Brender-Drazen definition variable. The correlation between reelect3, reelect3lg and reelectcons is obviously 1, since reelect3lg is a reelect3 expanded and reelectcons is constructed from every election in which the reelect3lg coincides with dpelect.

The same is true for the expanded fiscal variables. I explain in the appendix that the alternative fiscal variable is constructed from supplementing missing values from Brender and Drazen 2008 with observations from Brender and Drazen (2005) (henceforth BD05) and Persson and Tabellini (2002). (henceforth PT02) Readers should be reassured by the fact that those overlapping observations between Brender and Drazen 2008 and Brender and Drazen 2005 and between Brender and Drazen 2008 and Persson and Tabellini 2002 are highly correlated.⁵⁸

The correlation between term GDP growth is surprisingly low. I employ the Penn World Tables to construct the variable whereas Brender and Drazen employ data from the World Development Indicators. The correlation between degrees of economic development is high considering that one variable is continuous and the other one is dichotomous. The correlation between the political development variables is weaker. A final and important point is that of interpretation of values. Variables have been normalized in such a way that a higher value implies a greater degree of whatever the variable is.

Now that the alternative variables have been compared individually with those in Brender and Drazen, I show the correlation matrix for the variables of the benchmark specification to show how they perform with respect to one another. These correlations matrices are presented in table 3.

⁵⁸The correlation between BD08 and BD05 for the electoral year fiscal balance change is .9928 whereas the correlation between BD08 and PT02 is .8772. Conversely, the correlations for the term fiscal balance change are .9480 and .8686, respectively.

Table 3. Correlation Matrix

Correlation Matrix for Brender and Drazen (347 Joint Observations)								
		reelect3	gdppc_gr3	ddef1	ddef3_n	maj	old	dev
Reelection Dummy	reelect3	1						
Term GDP Growth	gdppc_gr3	0.2137	1					
Electoral Year Fiscal Balance Change	ddef1	0.1158	0.1778	1				
Term Fiscal Balance Change	ddef3_n	0.0881	-0.0479	-0.1692	1			
Majoritarian Dummy	maj	0.1108	-0.0467	-0.0744	0.0353	1		
Old Democracy Dummy	old	0.0494	0.0803	0.0707	0.0365	0.0313	1	
Developed Country Dummy	dev	0.1371	0.1059	0.096	0.0185	-0.1079	0.5508	1
Correlation Matrix for Alternative Variables (377 Joint Observations)								
		dpelect	termgdpgr	consbalch0	consbalch1	plural2	oldcons	dev
Reelection Dummy	dpelect	1						
Term GDP Growth	termgdpgr	0.2673	1					
Electoral Year Fiscal Balance Change	consbalch0	0.0704	0.1521	1				
Term Fiscal Balance Change	consbalch1	0.0163	0.0279	-0.0607	1			
Majoritarian Dummy	plural2	0.0182	-0.0238	0.0008	0.048	1		
Old Democracy Dummy	oldcons	0.0361	0.0388	0.1424	-0.0077	-0.0826	1	
Developed Country Dummy	dev	0.1238	0.106	0.0837	0.0136	-0.0985	0.6049	1

It is reassuring to see that the correlations between the dependent and independent variables have the same sign across the two matrices, and roughly similar magnitudes. The correlation of the term fiscal balance change is low in both matrices but too close to 0 in the alternative variables matrix. Term fiscal balance change also has opposite signs in its correlation with economic growth, but the correlation is close to 0 in both cases. Additionally, the correlations between majoritarian/plurality electoral system and electoral year fiscal balance also have opposite signs, but the value for the alternative variables matrix is too close to 0. We have the same problem between the old democracy variable and both the term fiscal balance change and the majority/plurality variable. In general terms, the correlation matrices look substantially similar. While some contrary signs appear, these are limited to relationships where the correlation was small in the first place.

3.4.1 Alternative Regressions

As explained below, I reconstruct the data in order to increase the number of observation. Additionally, I try a different electoral definition and I replace fiscal deficits with cyclically adjusted deficits. These are the main results of the paper and are presented in table 4.⁵⁹

⁵⁹The regressions in table 4 are run with a constant term but these are not displayed for space considerations. The constant terms are all negative and statistically significant for the full sample regressions and the developing countries, as well as for

Table 4. Brender and Drazen with Different Sample, Electoral Definition and Cyclically Adjusted Deficits

	Benchmark		Increased Sample	Alternative Electoral Definition		Cyclically Adjusted Deficits	All
Dependent Variable	(1) reelect3	(2) reelect3	(3) reelect3lg	(4) dpelect	(5) reelectcons	(6) reelect3	(7) dpelect
Data Source:							
Growth	BD08	PWT	PWT	PWT	PWT	BD08	PWT
Fiscal	BD08	Alt	Alt	Alt	Alt	BD05, Cyc. Adj.	BD05, Cyc. Adj.
Controls	BD08	Alt	Alt	Alt	Alt	BD08	Alt

Logit, Full Sample							
Growth	21.36*** (0.000216)	25.07*** 0	24.66*** 0	24.15*** 0	30.01*** 0	25.50*** (0.000387)	22.50*** (0.000149)
EY Balance Change	11.78* (0.0979)	4.859 (0.517)	0.570 (0.920)	1.947 (0.703)	1.162 (0.847)	3.813 (0.608)	-2.057 (0.627)
Term Balance Change	10.58** (0.0361)	8.473 (0.111)	6.556 (0.188)	3.761 (0.431)	6.569 (0.232)	13.36** (0.0147)	5.775 (0.217)
Plurality	0.715*** (0.00638)	0.490** (0.0464)	0.454** (0.0491)	-0.0197 (0.928)	0.279 (0.252)	0.837*** (0.00792)	0.0130 (0.958)
Old Democracy	-0.341 (0.261)	-0.0702 (0.820)	0.0133 (0.964)	0.0683 (0.792)	0.0947 (0.748)	-0.369 (0.329)	0.187 (0.535)
Developed	0.705** (0.0140)	0.561* (0.0595)	0.483* (0.0932)	0.569** (0.0247)	0.577** (0.0438)	0.720** (0.0384)	0.463 (0.118)
Observations	347	319	362	394	326	247	301
Pseudo R Squared	0.0753	0.0830	0.0758	0.0743	0.0984	0.0852	0.0642
Chi2	31.61	30.30	32.82	31.41	34.63	26.06	19.87

Logit, Developed Countries							
Growth	-0.755 (0.937)	8.625 (0.333)	10.87 (0.184)	22.04** (0.0149)	18.70* (0.0594)	0.483 (0.967)	21.31** (0.0407)
EY Balance Change	35.19*** (0.00143)	21.84** (0.0494)	14.03 (0.153)	9.187 (0.333)	15.16 (0.159)	32.88*** (0.00302)	7.540 (0.449)
Term Balance Change	13.23* (0.0957)	9.207 (0.227)	9.781 (0.174)	3.472 (0.629)	6.596 (0.405)	22.16*** (0.00881)	9.385 (0.206)
Plurality	0.586 (0.142)	0.321 (0.344)	0.340 (0.301)	-0.0422 (0.894)	0.165 (0.629)	0.520 (0.256)	-0.253 (0.463)
Old Democracy	-1.266** (0.0331)	-0.0219 (0.968)	-0.166 (0.743)	0.592 (0.182)	0.211 (0.678)	-1.748** (0.0197)	0.572 (0.224)
Observations	180	169	185	200	165	140	165
Pseudo R Squared	0.0707	0.0426	0.0353	0.0596	0.0528	0.0979	0.0644
Chi2	15.35	8.955	7.823	12.21	9.343	13.74	9.430

Logit, Developing Countries							
Growth	34.47*** 0	36.53*** 0	33.65*** 0	23.09*** (0.000250)	35.86*** 0	34.48*** (0.000250)	18.62** (0.0130)
EY Balance Change	1.210 (0.902)	-4.155 (0.716)	-4.838 (0.581)	-2.738 (0.678)	-5.125 (0.575)	-9.859 (0.247)	-7.176 (0.252)
Term Balance Change	13.48* (0.0601)	9.981 (0.200)	5.259 (0.447)	3.859 (0.555)	7.795 (0.321)	13.78* (0.0700)	3.846 (0.531)
Plurality	0.703* (0.0590)	0.522 (0.167)	0.483 (0.158)	-0.0814 (0.791)	0.278 (0.439)	1.036** (0.0296)	0.202 (0.582)
Old Democracy	-0.191 (0.591)	-0.112 (0.779)	0.142 (0.700)	-0.251 (0.449)	0.0130 (0.973)	-0.293 (0.529)	-0.0866 (0.829)
Observations	167	150	177	194	161	107	136
Pseudo R Squared	0.112	0.136	0.120	0.0616	0.124	0.147	0.0540
Chi2	21.22	22.66	26.52	14.80	24.55	20.97	8.868

developed countries for equations 1 and 6.

