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[1]This chapter is based on joint work with Johannes Rincke, LMU Munich.
[2]This chapter is based on joint work with Johannes Rincke, LMU Munich.

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Preface

The fundamental idea underlying this thesis is the importance of elections as an incentive device for solving political agency problems between the government and its citizens. Beginning with Barro (1973) and Ferejohn (1986) political agency models demonstrate the importance of elections as an incentive device for disciplining the self-interest of politicians and emphasize the role of political competition regarding that matter. But, while it is widely accepted that competition is salient for the efficient functioning of markets for goods and services, the precise role of competition in politics is less evident. Numerous authors like Becker (1983, 1985) and Wittman (1989) have argued that political competition enhances the efficiency of democracies. Moreover, there is some empirical evidence indicating that political competition is indeed important for mitigating agency problems that are prevalent in politics.[1] However, the literature also discusses the possibility that the incentives politicians face when striving for reelection distort policy choices. Political budget cycle models following Nordhaus (1975), for example, argue that politics becomes short-sighted whenever elections are pending. Lizzeri and Persico (2005), for instance, argue that more competition forces parties to focus on the interests of a narrower constituency thereby strengthening the influence of special interests.

The aim of the thesis is to provide some more pieces of evidence which help to clarify the functioning of elections as an incentive mechanism. We are going to study how the short-term incentives provided by elections can be mitigated, which role the informedness of voters plays for holding the government accountable, whether restrictions to the entry of potential political candidates are effective and whether established parties exploit their power to restrict electoral competition.[2] Throughout this thesis, we build - as regards content and methodologically - on the innovations brought forward by

[1] See e.g. Besley, Persson, and Sturm (2006).

[2] The terms 'political competition' and 'electoral competition' are in principle interchangeable. Nevertheless, we mainly use the latter term in Chapter 3 and 4 in order to indicate that we only refer to competition by other candidates in elections.

political economics in contrast to the Pigouvian paradigm. The latter refers to the notion of a social planner when determining policy questions[3] and consequently neglects both the implementation of these policies and the design of institutional constraints for policy-makers. The crucial idea underlying of political economics is to study precisely these questions by focussing on the political decision-making process itself.[4] In doing so, political economics applies the rigorous framework of rational choice and formal microeconomic foundations when analyzing politics. At the same time, the application of modern econometric methods in order to test the hypotheses generated by theoretical models empirically has become indispensable.

When dealing with political agency problems between the government and its citizens, and in particular the incentives provided by elections, political agency models are a natural stating point.[5] Chapter 1 and 2 both contain a probabilistic voting version of these models as introduced by Persson and Tabellini (2000). These offer an explicit microeconomic foundation of the constraints faced by the incumbent politician. Due to the random elements in the voting decision of the citizens, the outcome of the election is difficult for policy-makers to predict. Thus, the resulting probability of winning becomes a smooth function of policy variables which allows to analyze how changes in the institutional setting alter the incentives of policy-makers. In both chapters, we start from a situation where the electoral incentives are inherently distorted. The two models differ in so far as Chapter 1 studies how the government's self-interest is constrained by the interaction with a further non-elected institution, whereas Chapter 2 analyzes how changes in the composition of the electorate affect the accountability of the government.

Despite the similarities regarding the underlying model, the first two chapters are based on an entirely different motivation. Chapter 1 is meant to critically scrutinize the concept of socially harmful bureaucrats as suggested by Public Choice scholars. Accordingly, this chapter is closest to this classical literature. For example, it entails an explicit normative analysis of the welfare effects of bureaucrats. Moreover, the specification of the bureaucracy's preferences is directly related to Niskanen (1971). The aim of Chapter 1 is to show that the conclusions of the classical Public Choice literature regarding bureaucracies are overly lopsided since the welfare effects of these institutions are not analyzed in the broader context of public decision-making, i.e. in the context of the interaction between different political agents. In contrast, Chapter 2

[3] See Atkinson and Stiglitz (1980).

[4] For a introduction to the wider historical context of the field political economics see Besley (2007)

[5] For a recent survey see Besley (2006).

does not target on defining an optimal institutional setting, but rather tries to formally analyze the relationship between foreign emergency aid and the political accountability of governments in recipient countries. Its main goal is to specify the conditions under which foreign aid impairs the incumbent government's constraints. At the same time, the model is intended to generate testable implication which we start to analyze in Chapter 2 as well.

The importance of exposing theoretical hypotheses to the data manifests itself in Chapter 2, and even more in Chapter 3 and 4. The empirical part of Chapter 2 and Chapter 3 have in common that they both aim at an exact identification of effects which have already been discussed in the literature but without taking possible endogeneity problems seriously. For that purpose Chapter 2 employs the instrumental variables approach and discusses two different potential instruments for foreign aid in order to determine its impact on the accountability of governments in recipient countries. In contrast, Chapter 3 builds on the difference-in-difference approach and exploits a decision by the US Supreme Court as a natural experiment in order to identify the impact of ballot access restrictions on electoral competition. Chapter 4, however, intends to offer new empirical evidence on the endogeneity of political institutions by exploiting the federal Voting Rights Act of 1965 as an instrument for electoral competition.

Chapter 3 and 4 both focus on the necessary preconditions for the functioning of political constraints by studying restrictions to political markets. This shifts the focus of our thesis to immediate determinants of political competition, namely laws governing the access of potential candidates to elections. Chapter 3 deals with the impact of such restriction on the candidates' decision-making behavior. Its main purpose is to convincingly show that ballot access laws are highly effective in reducing electoral competition. In doing so, this chapter fits neatly into the related literature since it analyzes the impact of ballot access restrictions as exogenous constraints on policy-makers. This is entirely different with respect to Chapter 4 where we test the idea that established parties design political institutions for their own purposes. This idea itself is very recent and besides Trebbi, Aghion, and Alesina (2007) there is little evidence regarding this issue. The study presented in Chapter 4 is the first one which finds evidence of the design of ballot access rules.

Before going into detail, we briefly outline the central ideas and major contributions of this thesis chapter by chapter.

Chapter 1: Political Agency and the Beneficial Effects of Bureaucrats

Chapter 1 is based on the idea that bureaucracies, which are widely regarded as a cause of inefficiently large government expenditures by economists, might be (up to certain limits) mitigate short-term politics. To study this issue, we introduce a probabilistic voting model which will also be employed in a modified version in Chapter 2. In the version of Chapter 1, the society consists of three groups of voters belonging to different generations. Since the young generation is excluded from taking part in elections, the political process results in an allocation of public expenditures that is distorted towards public consumption expenditures. As the old generation is already deceased in the second period, its members have no interest in the provision of public investment goods. The young generation of voters with an immediate interest in public investments is, however, excluded from voting like it is generally stipulated in the existing voting laws. This in turn gives the incumbent politician an incentive to shift public expenditures towards present consumption in order to be reelected. We show that in this situation, voters benefit from the presence of an independent bureaucracy for two reasons. Firstly, as bureaucrats increase public expenditures excessively, they also raise the level of public investment which is beneficial if the level of public investments is too low in the first place. Secondly, the additional expenditures induced by the bureaucracy increase the excess burden of taxation thereby reducing the leeway of politicians to capture rents for themselves.

Most importantly our paper contributes to the discussion of the role of bureaucrats in economics. In contrast to sociologists like Weber (1922/2001) who emphasized the importance of bureaucracies for the functioning of the modern state, economists have mainly pointed out the potential drawbacks of bureaucracies. Both Niskanen's (1971) analysis and the modified version by Migué and Bélanger (1974) conclude that bureaucracies become too large according to the government's preferences and evaluate these expenditure increases as detrimental. We, however, find that the influence of bureaucracies can be welfare increasing if pre-existing political distortions are present and the excess burden of taxation is taken into account. Moreover, our analyis provides a theoretical underpinning of the empirical literature on the impact of bureaucracies. Rauch (1995) shows that the establishment of professional bureaucracies instead of politically appointed bureaucracies was crucial for growth when analyzing municipal reforms in US cities at the beginning of the 20th century. He argues that professional bureaucracies increase the time horizon of public decision makers.

The main insight from this chapter is that the welfare effects of institutions like bureaucracies need to be considered in the broader context of public decision-making, i.e. in the context of the interaction between different political agents. Furthermore, our model offers a way to reconcile Rauch's empirical findings with Niskanen's view of budget-expanding bureaucrats. A small and limited level of bureaucratic influence generates Rauch's results, whereas an excessive influence confirms Niskanen's hypothesis.

Chapter 2: Political Accountability and Development Aid

Chapter 2 investigates the conditions under which foreign emergency aid undermines political accountability in development countries. For that purpose, we set up a simple retrospective voting model similar to that employed in Chapter 1 which we adapt to the characteristics of aid-dependent countries. In our model, an incumbent politician in the recipient country decides on investments in disaster prevention and relief infrastructure which both influence the probability of natural disasters and the extent of damage. Crucially for our results, a part of the electorate is uninformed about the actions taken by the incumbent politician and bases its voting decision on its actual economic situation. These voters only learn something about the incumbent politician's effort if a disaster actually occurs. By providing emergency aid, international donors insure the incumbent politician at least partly against the political risk that ill-informed voters who are affected by a disaster detect the government's negligence. Therefore, our main result is that foreign emergency aid weakens the incentives provided by electoral constraints. Among other things, we also find that the incumbent's performance shrinks when the fraction of ill-informed voters rises. Moreover, we test the main implication of our model and discuss the possibility to employ the voting pattern in the UN General Assembly as an alternative instrument for foreign aid.

Chapter 2 contributes to the limited literature on the linkage between foreign aid and political accountability. Cohen and Werker (2007) also scrutinize the impact of foreign aid on disaster prevention by a national government, but do not provide an explicit model of the political process. In their model the government maximizes a social welfare function. Moreover, this chapter relates to Besley and Burgess (2002) who also argue that having a more informed electorate strengthens incentives for governments to be responsive. However, they focus on the importance of the media in providing information and do not offer an explicit analysis of the voting behavior of differently in-

formed citizens. Knack (2001) tests whether aid dependency can potentially undermine the quality of governance by weakening accountability and encouraging rent-seeking. He finds that aid significantly reduces a country's quality of governance, but does not discuss the potential endogeneity of the instruments employed in his analysis.

The main contribution of Chapter 2 is to analyze the impact of foreign aid on political accountability explicitly in a voting model and to formalize the argument that international donors ensure a recipient country's government against the consequences of insufficient disaster prevention. Moreover, we extend the empirical analysis by Knack (2001) by assessing the quality of different potential instrumental variables.

Chapter 3: Ballot Access Restrictions and Electoral Competition

This chapter studies whether restrictions to political markets actually deter potential candidates. To provide an adequate answer, we analyze a particular institution, namely ballot access laws, which govern the access of third party[6] and independent candidates to election. These restriction require potential candidates to file a petition signed by a certain number of eligible voters. Since the major parties are likely to use their predominant position in order to obstruct political competitors as suggested by Aghion, Alesina, and Trebbi (2004) as well as Trebbi, Aghion, and Alesina (2007), we expect stringent regulations in states with stiff electoral competition and liberal regulations in those with little competition. This in turn renders naive estimates of the impact of ballot access restrictions on electoral competition uninformative. To overcome this endogeneity problem, we exploit the decision of the US Supreme Court in *Williams v. Rhodes*, which declared Ohio's ballot access requirements unconstitutional in 1968, as a natural experiment. This allows us to identify the effectiveness of ballot access requirements in reducing the degree of electoral competition in US House elections as measured by the number of minor party and independent candidates. The results based on a series of difference-in-difference estimations indicate that ballot access requirements as used in most US states have a strong deterrent effect on these candidates.

Chapter 3 confirms the previous studies like Ansolabehere and Gerber (1996) and Stratmann (2005) which also analyze the effectiveness of ballot access laws in deterring minor party candidates, but do not address the problem that ballot access restrictions

[6]The terms 'third party' and 'minor party' are interchangeable.

might be adapted to differing levels of electoral competition. Instead these studies rely on the assumption that ballot access laws are exogenously given which is highly critical as explicitly shown in Chapter 4. Chapter 3 also adds to the literature on third parties and independent candidates in the United States. Duverger (1964) points out that the majoritarian voting system promotes the existence of two dominating political parties. Similarly, Amorim Neto and Cox (1997) emphasizes the interaction between the electoral system and the heterogeneity of the society as a determinant of the number of parties. Yet, the effectiveness of ballot access laws and the wide-spread use of these regulations strongly indicate that institution beyond the electoral system need to be taken into account when explaining the number of parties.

The main contribution of Chapter 3 is the provision of a precisely identified estimate of the effect of ballot access restriction on the degree of electoral competition while explicitly addressing the endogeneity of the relevant state laws. In doing so, this chapter also builds the basis for a detailed analysis of the design of political institutions as it follows in the next chapter.

Chapter 4: The Design of Political Institutions

Chapter 4 starts from the fact that entry restrictions to political markets actually deter potential candidates as shown in Chapter 3. Since established parties both have the possibility and an immediate incentive to design the corresponding laws, we ask whether there is any evidence of the intentional design of political institutions which fosters the interests of established parties. Like in the previous chapter, we focus on the design of laws governing ballot access of third parties and independent candidates in US states. Using state-level variation in the definition of these rules between 1946 and 1976, we ask how the degree of competition in gubernatorial elections faced by the major parties affects the design of ballot access requirements. As in Chapter 3, it is crucial to account for the endogeneity of observed levels of electoral competition since this measure already reflects the deterrent effect of existing ballot access requirements on potential third party and independent candidates. Thus, we exploit the federal Voting Rights Act (VRA) of 1965 as a source of exogenous state-level variation in electoral competition. First, we substantiate the widespread notion that the Voting Rights Act dramatically altered the political landscape of the US South by a series of difference-in-difference estimations. These estimates indicate that the federal intervention to abolish limitations to black voter participation, such as poll taxes and literacy

tests, significantly raised the number of candidates in gubernatorial elections. This finding is shown to be robust to a number of changes in our specification. Second, we solve the endogeneity problem of our main regression by constructing an instrumental variable from the federal intervention itself, thereby exploiting the exogenous variation in electoral competition induced by the Voting Rights Act. We find across various specifications that state policymakers systematically tighten state ballot access laws in reaction to increased electoral competition by new political parties and independent candidates.

Chapter 4 refers to a small number of contributions which discusses the strategic choice of electoral rules like Alesina and Glaeser (2004), Acemoglu and Robinson (2000) and Aghion, Alesina, and Trebbi (2004). Moreover, there is a direct link to Trebbi, Aghion, and Alesina (2007) who report empirical evidence that the choice of electoral rules in US cities varies with the share of minorities in a way that effectively limits minority representation.

The main contribution of Chapter 4 consists in the identification of the extent to which established parties use the legislature in order to reduce electoral competition thereby providing detailed evidence on the endogenous nature of political institutions.

Chapter 1

Bureaucracies and short-term politics

1.1 Introduction

Beginning with Barro (1973) and Ferejohn (1986) political agency models demonstrate the importance of elections as an incentive device for disciplining the self-interest of politicians.[1] The beneficial effects of elections are also supported by an increasing number of empirical studies.[2] However, there are important contributions to the literature which highlight potential distortions resulting from the incentives politicians face when striving for reelection. An example are political budget cycle models following Nordhaus (1975) which argue that politics becomes short-sighted whenever elections are pending. Recent evidence provided by Alt and Lassen (2006) suggests that such distortions are a widespread phenomenon even in advanced democracies and depend on the country's fiscal transparency. Equally, Shi and Svensson (2006) emphasize that political budget cycles are a common feature of most democracies, but differ substantially across countries. Against this background, the question arises which institutional conditions might compensate the negative side-effects of elections and alleviate short-term politics.