Each column presents the results for the full sample, the developed countries sample and the developing countries sample. Column 1 displays the benchmark specification from Brender and Drazen and is this the same as equations 1-3 in table 1. Column 2 displays the same benchmark specification and is limited to the sample from Brender and Drazen (2008) but employs the alternative independent variables that I had to construct (i.e. old is replaced with oldcons and maj is replaced with plural2). Column 3 displays the results when the sample size is expanded. Column 4 displays the effects of replacing the electoral definition from the Brender-Drazen definition, to my more liberal definition of electoral success. Column 5 displays the results when the electoral definition is replaced with the "consensus" definition, that is, an electoral definition which keeps those observations in which the values for the Brender and Drazen (2008) and my alternative definition coincide. In column 6, the fiscal balance change variables are replaced with cyclically adjusted fiscal variables. Finally, column 7 displays the results from using the extended sample, the alternative electoral definition and the cyclically adjusted fiscal variables.⁶⁰

The following results arise: column 2 behaves similarly to column 1. Some differences are that the magnitude of the effect of growth is slightly larger. Additionally, the effects of growth no longer carry a negative sign in the developed country sample. The plurality, developed and old democracy dummies behave in a similar fashion in both specifications. An important difference, though is that the electoral year balance change is no longer statistically significant in the full sample specification. Similarly, term fiscal balance change is no longer statistically significant, although this shouldn't be a cause of concern for the full sample, where the variable has a p-value of .11.

As the sample is extended in column 3, the results are similar to column 2. Economic growth is statistically significant for the full sample and for developing countries. While it is not significant for developed countries, it is worth noting that the coefficient becomes larger and the p-value smaller. The p-values and magnitudes for the coefficients for the fiscal variables in the developed sample are similar to the p-value and coefficient for economic growth.⁶¹

⁶⁰Unfortunately, since data from BD05 is employed to construct the cyclically adjusted fiscal variables, sample size is limited because of the small sample for fiscal observations.

⁶¹Notice that the p-values of less than .2, which although not statistically significant, they still suggest an important correlation.

As the alternative definition of electoral variables is employed, economic growth becomes statistically significant for all samples. The magnitude of the coefficient is also very similar for all three samples. Additionally, fiscal variables appear to be completely irrelevant for reelection in developed countries, as displayed by the high p-values. By replacing the definition of electoral success with the "consensus" definitions in column 5, the results from column 4 still hold with minor differences: the effect of growth loses some significance in the developed countries sample but remains statistically significant at the 10% level. Additionally, the magnitude of the effect is now considerably larger in the full sample and in the developing country sample than in the developed country sample. Finally, while electoral year fiscal balance change remains not statistically significant, the coefficient is larger and the p-value is less than .2.

In column 6, the benchmark specification is run with the exception that the fiscal variables are replaced with cyclically adjusted variables. The results are very similar to the benchmark. For the developed countries sample, the main difference is that electoral year balance loses its significance with respect to column 1 but term balance remains statistically significant. For the developed country sample, both the fiscal variables are significant. While economic growth is no longer significant, the coefficient is still positive. Finally, for the developing countries sample, economic growth is significant and while term fiscal balance change is no longer significant, it is only marginally not significant. Overall, there is a slight reduction in magnitude and significance for the fiscal variables with respect to the benchmark, but they behave similarly.

In column 7, I employ the alternative electoral definition as well as cyclically-adjusted deficits. The only statistically significant variable in this case is GDP growth. Surprisingly, the magnitude of the coefficient is slightly larger for the developed countries sample than for the developing country sample. Additionally, although electoral year fiscal balance change is not significant, the p-values are low in the developed countries sample.

Taking all the results together, economic growth definitely increases reelection chances in developing countries. Economic growth is also statistically significant for the full sample. The increase in sample size and the use of alternative electoral definitions increases the likelihood that economic growth is statistically significant in developed countries. The effect is smaller in developed countries than in developing countries. Additionally, growth is statistically significant in all specifications in the full sample and developing countries

sample.

The evidence for fiscal variables is as follows. There seems to be strong evidence that term fiscal prudence increase reelection chances for the full sample and there is weak evidence with respect to the same in developing countries. Additionally, there is strong evidence that fiscal prudence during electoral years increases reelection chances in developed countries. Surprisingly, there is not a single equation in which both electoral year balance and economic growth are statistically significant.

I run these same equations but control for country fixed effects. The results are displayed in Table 5.

Table 5. Different Sample, Electoral Definition and Cyc. Adj. Def., Using Fixed Effects

Dependent Variable Data Source: Growth Fiscal Controls	Benchmark		Increased Sample	Alternative Electoral Definition		Cyclically Adjusted Deficits	All
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	reelect3	reelect3	reelect3lg	dpelect	reelectcons	reelect3	dpelect
	BD08	PWT	PWT	PWT	PWT	BD08	PWT
	BD08	Alt	Alt	Alt	Alt	BD05, Cyc. Adj.	BD05, Cyc. Adj.
	BD08	Alt	Alt	Alt	Alt	BD08	Alt
Full Sample							
Growth	21.82*** (0.00453)	24.54*** (0.000697)	24.73*** (0.000181)	28.06*** (1.80e-05)	33.43*** (2.10e-05)	33.50*** (0.00112)	27.22*** (0.000177)
EY Balance Change	16.06** (0.0419)	6.805 (0.430)	2.272 (0.762)	5.436 (0.462)	2.513 (0.770)	9.888 (0.271)	4.465 (0.552)
Term Balance Change	11.60** (0.0410)	9.502 (0.109)	5.135 (0.334)	2.959 (0.608)	5.268 (0.425)	17.59** (0.0146)	4.399 (0.459)
Plurality	0.173 (0.868)	-12.38 (0.993)	-0.186 (0.893)	0.196 (0.849)	0.171 (0.905)	0.472 (0.650)	0.446 (0.685)
Old Democracy	-2.174*** (0.00380)	-1.780 (0.230)	0.0364 (0.959)	-0.675 (0.357)	-0.658 (0.452)	-3.121** (0.0126)	0.0319 (0.968)
Observations	301	272	320	331	265	207	250
Number of Countries	53	49	54	51	47	41	43
Pseudo R Squared	0.103	0.0922	0.0667	0.0887	0.113	0.148	0.0851
Chi2	27.61	22.20	19.36	26.74	27.12	25.61	18.78
Avg. obs per country	5.679	5.551	5.926	6.490	5.638	5.049	5.814
Min obs per country	2	2	2	2	2	2	2
Max obs per country	14	12	13	14	12	10	12

Table 5 Continued. Different Sample, Elect. Def. and Cyc. Adj. Def., Using Fixed Effects

Dependent Variable Data Source: Growth Fiscal Controls	Benchmark		Increased Sample	Alternative Electoral Definition		Cyclically Adjusted Deficits	All
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	reelect3	reelect3	reelect3lg	dpelect	reelectcons	reelect3	dpelect
Growth	BD08	PWT	PWT	PWT	PWT	BD08	PWT
Fiscal	BD08	Alt	Alt	Alt	Alt	BD05, Cyc. Adj.	BD05, Cyc. Adj.
Controls	BD08	Alt	Alt	Alt	Alt	BD08	Alt

Developed Countries							
Growth	13.60 (0.229)	18.26* (0.0709)	18.96** (0.0401)	29.12*** (0.00212)	31.30*** (0.00571)	18.34 (0.231)	25.07** (0.0122)
EY Balance Change	29.74** (0.0157)	16.53 (0.166)	12.38 (0.255)	7.146 (0.510)	5.877 (0.638)	26.51* (0.0765)	7.984 (0.490)
Term Balance Change	10.70 (0.176)	7.451 (0.345)	7.450 (0.317)	1.513 (0.837)	4.543 (0.578)	19.80** (0.0348)	7.567 (0.339)
Plurality	1.266 (0.265)			1.072 (0.496)		0.948 (0.419)	0.812 (0.609)
Old Democracy	-2.580* (0.0697)	-1.569 (0.346)	-1.129 (0.440)	-0.532 (0.648)	-1.432 (0.366)	-2.465* (0.0917)	-0.622 (0.599)
Observations	173	162	178	190	153	129	156
Number of Countries	22	22	22	22	21	20	21
Pseudo R Squared	0.0985	0.0729	0.0635	0.0893	0.102	0.146	0.0892
Chi2	16.27	11.18	11.02	16.53	14.83	16.91	13.03
Avg. obs per country	7.864	7.364	8.091	8.636	7.286	6.450	7.429
Min obs per country	5	4	4	4	3	4	4
Max obs per country	14	12	13	14	12	10	12

Developing Countries							
Growth	29.52** (0.0189)	30.63*** (0.00704)	29.58*** (0.00337)	26.74*** (0.00619)	36.44*** (0.00293)	40.90** (0.0301)	29.22** (0.0178)
EY Balance Change	9.172 (0.391)	-2.283 (0.861)	-6.414 (0.537)	3.932 (0.710)	-0.0171 (0.999)	3.707 (0.786)	3.629 (0.741)
Term Balance Change	15.63 (0.100)	13.26 (0.154)	3.341 (0.675)	4.178 (0.668)	7.812 (0.515)	18.73 (0.172)	-0.632 (0.945)
Plurality	-15.54 (0.991)	-0.142 (1.000)	-0.250 (0.865)	-0.366 (0.802)	0.00503 (0.997)	-14.88 (0.998)	-0.360 (0.817)
Old Democracy	-2.727** (0.0198)	-14.56 (0.996)	0.571 (0.506)	-0.574 (0.562)	-0.233 (0.825)	-18.55 (0.995)	0.813 (0.452)
Observations	128	110	142	141	112	78	94
Number of Countries	31	27	32	29	26	21	22
Pseudo R Squared	0.169	0.149	0.0976	0.0933	0.136	0.216	0.0966
Chi2	17.40	13.06	11.38	10.84	12.98	12.43	7.214
Avg. obs per country	4.129	4.074	4.438	4.862	4.308	3.714	4.273
Min obs per country	2	2	2	2	2	2	2
Max obs per country	9	9	9	9	9	7	8

The results in column 1 correspond with columns 4-6 in Table 1. Column 2 displays the benchmark using the alternative independent variables for plurality and old democracy. Some differences with respect to column 1 are that electoral year fiscal balance change is no longer significant for either the full sample or the developed countries sample. Term fiscal balance change is no longer statistically significant for the full sample, but it is only marginally non-significant. Finally, GDP growth is significant for all samples. Column 3 mirrors the results of column 2. In both cases, the effects of growth on reelection are greater for developing countries than for developed countries.

Using the more liberal alternative definition of electoral success, the same results hold. The only difference is that the effect of growth appears to be stronger for developed countries than for developing countries. Using the "consensus" definition of electoral growth, I get the same results as in columns 2 and 3: growth is significant for all samples and fiscal variables have no effect on reelection.

As I correct for cyclically adjusted deficits, I get results very similar to the benchmark. GDP growth has a significant effect in the full sample and in developing countries but not in developed countries. The coefficient of growth is higher than in the benchmark for all samples, though. Term balance change is statistically significant in the full sample and the developed countries sample. Finally, electoral year fiscal prudence is rewarded in developed countries. In the final specification, which features both the liberal definition of reelection and cyclically adjusted fiscal variables, growth turns out to be significant, whereas fiscal variables are not statistically significant.

I was worried about my plurality definition. For that reason, I also ran the equations using the definition of majoritarian electoral systems from Norris (2009). The tables are omitted but available upon request. The disadvantage of doing so was that the sample size dropped dramatically. The main differences in results for the standard logit specification were that growth only benefited incumbents when the alternative electoral definition was used. In addition, the evidence in favor of fiscal policies helping reelection was stronger: term fiscal balance was statistically significant in the full sample. Electoral year balance change was significant in developed countries for every specification except for those employing the alternative definition of electoral success (i.e. columns 4 and 7). In contrast, the fixed effects specifications showed strong evidence in favor of growth. Economic growth is significant for all full sample and developing countries sample specifications.

In addition, they are statistically significant for developed countries in specifications 4-7. In specifications 2 and 3, the p-values are .16 and .11, respectively. As for fiscal performance, There is partial evidence that term balance change helps reelection in the full sample but the evidence is weak for both the developed and developing countries sub-samples. Electoral year balance change is only significant in the fill sample for specification 4 and in the developing countries sample in specification 2.

3.5 Robustness Tests

One finding of interest from the Brender-Drazen model is that voters in developing countries behave differently from voters in developed countries. I look at some explanations as to why this may be the case. For example, it may be possible that in developing countries, voters are more easily fooled. That would suggest that perhaps lower levels of human development may cause this difference.

Alternatively, informational issues may affect outcomes: there may be a greater degree of transparency in developed countries which may lead to either voters punishing opportunism or economic agents rendering expansionary policies ineffective.

Finally, a higher degree of institutional development may cause incumbents to have a more important role on macroeconomic outcomes.⁶² If that is the case, then voters may give macroeconomic voting a higher weight in less developed countries.

In order to control for human development, I use the average years of schooling from Barro-Lee. To control for transparency, I use the Freedom House Civil Liberties as a proxy. In fact, Freedom House does have an indicator for freedom of press but unfortunately, it is a rather recent indicator, which limits data availability to a point that it is not useful for the purposes of this study. Finally, I use the Polity IV indicator as a measure of institutional development. In addition, I generate a variable that counts the number of years since the Polity IV indicator was last non-positive (I start to count in the year 1946 for those that have had a positive indicator since before).

Finally, country fixed effects are employed for the remainder of the paper: it seems unreasonable to impose the homogeneity restriction. The results differ significantly between the pooled and fixed effects specification. In table 6, I control for institutional factors, transparency and human development.

⁶²Jones and Olken (2005) have shown that not only does leadership affect macroeconomic outcomes, but that the magnitude of the effect is inversely related to the degree of institutional development.