In the following, we argue that bureaucracies, which are widely regarded as a cause of inefficiently large government expenditures by economists, might (up to certain limits)

[1] For a recent survey see Besley (2006).

[2] For example, Besley, Persson, and Sturm (2006) find evidence that political competition reduces the influence of special interest groups thereby fostering growth.

mitigate short-term politics. To study this issue, we propose a simple probabilistic voting model where the society consists of three groups of voters belonging to different generations. Since the young generation is excluded from taking part in elections, the political process results in an allocation of public expenditures that is distorted towards consumption expenditures. We show that in this situation, voters benefit from the presence of an independent bureaucracy for two reasons. Firstly, as bureaucrats increase public expenditures excessively, they also raise the level of public investment which is beneficial if the level of public investments is too low in the first place. Secondly, the additional expenditures induced by the bureaucracy increase the excess burden of taxation thereby reducing the leeway of politicians to capture rents for themselves.

To begin with, we model a situation where the incentives of elections are inherently distorted. For that purpose, we set up a probabilistic voting model with two periods where voters belong to three different generations.[3] Therein, we assess the level of public investments which are provided by the government in the first period, but only yield returns in the second period. Since the members of the old generation are no longer present in the second period, they have no interest in the provision of public investment goods. The young generation of voters with an immediate interest in public investments, however, is excluded from voting like it is generally stipulated by the existing voting laws. This in turn gives the incumbent politician an incentive to shift public expenditures towards present consumption in order to be reelected. Consequently, the allocation of public goods provided by office-seeking politicians is distorted when seen from the perspective of a social planner. Naturally, this "short-term"distortion towards present consumption prevails even if political competition becomes increasingly stiff and politicians can no more appropriate any rents for themselves. In contrast, the "imperfect agency" distortion, i.e. the rents appropriated by the incumbent politician, disappears completely if political competition increases sufficiently. The crucial point is that political competition is no remedy for a distortion which is inherent to the incentive structure of elections. In our case, it is immediately evident that politicians neglect the interest of those who do not posses the right to vote if the incentive mechanism disciplining their actions is based on votes.

After showing that the exclusion of the young generation from the election results in distorted policy choices, we analyze how the institutional setting shapes the extent of short-term politics. In doing so, we focus on non-elected political institutions and bureaucracies in particular. More precisely, we think of top bureaucrats in ministries

[3]Regarding the probabilistic voting framework see Lindbeck and Weibull (1987).

and at other government agencies who have a considerable influence on political decisions due the special knowledge of 'their' policy area. Building on Kessing and Konrad (2008), we argue that bureaucrats have a bias for high government expenditures which is not curbed by electoral constraints as bureaucrats are often appointed for a long time. Consequently, bureaucrats are less sensitive to the citizens' preferences as correctly criticized by Public Choice scholars.[4] In our setting, however, this deviation from the will of the electorate is not welfare-decreasing in general, but may entail a welfare-improving flip-side: If bureaucrats increase public expenditures excessively, they also raise the level of public investment which is beneficial if political competition induces politicians to provide too little public investments in the first place. A priori it is not clear whether this beneficial effect dominates the detrimental overall expenditure increase caused by bureaucrats. However, it can be shown that starting from a situation where politicians have full control, a small increase of the bureaucrats' influence increases voters' utility. This result is based on a typical second best argument: The increase of public consumption is a second order loss, whereas the increase of public investment is a first order gain. Moreover, we find that the presence of a bureaucracy reduces the leeway of politicians to capture rents for themselves. This argument builds on the idea that the marginal excess burden of taxation increases with the level of taxation. Therefore, voters are more sensitive with respect to additional expenditures if a bureaucracy is present and accordingly the tax rate is higher.

Since we start by modeling distortions of the political process, our paper is related to the literature on political business cycles following Nordhaus (1975). These models generally argue that informational asymmetries are the causes for policy distortions. Rogoff (1990), for example, proposes an adverse selection model where the more talented politician distorts the budget. Shi and Svensson (2006) propose a moral hazard model of electoral competition and also provide evidence that elections affect the composition of public expenditures. Moreover, they find that political budget cycles are significantly larger in developing countries than in developed countries. Alt and Lassen (2006) show that political budget cycles also exist in countries with low fiscal transparency including many advanced democracies.

Most importantly our paper contributes to the discussion of the role of bureaucrats in economics. In contrast to sociologists like Weber (1922/2001) who emphasized the importance of bureaucracies for the functioning of the modern state, economists have mainly pointed out the potential drawbacks of bureaucracies. Both Niskanen's

[4]For a summary of the empirical evidence see Mueller (2003).

(1971) analysis and the modified version by Migué and Bélanger (1974) conclude that bureaucracies become too large according to the government's preferences and evaluate these expenditure increases as detrimental. A more recent example of this view is provided by Fuest (2000) who also discusses the case where politicians have only limited control over fiscal policy and need to bargain with bureaucrats over the budget. In his framework welfare unambiguously declines as bureaucrats gain bargaining power. We, however, find that the influence of bureaucracies can be welfare increasing if pre-existing political distortions are present and the excess burden of taxation is taken into account.

A number of recent contributions to the economic literature analyze whether political agents should rather be appointed or elected. Alesina and Tabellini (2007) investigate the normative criteria that guide the allocation of a policy task to an elected politician versus an independent bureaucrat in a career concern model. In a companion paper with multiple policy tasks, Alesina and Tabellini (2008) come to the conclusion that bureaucrats are better if short-termism is prevalent. In contrast to their work, our paper focuses on the interaction between bureaucrats and politicians. The idea that elections align the interests of the electorate with those of politicians is confirmed by Besley and Coate (2003) who find evidence that elected regulators are more pro-consumer oriented than appointed regulators as elections allow to unbundel policy issues.

The empirical literature on the impact of bureaucrats is very limited. A notable exception is Rauch (1995) who shows that the establishment of professional bureaucracies instead of politically appointed bureaucracies was crucial for growth when analyzing municipal reforms in US cities at the beginning of the 20th century. He argues that professional bureaucracies increased the time horizon of public decision makers. In a subsequent investigation, Rauch and Evans (2000) specify the key institutional characteristics of the successful 'Weberian' bureaucracy like meritocratic recruitment through competitive examinations, civil service procedures for hiring and firing rather than political appointments and dismissals, and filling higher levels of the hierarchy through internal promotion.

The paper is organized as follows: Section 1.2 presents the baseline model of politicians under electoral constraints and compares the outcome of the political equilibrium to a normative benchmark. Section 1.3 discusses the incentives bureaucrats face and incorporates a bureaucracy into the decision-making process. The welfare implications

of our model are analyzed in section 1.4. Section 1.5 concludes with an outlook on possible future research.

1.2 The model

In this section, we provide a framework where an age limit for voting inherently distorts the incentives of elections therefore causing short-term politics.[5] For that purpose, we present a simple probabilistic voting model where the society consists of three groups of voters belonging to different generations. In the first part of this section, we derive the political equilibrium and analyze its implications. In the second part, we set up the social planner's maximization problem and compare this normative benchmark with the outcome of the political equilibrium.

1.2.1 Political equilibrium

In our model, voters are backward-looking and decide on whether to reelect an incumbent politician. In the first period an incumbent is already in office and decides on public policies including his rents. In particular, the politician sets a certain tax rate to finance the provision of a public consumption good and a public investment good. Elections are held at at the end of the first period. If reelected, the incumbent stays in office for another term without taking any further action and only receives the benefits from office as stated below. In the second period citizens also obtain the benefits from the public investments undertaken in the first period. Thereafter the game ends.

In order to model the idea that the exclusion of young citizens from the electorate distorts the incentives inherent to elections, we require at least a young generation which is excluded in the elections and an old generation which does not benefit from public investments. A further middle-aged generation is necessary to avoid corner solutions. Accordingly, the society in our setting consists of a continuum of voters belonging to different generations A_J with $J \in (y, m, o)$. In period one, there is a young generation A_y, a middle-aged generation A_m, and an old generation A_o. The size of each generation is $\alpha_J > 0$. The total size of the population in period one is

[5]The general insight of our analysis does not depend on this idea. Alternatively, distortions towards short-term expenditures could also originate from time-inconsistency problems or distributional conflicts among the electorate (c.f. Fernandez and Rodrik (1991)).

$\alpha_y + \alpha_m + \alpha_o = 1$. Each generation ages from period one to period two. Whereas A_y and A_m just grow older, A_o is already deceased in the second period. Finally, we assume that no new generation enters in the second period. The latter does not restrict the generality of our results since it is more demanding to reach our conclusions when abstracting from future generations as will become clearer in the next section.[6]

For ease of exposition, we assume that the members of all generations receive the same exogenous income Y in the first period.[7] The government levies a proportional income tax with tax rate τ to finance the provision of two public goods G and I. To introduce a trade-off between the short run and the long run, we assume that the public consumption good G increases the utility of voters immediately in period one. Public investments I, however, do not become effective until the next period. One might think of subsidies and transfers as public consumption goods and of expenditures for education and infrastructure as public investment goods.[8]

In period one all tax revenue is generated and all public goods are provided. Including the incumbent's (monetary) rents r the budget constraint of the government in period one can be written as[9]

$$T = \alpha_y \tau Y + \alpha_m \tau Y + \alpha_o \tau Y = \tau Y = G + I + r. \tag{1}$$

The individual preferences of the three generations' members regarding public goods provision are denoted W_J. Note that these refer to the total payoff of both periods and are assumed to take the following form:

$$W_y = W_m = (1 - \tau)Y + H(G) + \delta F(I) \tag{2}$$

and

$$W_o = (1 - \tau)Y + H(G), \tag{3}$$

where $H_G > 0, H_{GG} < 0$ and $F_I > 0, F_{II} < 0$. The parameter δ represents a standard discount factor necessary to adjust the value of future pay-offs.

The incumbent cares only about (monetary) rents and about being reelected. The

[6]We also exclude altruism between the different generations which could mitigate the inefficiency arising in the political equilibrium as discussed below.

[7]It could equally be assumed that the income of the young generation is lower than that of the other two. In that case the deviation from the normative benchmark becomes even more pronounced.

[8]Empirically, the distinction between public consumption and investment may be difficult to draw. We define G as the sum of all public expenditures that become effective in the short term.

[9]We assume that tax revenues always suffice to cover the costs of public goods provision.

monetary rents r are taken from the government's tax revenues and are therefore captured in period one. In contrast, the ego rent R which represents the pleasure of being in power only accrues to the incumbent when remaining in office for another period. Accordingly, R is exogenously determined and, in particular, independent of the current level of rent extraction r. The incumbent's reelection probability $P(G, I, r)$ is influenced both by the provision the two public goods, G and I, and the level of rents r. Hence, the incumbent's pay-off can be written as

$$\Omega = u(r) + \delta P(G, I, r)R, \tag{4}$$

where the utility function u captures the incumbent's valuation of rents with $u_r > 0, u_{rr} < 0$. The parameter δ is the same standard discount factor as before.

In line with the existing voting rights regulations in most countries, we assume that there is an age limit below which individuals are not admitted to elections. At the same time, we assume that no upper bound for the voting age exists. Importantly for our model, the young generation A_y is below the voting age limit and hence excluded from taking part in elections. Empirically, one could think of juveniles as the counterpart of A_y or all individuals below 18. Yet, for our results to hold it is only necessary that a part of the society with systematically different preferences from the remaining individuals is excluded from the electorate. Hence, the electorate in our model only consists of A_m and A_o. These voters base their election decision both on the policies chosen by the incumbent and on the non policy-related aspects of the incumbent and his opponent. Specifically, voter i in group J votes for the incumbent if

$$W_J(G, I, r) + \epsilon \geq \omega_{Ji}, \tag{5}$$

where ϵ characterizes the average popularity of the incumbent politician relative to the opponent in the overall population and is assumed to be uniformly distributed on $[-\frac{1}{2\psi}, \frac{1}{2\psi}]$.[10] The popularity of the incumbent is probabilistic and beyond his influence like the oil price for a national politician. The higher is the value of ψ, the higher is the density of swing voters and the more competitive is the election. The parameter ω_{Ji} denotes the threshold level above which a voter favors the incumbent and is assumed to be uniformly distributed on $[-\frac{1}{2\phi_J}, \frac{1}{2\phi_J}]$, where ϕ denotes the average reservation

[10]For the microfoundation of the probability function, we apply a simple reformulation of the standard probabilistic voting model as proposed by Svaleryd and Vlachos (2007). Regarding the generalization of the special distributional assumption see Persson and Tabellini (2000, pp. 52 et seqq.) and Lindbeck and Weibull (1987).

utility level. The reservation utility level depends on non-policy issues like ideology or personal characteristics. Note that ω_{Ji} is a group-specific parameter, thus the two groups of voters are allowed to be differently demanding and can differ in their political influence. Finally, the opposition candidate is assumed to be identical to the incumbent politician. Hence, the voters' sole motive for ousting the incumbent is the ex post punishment of bad policy choices.

Given the previous assumptions, the share of voters from generation A_J voting for the incumbent is given by

$$v_J = \alpha_J(\frac{1}{2\phi_J}W_J + \epsilon). \tag{6}$$

Correspondingly, the incumbent's total vote share reads

$$\pi_I = \sum_J \alpha_J \; v_J. \tag{7}$$

Note that the total vote share (7) is a random variable depending on the realized value of ϵ.[11] When making policy decisions, the incumbent only knows the distribution of the popularity shock ϵ and of the voters' threshold utility levels ω_{Ji}. Due to the uncertainty regarding the median voter's optimal policy, the incumbent's probability of winning becomes a smooth function of the policy variables and is given by

$$P(G, I, r) = Prob[\pi_I \geq \frac{\alpha_m + \alpha_o}{2}] = \frac{1}{2} + \frac{\psi}{\phi}[\sum_J \alpha_J \phi_J W_J(G, I, r)]. \tag{8}$$

When choosing the optimal policy platform, the incumbent politician takes the above reelection probability as given and solves the following optimization problem

$$\underset{G,I,r}{Max}\; \Omega = u(r) + \delta P(G, I, r)R. \tag{9}$$

Since the opponent candidate is assumed to be identical to the incumbent, the equilibrium policy choices G^*, I^* and r^* are characterized by the first-order conditions resulting from equation (9)

$$\frac{\partial \Omega}{\partial G} : H_G = 1 \tag{10}$$

and

$$\frac{\partial \Omega}{\partial I} : F_I = \frac{\alpha_m \phi_m + \alpha_o \phi_o}{\delta \alpha_m \phi_m} \tag{11}$$

[11] The distribution of ϵ is assumed to be wide enough to rule out corner solutions.

and

$$\frac{\partial \Omega}{\partial r} : u_r = \delta R \psi. \tag{12}$$

Since both groups of voters have identical costs and benefits from the provision of the public consumption good, condition (10) and the related level of G^* are independent of group characteristics. Correspondingly, the incumbent politician provides G such that the marginal utility of an additional unit equals the constant marginal cost of public goods. In contrast, the optimal provision of the public investment good I^* determined by (11) depends both on the population share of the two groups of voters as well as on their political influence. Ceteris paribus, I^* is smaller, the larger is the share and the stronger is the political influence of the old generation A_o. Moreover, I^* is smaller, the less patient voters are (smaller δ). Condition (12) states that rents in the political equilibrium, r^*, decrease if the candidates are more patient (δ increases), if the value of holding office is larger (R increases), or if the uncertainty in the election is reduced (ψ increases). Intuitively, the uncertainty of the election can be interpreted as a measure of the intensity of political competition. Finally, r^* also depends on the characteristics of the candidates' utility function $u(r)$.