Table 6. Controlling for Alternative Explanations

	Benchmark		Increased Sample	Alternative Electoral Definition		Cyclically Adjusted Deficits	All
	(1) reelect3	(2) reelect3	(3) reelect3lg	(4) dpelect	(5) reelectcons	(6) reelect3lg	(7) dpelect
Dependent Variable							
Data Source:							
Growth	BD08	PWT	PWT	PWT	PWT	BD08	PWT
Fiscal	BD08	Alt	Alt	Alt	Alt	BD05, Cyc. Adj.	BD05, Cyc. Adj.
Controls	BD08	Alt	Alt	Alt	Alt	BD08	Alt
Full Sample							
Growth	26.42** (0.0178)	26.07*** (0.00754)	24.21*** (0.00447)	32.52*** (0.000155)	34.97*** (0.000491)	37.86*** (0.00545)	33.17*** (0.000328)
EY Fiscal Balance	14.83 (0.155)	8.431 (0.464)	5.929 (0.517)	4.393 (0.626)	0.570 (0.959)	5.391 (0.636)	4.763 (0.588)
Term Fiscal Balance	15.56* (0.0524)	18.23** (0.0409)	9.600 (0.170)	7.955 (0.256)	15.40* (0.0839)	17.25* (0.0554)	4.179 (0.535)
Plurality	0.909 (0.445)	-7.562 (0.993)	-2.378 (0.737)	0.758 (0.600)	-1.557 (0.776)	0.742 (0.544)	0.744 (0.605)
Old Democracy	-3.065** (0.0349)	-1.884 (0.341)	0.111 (0.907)	-0.905 (0.334)	-0.637 (0.583)	-3.507** (0.0340)	-0.656 (0.505)
Civil Liberties - Freedom House	4.781 (0.146)	5.576* (0.0844)	3.050 (0.158)	1.747 (0.398)	4.639* (0.0812)	8.387* (0.0505)	1.064 (0.622)
Years of Schooling - Barro-Lee	-0.254 (0.464)	-0.605 (0.142)	-0.340 (0.331)	-0.372 (0.301)	-0.399 (0.323)	-0.488 (0.293)	-0.407 (0.283)
Years as a Democracy since 1946 - Polity IV	0.0475 (0.186)	0.0400 (0.318)	0.0174 (0.604)	0.0301 (0.383)	0.0176 (0.646)	0.0617 (0.184)	0.0356 (0.343)
Polity IV Score	-7.061*** (0.00639)	-13.43*** (0.00245)	-5.499*** (0.00934)	-4.531** (0.0168)	-5.194** (0.0144)	-6.064** (0.0315)	-3.728* (0.0504)
Observations	210	193	233	254	197	170	212
Number of Countries	43	41	46	44	39	35	37
Pseudo R Squared	0.216	0.230	0.154	0.183	0.222	0.215	0.162
Chi2	37.91	36.72	30.86	39.88	37.18	30.46	29.98
Avg. obs per country	4.884	4.707	5.065	5.773	5.051	4.857	5.730
Min obs per country	2	2	2	2	2	2	2
Max obs per country	11	9	10	11	10	10	11

Table 6 (Continued). Controlling for Alternative Explanations

Dependent Variable Data Source: Growth Fiscal Controls	Benchmark		Increased Sample	Alternative Electoral Definition		Cyclically Adjusted Deficits	All
	(1) reelect3	(2) reelect3	(3) reelect3lg	(4) dpelect	(5) reelectcons	(6) reelect3lg	(7) dpelect
	BD08	PWT	PWT	PWT	PWT	BD08	PWT
	BD08	Alt	Alt	Alt	Alt	BD05, Cyc. Adj.	BD05, Cyc. Adj.
	BD08	Alt	Alt	Alt	Alt	BD08	Alt
Developed Countries							
Growth	22.45 (0.208)	14.12 (0.307)	16.85 (0.155)	34.01*** (0.00519)	31.49** (0.0339)	20.35 (0.278)	30.87** (0.0103)
EY Fiscal Balance	27.74* (0.0832)	26.57 (0.107)	18.50 (0.181)	8.916 (0.496)	1.832 (0.906)	24.56 (0.160)	10.21 (0.445)
Term Fiscal Balance	16.43 (0.113)	17.42 (0.101)	16.09 (0.101)	7.280 (0.416)	11.93 (0.268)	20.67* (0.0570)	9.650 (0.291)
Plurality	0.871 (0.594)			1.299 (0.445)		0.550 (0.759)	1.317 (0.438)
Old Democracy	-2.610 (0.227)	-1.835 (0.426)	-1.435 (0.456)	-0.651 (0.677)	-1.598 (0.439)	-1.581 (0.521)	-0.650 (0.677)
Civil Liberties - Freedom House	1.533 (0.859)	5.028 (0.503)	5.388 (0.457)	3.226 (0.475)	5.247 (0.493)	3.851 (0.710)	2.598 (0.583)
Years of Schooling - Barro-Lee	-0.471 (0.497)	-0.666 (0.346)	-0.109 (0.864)	-0.158 (0.799)	-0.282 (0.687)	-0.624 (0.448)	-0.129 (0.843)
Years as a Democracy since 1946 - Polity IV	0.0464 (0.395)	0.0362 (0.484)	0.00193 (0.968)	0.00473 (0.921)	0.0211 (0.679)	0.0365 (0.580)	-0.00752 (0.882)
Polity IV Score	-32.01 (0.164)	-17.15* (0.0631)	-19.63** (0.0300)	-9.348 (0.197)	-150.2 (0.992)	-149.9 (0.993)	-7.915 (0.310)
Observations	119	112	125	141	110	110	134
Number of Countries	18	18	18	19	17	17	18
Pseudo R Squared	0.223	0.177	0.168	0.150	0.216	0.212	0.135
Chi2	23.51	17.26	19.40	19.58	21.38	20.50	16.84
Avg. obs per country	6.611	6.222	6.944	7.421	6.471	6.471	7.444
Min obs per country	4	4	4	4	3	4	5
Max obs per country	11	9	10	11	10	10	11
Developing Countries							
Growth	55.29** (0.0111)		31.12** (0.0175)	31.88** (0.0163)	42.43*** (0.00859)	72.38** (0.0397)	39.99** (0.0332)
EY Fiscal Balance	0.303 (0.984)		-2.466 (0.854)	2.840 (0.840)	2.589 (0.884)	-6.865 (0.735)	13.76 (0.363)
Term Fiscal Balance	28.65 (0.101)		2.295 (0.842)	11.18 (0.391)	30.74 (0.142)	34.70 (0.174)	-2.900 (0.809)
Plurality	-16.24 (0.998)		-1.958 (0.579)	-0.804 (0.912)	-1.247 (0.750)	-13.79 (0.998)	-1.251 (0.844)
Old Democracy	-19.60 (0.995)		1.208 (0.381)	-1.255 (0.397)	0.227 (0.885)	-21.66 (0.993)	-0.191 (0.918)
Civil Liberties - Freedom House	13.76** (0.0257)		2.611 (0.318)	1.102 (0.668)	4.859 (0.127)	18.88** (0.0443)	1.056 (0.718)
Years of Schooling - Barro-Lee	-0.510 (0.428)		-0.291 (0.512)	-0.564 (0.282)	-0.188 (0.740)	-1.623 (0.388)	-0.920 (0.188)
Years as a Democracy since 1946 - Polity IV	0.100 (0.203)		0.00433 (0.936)	0.0678 (0.269)	0.00108 (0.987)	0.266 (0.206)	0.141 (0.104)
Polity IV Score	-8.109** (0.0156)		-4.233** (0.0228)	-4.217** (0.0434)	-4.688** (0.0214)	-8.709* (0.0576)	-4.208* (0.0689)
Observations	91	91	108	113	87	60	78
Number of Countries	25	25	28	25	22	18	19
Pseudo R Squared	0.373	0.373	0.230	0.259	0.309	0.432	0.296
Chi2	26.08	26.08	19.37	22.53	21.13	19.39	17.81
Avg. obs per country	3.640	3.640	3.857	4.520	3.955	3.333	4.105
Min obs per country	2	2	2	2	2	2	2
Max obs per country	7	7	7	8	7	6	8

The institutional development (Polity IV score) is has the correct sign in all specifications. Additionally,

it is statistically significant in the full sample and developing countries sample. In contrast, it is only statistically significant for two specifications in developed countries. Additionally, human capital has the correct sign. In contrast, the civil liberties has a sign contrary to what was expected and is statistically for some specifications in the full sample and the developing country sample. It is possible that this occurs because of a high correlation between civil liberties and the Polity score.

Economic growth is statistically significant in the full sample and in developing countries. For developed countries, it is statistically significant for the alternative and "consensus" electoral definition variables (i.e. columns 3, 4 and 7). Recall that column 7 shows the three original modifications: change in sample size, use of cyclically adjusted deficits and the alternative electoral definition.

Term fiscal balance change is statistically significant in some of the specifications for the full sample as well as for the cyclically adjusted fiscal balance equation (column 6) and is borderline not significant for columns 1-3. Finally, electoral year balance change is significant only for the benchmark specification.

While two of the alternative explanations turned out to have the correct sign, and while one of them has some explanatory power, these still do not justify why economic growth is statistically significant in developing countries and not consistently so in developed countries.

3.5.1 Interaction Terms

As a second robustness test, I employ interaction terms. An advantage of interacting variables is that it allows us to test for the effects of our variables of interest separately for samples with different characteristics while preserving the larger sample size and the joint information for the rest of the control variables.

I take two different approaches. The first, which is similar to the method employed by BD08 in the robustness equations, is to interact growth and the fiscal balances with a dummy for developed and a dummy for developing countries. The results are presented in table 7. The second method involves using a continuous variable for economic development and regressing the effects of the variables of interest and of the variables of interest times the degree of economic development variable. The results from this second approach are presented in tables 8 and 9.

Table 7 is constructed as follows: The first column displays the results using the BD08 electoral definition,

the BD08 observations and the BD08 control variables. Column 2 displays the results using the BD08 electoral definition and BD08 observations but replacing the control variables with the alternative measures. (i.e. maj and old are replaced with plural2 and oldcons). I use the same variables in column 3 is the same as column 2 but over the expanded sample. In column 4, I control for institutional development, human development and transparency. For columns 5-8, I run the same regressions as in columns 1-4 but replace the dependent variable with my alternative definition.

Table 7. Economic Development Interaction Terms à la Brender and Drazen

Dependent Variable	(1) reelect3	(2) reelect3	(3) reelect3lg	(4) reelect3lg	(5) dpelect	(6) dpelect	(7) dpelect	(8) dpelect
Interaction BW Developed Country and Term GDP growth	13.82 (0.143)	18.35* (0.0697)	17.93* (0.0504)	14.82 (0.181)	22.62** (0.0226)	31.53*** (0.00550)	28.47*** (0.00223)	32.25*** (0.00554)
Interaction BW Developing Country and Term GDP growth	32.29*** (0.00607)	30.82*** (0.00658)	29.19*** (0.00377)	32.43** (0.0173)	39.99*** (0.00284)	37.74*** (0.00401)	27.12*** (0.00575)	32.92** (0.0123)
Interaction BW Developed Country and EY Balance Change	22.88* (0.0573)	16.61 (0.164)	13.00 (0.238)	15.62 (0.225)	13.70 (0.261)	7.399 (0.558)	7.431 (0.490)	7.826 (0.531)
Interaction BW Developing Country and EY Balance Change	-0.690 (0.956)	-2.751 (0.831)	-6.327 (0.545)	-2.622 (0.845)	9.286 (0.495)	8.016 (0.577)	3.068 (0.771)	0.343 (0.979)
Interaction BW Developed Country and Term Balance Change	8.742 (0.274)	7.446 (0.345)	7.442 (0.316)	14.59 (0.101)	5.091 (0.526)	2.076 (0.795)	2.102 (0.774)	6.208 (0.471)
Interaction BW Developing Country and Term Balance Change	11.76 (0.195)	13.32 (0.153)	3.423 (0.664)	3.747 (0.738)	14.39 (0.283)	14.72 (0.271)	4.028 (0.677)	12.01 (0.358)
Plurality	0.268 (0.802)	-11.23 (0.989)	0.0575 (0.968)	-2.226 (0.761)	-0.168 (0.872)	-12.28 (0.989)	0.232 (0.822)	0.856 (0.562)
Old Democracy	-2.149*** (0.00444)	-1.716 (0.279)	0.0948 (0.896)	0.160 (0.868)	-1.854** (0.0108)	-1.923 (0.238)	-0.676 (0.361)	-0.928 (0.324)
Civil Liberties - Freedom House				3.092 (0.167)				1.850 (0.375)
Years of Schooling - Barro Lee				-0.355 (0.314)				-0.353 (0.331)
Years as a Democracy since 1946 -				0.0133 (0.696)				0.0282 (0.414)
Polity Score				-5.556** (0.0112)				-4.548** (0.0168)
Observations	285	272	320	233	268	255	331	254
Number of Countries	50	49	54	46	46	45	51	44
Pseudo R Squared	0.120	0.100	0.0735	0.165	0.129	0.138	0.0892	0.185
Chi2	30.72	24.12	21.33	32.95	31.53	31.86	26.89	40.25
Avg obs per country	5.700	5.551	5.926	5.065	5.826	5.667	6.490	5.773
Min obs per country	2	2	2	2	2	2	2	2
Max obs per country	13	12	13	10	13	12	14	11

Economic and Fiscal variables from alternative specification.

I use the alternative variables for plurality and old democracy for all equations except 1 and 5, where I use BD08.

Equations 1, 2, 5 and 6 limit sample to observations employed in BD08.

The main results are that economic growth is always rewarded in developing countries, additionally, the evidence that economic growth is rewarded in developed countries is overwhelmingly strong: The results are significant for all specifications except for specifications 1 and 4, and even then, the p-values are low.

The effect of growth does appear to have a higher magnitude for developing countries (it appears so for columns 1-6).

Table 8 displays the effects when I interact the degree of economic development of the countries in the sample, as measured by the natural log of their GDP per capita in 1995 International U.S. Dollars and then multiply that variable times the variables of interest. I regress the dependent variable on the variables of interest, the interaction between the variables of interest and log GDP and other controls. Columns 1 and 2 display the results using the BD08 electoral definition, sample and control variables. Columns 3 and 4 use the BD08 electoral definition over the large sample. Columns 5 and 6 use the alternative electoral definition and Columns 7 and 8 use the "consensus" electoral definition.

Finally, alternative explanations are controlled for in the even numbered columns.

Table 8. Economic Development Interaction Terms Using Continuous Variables.

Dependent Variable	(1) reelect3	(2) reelect3	(3) reelect3lg	(4) reelect3lg	(5) dpelect	(6) dpelect	(7) reelectcons	(8) reelectcons
Term GDP Growth	99.63 (0.238)	164.0 (0.220)	124.6 (0.124)	152.4 (0.193)	148.5* (0.0824)	310.6** (0.0403)	234.3** (0.0216)	332.1* (0.0560)
Interaction between GDP Growth	-8.188 (0.358)	-14.66 (0.295)	-10.70 (0.212)	-13.61 (0.270)	-12.73 (0.156)	-28.79* (0.0646)	-21.09** (0.0470)	-30.38* (0.0909)
EY Balance Change	-96.15 (0.373)	255.1 (0.195)	-127.3 (0.158)	45.48 (0.708)	-63.09 (0.490)	19.76 (0.876)	-82.83 (0.437)	222.1 (0.297)
Interaction between EY Balance Change and Log Income	11.46 (0.320)	-24.88 (0.223)	14.01 (0.148)	-4.108 (0.749)	7.471 (0.443)	-1.401 (0.916)	9.374 (0.410)	-22.54 (0.308)
Term Balance Change	55.92 (0.506)	203.8 (0.168)	17.48 (0.826)	25.39 (0.800)	84.37 (0.384)	142.5 (0.234)	96.68 (0.386)	346.2* (0.0765)
Interaction between Term Balance Change and Log Income	-4.830 (0.583)	-18.90 (0.208)	-1.184 (0.887)	-1.521 (0.883)	-8.284 (0.407)	-13.63 (0.264)	-9.152 (0.423)	-33.15* (0.0922)
Plurality	0.183 (0.865)	1.277 (0.388)	-0.117 (0.933)	-2.935 (0.814)	0.194 (0.851)	0.829 (0.597)	0.0271 (0.985)	-1.044 (0.958)
Old Democracy	-2.102*** (0.00459)	-3.071* (0.0884)	0.215 (0.767)	0.0664 (0.947)	-0.511 (0.492)	-0.869 (0.385)	-0.435 (0.627)	-1.062 (0.414)
Polity Score		-19.54*** (0.00157)		-6.582*** (0.00986)		-5.361*** (0.00979)		-6.873*** (0.00590)
Years as a Democracy since 1946		0.0673* (0.0910)		0.0306 (0.381)		0.0375 (0.295)		0.0305 (0.458)
Years of Schooling - Barro Lee		-0.394 (0.287)		-0.377 (0.293)		-0.236 (0.540)		-0.237 (0.598)
Freedom House Civil Liberties		5.118 (0.158)		3.186 (0.169)		1.752 (0.450)		5.301* (0.0771)
Observations	285 50	197 41	320 54	233 46	331 51	254 44	265 47	197 39
Pseudo R Squared	0.116	0.272	0.0767	0.164	0.0988	0.210	0.134	0.271
Chi2	29.65	44.78	22.26	32.77	29.78	45.74	32.29	45.39
Avg obs per country	5.700	4.805	5.926	5.065	6.490	5.773	5.638	5.051
Min obs per country	2	2	2	2	2	2	2	2
Max obs per country	13	10	13	10	14	11	12	10

Economic and Fiscal variables from alternative specification.