1.2.2 Pareto efficient policy

To assess the outcome of the political equilibrium, we adopt the perspective of a social planner. Total welfare naturally includes the utility of the young generation which is neglected in the electoral process.[12] Accordingly, the normative benchmark is given by the maximization of a utilitarian social welfare function of the following form:

$$\underset{G,I}{Max}\ W = \alpha_y W_y + \alpha_m W_m + \alpha_o W_o \tag{13}$$

subject to the budget constraint $G + I = T$. The corresponding first-best provision of the two public goods G_S^* and I_S^* is characterized by the subsequent first-order conditions

$$\frac{\partial W}{\partial G} : H_G = 1 \tag{14}$$

and

$$\frac{\partial W}{\partial I} : F_I = \frac{1}{\delta(\alpha_y + \alpha_m)}. \tag{15}$$

[12] From a purely normative perspective it would not matter whether individuals are able to actually participate in elections.

Condition (14) states that the efficient amount of the public consumption good G_S^* is defined by the equality of the marginal utility of an additional unit of G and the marginal costs of public funds. As before, this condition is independent of the differing characteristics of the three generation as all face the same costs and benefits regarding G. The efficient amount of the public investment good I_S^* depends on the size of the different generations, but not on their political strength. The latter does not matter in welfare terms. I_S^* declines in the share of the old generation α_o and rises in the share of the young generation α_y and the share of the middle-aged generation α_m. Moreover, I_S^* is smaller the less patient voters are (smaller δ). As immediately obvious, no rents exist in the social optimum ($r_S^* = 0$).

The comparison of the normative benchmark and the political equilibrium shows that the provision of G is efficient in the political equilibrium ($G^* = G_S^*$) since equations (10) and (14) are identical. This result is due to our specification that individuals from all three generations face the same costs and benefits with respect to G. When assessing the level of I by comparing equations (11) and (15), we find that I^* is inefficiently low ($I^* < I_S^*$) as long as

$$\frac{\alpha_m\phi_m + \alpha_o\phi_o}{\alpha_m\phi_m} > \frac{1}{(1-\alpha_o)}. \tag{16}$$

When assuming that all groups are equally influential ($\phi_m = \phi_o$), condition (16) is always fulfilled except for the extreme cases where either $\alpha_y = 0$ or $\alpha_o = 0$, i.e. if either the old or the young generation does not exist. When considering the case where all generations are of equal size ($\alpha_J = 1/3$) which is quite plausible in our context, we obtain $I^* = I_S^*$ only if $\phi_m/\phi_o = 2$, i.e. if the middle-aged generation has twice the political influence of the old generation.[13] At that point, the influence of the middle-aged generation just compensates the negligence of the young generation's preferences in the political process. In general, $I^* < I_S^*$ is valid, unless the political influence of the old generation is low in comparison to its size. Since this is unlikely, we henceforth assume equally influential groups ($\phi_m = \phi_o$) which implies $I^* < I_S^*$.

The intuition for this result is as follows: As the old generation only finances the public investment good, but does not benefit from its provision, the incumbent can increase its vote share among the old generation by distorting public policies towards short-term valuable expenditures. As no rents are captured in the optimum ($r_S^* = 0$), all rents accruing to the government in the political equilibrium r^* constitute a welfare

[13]Note that the underprovision of I becomes more pronounced, the more influential is the old generation (the higher is ϕ_O).

loss. As evident from equation (12), this "imperfect agency "distortion decreases in the level of political competition. Yet, political competition is obviously no remedy for the distortion towards public consumption since this distortion is inherent to elections in our model. To sum up the results until now, we state

Proposition 1 *If the young generation is excluded from the electorate, political competition leads to a level of public investment goods which is too low in comparison to the solution of the social planner. Moreover, the incumbent politician captures rents which constitutes a pure welfare loss.*

1.3 Sharing power with a bureaucracy

In this section, we extend the above model and analyze how the behavior of the incumbent politician changes if a second institution, in our case a bureaucracy, influences policy decisions. In doing so, we build on the idea that the administrative units, which the government requires in order to actually provide public goods, are to a certain extent able to influence the allocation of tax revenues. In the first part of this section, we analyze how the influence of a bureaucracy alters the composition of the public goods provided. The conditions under which a bureaucracy effectively constrains politicians are analyzed in the second part.

1.3.1 Impact on public goods provision

So far we have assumed that politicians do not only possess the right to decide on public policies, but are also able to implement these without any costs. In reality, however, politicians depend on the expertise and knowledge of bureaucrats when executing their decisions. Due to this expertise, bureaucrats have an informational advantage which can be exploited when elaborating drafts or implementing policies. As there is little scope for exchanging an established bureaucracy, bureaucrats are likely to affect public policy decisions to their own favor as suggested by Niskanen (1971).

When analyzing the functioning of bureaucracies, economists have generally pointed out the potential drawbacks of non-elected administrations. Niskanen (1971), for example, maintains that bureaucrats are mainly interested in the size of their budget

which is positively correlated to certain privileges like power. Accordingly, the presence of bureaucrats leads to excessive public expenditures. In the same way, Kessing and Konrad (2008) argue that bureaucrats derive utility from the absolute size of the budget ($G+I$ in our case). We follow this account and also argue that the influence of a bureaucracy increases government expenditures. When adding a bureaucrat to our model, we define his utility function as

$$B = K(G - G^*) + K(I - I^*), \tag{17}$$

where $K_G > 0, K_{GG} < 0$ and G^* and I^* are the levels of public goods provision in the political equilibrium. This specification entails the main characteristic of bureaucracies mentioned in the economic literature. At the same time, this formulation is concise enough to allow the subsequent analysis of the interaction between an incumbent politician and a bureaucrat. With the function $K(\cdot)$ we add more structure than Kessing and Konrad (2008). This ensures that the bureaucrat values both kinds of expenditures alike and allocates any funds at his disposal equally on both goods. This specific construction of the bureaucrat's objective function eases the following analysis considerably, but is not necessary for our conclusions to hold. For our purpose, we only require that bureaucrats have at least a small interest in public investment goods which is highly plausible given the long time horizon of bureaucracies.[14]

To analyze the interaction between the government and the bureaucrat, we model the latter as a monopoly bureaucrat. In doing so, we build on the analysis of the separation of powers by Persson, Roland, and Tabellini (1997).[15] In our case, the government is forced to adjust its policies, because it needs to seek the bureaucrat's willingness to cooperate. Consider the following stylized arrangement: the incumbent proposes a public-goods spending $[G, I]$. If the bureaucrat approves the proposal, he cooperates with the government in implementing the respective policies. If the bureaucrat is dissatisfied with the proposal, he exploits all his bargaining power in order to boycott the incumbent's plans. In that case, the incumbent loses the disposal power over an amount $a > 0$ of the budget. The parameter a denotes the bargaining power of the bureaucrat and might practically be determined both by the size of a bureaucracy and institutional features like budgeting rules. In addition, resources in the amount of

[14]Kessing and Konrad (2008) explicitly show that bureaucratic budget competition leads to an excessive employment of durable production factors. Therefore, one could even justify a specification of the bureaucrat's objective function that entails a bias towards public investment expenditures.

[15]Alternatively, one could generate a similar result via a bargaining model. While being fully equivalent, the formulation with a monopoly bureaucrat is considerably more tractable.

$x > 0$ are lost during the boycott.[16]

We denote the equilibrium outcome in the case where the incumbent is constrained by a bureaucrat by G_B^*, I_B^* and r_B^*. Assume for a moment, that the incumbent sticks to the policies as derived in section 1.2. Obviously, the corresponding proposal $[G^*, I^*]$ is rejected by the bureaucrat. Using his bargaining power, the bureaucrat is going to raise the provision of both public goods up to the default level $\bar{G} = G^* + \frac{a}{2}$ and $\bar{I} = I^* + \frac{a}{2}$ as implied by the above setting and equation (17). In doing so, the parameter a determines the mark-up on G^* and I^* which the bureaucrat can force the incumbent to concede.[17] Due to the costly boycott, the incumbent's effective rent shrinks to $\tilde{r} = r^* - a - x$. Thus, the incumbent's best response is to announce the provision of $\bar{G}$ and $\bar{I}$ in the beginning which secures the approval of the bureaucrat and allows to capture a larger effective rent $\tilde{r} = r^* - a$.

Anticipating the bureaucrat's impact, the incumbent needs to revise his policy proposals. Effectively, he cannot do otherwise but announce to provide $G_B^* = \bar{G}$ and $I_B^* = \bar{I}$. Note that $\bar{G}$ and $\bar{I}$ are the only public goods policies which can be announced consistently both vis-a-vis the electorate and the bureaucrat.[18] At the same time, voters need to adjust their demands. Though already knowing that the size of public goods exceeds the political optimum, voters cannot alter their lot as the opponent candidate faces the same constraint. Hence, $G_B^* = G^* + \frac{a}{2}$ and $I_B^* = I^* + \frac{a}{2}$ are the equilibrium public goods provision levels in the case where the incumbent is constrained by a bureaucrat. We sum up this result in

Proposition 2 *The presence of a bureaucracy increases the provision of both public goods in the political equilibrium.*

1.3.2 Impact on rents

Before entering the normative discussion, we first analyze the impact of the presence of a bureaucracy on the rents of the incumbent politician. We need to determine the extent to which the incumbent re-optimizes the level of rents, r_B^*, under the new

[16] We assume $T > a > x$.

[17] Our formulation implies that the default levels $\bar{G}$ and $\bar{I}$ are exogenous to the announcements of the candidate at stage one (as it is generally the case in the literature on separation of powers).

[18] In particular, we rule out the possibility that the incumbent announces a public good allocation of the form $[G' = G^* - \frac{a}{2}, I' = I^* - \frac{a}{2}]$ in order to neutralize the bureaucracy.

constraints. To start with, we assume that the incumbent continues to choose r^* and finances the additional public goods out of "its own"pocket. Yet, with an effective rent $\tilde{r} = r^* - a$ condition (12) is no more fulfilled as evident from

$$u_r(r^* - a) < \delta R\psi. \tag{18}$$

Equation (18) clearly indicates that the incumbent is not going to reduce his rents at all in this setting, i.e. $r_B^* = r^*$. Consequently, the tax rate has to be increased in order to finance the additional expenditures in the amount of a. Note that the decision regarding r does not affect the levels of public goods provided as the bureaucrat always forces the incumbent politician to provide $G_B^* = \bar{G}$ and $I_B^* = \bar{I}$.

The result that the presence of a bureaucracy does not restrict the incumbent politician depends on the availability of a tax that is free of any distortions. In reality, however, taxation is not costless since citizens undertake unproductive activities in order to avoid or to reduce taxes causing the so-called excess burden. Since more tax revenue can only be generated by taxing increasingly less suitable sources, the excess burden is not constant but increases in the level of taxation. To account for the excess burden in our model, we assume that taxes in the amount of $(1+\kappa)$ need to be collected in order to generate one unit of tax revenue. Moreover, κ is specified as an increasing function of T. Accordingly, the budget constraint of the government becomes:

$$T = (1+\kappa)(I + G + r), \tag{19}$$

where $\kappa(T)$ with $\kappa_T > 0$ and $\kappa_{TT} > 0$, i.e. the marginal excess burden increases in the level of taxation. This formulation implies that additional funds become increasingly more expensive for the incumbent politician.[19]

Of course, with the additional cost of taxation, the new optimal level of rents r^* in the unconstrained political equilibrium is lower than without an excess burden. The same holds true for the levels of public goods provision which are generally lower than up till now. The only qualitatively important change in our analysis concerns the level of rents captured by the incumbent politician in the constrained political equilibrium. Let us denote the corresponding equilibrium rent in the presence of a bureaucracy and under the consideration of the excess burden of taxation by r_{BE}. When being forced by

[19] Alternatively, one could argue that voters are averse to excess expenditures like the incumbent politician's rent and the bureaucrat's mark-up. See Svaleryd and Vlachos (2007) who introduce a similar cost which depends on whether voters are informed or not.

the bureaucracy to increase the provision of public goods, the incumbent has to decide whether to finance the additional expenditures by increasing taxes or by reducing his own rents. With an excess burden cost of taxation, the incumbent is still not willing to give up an amount a of his equilibrium rents (implying $r_{BE} = r^* - a$) in order to keep taxes at the previous level ($T = T^*$) since

$$\frac{u_r(r^* - a)}{1 + \kappa_r(T^*)} > \delta R\psi. \tag{20}$$

At the same time, it is no more optimal for the incumbent to compensate the impact of the bureaucrat fully by increasing taxes up to $\hat{T} > T^*$ in order to secure $r_{BE} = r^*$ since

$$\frac{u_r(r^*)}{1 + \kappa_r(\hat{T})} < \delta R\psi. \tag{21}$$

As a consequence, r_{BE} needs to be between $r^* - a$ and r^* while the tax rate increases less than in the case without an excess burden of taxation. Thus, the introduction of a bureaucrat does not only lead to an improved provision of public goods but also reduces rents when considering the excess burden of taxation. The exact level of r_{BE} depends on the curvature of u and κ. Ceteris paribus, the steeper κ is, the more limited is the leeway of the incumbent. Intuitively, the incumbent can obtain a larger rent without the bureaucrat, because the marginal cost of public funds is comparatively small as long as taxes are low. The bureaucrat, however, already causes expenditures to rise well above optimal levels. Hence, the incumbent faces a higher marginal cost of capturing rents in the constrained case, i.e. more votes are lost for each additional unit of rents. We can state

Proposition 3 *When considering the excess burden of taxation, the additional expenditures necessary for the increase in public goods provision are partly financed at the cost of the incumbent politician's rents.*

To illustrate the above outcome, we provide an analytical example by assuming specific functional forms of u and t. When, e.g. $u(r) = br - \frac{b}{2}r^2$ and $\kappa(T) = dT + \frac{d}{2}T^2$, with $b, d \in [0, 1]$ and $T = G^* + I^* + a + r$, we obtain the following explicit solution[20]

$$r_{BE} = \frac{b - d(\delta R\psi)(1 + \Theta)}{b + d(\delta R\psi)}, \tag{22}$$

[20]To rule out negative rents, b needs to be sufficiently large, i.e. $b > d(\delta R\psi)(1 + a)$.

where $\Theta = G^* + I^* + a$. Taking the candidates' utility function as given, the level of rents decreases in the parameter d as evident from

$$\frac{\partial r_{BE}}{\partial d} = -\frac{(2+a)b\delta R\psi}{(b+d\delta R\psi)^2} < 0. \tag{23}$$

Equation (23) displays that the taxation technology, in particular the characteristics of the marginal excess burden, determines the level of rents r. The more the excess burden grows as total expenditures increase, the lower are the incumbent's rents. Empirically, the extent to which the government can compensate the influence of the bureaucracy by increasing its rents might depend on the taxation technology and further institutional factors.

1.4 The beneficial welfare effects of a bureaucracy

We have seen that the incorporation of a bureaucracy tends to increase public expenditures. This result is in line with the previous literature on bureaucrats which generally regarded the additional expenditures as a waste of resources. Fuest (2000), for example, analyzes a model where politicians need to bargain with bureaucrats over the budget. In his framework, which only focuses on the absolute level of public expenditures, welfare unambiguously declines as bureaucrats gain bargaining power since the latter increase public spending beyond the socially optimal level. Yet, in our setting the normative implications are not necessarily negative. We take into account that political competition might lead to suboptimal policy choices and that the presence of a bureaucracy might constrain an incumbent's ability to capture rents. For these two potential positive side-effects, the influence of a bureaucracy might be beneficial up to a certain extent.

The first question to ask when evaluating the changes induced by the introduction of a bureaucrat, is whether its impact is at least beneficial at the margin, i.e. when starting from a situation where the incumbent is unconstrained ($a = 0$). Consequently, we are interested in the change in total welfare W at G^*, I^* and r^* if a increases marginally. In general, this effect is determined by

$$\frac{\partial W(G^*, I^*, r^*)}{\partial a} = (-1 + H_G(G^*))\frac{1}{2} + (1-\alpha_o)(-1+\delta F_I(I^*))\frac{1}{2} - \frac{\partial r}{\partial a}. \tag{24}$$

As displayed in equation (24), the overall effect of a change in the bargaining power

of the bureaucrat depends on two issues: First, its effect on provision of public goods, and second, its effect on the level of total rents r.