Plurality and old democracy variables are the alternative definition except for equations 1 and 2 where they are the BD08 variables.

These results are not very reassuring: economic growth is only statistically significant for the alternative and "consensus" specifications. Regardless, the sign is correct for all the specifications and the p-values are small. The interaction variable has a negative sign but is of a much smaller magnitude than the growth

variable. Recall from Table 2, the maximum level for log income was 10.82. There are no elections in the sample for which the ratio of the coefficient of GDP growth over the coefficient of the interaction between GDP growth and the log of GDP. What this means is that while economic growth has a much stronger effect on reelection outcomes for developing countries, the effect is still positive for developed countries.

There is little evidence that fiscal variables affect reelection chances. Term balance change is only statistically significant for the specification in column 8. Surprisingly, the effect is stronger for developing countries than developed countries, as evidenced by the interaction term.

Finally, institutional development is statistically significant and has the correct sign.

Table 9 is constructed using the same variable, samples and definitions as Table 8 with the sole difference that now the fiscal variables are replaced with cyclically adjusted fiscal variables.

Table 9. Economic Development Interaction and Cyclically Adjusted Fiscal Variables.

Dependent Variable	(1) reelect3	(2) reelect3	(3) reelect3lg	(4) reelect3lg	(5) dpelect	(6) dpelect	(7) reelectcons	(8) reelectcons
Term GDP Growth	274.3* (0.0601)	409.2* (0.0513)	275.9** (0.0248)	410.3** (0.0336)	220.8* (0.0517)	399.5** (0.0283)	308.0** (0.0242)	433.8** (0.0391)
Interaction between GDP Growth and Logged Income	-24.51 (0.100)	-37.87* (0.0766)	-25.69** (0.0442)	-39.11** (0.0498)	-20.35* (0.0839)	-37.92** (0.0419)	-28.63** (0.0424)	-40.49* (0.0608)
EY Balance Change	29.69 (0.826)	145.8 (0.435)	-37.92 (0.737)	146.9 (0.409)	-33.86 (0.743)	51.68 (0.708)	-50.74 (0.694)	170.3 (0.445)
Interaction between EY Balance Change and Logged Income	-1.570 (0.914)	-14.37 (0.467)	4.892 (0.686)	-14.54 (0.438)	4.450 (0.686)	-4.531 (0.754)	5.951 (0.666)	-17.66 (0.452)
Term Balance Change	115.6 (0.314)	291.0 (0.116)	53.54 (0.595)	135.0 (0.404)	5.275 (0.962)	-14.87 (0.918)	26.69 (0.842)	190.8 (0.369)
Interaction between Term Balance Change and Logged Income	-9.850 (0.405)	-27.48 (0.144)	-3.666 (0.726)	-11.68 (0.478)	0.146 (0.990)	2.172 (0.883)	-1.509 (0.912)	-17.67 (0.412)
Plurality	1.005 (0.386)	1.533 (0.289)	0.247 (0.870)	-6.152 (0.373)	0.591 (0.604)	0.762 (0.617)	1.085 (0.550)	-1.776 (0.941)
Old Democracy	-3.609** (0.0120)	-4.725** (0.0258)	0.913 (0.334)	-0.254 (0.845)	0.338 (0.686)	-0.541 (0.610)	0.449 (0.656)	-1.000 (0.502)
Polity Score		-7.389** (0.0210)		-6.910** (0.0105)		-5.111** (0.0202)		-7.148** (0.0141)
Years as a Democracy since 1946		0.0639 (0.234)		0.0300 (0.463)		0.0435 (0.265)		0.0360 (0.419)
Years of Schooling - Barro Lee		-0.265 (0.650)		-0.313 (0.439)		-0.284 (0.486)		-0.307 (0.514)
Freedom House Civil Liberties		9.584* (0.0632)		2.835 (0.263)		0.637 (0.795)		5.030 (0.144)
Observations	207 41	170 35	239 44	195 37	250 43	212 37	194 39	164 33
Pseudo R Squared	0.208	0.281	0.140	0.208	0.101	0.192	0.152	0.254
Chi2	36.01	39.77	29.86	35.78	22.23	35.50	25.61	35.41
Avg obs per country	5.049	4.857	5.432	5.270	5.814	5.730	4.974	4.970
Min obs per country	2	2	2	2	2	2	2	2
Max obs per country	10	10	14	13	12	11	10	9

The results are very similar to those in Table 8 with the difference that growth is significant for every specification, although the effect is definitely smaller for developed countries than for developing countries. Additionally, Fiscal variables have no effect on reelection. Institutional variables are significant and have the correct sign. Human development has the correct sign but is not significant. Finally, civil liberties has the incorrect sign and is statistically significant for one of the specifications.

3.5.2 Interaction Terms for Democracy

Brender and Drazen show evidence that economic growth is not rewarded in old democracies and that fiscal deficits are punished. I run the same analysis as in tables 7 and 8 but use degree of democratization as the interaction variable instead of using the degree of development. For the dummies used to interact the variables in the discrete specification I employ BD08's old dummy variable. The results are displayed in table 10. For the continuous specification, I employ the normalized Polity IV score as my interaction term. The results are displayed in table 11.

Table 10. Old Democracy Interaction Terms à la Brender and Drazen

Dependent Variable	(1) reelect3	(2) reelect3	(3) reelect3lg	(4) reelect3lg	(5) dpelect	(6) dpelect	(7) reelectcons	(8) reelectcons
Interaction Term Between Old Democracy and Term GDP Growth	18.73*** (0.00867)	20.75** (0.0460)	21.39*** (0.00448)	22.82** (0.0359)	29.58*** (0.000516)	34.77*** (0.00225)	28.11*** (0.000959)	27.93** (0.0159)
Interaction Term Between New Democracy and Term GDP Growth	32.17** (0.0134)	31.71* (0.0678)	39.37*** (0.00755)	39.49** (0.0425)	91.72*** (0.00228)	86.47** (0.0191)	90.41*** (0.00284)	86.45** (0.0248)
Interaction Term Between Old Democracy and EY Balance Change	15.45 (0.104)	13.47 (0.287)	11.20 (0.255)	11.94 (0.363)	4.523 (0.657)	-0.206 (0.987)	5.787 (0.585)	-3.205 (0.822)
Interaction Term Between New Democracy and EY Balance Change	-9.046 (0.556)	10.81 (0.622)	-12.68 (0.432)	0.288 (0.990)	10.83 (0.631)	12.96 (0.660)	8.745 (0.695)	2.054 (0.946)
Interaction Term Between Old Democracy and Term GDP Growth	10.41* (0.0953)	14.28 (0.116)	10.21 (0.102)	16.49* (0.0769)	0.485 (0.945)	8.937 (0.333)	3.339 (0.642)	12.92 (0.187)
Interaction Term Between New Democracy and Term GDP Growth	3.296 (0.855)	29.26 (0.331)	7.367 (0.695)	31.36 (0.322)	77.72** (0.0247)	99.41* (0.0778)	74.70** (0.0302)	88.80 (0.126)
Plurality	0.425 (0.674)	1.117 (0.434)	-14.16 (0.990)	-10.21 (0.994)	-15.69 (0.987)	-10.44 (0.992)	-14.20 (0.983)	-11.65 (0.997)
Polity Score		-15.05*** (0.00215)		-14.20*** (0.00254)		-15.25** (0.0166)		-16.46*** (0.00923)
Years of Democracy, from 1946 - Polity IV		0.0544 (0.201)		0.0410 (0.313)		0.0172 (0.690)		0.0343 (0.441)
Years of Schooling		-0.559 (0.189)		-0.584 (0.181)		-0.272 (0.590)		-0.347 (0.499)
Civil Liberties - Freedom House		3.807 (0.186)		5.306* (0.0942)		5.833* (0.0661)		7.814** (0.0431)
Observations	285	197	272	193	255	189	235	172
Number of Countries	50	41	49	41	45	39	44	37
Pseudo R Squared	0.0799	0.217	0.0967	0.230	0.175	0.270	0.165	0.276
Chi2	20.40	35.79	23.29	36.67	40.21	43.69	34.79	39.96
Avg obs per country	5.700	4.805	5.551	4.707	5.667	4.846	5.341	4.649
Min obs per country	2	2	2	2	2	2	2	2
Max obs per country	13	10	12	9	12	9	12	9

Economic growth increases reelection chances for all specifications except for new democracies in the BD08 specification (column 1). The effect is stronger for new democracies than for old democracies. Electoral year balance changes have no effect on reelection outcomes. There is some weak evidence that term growth increases reelection chances for both old and new democracies. Finally, civil liberties and the polity score have statistically significant effects and again the sign for civil liberties is different than predicted.

Table 11. Old Democracy Interaction Terms Using Continuous Variables.

Dependent Variable	(1) reelect3	(2) reelect3	(3) reelect3lg	(4) reelect3lg	(5) dpelect	(6) dpelect	(7) reelectcons	(8) reelectcons
Term Growth	93.18** (0.0318)	88.13 (0.393)	135.9*** (0.00112)	144.8** (0.0180)	131.4*** (0.00102)	141.7** (0.0237)	239.7*** (0.00284)	220.8** (0.0176)
Interaction Term Between Polity and Term Growth	-75.98* (0.0934)	-70.64 (0.513)	-119.4*** (0.00567)	-131.1** (0.0401)	-110.5*** (0.00707)	-117.1* (0.0721)	-214.3*** (0.00869)	-196.1** (0.0396)
EY Balance Change	-62.35** (0.0424)	45.78 (0.519)	-54.85** (0.0260)	17.49 (0.663)	11.73 (0.690)	48.07 (0.396)	-17.74 (0.719)	90.36 (0.420)
Interaction Term Between Polity and EY Balance Change	80.47** (0.0172)	-31.86 (0.670)	63.82** (0.0200)	-12.58 (0.773)	-7.746 (0.808)	-46.28 (0.444)	18.16 (0.730)	-93.94 (0.415)
Term Balance Change	33.08 (0.357)	3.861 (0.966)	19.42 (0.346)	-69.30 (0.280)	-5.963 (0.882)	-59.31 (0.393)	25.42 (0.663)	49.87 (0.654)
Interaction Term Between Polity and Term Balance Change	-25.60 (0.507)	13.00 (0.890)	-14.88 (0.525)	84.42 (0.208)	11.04 (0.792)	70.39 (0.331)	-18.60 (0.759)	-33.63 (0.767)
Plurality	0.202 (0.847)	1.135 (0.423)	-2.229 (0.535)	-1.946 (0.915)	0.129 (0.909)	0.743 (0.633)	-1.638 (0.763)	-3.216 (0.984)
Old Democracy	-2.580*** (0.00301)	-2.525* (0.0915)	0.542 (0.471)	-0.0206 (0.984)	-0.204 (0.783)	-0.667 (0.511)	-0.0954 (0.918)	-1.215 (0.395)
Polity Score		-14.75** (0.0153)		-6.960*** (0.00419)		-6.113*** (0.00974)		-9.190*** (0.00958)
Years of Schooling		0.0578 (0.156)		0.0367 (0.315)		0.0391 (0.288)		0.0342 (0.421)
Years of Democracy, from 1946 - Polity IV		-0.502 (0.208)		-0.502 (0.193)		-0.461 (0.239)		-0.433 (0.357)
Civil Liberties - Freedom House		3.901 (0.236)		2.952 (0.235)		1.005 (0.661)		5.130 (0.107)
Observations	256	197	291	233	302	254	240	197
Number of Countries	45	41	49	46	46	44	42	39
Pseudo R Squared	0.147	0.249	0.128	0.194	0.129	0.214	0.202	0.276
Chi2	33.57	41.03	33.83	38.74	35.55	46.46	44.16	46.13
Avg obs per country	5.689	4.805	5.939	5.065	6.565	5.773	5.714	5.051
Min obs per country	2	2	2	2	2	2	2	2
Max obs per country	13	10	13	10	14	11	12	10

Term growth is statistically significant for all specifications but column 2. In all of those cases, the effect is stronger for emerging democracies but it remains positive and significant at all levels of political development.

Electoral year balance change is statistically significant for specifications 1 and 3, which means that the results are no longer significant once we control for institutional factors. Regardless, the electoral year balance change has a stronger effect in more established democracies than in emerging democracies. Term fiscal balances are not statistically significant. Finally, institutional development is statistically significant and has the correct sign. In summary, the evidence shows that economic growth increases reelection chances, especially in emerging democracies.

3.6 Conclusions

In general terms, it seems incontrovertible that economic growth increases reelection chances in developing countries, and regardless to the degree of political development. It also seems that economic growth increases reelection chances in advanced economies although the effect is definitely smaller and these results are not conclusive. As I increase the sample size and liberalize the definition of electoral success, economic growth becomes statistically significant even for developed countries. Additionally, as institutional factors and country specific fixed effects are controlled for, the evidence that economic growth increases reelection chances, becomes more convincing.

As for fiscal deficits, there is inconclusive evidence that fiscal prudence increases reelection chances, especially for developing countries. It seems that voters reward term fiscal prudence. There is some weak evidence that voters in developing countries punish term fiscal deficits. There is no evidence that voters punish electoral year deficits. In more advanced economies and more established democracies, voters do reward electoral year fiscal performance. A plausible explanation may be that there is a larger informational lag with respect to fiscal policy in less advanced economies and less democratic countries. As a lengthier panel of data becomes available with respect to transparency and freedom of press, it may be possible to correctly test this conjecture.

Looking at the analysis in this chapter, if I was only interested in reelection, I would definitely employ fiscal and monetary tools in attempt to increase my electoral chances.