To isolate the first beneficial effect of a bureaucracy, let us abstract from the excess burden of taxation. In that case, we can ignore the impact of the bureaucrat's bargaining power on the rents appropriated by the incumbent since these remain unaffected by the bureaucracy, i.e. $\frac{\partial r}{\partial a} = 0$. Therefore, the welfare effect of the bureaucracy only depends on its impact on the provision of public goods. This allows us to put forward the following line of arguments: As public consumption is provided optimally when the incumbent politician determines policies alone, a marginal increase in its provision has no first-order welfare effects. Yet, the marginal increase in public investment is a first-order gain as public investment is underprovided in the beginning. Hence, the first beneficial effect of a bureaucracy consists in an improved level of public investment goods.

The second beneficial effect of a bureaucracy becomes evident when considering the excess burden of taxation. As shown in subsection 1.3.2, the increasing cost of taxation forces the incumbent to finance a part of the increase in public goods at the expense of "his own"rents which effectively reduces the marginal costs of public funds. Hence, an increase in the bargaining power of the bureaucrats effectively constrains the incumbent's ability to capture rents in addition to the increase in public investments as discussed above. Thus, a bureaucracy becomes even more valuable. We sum up our results in

Proposition 4 *When starting from $a = 0$, a marginal rise in the bureaucrat's bargaining power increases voters' overall welfare for two reasons: First, due to the improved provision of public investment goods, and second due to the additional constraint imposed on the incumbent politician. Proof see Appendix.*

Evidently, the benefit of an increase in public investment due to the bureaucrat's influence is less important, the higher the previously existing level of public investment is. At the same time, the costs of excessively supplying public consumption increase in the level of public consumption. Consequently, the above result is only valid if the bureaucracy's bargaining power is limited. At some point, the cost of excessively providing G just compensates the benefit from improving the level of I. The corresponding optimal influence level of the bureaucrat, a^*, is determined by the maximization of the total welfare in the constrained political equilibrium with respect to the bureaucrat's level

of influence, i.e.

$$\underset{a}{Max}\ W(G_B^*, I_B^*, r_B^*) \tag{25}$$

which yields

$$\frac{\partial W}{\partial a} = H_G(G^* + \frac{a}{2}) - 1 + \delta(1-\alpha_o)F_I(I^* + \frac{a}{2}) - 1 + \frac{\partial r}{\partial a} = 0. \tag{26}$$

Equation (26) illustrates the above argument that the optimal level of a bureaucracy's influence needs to be strictly limited. When starting from $a = 0$, $H_G(\cdot) - 1$ becomes more and more negative as a increases due to $H_{GG} < 0$. At the same time the positive $F_I(\cdot) - 1$ becomes smaller as a increases due to $F_{II} < 0$. When accounting for the excess burden of taxation, the second beneficial effect of bureaucracies needs to be taken into account. Since $\frac{\partial r}{\partial a} > 0$ the optimal level is strictly higher in the latter case. The intuition is as follows: When abstracting from the excess burden of taxation, the beneficial effect of the bureaucracy is due to inefficient provision of public investments in the underlying political equilibrium. With an excess burden of taxation, the bureaucracy puts an additional constraint on the incumbent which limits his ability to capture rents.

To prove the existence of an optimum, we need to consider the second-order condition of the above maximization problem which reads

$$\frac{\partial^2 W}{\partial a^2} = \frac{1}{2}[H_{GG}(G^* + \frac{a}{2}) + (1-\alpha_o)F_{II}(I^* + \frac{a}{2})] + \frac{\partial^2 r}{\partial a^2}. \tag{27}$$

Since $F_{GG} < 0$ and $F_{II} < 0$, an optimal level of the bureaucrat's influence a^* exists as long as $\frac{\partial^2 r}{\partial a^2} \leq 0$. Intuitively, the benefit from constraining the incumbent's tendency to capture rents by the presence of a bureaucracy needs to be decreasing or at least constant in the level of the bureaucracy's influence. This assures that the excessive expenditures caused by the bureaucracy outweigh its benefits at some point which is empirically highly plausible. Proposition 5 summarizes this result.

Proposition 5 *There exists an optimal influence level of a bureaucracy which is strictly higher when the excess burden of taxation is taken into account.*

The relationship between the optimal level of influence of a bureaucracy a^* and the size of the old generation α_o is obtained from equation (26) by means of the implicit

function theorem which yields

$$\frac{\partial a^*}{\partial \alpha_o} = -\frac{(1-\alpha_0)\delta F_{II}(I^* + \frac{a}{2})\frac{\partial I^*}{\partial \alpha_o} - \delta F_I(I^* + \frac{a}{2})}{\frac{1}{2}[H_{GG}(G^* + \frac{a}{2}) + (1-\alpha_o)F_{II}(I^* + \frac{a}{2})] + \frac{\partial^2 r}{\partial a^2}} \tag{28}$$

Note that the denominator is the second order condition of the above maximization problem as displayed in equation (27). Accordingly the sign of $\frac{\partial a}{\partial \alpha_o}$ is given by the sign of the nominator of equation (28). Intuitively, the relationship between the optimal level of influence of a bureaucracy a^* and the size of the old generation α_o depends both on the effect of α_o on the socially optimal level of public investments I_S^* and on the effect of α_o on the level of public investments in the political equilibrium I^*. In the end, the difference between I_S^* and I^* determines the welfare improving potential of a bureaucracy and hence a^*. The nominator of equation (28) indicates that $\frac{\partial a}{\partial \alpha_o} > 0$ is more likely, the stronger is the impact of α_o on the level of public investments in the political equilibrium I^* (strongly negative $\frac{\partial I^*}{\partial \alpha_o}$) and the more important is this effect in utility terms (strongly negative $F_{II}(I^* + \frac{a}{2})$). Of course, in welfare terms this effect needs to be discounted by $(1-\alpha_o)$ the relative size of the young and middle-aged population. The impact of α_o on the socially optimal level of public investments I_S^* is also taken into account by $\delta F_I(I^* + \frac{a}{2})$ which represents the reduced necessity of public investments for a each marginal increase in α_o.

1.5 Conclusion

This paper starts from the observation that public budgets in many countries are biased towards consumption expenditures. We set up a model in which this feature results from electoral competition in a society where the young generation is excluded from the electorate. Under these circumstances, the same electoral constraints that discipline politicians on the one hand, induce them to allocate too many resources to present consumption and too little to public investment. Bureaucrats, however, are not directly responsible to voters, but appointed for lifetime. The corresponding insensitivity regarding the interests of voters induces an increase of public expenditures. Consequently, the influence of bureaucrats leads to a beneficial mix of distortions where the political bias towards present expenditures is mitigated by the expenditure bias of bureaucrats. Moreover, we find that the additional expenditures caused by the bureaucracy reduce the incumbent's ability to capture rents when considering the excess

burden of taxation.

We conclude that the independence of bureaucracies from political competition does not always need to be detrimental - even though it gives rise to an expenditure bias. Given that elections tend to make politics short-sighted, an independent bureaucracy might even be welfare enhancing. In other words, bureaucrats' limited necessity of being responsible to the electorate does not only have a negative impact on the size of the public budget as in our model. It also creates a long-term perspective which might be highly valuable in an environment of fierce political competition. Moreover, we find that the presence of a bureaucracy reduces the ability of the incumbent politician to capture rents.

Our finding demonstrates that the welfare effects of institutions like the bureaucracy need to be considered in the broader context of public decision-making, i.e. in the context of the interaction between different political agents. Furthermore, our model offers a way to reconcile Rauch's empirical results with Niskanen's view of budget-expanding bureaucrats. A small and limited level of bureaucratic influence generates Rauch's results, whereas an excessive influence confirms Niskanen's hypothesis.

The above model can be extended to a multi-period model where a new type of political business cycle could be derived. If some investments yield a return during the period in which the elected government is in power, we would expect that the bias towards present consumption increases as the election date is appraoching. This implication could be tested empirically.

1.6 Appendix

Proof of Proposition 4

Given the definition of the bureaucrats' default levels as defined in section 1.3.1, we can easily derive $\frac{\partial G}{\partial a} = 1/2$ and $\frac{\partial I}{\partial a} = 1/2$ as displayed in equation (24).

From section 1.2, we know that $H_G(G^*) = 1$ and $F_I(I^*) > \frac{1}{\delta} + \frac{\alpha_O^1 - \alpha_Y^1}{(\alpha_Y^1 + \alpha_M^1)\delta}$.

Correspondingly, we can state $\frac{\partial W(G^*,I^*,r^*)}{\partial G} = 0$ and $\frac{\partial W(G^*,I^*,r^*)}{\partial I} > 0$ which completes our proof of $\frac{\partial W(G^*,I^*,r^*)}{\partial a} > 0$.

Chapter 2

Foreign aid and political accountability

2.1 Introduction

The effectiveness of foreign aid is highly controversial. Widespread instances of inefficient usage and waste of resources have alerted donor organizations like the World Bank to re-think their foreign aid management.[1] Weak institutional frameworks, especially corruption and a lack of political accountability, are most frequently cited as a reason for the ineffectiveness of aid.[2] However, it is not thoroughly scrutinized whether foreign aid also has a (possibly negative) impact on institutional quality itself. In the case of democratic countries, foreign aid might undermine the link between the government's performance and the political outcomes thereby prolonging the time incompetent politicians stay in office.

This paper investigates the conditions under which foreign emergency aid undermines political accountability in development countries. For that purpose we set up a simple retrospective voting model with differently informed groups of voters where an elected incumbent in the recipient country decides on the level of investments in disaster prevention and relief infrastructure. Within this framework, we analyze the relationship between emergency aid and the incumbent politician's accountability vis-a-vis the electorate. Our main proposition is that the quality of governance is most likely to dete-

[1] C.f. World Bank (1998).

[2] See e.g. Svensson (1999), Burnside and Dollar (2000) and Collier and Dollar (2002).

riorate when donors offer unconditional and unlimited support since this secures the votes of the ill-informed vulnerable voters for the incumbent independent of his actual performance.

The natural starting point for the discussion of political accountability issues are political agency models where imperfectly informed voters constrain self-interested politicians by threatening not to reelect them.[3] We adapt this framework as proposed by Persson and Tabellini (2000) to the developing world by explicitly modeling the salient characteristics of aid-dependent countries. Most importantly, we consider differently informed groups of voters when analyzing the impact of foreign aid on political accountability.[4] There are many reasons why poor and vulnerable citizens are considerably less informed than richer citizens, in particular poorer citizens tend to be ill-educated. This issue is particularly relevant in development countries where poor and vulnerable people make up a large fraction of the population. Moreover, information gaps are generally more pronounced in these countries due to larger economic and social differences between urban and rural areas.

The second important feature of developing countries considered in our analysis is the frequent occurrence of natural disasters. In our model, diasters destroy the income of citizens, but the incumbent politician can undertake investments in disaster prevention and relief infrastructure which influence the probability of natural disasters and the extent of damage. As the uninformed part of the electorate does not observe the actions taken by the incumbent politician directly, its current economic situation determines its voting decision. Thus, these voters learn something about the incumbent politician's effort if a disaster occurs. By providing emergency aid, international donors insure the incumbent at least partly against the political risk that uninformed voters who are affected by a disaster detect the government's negligence. Hence, our main result is that foreign emergency aid weakens the incentives provided by electoral constraints. However, our analysis shows that this results depends on whether the effort of the incumbent affects the probability of disasters or the extent of damage. We also analyze the impact of changes in the share of informed voters on the accountability of the government. We find that the incumbent's performance shrinks when the fraction of uninformed voters rises.

Our analysis yields a number of testable implications regarding the possible effect of aid

[3]For an overview of the political agency literature see Besley (2006).

[4]Besley and Burgess (2002) also build their analysis on the idea that a part of the electorate is ill-informed about the actions of the incumbent politician.

on the quality of governance. We start to test the resulting hypotheses in the second part of this chapter by exploiting the fact that the pattern of foreign aid giving is partly determined by political and strategic considerations. Alesina and Dollar (2000) show empirically that strategic considerations are crucial determinants of foreign aid. Kuziemko and Werker (2006) find that the amount of aid received from the United States increases by 59 percent when a country rotates onto the UN Security Council. In a similar vein, Dreher, Sturm, and Vreeland (forthcoming) find evidence that temporary members of the UN Security Council receive favorable treatment from the World Bank. Building on these insights, we propose to employ the voting pattern in the UN Assembly as an instrument for development aid in order to identify the impact of foreign aid on political accountability.

The literature on the linkage between foreign aid and political accountability is very limited. The only existing theoretical contributions are Svensson (2000) and Cohen and Werker (2007).Svensson (2000) analyzes the relationship between corruption and foreign aid in a rent-seeking model and emphasizes that the mere expectation of aid may suffice to increase rent-seeking. In contrast to his analysis, we focus on a model where the main determinant of the government's policies are elections rather than a group contest. Cohen and Werker (2007) scrutinize the impact of foreign aid on disaster prevention by a national government. In their model the probability of a shock is exogenous and the government can only influence the shock's impact by preventive and palliative spending. The crucial issue in their analysis remains whether these two means are substitutes or complements. In contrast to our approach, Cohen and Werker (2007) do not provide an explicit model of the political process, instead the government maximizes a social welfare function. Both Svensson (2000) and Cohen and Werker (2007) do not capture our central idea that electoral constraints are weakened by the provision of emergency relief because it (partly) ensures the government against the risk of losing votes in case a disaster occurs. When analyzing the importance of the media for the responsiveness of local governments in India, Besley and Burgess (2002) also argue that having a more informed electorate strengthens incentives for governments to be responsive. However, they focus on the importance of the media in providing information and do not offer an explicit analysis of the voting behavior of differently informed citizens. Finally, our paper contributes to the literature on foreign aid, its effectiveness, its determinants and its impact.[5]

[5]See e.g. Svensson (1999), Burnside and Dollar (2000) and Collier (1997). Note that our model deals with the relationship between emergency aid to countries affected by a disaster and not about permanent aid payments.

Knack (2001) tests whether aid dependency can potentially undermine the quality of governance by weakening accountability and encouraging rent-seeking in a cross-country study based on International Country Risk Guide (ICRG) ranking in the period from 1982 to 1995. He finds that aid significantly reduces a country's ranking in the ICRG when instrumenting aid with different economic and political variables. Our paper differs from his work in two respects: First, we provide a formal argument for the different ways in which aid affects accountability. Second, our identification strategy employs political variables as an instrument instead of economic variables since the latter are unlikely to solve the underlying endogeneity problems. Finally, we use a different indicator of the quality of governance and focus on a more recent time period.

The paper is organized as follows: Section 2.2 presents a retrospective voting models with differently informed groups of voters and analyzes the impact of foreign emergency aid on political accountability. In section 2.3 we discuss an identification strategy which could be suitable to test the predictions of our theoretical model and present some results regarding the use of different potential instruments. Section 2.4 concludes with an outlook on possible future research.

2.2 The model

In this section, we present a simple probabilistic voting model where a part of the electorate remains uninformed about the actions of the incumbent. These uninformed voters base their voting decision on their actual economic situation which is only partly determined by the government's policies, but also partly influenced by the actions of international donor organizations.