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A Appendix: Data for Chapter 3

Here are the descriptive statistics of the variables employed in this paper:

A.1 Construction of Election Variables

Variables were constructed in similar ways. In both cases, the variable is a binary variable taking a value of 1 when the incumbent is reelected and when she is booted. Both Brender and Drazen (2008) and I constructed the variable using several sources, such as the Zarate Political Collections, IDEAS, IFES, the "World Statesmen" encyclopedia, the African Elections Database, the Inter-Parliamentary Union the BBC Country Reports, Wikipedia, as well as national electoral agencies. The main difference in our variables is our approach to defining electoral loss: Brender and Drazen's approach focuses on the incumbent leader whereas mine focuses on the incumbent party.

reelect3: Brender and Drazen construct their reelection variable as a dummy taking a value of 1 when the incumbent is reelected. I focus on their extended sample (in which non-incumbents run for office). Brender and Drazen construct their variable by comparing tenure dates to election dates. They get tenure dates using data from as well as from the "World Statesmen" encyclopedia. They use data from IDEA and IFES. They restrict the sample to whether the leader or party has been in power for the two last fiscal years. In order for Brender and Drazen to code a reelection success, the following conditions must be met: 1) either the incumbent is reelected or he dies and his successor is elected or he is constitutionally precluded from running for reelection and his successor is elected and 2) the incumbent must have not quit within 365 days before the election, or else, the election will be considered a loss.

dpelect: I take a simpler approach: If either the incumbent or a successor from its party is reelected, then I consider it an electoral success. I take this alternative approach for three reasons: 1) It may be hard to distinguish whether resignations may be due to health issues, personal reasons and political reasons: to claim that resignation of incumbents is an electoral failure may overestimate electoral losses, 2) replacement of the incumbent by its preferred successor prior to the election is very common in parliamentary regimes⁶³

⁶³This may be due to strategic reasons: if the performance of the incumbent is good an early transition may generate incumbency advantages and increase the chances of election for her preferred successor.

and 3) for the most part, successors from within the same party are more likely to have similar policies than a successor from an opposing party. In addition, many of the important operators of an administration will most likely remain under a partisan successor. It is not clear that either choice of election variables is better than the other. It is worth saying that under my definition, reelection is more frequent.

reelect3lg: I supplement reelect3 by analyzing those elections which appear as missing values in reelect and are considered in dpelect. I follow the coding criterion employed in BD08 and summarized up in the reelect3 explanation above.

reelectcons: I take those observations in which both reelect3lg and dpelect are coded in the same way, that is, I include only those variables in which either a) reelect3lg=dpelect=1 or b) reelect3lg=dpelect=0 and drop the rest.

The correlation between reelect3 and dpelect is .8358 and between reelect3lg and dpelect is .8096.

A.2 Construction of Economic Variables

gdppc_gr3: Brender and Drazen construct their average economic growth variable by taking the geometric variable of per capita GDP from the World Bank's World Development Indicators, that is, **gdpppc_gr3=**

$$\sqrt[T]{\frac{GDPPC_{EY}}{GDPPC_{ey-T}}} - 1 \text{ where } T \text{ represents the year in which the incumbent began her term.}$$

termgdpgr: I use data for per capita GDP from the Penn World Tables version 6.3. I take the same approach as Brender and Drazen, but I limit the maximum number of term years to 6.⁶⁴

loggdpusd: I take the natural log of real GDP per capita in 1995 International USD. I interact this variable with the economic and fiscal variables in order to generate a continuous variable which measures the interaction between development and economic and fiscal variables.

A.3 Construction of Fiscal Variables

Primary Fiscal Data comes from the IMF's International Finance Statistics. The standard measure employed for the budget surplus is the IMF's IFS Central Government's Total Revenue & Grants minus Total Expenditures. I take the data from secondary sources that employ the IMF's IFS dataset such as PT02,

⁶⁴It is quite possible that voters only look at more recent performance. In any case it should not change anything.

BD05 and BD08. Additionally, I employ primary data from the IMF's IFS as well as from the IMF's WEO and the OECD's OECD Stats.

There are some reasons why I use secondary data: I wanted to employ the data from the IMF directly but unfortunately, there are several problems in doing so. The first one is that the IMF decided to change their accounting method in 2001, which complicates the comparability of variables. In addition, as part of this process, they decided to post both cash accounts and accrual accounts and it is not entirely clear which variable better replaces their previous definition. On the one hand, The World Bank replicates some of the cash account variables and argues that the Central Government Cash Surplus/Deficit is the best replacement for the fiscal deficit (which is usually de

Another cause of concern is that the data that is available online displays different accounts for different countries. Some of the countries display their Central Government balance whereas other countries display on their Budgetary Account balance and other countries display their General Government balance. Most empirical studies dealing with a balance use the Central Government Total Revenue & Grants minus Total Expenditures.

ddef1: Brender and Drazen's measure of term change in the fiscal balance. Brender and Drazen use data from the IMF's International Financial Statistics. They subtract the central government's Total Revenue & Grants from Total Expenditures. They then divide over Nominal GDP in order to get the year budget balance as percent of GDP. They then take the average of the two years prior to the election and subtract from the average of the two previous years, that is, they use: $.5[(\frac{Balance}{NGDP})_{EY-1} + (\frac{Balance}{NGDP})_{EY-2} - (\frac{Balance}{NGDP})_{EY-3} - (\frac{Balance}{NGDP})_{EY-4}]$.

ddef3_n: Brender and Drazen's measure of electoral year change in the fiscal balance. Brender and Drazen use data from the IMF's International Financial Statistics. They subtract the central government's Total Revenue & Grants from Total Expenditures. They then divide over Nominal GDP in order to get the year budget balance as percent of GDP. They then subtract the value in the election year versus the previous year, that is, they use: $(\frac{Balance}{NGDP})_{EY} - (\frac{Balance}{NGDP})_{EY-1}$.

I construct several variables for term and electoral year changes in the budget deficit using different sources.

balchjme0 and **balchjme1**: I take the Balance/NGDP data from BD05, and subject it to the manipulation described above for ddef1 and ddef3_n to generate balchjme0 and balchjme1 respectively. The data is available at Allan Drazen's University of Maryland webpage. balchjme0 has a correlation coefficient of .9928 with ddef1. balchjme1 has a correlation coefficient of .9480 with ddef3_n.

splbalch0 and **splbalch1**: I take the surplus/GDP data from, PT02, and subject it to the manipulation described above for ddef1 and ddef3_n to generate splbalch0 and splbalch1. The data is available at Guido Tabellini's Universita Bocconi. splbalch0 has a correlation coefficient of .8772 with ddef1. splbalch1 has a correlation coefficient of .8379 with ddef3_n.

consbalch0: I take ddef1 and supplement missing values with balchjme0. I then supplement missing values with splbalch0.

consbalch1: I take ddef3_n and supplement missing values with balchjme1. I then supplement missing values with splbalch1.

The construction of the cyclically adjusted variables is explained in detail in the respective section, and is thus omitted here.

A.4 Construction of the Control Variables

developed: Dummy taking a value of 1 if the country is a developed country employed by BD08. The criteria for a developed country is the following: A country is developed according to the criteria employed by BD08 if they are either and old Western European country, Japan, Canada, the U. S., Australia or New Zealand. Post-soviet European countries, Asian, African, Middle Eastern and Latin American countries are all considered developing countries.

maj: Dummy taking a value of 1 for countries with majoritarian electoral systems and a value of 0 for countries with proportional electoral systems. The variable is employed in BD08 using data from the Database for Political Institutions.

plural2: I construct an alternative dummy taking a value of 1 for plurality electoral systems and 0 for proportional electoral systems. I construct it using the DPI as well, and I follow the following criteria: 1) if pluralty[sic]=1 and pr(proportional)=0, then plural2=1. If pluralty=0 and pr=1, then plural2. I then

replace missing values by looking at whether the house of representatives is chosen by plurality rules or proportional rules and code accordingly. I finally replace missing values by looking at whether the senate is chosen by plurality rules or proportional rules.

old: Brender and Drazen 2008 construct this dummy variable by giving a value of 1 if a given country has had four or more elections since the last time the Polity IV composite index was negative.

oldcons: I construct this variable from information in the Polity IV dataset:, namely, a country has to be an institutionalized democracy for at least 15 years, which I define as having 1) a regulated executive recruitment process ($xrreg=1$), 2) some degree of competitiveness for executive recruitment ($xrcomp \geq 2$), some degree of executive recruitment openness ($xropen \geq 3$) and constraints on the executive are strong ($xconst \geq 6$). The inclusion of executive constraints is important because a strong executive can reverse democratic advancement. The correlation between old and oldcons is .7974.

polity2norm: This variable is a normalized version of the smoothened Polity IV score. I divide over 10 in order to normalize between -1 and 1.

p_yrsdemo46: I sum the number of years since 1946 or since the country has maintained a non-negative polity score.

fh_cl: Freedom House Civil Liberties indicator. I normalized it to lie between 0-1 and invert the ranking so that a value of 1 implies a greater respect for civil liberties by the authorities.