Consider a retrospective voting model with two periods. In the beginning an incumbent politician is already in office and decides on the government's policies. At the end of the first period an election is held where the voters evaluate the performance of the incumbent relative to a challenger. If reelected, the incumbent stays in office for another term without taking any further action and only receives the benefits from office as stated below. Thereafter the game ends.[6]

All voters start with an exogenous income $Y = \bar{Y}$, but experience a negative income

[6]The only purpose of the second period is to explicitly model the incumbent's incentives when deciding on the government's policies in the face of the elections.

shock with probability $\delta \in [0,1]$ in the first period - after the incumbent has made his policy decisions, but before the election takes place. We assume that the complete income is lost in case of a shock. Thus, voters fully depend on the relief σ provided by the government, i.e. $Y = \sigma$.[7] The shock could be interpreted as a natural disaster like a drought, flood or famine, or alternatively as an economic downturn, and the initial income might consist in the means for subsistence production which are destroyed by the disaster.

In our model, the government can influence the expected damage of natural disasters by actions undertaken at the beginning of the first period. In doing so, we consider two cases: In the first case, the government can influence the probability of the shock. Thus, we interpret the government's action e as an investment in prevention which reduces the probability that a disaster occurs, i.e. $\delta_e < 0$. Moreover, we assume that the marginal impact of these preventive measures decrease in the existing level, i.e. $\delta_{ee} > 0$. In practice, such measures might consist in the provision of a back-up water supply, the construction of dykes, etc.[8] In the second case, the government can influence the extent of the potential damage by choosing appropriate policies at the beginning of period one. Since we are not interested in the appropriateness of the actions of a government in case of a disaster, we regard the amount of emergency relief that the incumbent can offer in case of a disaster as determined by exogenous factors. At the time where a disasters occurs, the government can offer its voters a certain given amount of relief which might consist in food storage, emergency shelter, etc. However, the government can increase the effectiveness of its support by investments undertaken at the beginning of period one, i.e. before the shock actually occurs. Accordingly, e is now interpreted as investments in infrastructure which increase the effective relief $\sigma(e, \cdot)$ provided. Intuitively, such investments might consist in the construction of roads which ease the support for citizens living in remote areas.

Crucially for our analysis, the economic situation of the citizens affected by a disaster can also be influenced by the actions of international donor organizations. As today's donor organization are both financially powerful and well-organized, we assume that the emergency aid a directly increases the relief provided by the national government.

[7] Without altering our results, one could also assume that only the non-informed voters or a subgroup of these are affected by the shock like in Besley and Burgess (2002).

[8] The investments in disaster prevention could also be interpreted as the enforcement of rules like building regulations which is costly since the government foregoes bribes when being strict.

Accordingly, the effective relief σ becomes

$$\sigma = \begin{cases} \sigma(a) & \text{in case 1} \\ \sigma(a,e) & \text{in case 2.} \end{cases} \tag{1}$$

with $\sigma_a > 0, \sigma_e > 0$. Note that a is the contribution of the donor agency and e the infrastructure investment by the incumbent politician. The donor agencies might be public institutions like the World Bank or private agencies. Empirically, their impact on an affected country's well-being in case of a disaster is considerable, in particular in cases which gain a lot of attention in the media like the Boxing Day tsunami in 2004. On the other hand, we rule out the possibility that donor agencies directly affect the probability of a disaster since international donors provide little support for preventive measures (see e.g. Benson and Clay (2004)). Obviously, it is more difficult for aid agencies to collect donations for preventive measures than for emergency aid.

As explained before, the main policy choice of the incumbent consists in preventive investments (case 1) and infrastructure investments (case 2). The incumbent himself, however, cares only about his (monetary) rents r and about being reelected. The monetary rents r stem from the government's tax revenues and are therefore captured in period one. In contrast, the ego rent R represents the pleasure of being in power and only accrues to the incumbent when remaining in office for another period. Accordingly, R is exogenously determined and, in particular, independent of the current level of rent extraction r. The incumbent refrains from capturing high rents in period one since voters might punish him in the upcoming election if they detect his negligence. This in turn reduces an incumbent's chance of holding office for a second term and obtaining the associate value of holding office R. Formally, this link is captured by the incumbent's reelection probability $P(e)$ which is derived below. In sum, the incumbent's pay-off Ω can be written as

$$\Omega = r + P(e)R. \tag{2}$$

As indicated by equation (2), the discount factor to adjust the value of future the potential pay-off in the second period is set to equal one.

To simplify our analysis, we regard the government budget as exogenous.[9] Thus, the

[9]One could argue that this assumption is particularly innocuous in our context since developing countries obtain a considerable amount of public revenues from tariffs and permanent aid transfers.

government's budget (including the incumbent's rents) reads

$$T = e + r.^{10} \tag{3}$$

As a consequence, the incumbent politician's rents are the residual remaining after financing the investments e.

In the election, voters decide on whether to reelect the incumbent politician. As is usual in retrospective voting models, we assume the opposition candidate to be identical to the incumbent politician. Hence, the voters' sole motive for ousting the incumbent is the ex-post punishment of bad policy choices. Particular to our model, a fraction $\gamma < \frac{1}{2}$ of voters are informed about the policies chosen by the incumbent and condition their voting decision on his actual performance. In contrast, the uninformed voters comprising $(1-\gamma)$ of the population are not able to gather the information necessary for a deliberate choice and thus vote according to their current economic situation. In principle, the uninformed voters could get informed, but this might simply be too costly. Practically, one might think of the first group as urban inhabitants with access to different information sources and an adequate level of education to assess a government's performance thoroughly. In contrast, the latter ill-informed group represents the rural population that might be illiterate or without reliable information sources. Thus this group can only learn an incumbent's performance by experiencing the impact of his policies on its economic situation.

In our model the voting decision of individuals from both groups is also influenced by non-policy related aspects of the candidates and by an uncertain overall popularity of the incumbent. This ensures that the resulting reelection functions becomes a smooth function of the policy variables as standard in the probabilistic voting framework. The inherent bias of the electorate towards one or the other candidate is described by the parameter ω_i which is assumed to be uniformly distributed on $[0, K]$. K denotes the best alternative offered by the opponent to each of the two groups. The average popularity of the incumbent politician relative to the opponent in the overall population is denoted η and assumed to be uniformly distributed on $[-\frac{1}{2\psi}, \frac{1}{2\psi}]$.[11] The popularity of the incumbent is probabilistic and beyond his influence like the oil price for a national politician. The higher is the value of ψ, the higher is the density of swing voters and the more competitive is the election.

[10] We assume that tax revenues always suffice to finance the government expenditures plus rents.

[11] Regarding the generalization of the special distributional assumption see Persson and Tabellini (2000) and Linbeck and Weibull (1987).

The informed voters base their election decision both on the policies chosen by the incumbent and non policy-related aspects of the incumbent relative to the opponent. We assume that the informed voters condition their voting decision on the incumbent's performance by offering a linear incentive scheme. Specifically, voter i in group I votes for the incumbent if

$$\beta e + \omega_i + \eta \geq K, \tag{4}$$

where β represents the steepness of the linear incentive scheme. To illustrate equation (4), let us abstract from η and assume $\beta = 1$ for a moment. Then, the voter who favors the incumbent most (due to non-policy related issues), $\omega_i = K$, will even opt for the incumbent if it does not undertake any investments ($e = 0$). On the other hand, the voter who dislikes the incumbent most ($\omega_i = 0$) only opts for the incumbent government if it does not capture any rents ($e = T$). Although the well-informed voters might also be affected by a possible shock, they always know whether the incumbent is actually responsible. Having a perfect signal of the incumbent's performance, the best they can do is to condition their voting decision on this signal.[12] When going back to the general formulation of equation (4), the share of informed voters opting for the incumbent is given by

$$s^i = \frac{\beta e + \eta}{K}. \tag{5}$$

Central to our model, the uninformed voters do not directly observe the incumbent's performance, but evaluate their immediate economic situation when deciding whom to elect. Similar as before, voter i in group N votes for the incumbent if

$$Y + \omega_i + \eta \geq K. \tag{6}$$

To illustrate equation (6), we again abstract from the overall popularity η. Then, the voter who favors the incumbent most, $\omega_i = K$, even opts for the incumbent if no relief is provided in case of a shock. On the other hand, the voter who dislikes the incumbent most ($\omega_i = 0$) only opts for the incumbent if it makes him as well off as in a situation without the shock. In general, the less able is the government in providing adequate help, the more non-informed voters realize that tax revenues were wasted another way and vote for the opponent. However, the non-informed voters cannot differentiate between the case where the government provided support and where an international

[12]The informed voters might also reward the incumbent for attaining foreign emergency aid. We argue that they know that the dependence from foreign donors is not sustainable in the long-term and therefore only reward improvements of their expected income which are due to the incumbent's performance.

donor steps in compensating the insufficient preparations of the government. This implies that many non-informed voters continue to support an incumbent politician with a bad performance as long as international donors provide sufficient emergency aid in case a disaster occurs. When refering to general formulation of equation (6), the share of non-informed voters opting for the incumbent reads

$$s^n = \begin{cases} \frac{\bar{Y}+\eta}{K} & \text{if no shock occurs} \\ \frac{\sigma+\eta}{K} & \text{if a shock occurs.} \end{cases} \tag{7}$$

Accordingly, the total vote share of the incumbent is given by

$$s(\alpha, \beta, e, a) = [\gamma \frac{\beta e + \eta}{K} + (1-\gamma)[\delta \frac{\sigma + \eta}{K} + (1-\delta)\frac{\bar{Y} + \eta}{K}]. \tag{8}$$

Note that the vote share (8) is a random variable since it depends on the realized value of η which the incumbent does not know when deciding on the policy variable e. The incumbent is only aware of the distribution of the popularity shock η (and of the voters' individual preferences ω_i). Due to the uncertainty regarding the median voter's optimal policy, the incumbent's probability of winning becomes a smooth function of the policy variables. In particular, the incumbent wins the election if $s > \frac{1}{2}$. Accordingly, the probability that the incumbent is reelected can be derived as

$$P(e) = Prob[s \geq 1/2] = \frac{1}{2} + \psi[\gamma\beta e + (1-\gamma)[\delta\sigma + (1-\delta)\bar{Y}] - \frac{1}{2}K]. \tag{9}$$

Intuitively, the incumbent faces a trade-off between capturing rents in period one and getting the value of another term in office.[13] Correspondingly. the policies chosen by the incumbent are determined by the following maximization problem[14]

$$\underset{e}{Max}\ \Omega = r + P(e)R \tag{10}$$

$$s.t.\ \ T = e + r. \tag{11}$$

[13]We restrict attention to interior solutions where the incumbent is neither reelected nor ousted for sure. Therefore, we need to assume that the distribution of η is assumed to be wide enough to rule out corner solutions which imply that the optimal investment level is always zero.

[14]Remember that the opponent candidate is assumed to be identical to the incumbent politician.

2.2.1 Investments in disaster prevention

Let us first look at the case where the incumbent politician can influence the probability of disasters by preventive measures undertaken at the beginning of period one. The corresponding first-order condition which determines the optimal level of investment in disaster prevention e^* is derived from equation (10) and reads

$$\frac{\partial \Omega}{\partial e} = \gamma\beta + (1-\gamma)[\delta_e(\sigma(a) - \bar{Y})] = \frac{1}{\psi R}. \tag{12}$$

From equation (12) the sign of the impact of foreign emergency aid payments on the level of preventive measures can be derived by means of the implicit function theorem

$$\frac{\partial e}{\partial a} = -\frac{\delta_e \sigma_a}{\delta_{ee}(\sigma - \bar{Y})} < 0. \tag{13}$$

As the relief in case of a shock cannot exceed the initial income systematically, i.e. $\sigma < \bar{Y}$, we find a negative relationship between foreign aid and investment. Intuitively, the donor agency effectively provides an insurance against the political consequences of a disaster thereby reducing the incentives of the incumbent to improve public policies. The incumbent exploits his additional leeway by capturing more rents for himself. In other words the government underinvests in disaster prevention when it knows that it will be bailed out in case a disaster occurs.

In the same way we can determine how the level of investments in disaster prevention changes if the size of the informed voters increases:

$$\frac{\partial e}{\partial \gamma} = -\frac{\beta - \delta_e(\sigma - \bar{Y})}{\delta_{ee}(\sigma - \bar{Y})} > 0, \tag{14}$$

as long as $\beta > \delta_e[\sigma - \bar{Y}]$, i.e. as long as the incentive scheme offered by the informed voters is steep enough, the investment in disaster prevention (the level of rents taken) by the incumbent is the higher, the smaller is the fraction of uninformed voters. At the same time, the stronger is the incentive scheme (the higher is β), the higher is the level of disaster prevention e. Of course, this result is reversed if the reward offered by the informed voters is less than the benefit in terms of votes when improving the expected economic situation for all voters. The intuition for this result is straightforward: the agency problem only occurs because some voters are uninformed. Since informed voters can control the incumbent better than uninformed ones, an increase in the number of

informed voters reduces the moral hazard problem.[15]

Moreover, the comparative static analysis yields the prediction that the level of e is larger, the more valuable is holding office (high R) and the stiffer the competition for office (high ψ).

Proposition 6 *The level of preventive investments e is the higher (a) the smaller is the amount of emergency aid provided by the international donor organization (low a)(b) the larger is the fraction of informed voters (high γ); (c) the steeper is the incentive scheme offered by the informed voters (high β); (d) the higher is the value of holding office; and (e) the stiffer is political competition (high ψ).*

2.2.2 Investments in relief infrastructure

Now we consider the case where the incumbent politician can influence the extent of damage in case of a disaster by infrastructure investments undertaken at the beginning of period one. The corresponding first-order condition which determines the optimal level of infrastructure investments e^* can be derived from equation (10) and reads

$$\frac{\partial \Omega}{\partial e} = \gamma\beta + (1-\gamma)\delta\sigma_e = \frac{1}{\psi R}. \tag{15}$$

The impact of foreign aid on the level of infrastructure investments is obtained from equation (15) by exploiting the implicit function theorem which yields

$$\frac{\partial e}{\partial a} = -\frac{\sigma_{ea}}{\sigma_{ee}}. \tag{16}$$

Obviously, the sign of equation (16) depends on the functional properties of σ. Whereas, we can easily assume $\sigma_{ee} < 0$, the sign of σ_{ae} is less definite and depends on whether a and e are substitutes or complements. Since the infrastructure investments e increase the impact of the government's relief, it is also plausible that a and e are complements. A better road system does not only ease the government's support for the voters affected by a disaster, but also facilitates the actions of donor agencies when

[15]Note that both results are robust to different alternative specifications, in particular we can stipulate a convex cost function for the provision of infrastructure investment e like $c(e)$ with $c_e > 0, c_{ee} > 0$. Such a specification is equivalent to saying that the incumbent's marginal valuation of rents decreases in its level.

providing emergency aid. In that case, we find that an increase in emergency aid a triggers a higher level of infrastructure investments e. Intuitively, the moral hazard problem is partly mitigated since the aid flow renders the investment in infrastructure more valuable.

Finally, we analyze the impact of the size of informed voters on the level of infrastructure investments in the same way as before. Analog to the previous analysis, we obtain

$$\frac{\partial e}{\partial \gamma} = -\frac{\beta - \delta\sigma_e}{\sigma_{ee}} > 0. \tag{17}$$

As before, we find that the level of infrastructure investments increases in the size of informed voters as long as the incentive scheme is steep enough. We can thus state

Proposition 7 *As long as the government's infrastructure investments and foreign emergency aid are complements, the level of infrastructure investments e_2 is the higher (a) the larger is the amount of emergency aid provided by the international donor organization (low a) if e_2 and a are complements (b) the larger is the fraction of informed voters (high γ).*

The above analysis shows foreign aid actually can impair the accountability of governments in aid-recipient countries. However, we also find that under certain conditions, foreign aid might even improve the incentives of the government. The impact of the share of informed citizens is always positive in our model. Empirically, one might expect that foreign aid affects different kinds of expenditures in a distinct way. Whether such a detailed prediction can be confirmed in an empirical study is not entirely certain. For the time being, we are only interested in determining the total effect of foreign aid on political accountability as following in section 2.3.

2.3 Empirical analysis

In the empirical part of this chapter we test the basic implication of the model discussed in the previous section. In particular, we analyze whether foreign aid payments entail a negative impact on the accountability of governments. However, the identification of this effect is far from being trivial: Corrupt and incompetent governments are a potential reason for weak economic conditions and hence induce foreign aid payments which are intended to support citizens from suffering under bad conditions. As a

consequence, the identification of the impact of foreign aid on the accountability of governments is obstructed by the evident endogeneity of foreign aid. To overcome this problem, we employ two different instruments for foreign aid (infant mortality and UN voting) and discuss their appropriateness.

2.3.1 Estimation approach

The main aim of our empirical analysis is to test whether foreign aid undermines the political accountability of governments in recipient countries. For that purpose, we estimate the effect of foreign aid on a measure of accountability in a sample of aid receiving countries based on the following structural equation:

$$AC_{it} = \alpha PCODA_{it} + \beta_2 X_{it} + \theta_i + \tau_t + u_{it} \tag{18}$$

where AC_{it} measures the political accountability of a government in country i in year t and $PCODA_{it}$ is the amount of official development aid per capita received by country i and year t. X_{it} is a vector of control variables, in particular per capita GDP. Unobserved country effects and period-specific effects are captured by θ_i and τ_t. Finally, u_{it} denotes a residual.

An ideal measure of accountability is difficult to obtain, and detailed data on investments in disaster prevention and infrastructure investment is not available for a large set of counties. Therefore, we use an indicator for the quality of governance, the Worldwide Governance Indicators (WGI) provided by Kaufmann, Kraay, and Mastruzzi (2007), in order to capture political accountability.[16] This WGI indicator is comparatively detailed and we employ the "Voice and Accountability" dimension in our study as it fits best to the concept of accountability as discussed in the theoretical analysis. The "Voice and Accountability" dimension measures issues like government corruption, the freedom of expression, and a free media. In order to proxy the support by international donors in case of shocks, we use official development aid disbursements per capita. In a sense, our empirical study is more general than the above theoretical analysis which restricted attention to foreign emergency aid. The control variables account for the possibility that changes in fundamental economic and social variables like total population and per capita income influence our results. For example, it might be that a

[16]Knack (2001) also use a qualitative measure of the quality of governance, namely the International Country Risk Guide

country experiences an increase in income during the time period considered, e.g. due to the discovery of natural resources, changes of the terms of trades etc., which triggers a reduction in foreign aid.

The coefficient of interest in our structural equation is α which captures the impact of foreign aid payments on political accountability. The identification of α is far from being trivial. A regression of a measure of governance quality on the amount of development aid and standard control variables is likely to suffer from an endogeneity problem. Historical and social characteristics of a country might jointly determine both measures. Equally, bad governance might lead to more need and hence higher aid payments. One possibility to overcome these endogeneity problems is to find an appropriate instrument. The instruments discussed in the literature are on the one hand proxies for need like infant mortality and GDP per capita as well as social and political variables like indicators for former colonies or measures of the donors' interests. Knack (2001), for example, uses a combination of these variables and finds that evidence that higher foreign aid levels indeed impair the quality of governance as measured by the International Country Risk Guide (ICRG). Yet, the economic variables used in this and other studies are likely prone to the endogeneity issues discussed above. GDP per capita determines both the quality of governance and need, respectively aid flows at the same time and the same holds true for infant mortality. A country might suffer from high infant mortality exactly because the government is corrupt and incompetent. Therefore, we try to come up with an alternative instrument, namely voting in the UN General Assembly, which should be independent of these economic variables. We test also whether using this instrument yields different results than the standard instrument infant mortality.

Our identification strategy exploits the fact that the pattern of foreign aid giving is partly determined by strategic considerations. International donor organizations provide foreign aid for different reasons. Either donor are altruistic and intend to help the vulnerable citizens in developing countries or donors use foreign aid in order to foster their own strategic goals.[17] Recent studies show that strategic concerns are an important determinant of foreign aid flows. Kuziemko and Werker (2006), for example, study whether the ten temporary members of the UN Security Council are more likely to obtain US foreign aid than other countries during their two-year term. Their findings indicate that a country receives 59 percent more aid from the United States and 8 percent more aid from the UN when it rotates onto the council. According

[17] An explicit formulation of donor's preferences can be found in Knack and Rahman (2007).

to these authors, this pattern can be explained by the temporary members trading their votes for the payment of foreign aid.[18] Since the variation in foreign aid which is due to strategic considerations is determined by exogenous factors like the present geo-political situation or historical cleavages, it might be reasonable to exploit this variation in order to obtain an estimate of the impact of foreign aid on political accountability in recipient countries.

We try to exploit the voting behavior of recipient countries in the UN General Assembly as an instrument for foreign aid. Specifically, our measure is the percentage of votes in accordance with the United States as published by the Bureau of International Organization Affairs at the US Department of State. This variable should be able to explain changes in the level of aid a country receives from the United States. The underlying idea is that the United States rewards countries for sharing its political position in the UN General Assembly by increasing the amount of foreign aid going to the allied countries. On the other hand, developing countries might vote in accordance with the United States in order to raise the aid payments received.

Of course, a valid instrument does not only need to be partially correlated with the potentially endogenous explanatory variable as argued above and tested in subsection 2.3.3, but also needs to be unrelated to the error term. Since the main determinant driving the voting behavior are strategic concerns, there is no immediate concern that this measure is correlated with the accountability of the recipient countries' governments. Nevertheless, at least one caveat needs to be taken into account: It is important that the government of the donor country fosters its own strategic interests without attention to the quality of governance of the countries it cooperates with. One could argue that this is warranted in our case due to the long-lasting cooperation of the United States with countries like Pakistan and Saudi-Arabia out of strategic reasons. Nevertheless, we restrict attention to countries which were already well established democracies in 2000 as indicated by the democratization measure of Polity IV.[19] This is also necessary to be in line with our theoretical analysis, but entails the advantage that it becomes rather unlikely that donor countries refrain from cooperating with a country in our sample out of a general concern for good governance. The exclusion of countries with low level of democratization also ensures us against the objection

[18] Alesina and Dollar (2000) were among the first to provide evidence that strategic considerations are crucial in determining foreign aid flows. Dreher, Sturm, and Vreeland (forthcoming) find evidence that temporary members of the UN Security Council receive favorable treatment from the World Bank.

[19] We chose this indicator since it refers to the political institutions of a country.

that donors might concentrate aid on countries which are already characterized by a considerable level of quality of governance.

Given our previous discussion, the UN voting pattern should be a better instrument than most economic variables like infant mortality. Even if infant mortality is partly determined by exogenous factors like climate and geographic conditions, there is still enough reason to believe that a considerable partial correlation between political accountability and infant mortality exists. Nevertheless, our first regressions employ infant mortality as an instrument for development in order to obtain a benchmark. As it is likely that the corresponding results are prone to bias, we repeat the estimates based on UN voting as an instrument for foreign aid.

2.3.2 Data

This section gives a brief overview of the main variables employed in the empirical analysis. We focus on the time period from 1998 to 2004 and consider a set of aid recipient countries. A detailed summary statistic can be found in Table 2.1.

To stay in line with our theoretical analysis in section 2.2 and to restrict attention to countries which are comparable with respect to the level of democratization, we exclude all countries which achieve a value less than 6 points on the corresponding measure in Polity IV. The accountability of governments is captured by the Worldwide Governance Indicators (WGI) provided by Kaufmann, Kraay, and Mastruzzi (2007). This survey covers a wide range of countries and quantifies six dimensions of governance between 1996 and 2006 of which we use the "Voice and Accountability" measure. This aggregate entails the advantage that it exhibits enough variation across time and countries to allow for meaningful estimation results. We normalized the value of the indicator to obtain positive values ranging from 0.61 to 3 with an average of 2.00. The data on official development aid stem from the OECD's International Development Statistics (IDS) online databases on aid and other resource flows. We use annual flows from the United States and take both inflation and exchange rate movements into account. The size of per capita aid flows ranges from 0.01 USD to 23.4 USD with an average of USD 4.85. As an instrument based on an economic variable we take infant mortality as provided by the WHO in the World Health Statistics. The data on the voting patterns in the UN General Assembly are available from the Bureau of International Organization Affairs at the US Department of State. Finally, we gathered control

Table 2.1: Summary statistics

Variable	Mean	Std. Dev.	Min	Max
Democratization	7.43	1.23	6	10
World governance indicator	2.00	0.43	0.61	3
Per capita ODA (in dollar)	4.85	5.61	0.011	23.4
Child mortality	70.0	52.7	13.8	229
UN Voting	37.0	15.8	0	77.8
Per capita GDP (1,000's)	4.10	2.87	0.58	17.0
Total population (100,000's)	59.2	168	0.44	1066

Sample includes observations for Argentina, Bangladesh, Benin, Bolivia, Botswana, Colombia, Ecuador, El Salvador, Fiji, Ghana, Guatemala, Guyana, Honduras, India, Indonesia, Kenya, Lesotho, Madagascar, Malawi, Mali, Mauritius, Mexico, Mozambique, Namibia, Nicaragua, Pakistan, Panama, Papua New Guinea, Paraguay, Peru, Philippines, Senegal, Solomon Islands, Thailand, Uruguay and Venezuela in the years 1998, 2000, 2002, 2003 and 2004 (Nob=150). Sources: Polity IV (2007), Kaufmann, Kraay, and Mastruzzi (2007), International Development Statistics (OECD), World Health Statistics (WHO), Bureau of International Organization affairs at the US Department of State (several years) and Heston, Summers, and Aten (2006). Democratization refers to the corresponding measure in Polity IV. Child Mortality refers to under-five mortality rate, i.e. the probability of dying between birth and exactly five years of age expressed per 1,000 live births. ODA is official development assistance and applies to aid from the members of Development Assistance Committee of the OECD to developing countries. UN Voting is the voting coincidence with the United States in the UN General Assembly.

variables for each country from Heston, Summers, and Aten (2006). These include total population and per capita GDP for each country and year. To to account for changes of the price level, we use deflated income data.

2.3.3 Results

To test the quality of the instruments discussed above, we regress the governance quality indicator WGI on a measure of the importance of development aid as displayed in equation (18). In the first series of regressions US aid is instrumented by infant mortality as a measure for need, whereas UN voting patterns is used in the second series of regressions. The estimation is conducted using a panel data set for 36 countries with observations between 1998 and 2004 listed in Table 2.1. We estimate robust standard errors clustered by country thereby allowing for arbitrary country-specific serial correlation.

The first three columns of Table 2.2 display the specification where we instrument foreign aid by infant mortality. Column presents a baseline estimation without year effect and control variables, column (2) adds year effects and column (3) per capita GDP and total population as control variables. As all three specifications indicate, there is an impact of foreign aid on the quality of governance which is, however, only

Table 2.2: Impact of foreign aid on political accountability, instrumental variable estimations with infant mortality or UN voting

Dep. variable: Worldwide Governance Indicator						
	(1)	(2)	(3)	(4)	(5)	(6)
Per capita ODA	-.075*	-.092*	-0.097*	-.042*	-.038*	-0.050**
	(0.042)	(0.054)	(0.053)	(0.023)	(0.020)	(0.024)
Per capita GDP	-	-	0.046	-	-	0.10
			(0.14)			(0.089)
Total population	-	-	-0.0084	-	-	-0.0015
			(0.0018)			(0.0016)
Year effects	no	yes	yes	no	yes	yes
Country effects	yes	yes	yes	yes	yes	yes
IV's: Infant Mortality	yes	yes	yes	no	no	no
IV's: UN Voting	no	no	no	yes	yes	yes
F-Statistic 1^{st} stage	10.2	7.62	6.74	8.80	13.2	12.4

Sample includes observation for a number of developing countries (see text and 2.1 for details) from 1998 to 2004 (150 observations). Standard errors (robust to heteroskedasticity and clustering on country level) in parentheses. Significance levels: ** 5%; * 10%.

weakly significant. The sign of the effect is negative as expected and as reported by Knack (2001). The F-Statistic of the first stage regression is around the critical value 10 in the first specification, but slightly below when adding further controls. Nevertheless, the point estimate is considerably stable across the different specifications suggesting that an additional USD per capita aid (0.17 standard deviations) decreases the quality of governance indicator by roughly 0.9 points which corresponds to 0.21 standard deviations.

The last three columns of Table 2.2 presents the second specification where we use the voting pattern in the UN General Assembly as an instrument. Analogously, column (4) presents a baseline estimation without year effect and control variables, column (5) adds year effects and column (6) per capita GDP and total population as control variables. Again, we find a negative impact of foreign aid on political accountability which is significant at the 10% level in columns (4) and (5), and even significant at the 5 % level in column (6). In the two last columns, the F-Statistic of the first stage regression is well above 10 indicating that the partial correlation between UN Voting and US foreign aid is sufficiently strong. The sign remains as before, however, the strength of the crucial effect declines considerably and is roughly half of the size of the specifications which employ infant mortality as an instrument. The results based on UN Voting as an instrument suggest that an additional USD per capita aid (0.17

Table 2.3: Impact of foreign aid on political accountability, instrumental variable estimations with two instruments

Dep. variable: Worldwide Governance Indicator				
	(1)	(2)	(3)	(4)
Per capita ODA	-.048**	-.041**	-0.054*	-0.054*
	(0.023)	(0.020)	(0.024)	(0.024)
Per capita GDP	-	-	0.11	0.11
			(0.090)	(0.094)
Total population	-	-	-	-0.0015
				(0.0016)
Year effects	no	yes	yes	yes
Country effects	yes	yes	yes	yes
F-Statistic 1^{st} stage	5.84	8.12	6.77	6.79
Hansen test (p-value)	0.51	0.34	0.28	0.33

Sample includes observation for a number of developing countries (see text and 2.1 for details) from 1998 to 2004 (150 observations). Standard errors (robust to heteroskedasticity and clustering on country level) in parentheses. Instruments for Per capita ODA are UN Voting and Child mortality. Significance levels: ** 5%; * 10%.

standard deviations) decreases the quality of governance indicator only by roughly 0.45 points which corresponds to 0.10 standard deviations.

As a final check of the two instruments we present a specification which includes both instruments at the same time. This allows to check whether both instruments have an independent explanatory value. Table 2.3 displays the corresponding results. Column (1) shows the baseline specification, and columns (2) to (4) each add time effects, per capita GDP and total population as control variables. The result indicate that a combination of both instruments yields a stronger partial correlation between the instrument and the endogenous variable than before. Even with two instruments, the F-statistic of the excluded instrument in the first stage regression remains high. The p-values for the Hansen test indicate that the overidentification restriction is not rejected at a reasonable level of significance. The size of the effect is similar as when employing UN Voting as an instrument.

Our results suggest that both political and economic variables are good instruments for foreign aid. However, our results equally show that the estimate of the size of the impact of foreign aid on the quality of governance considerably depends on the instrument chosen. Moreover, the untestable caveats regarding the instruments as discussed before - in particular with respect to infant mortality - remain.

2.4 Conclusion

This paper starts from the idea that foreign emergency aid might affect political accountability in developing countries. We set up a model in which elections induce the government to invest in disaster prevention and relief infrastructure. Particular to our model, a part of the electorate is uninformed about the actions of the incumbent politician and conditions its voting decision on its current economic situation. In the event of a shock like a natural disaster, the voters' economic situation deteriorates considerably and the incumbent politician loses the support of the non-informed voters in the upcoming election. Therefore, the government has an interest in reducing both the likelihood as well as the impact of disasters by investments in prevention and infrastructure. However, as soon as an international donor supports the affected citizens in case of a disaster the incentives of the government to invest are partly lost since the donor ensures a certain level of income (and hence a certain level of support for the incumbent politician) even in case of the shock. Yet, we also find that under certain conditions, foreign aid might even improve the incentives of the government.

Given the results of our empirical study, we conclude that foreign agency aid payments entail considerable negative side-effects on the functioning of the political system of developing countries. As a consequence of the weakened incentive to invest in the prevention and dealing of disasters, we expect emergency aid to increase the expected loss associated with disasters. Hence, increasing aid is likely to increase the need for aid in the future. This effect might even be enforced when the support from foreign countries also impairs the development of a well-informed electorate. Our finding demonstrates that the potential harmful side-effects of foreign aid payments on the political system of developing countries need to be taken into account when setting-up the donor countries' policy agenda, particularly, since the quality of governance and the associated informedness of voters are of utmost importance for the development of a country.

The most obvious normative implication of our analysis would be to condition support in case of shocks on investments in disaster prevention and relief infrastructure. Then the government of the recipient country has an even stronger interest in investing since the political risk associated with the occurrence of a disaster increases. However, as is well known from the discussion of conditionality in general, the commitment to such a strategy is often not credible, last but not least given its altruistic motivation. Moreover, in the case of emergency relief further factors beyond the control of the donor

countries' governments like attention gained in the media considerably determine aid flows as Strömberg and Eisensee (2007) have shown. Finally, it is salient that the actions of the incumbent needs to be observable and not reversible. In the end, altruistic donors still face an even more pronounced conflict between securing the well-being of citizens affected by hardship and stabilizing country's political system which remains difficult to resolve. The main implication of our discussion might be the necessity of additional measures that directly strengthen the accountability of the recipient country's government by increasing the share of informed voters like programs to improve the quality of education or the independence of the media.

Our theoretical analysis can be extended by explicitly modeling the information gathering process. This would allow to check whether foreign emergency aid entails an additional negative impact on the accountability of the incumbent politician by weakening the incentives of voters to gather information. With respect to the empirical part, our future aim is to disentangle the impact of foreign aid on political accountability in detail by testing the remaining predictions of our theoretical analysis.

Chapter 3

Ballot access restrictions and electoral competition*

3.1 Introduction

The idea that competition is a salient prerequisite for the efficient functioning of markets is one of the central insights of economics. Consequently, the literature has thoroughly analyzed the ways in which incumbent firms might reduce competition, for example, by creating entry barriers to deter potential competitors.[1] Numerous authors like Becker (1983, 1985) and Wittman (1989) have argued that political competition exhibits a similar importance for political markets.[2] Recent empirical evidence also indicates that political competition is crucial for mitigating agency problems that are prevalent in politics. Besley, Persson, and Sturm (2006), for example, provide evidence suggesting that a considerable part of economic growth in the US South can be explained by variation in political competition. According to their interpretation, political competition improves the quality of candidates thereby fostering economic growth.

Our investigation in Chapter 3 starts from the idea that similar to incumbent firms in oligopolistic markets, incumbent political parties might reduce the effective degree of competition by deterring other parties from participating in elections. In spite of

*This chapter is based on joint work with Johannes Rincke, LMU Munich.

[1]For a discussion of the literature on barriers to entry see Tirole (1988).

[2]Stigler (1972) provides a more general discussion of the analogies between market competition and political competition.

a number of possible ways in which the parties in power might hinder potential contestants, the empirical evidence regarding the effectiveness of restrictions to political competition is still very limited. To shed light on this issue, we estimate the effect of ballot access requirements on the degree of electoral competition in US House elections as measured by the number of minor party and independent candidates. Since the stringency of ballot access regulations cannot be treated as being exogenous to candidates' entry decisions, we exploit a natural experiment to identify the effectiveness of ballot access restrictions. Our results suggest that ballot access regulations as used by most states in the US significantly reduce electoral competition.

Ballot access laws specify the conditions potential candidates need to fulfill in order to be listed on the ballot. In the United States, these restrictions greatly differ between major and minor parties. For major party candidates, the most common route to gain access to the ballot is a primary election. Minor parties and independent candidates, however, commonly need to file a petition signed by a certain number of eligible voters. These number of signatures required vary considerably both in absolute and relative terms. For example, in 1964 a candidate in Arkansas did not have to show any signatures to be listed on the ballot, whereas a candidate in Ohio had to present around 465,000 signatures which corresponded to 4.6 % of the total population. As a consequence, these petition requirements can potentially be designed by the (major) parties in power in a way that serves their interests and deters competition from minor political parties and independent candidates. At first glance restricting access to the ballot appears to be unnecessary in US politics since the majoritarian voting system promotes the existence of two dominating political parties as Duverger (1964) pointed out. Nevertheless, third party as well as independent candidates frequently appear on the ballot in state as well as federal elections. During the period considered in our analysis (1952 to 1984), around 17.2% of the races in US House elections saw three candidates, and an additional 8.7% had four or more candidates.

When measuring the effectiveness of ballot access rules, it needs to be taken into account that the state laws specifying the requirements for minor party and independent candidates are subject to changes by the state legislatures. Moreover, with the state legislatures being dominated by the two major parties, it is likely that the design of the respective state laws reflects the major parties' self-interest in limiting competition by minor parties and independent candidates. Consequently, a strong demand for participation in elections by potential third party and independent candidates might trigger more restrictive ballot access requirements. Of course, if ballot access restrictions are

effective in reducing the number of third party candidates, we will observe low levels of competition once these restrictions are in place. In contrast, if the established parties do not face any competition from candidates of other parties, there is no need to implement particularly restrictive ballot access rules. In such a situation, the stringency of ballot access laws is determined endogenously. Hence, a simple regression of the degree of electoral competition on the stringency of ballot access requirements is generally prone to bias. In our example, we would observe low levels of competition everywhere, but some states with more and others with less restrictive laws. We may then falsely conclude that ballot access requirements do not affect the degree of political competition. By recognizing that ballot access regulations cannot, in general, be treated as being exogenous to candidates' entry decisions, our study relates to recent work on endogenous political institutions by Aghion, Alesina, and Trebbi (2004) and Trebbi, Aghion, and Alesina (2007).[3]

To overcome the endogeneity problem, this study exploits variation in ballot access rules from a natural experiment. In particular, we make use of the US Supreme Court's 1968 decision in *Williams v. Rhodes* which struck down the highly stringent ballot access law the State of Ohio had enacted in 1951. The resulting sharp decrease in Ohio's signature requirements provides us with variation in ballot access that comes from an arguably exogenous source. Exploiting this exogenous variation allows us to identify the impact of ballot access restrictions on the entry decisions of third party and independent candidates. We estimate the effectiveness of petition requirements as a measure of the stringency of ballot access with data for US House elections from 1952 to 1984. Using electoral districts in other states with stable ballot access regulations as a control group, we show by means of difference-in-difference estimations that the Supreme Court decision of 1968 resulted in a significant increase in electoral competition. In particular, we find that the number of minor party candidates rose by roughly 0.35 (in comparison to the control group) due to the forced liberalization of Ohio's regulations which is considerable given Ohios's long-term average of 0.22. The magnitude of our estimates can be interpreted quite generally. Between 1951 and 1968 the petition requirements for third party and independent candidates in Ohio were practically insurmountable. Due to the Supreme Court decision, Ohio had to reduce its signature requirements to a level comparable to the moderate regulations existent in most other states. Thus, our difference-in-difference estimations quantify the potential increase in electoral competition if ballot access restrictions were lowered to moderate

[3]This idea will be further elaborated in Chapter 4.

levels in the remaining states which practically exclude minor party candidates until today.[4]

Our work is related to a number of earlier contributions. Abramson and Aldrich (1995) and Rosenstone, Behr, and Lazarus (1996), for example, study the relevance of third party and independent candidates in the history of US presidential elections. Amorim Neto and Cox (1997) discuss the determinants of the number of parties in general and explain it as an outcome of the interaction between the electoral system and the heterogeneity of the society. One of the first contributions discussing entry barriers in politics and the role of rewards of office in fostering electoral competition is provided by Tullock (1965). Glenn and Choi (2006) show that congressional legislators tend to vote more in line with their own preferences rather than those of their constituency when barriers to competition are raised. Moreover, there are a few empirical studies analyzing the effectiveness of ballot access laws in deterring minor party candidates. Examining congressional elections from 1984 to 1990, Ansolabehere and Gerber (1996) find that higher filing fees increase the frequency of uncontested elections and decrease the frequency of retirements. In the same vein, Stratmann (2005) examines the effect of filing fees and signature requirements on the number of candidates in US lower house elections at the state level in 1998 and 2000. His findings suggest that higher filing fees reduce both the number of major party and minor party candidates. In contrast to Ansolabehere and Gerber (1996) and Stratmann (2005), who do not discuss the problem of endogenous determination of ballot access restrictions and thus rely on the assumption that ballot access is exogenously given, we explicitly address the relevant state laws as being endogenous to the degree of electoral competition. The importance of taking into account the potentially endogenous nature of political institutions is discussed in Aghion, Alesina, and Trebbi (2004) and Trebbi, Aghion, and Alesina (2007). In Chapter 4, we explicitly demonstrate that between 1946 and 1976 state ballot access laws in the United States have been systematically tightened in response to stronger political competition.

The remainder of the paper is organized as follows. Section 3.2 provides the historical background of Ohio's ballot access laws. The empirical approach and the data are discussed in Section 3.3. Thereafter, Section 3.4 presents our results, and Section 3.5 concludes.

[4]Georgia, for instance, still requires minor party congressional candidates to file petitions, separately for each congressional district, signed by 5% of registered voters eligible to vote in the last election. In order to place its candidates on the ballot in all Georgia districts, a new party would thus have to collect almost 200,000 signatures.

3.2 The history of ballot access in Ohio

The establishment of election rules was left to the states in the US Constitution of 1789 since the framers could not agree on a single election law for the new federal government.[5] Access to the ballot remained entirely unregulated during much of the 19th century, and the candidates themselves were allowed to print and distribute paper ballots. As these practices resulted in polling irregularities and discouraged independent candidates due to the immense costs of providing their own ballots, the state governments in the 1890s gradually adopted the Australian ballot, prescribing that ballots were to be printed and distributed by the state government (Argersinger, 1980). Consequently, an official nomination procedure for potential candidates had to be established. These ballot access requirements became increasingly more complex and more stringent in the course of the 20th century. Since ballot access requirements are set by the state legislators, the demands vary considerably both in absolute and relative terms.

The State of Ohio introduced a particularly restrictive ballot access law in 1951. Interestingly, the circumstances of its introduction seem to substantiate the notion that the stringency of entry barriers to political markets can, in general, not be regarded as exogenously given. Before 1951, Ohio required a third party candidate to collect the signatures of only 1% of the registered voters, and third party candidates frequently appeared on the ballot, both in federal and in state elections. In the 1948 presidential election, Henry Wallace from the Progressive Party polled 1.3% of the votes, leaving the Republican candidate Harry Truman a margin of only about 7,000 votes to win the state against the Democratic candidate Thomas Dewey.

To rule out the possibility that third party candidates would prevent a clear victory by one of the major parties, the Ohio legislature adopted a new ballot access law in 1951 which practically excluded any third party candidates (Bott, 1990). Ohio demanded the submission of a petition signed by 15% of the voters participating in the last gubernatorial election for a party to be recognized officially, and one signed by 7% of the voters for an independent candidate to qualify for a statewide election; independent presidential candidates were not permitted. As a consequence, only the two major parties, which had to satisfy less strict requirements, competed in Ohio's political arena in the following years.

[5] See Bott (1990) for a brief history of ballot access in the United States.

Unsatisfied with their situation, several minor parties challenged the Ohio ballot access laws by appealing to the US Supreme Court. In October 1968 the Supreme Court ruled in *Williams v. Rhodes* that Ohio's regulations violated the 1st and 14th Amendments of the Constitution. In the *Williams* opinion, Justice Black observed that '[t]he state of Ohio in a series of election laws has made it virtually impossible for a new political party, even though it has hundreds of thousands of members, to be placed on the state ballot [...]'.[6]

Forced to reduce the barriers to entry for non-major party candidates, in October 1969 the Ohio legislature decided to lower the number of signature required for new parties to 7% and for independent candidates to 4% of the last gubernatorial vote. Yet even this softened regulation was declared unconstitutional by a three-judge US District Court in July 1970. Hence, the Ohio legislature took action again and adopted a new law (effective since March 1972) which reduced the requirements to 5,000 signatures for an office voted on statewide (including President) and 1% of the last gubernatorial vote in the respective district for congressional elections.

3.3 Estimation approach and data

The main purpose of our paper is to provide evidence of the effect of ballot access restrictions on electoral competition. As mentioned in the introduction, the identification of this effect is complicated by the apparent endogeneity of any regulation defining barriers to the entry of new political parties. We present a straightforward approach to solve the identification problem which exploits the Supreme Court decision of 1968 and the resulting significant reduction of ballot access requirements in Ohio as a natural experiment. To qualify as a natural experiment the units of observation need to be affected by a sharp and unexpected change in some key variable of interest (in our case, the restrictiveness of petition requirements for minor party and independent candidates). It is undisputable that the change in Ohio's ballot access laws resulting from the ruling in *Williams v. Rhodes* qualifies as such an event. The state moved from being by far the most restrictive state in terms of petition requirements to a regulation that was very similar to those in most other states. For a number of reasons the Supreme Court decision in *Williams v. Rhodes* can also be regarded as an unexpected event. First of all, when the Supreme Court struck down the law it had already been

[6] Cited in Bott (1990, p. 176).

in place for 17 years. Secondly, *Williams v. Rhodes* was the first ruling against existing ballot access laws in the history of the Supreme Court. Note furthermore that in *Jenness v. Fortson*, a case showing remarkable similarities to *Williams v. Rhodes*, the Court upheld the ballot access law of the State of Georgia in 1971.[7] Likewise, in a number of court cases in later years, existing ballot access regulations were confirmed.[8] Thus, the behavior of the Supreme Court was not characterized by a general tendency to rule against pronouncedly restrictive state ballot access laws. Rather, *Williams v. Rhodes* constitutes a unique and unprecedented event.

Our estimation approach aims at comparing electoral competition in congressional districts in Ohio between 1952 and 1984 to electoral competition in a control group of congressional districts in other states. The key point about the control-group districts is that *Williams v. Rhodes* affected signature requirements only in Ohio and not in other states. Hence, comparing the change in the number of third party and independent candidates in districts in Ohio to the change in districts from other states should identify the true effect of *Williams v. Rhodes* on electoral competition even in the presence of changes in political participation common to all states. Technically, we exploit the Supreme Court decision of 1968 by running difference-in-difference estimations. Our baseline estimation equation takes the form

$$\#MINOR_{it} = \alpha + \beta\, OHIO_i \times \text{1970-84}_t + \gamma\, OHIO_i + \tau_t + e_{it}, \tag{1}$$

where $\#MINOR_{it}$ is the total number of minor party and independent candidates that were listed on the ballot in district i in year t, α is a constant, and $OHIO_i \times \text{1970-84}_t$ is the interaction effect of a Ohio state dummy and a dummy for years after 1968, i.e., after the Supreme Court decision on Ohio's ballot access law.[9] Moreover, τ_t is a year effect and e_{it} is a residual. The coefficient β captures the differential effect of the change in Ohio's ballot access requirements. Note that in some estimations we do not include year effects, but just a single post-shock indicator for years after 1968.

A straightforward alternative to Equation (1) is to allow for a separate interaction

[7] Winger (2002) provides a detailed discussion of the Supreme Court's ruling in *Jenness v. Fortson*.

[8] See, e.g., Winger (2002) and Bott (1990).

[9] We treat the year 1968 as belonging to the pre-shock period because presumably there was too little time for most potential new candidates to prepare and run a campaign. We present robustness checks for this assignment later on, suggesting that assigning the year 1968 to the post-shock period or dropping observations from 1968 does not affect any of our main results.

effects for each post-shock year,

$$\begin{aligned} \#MINOR_{it} &= \alpha + \beta_{70}\, OHIO_i \times 1970_t + \beta_{72}\, OHIO_i \times 1972_t + \cdots \\ &\quad + \beta_{84}\, OHIO_i \times 1984_t + \gamma\, OHIO_i + \tau_t + e_{it}, \end{aligned} \tag{2}$$

where $OHIO_i \times 1970_t, \ldots, OHIO_i \times 1984_t$ denote interactions of the Ohio state dummy and indicators for observations from $1970, \ldots, 1984$. Equation (2) is more flexible, as it accounts for different treatment effects across years. We also estimate specifications including a time trend specific to congressional districts in Ohio to account for possible changes over time in electoral competition in the state not otherwise included in the model. This is potentially important as the estimates of the treatment effects might otherwise pick up an independent state-specific trend, leading to false conclusions regarding the effectiveness of petition requirements in preventing electoral competition.[10]

Regarding the residuals in both estimation equations suggested above, note that while we would like to account for unobserved congressional district effects, this is not generally feasible. The reason is that, due to redistricting, the districts change considerably (at least) every 10 years according to the update of population figures by the decennial census. For instance, the districts in the 1972 congressional election do not coincide in general with the districts in the 1968 or 1970 election. We do include, however, a separate indicator for districts in Ohio. Together with the constant term, this dummy variable will account for all time-constant characteristics shared by districts in Ohio as opposed to control group districts. Furthermore, we allow for heteroscedasticity as well as serial correlation of the residuals by reporting fully robust standard errors in the tables below.

In our analysis, we compare the congressional districts from Ohio to those from Illinois. The latter constitute a well-suited control group because Illinois was not affected by the Supreme Court decision but is very similar to Ohio in many respects. Furthermore, Illinois did not change its ballot access requirements between 1952 and 1984.[11] This is important, as such changes would interfere with the differential impact of the Supreme Court decision on Ohio's congressional districts. Illinois' election law constantly demanded a number of signatures equal to a considerable 5% of the vote in the last election in the respective district in which a candidate was seeking access to the ballot.

[10] Details on the specifications are reported in the tables showing the estimation results.

[11] We checked this by searching over the states' revised statutes for changes in ballot access laws for the whole period considered in our analysis.

Table 3.1: Characteristics of treatment and control group (means)

Variable	Year	Ohio	Illinois
Number of congressional districts	1952	23	25
	1968	24	24
	1984	21	22
Total population (1,000's)	1952	8299	8986
	1968	10462	10907
	1984	10817	11428
Per capita income	1952	5143	5775
	1968	7018	7680
	1984	8607	9628
Educational attainment	1952	0.375	0.361
	1968	0.509	0.501
	1984	0.705	0.704
Urbanization	1952	0.708	0.782
	1968	0.749	0.827
	1984	0.736	0.838

Data sources: Statistical Abstract of the United States (various years). Per capita income is measured in 1980 dollars. Educational attainment refers to share of total population 25 years and over with a high school diploma or a higher degree. Urbanization is percentage of urban population as defined by the US Census.

Thus, Illinois and Ohio required similar numbers of petition signatures before 1968. As Table 3.1 shows, Ohio and Illinois are also very alike in many other respects. First of all, both comprise a similar number of congressional districts. Ohio has between 21 and 24 districts, while Illinois has 22 to 25. Moreover, both states are demographically and economically very much alike. During the period we consider, both have almost the same population, per capita income, educational attainment and level of urbanization. Finally, Illinois is roughly of the same size and geographically close to Ohio.

Table 3.2 presents summary statistics of the dependent and the key explanatory variables. The data on election outcomes for US House elections between 1952 and 1984 come from the Inter-University Consortium for Political and Social Research, ICPSR (1994). These contain a record for each individual candidate, providing information on the candidate's name, party affiliation, and the number of votes received. From the party code we identified third party and independent candidates. In some rare cases the party codes are missing. Therefore, we checked the party affiliation of all candidates with missing party codes by referring to the official congressional election statistics.[12]

[12]These statistics are available from the office of the Clerk of the US House of Representatives at http://clerk.house.gov/member_info/electionInfo/index.html.

Table 3.2: Summary statistics

Variable	Mean	S.D.	Min	Max
Number of third party and independent candidates	0.123	0.425	0	4
Ohio	0.488	0.500	0	1
1970-84	0.462	0.499	0	1
Ohio× 1970-84	0.227	0.419	0	1

Sample includes all electoral races for the US House of Representatives from 1952 to 1984 in Ohio and Illinois (799 observations). Sources: ICPSR (1994), the Office of the Clerk of the US House of Representatives, Winger (2006) and the revised state codes for the respective states and several years. 'Ohio' is an indicator for the state of Ohio. 'Ohio× 1970-84' is the interaction between 'Ohio' and an indicator for years after 1968.

For our analysis we considered only third party and independent candidates that were actually listed on the ballot. Hence, we eliminated write-in candidates from our dataset and ignored scattered votes. Moreover, we restrict attention to general elections. The numbers in Table 3.3 confirm that our sample is almost perfectly balanced between districts belonging to either treatment and control group, and observations from pre- as well as post-shock periods.

3.4 Results

3.4.1 The effectiveness of ballot access laws: Ohio vs. Illinois

Before turning to the outcomes of our difference-in-difference estimations, we will first provide an intuition for our results by a comparison of means of the number of third party and independent candidates before and after 1968. As Table 3.3 shows, the average number of third party and independent candidates on the ballot in Ohio jumped from virtually zero before 1968 to 0.44 on average after 1968. In Illinois, the increase in the number of third party and independent candidates was much less pronounced.

This difference is illustrated in more detail in Figure 3.1. Between 1952 and 1968, the number of third party and independent candidates was close to zero in both states. While Illinois experienced a moderate increase beginning in 1972, the average number of third party and independent candidates in Ohio quickly soared to more than 0.8 in 1976. This number went down to values around 0.3 in 1978/80 and rose again to a value somewhat below 0.8 in 1982. In all years beginning with 1970, the number of third party and independent candidates in Ohio was larger than in Illinois. The numbers in Table 3.3 and the graphs in Figure 3.1 give a first impression of the effectiveness of Ohio's

Table 3.3: Average number of congressional candidates per district, Ohio vs. Illinois

	1952-1968			1970-1984		
	Nob	Mean	S.D.	Nob	Mean	S.D.
OHIO						
Overall number of candidates	209	1.99	0.18	181	2.36	0.81
Major party candidates	209	1.98	0.14	181	1.92	0.27
Third party & independent candidates	209	0.01	0.12	181	0.44	0.75
ILLINOIS						
Overall number of candidates	221	2.00	0.12	188	2.05	0.31
Major party candidates	221	1.99	0.07	188	1.97	0.16
Third party & independent candidates	221	0.01	0.09	188	0.08	0.29

Sample: Congressional districts of Ohio and Illinois in Congressional election years from 1952 to 1984 (799 observations).

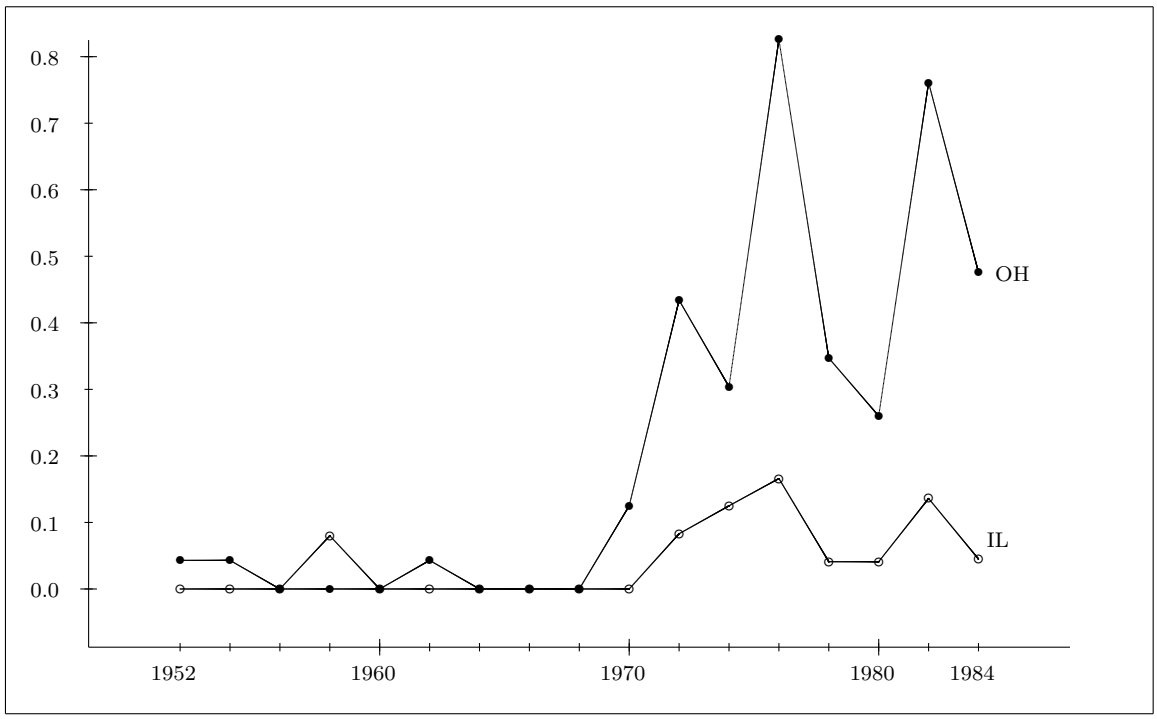
ballot access laws before 1968. The evidence suggests that the Supreme Court decision had a strong and immediate impact on electoral competition. However, we need a more technical approach to substantiate the descriptive evidence. In particular, we would like to check the statistical significance of the effects suggested by the descriptive analysis.

We now turn to the results of our difference-in-difference estimation approach. Table 3.4 displays a first set of results. The dependent variable is the number of third party and independent candidates. Our units of observation are 799 electoral races for the US House of Representatives in Ohio and Illinois between 1952 and 1984. Note that for all regressions we report standard errors that account for clustering on congressional districts. Since districts boundaries change regularly due to redistricting, we form district-specific clusters for the periods 1952-1960, 1962-1970, 1972-1980, and 1982-1984, giving a total number of 186 clusters.

Column 1 shows the results for a baseline specification of our difference-in-difference model. Besides the interaction term Ohio×1970-84, it accounts only for an Ohio state effect and an indicator for post-shock periods. The increase in the number of third party and independent candidates in Ohio (relative to congressional districts in Illinois) resulting from the Supreme Court decision is estimated to be 0.35 and is significant at the 1% level. The magnitude of the treatment effect is notable (recall that the average number of minor party candidates is only 0.12 in our sample).

In Column 2 we replace the indicator for post-shock periods by a full series of year effects. The results are very close to those obtained in Column 1. In Column 3 we split the single treatment effect employed in the first two specifications into a full series of

Figure 3.1: Minor-party and independent candidates, 1952-1984



Graphs show, separately for Ohio and Illinois, average number of third party and independent candidates per district in US House elections, 1952-1984.

interaction effects, giving a separate treatment effect for each post-shock year. Column 3 thus gives a much more detailed picture of the effects of the change in ballot access on the entry of third party and independent candidates. We note that the estimates for all year-specific treatment effects are positive, with six out of eight estimated coefficients being statistically different from zero at least at the 10% level. The treatment effect is strongest in 1976, indicating that in this particular election the reduction in ballot access requirements is responsible for 0.65 additional congressional candidates in Ohio relative to districts in Illinois.

As mentioned above, the difference-in-difference approach generally is prone to bias in the presence of a treatment-group specific trend which is not properly accounted for in the model. To hedge against such a potential bias, we allow for a time trend specific to districts in Ohio. As the results reported in Column 4 show, the coefficient of the trend itself is not statistically different from zero, and the general picture regarding the treatment effects is unchanged. Note, however, that now seven out of eight year-specific treatment effects are estimated to be statistically different from zero.

So far we have presented results with observations from the year 1968, i.e., the year of

Table 3.4: Effectiveness of ballot access laws, difference-in-difference, Ohio vs. Illinois

Dependent variable: Number of third party and independent candidates							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Ohio	0.005	0.005	0.005	0.021	0.023	0.009	0.038
	(0.012)	(0.012)	(0.012)	(0.036)	(0.040)	(0.008)	(0.039)
1970-84	0.070***	-	-	-	-	0.094**	-
	(0.023)					(0.036)	
Time trend	-	-	-	-0.003	-0.003	-	-0.004
				(0.005)	(0.006)		(0.004)
Ohio×70-84	0.351***	0.352***	-	-	-	0.317***	-
	(0.067)	(0.068)				(0.085)	
Ohio×1970	-	-	0.119*	0.134*	0.139*	-	0.129*
			(0.070)	(0.071)	(0.075)		(0.069)
Ohio×1972	-	-	0.345**	0.364**	0.369**	-	0.360**
			(0.162)	(0.163)	(0.165)		(0.162)
Ohio×1974	-	-	0.173	0.195	0.201	-	0.192
			(0.194)	(0.196)	(0.198)		(0.195)
Ohio×1976	-	-	0.653***	0.678***	0.685***	-	0.677***
			(0.199)	(0.201)	(0.204)		(0.200)
Ohio×1978	-	-	0.300**	0.327**	0.335**	-	-
			(0.141)	(0.145)	(0.150)		
Ohio×1980	-	-	0.213	0.243*	0.252*	-	-
			(0.135)	(0.141)	(0.147)		
Ohio×1982	-	-	0.620***	0.653***	0.662***	-	-
			(0.207)	(0.212)	(0.216)		
Ohio×1984	-	-	0.425**	0.461***	0.471**	-	-
			(0.169)	(0.177)	(0.183)		
Adjusted R^2	0.159	0.191	0.206	0.205	0.201	0.148	0.215
Years	1952-84	1952-84	1952-84	1952-84	1952-84[a]	1960-76	1960-76
Sample size	799	799	799	799	751	427	427
Year effects	No	Yes	Yes	Yes	Yes	No	Yes

[a] Observations from 1968 omitted. All regressions include a constant. Standard errors (robust to heteroscedasticity and clustering on districts) in parentheses. 'Ohio' is an indicator for districts located in the State of Ohio.'Time trend' refers to a time trend for Ohio. '70-84' is an indicator for the post-shock period, 1970-1984. Significance levels: * 10%; ** 5%; *** 1%.

the Supreme Court decision, assigned to the pre-shock period. In order to check the robustness of our findings with respect to this assignment, we excluded these observations and re-estimated the model with the full series of year-specific treatment effects and including the Ohio time trend. The results, displayed in Column 5, are almost identical to those obtained with observations from 1968 assigned to the pre-shock period. We conclude that the assignment of these observations does not critically affect

our results.

A well-known further criticism of difference-in-difference estimations is that with many time periods in the sample and significantly serially correlated observations, the approach may overstate the true effects. To account for this objection, we re-estimated both the baseline specification (Column 6) and the model with a full series of year effects, the Ohio time trend and year-specific treatment effects (Column 7) using observations only from the period 1960-1976. This reduces the number of observations to 427. Again, our results prove to be highly robust. In particular, the coefficient estimates of the year-specific treatment effects in Column 7 are very close to their counterparts in Column 5.

The bottom line from the series of difference-in-difference estimations reported in Table 3.4 is that the preliminary findings from the descriptive analysis are confirmed. In particular, we note that the strong effect of the Supreme Court decision on electoral competition is statistically significant and robust to various and substantial changes in specification.

3.4.2 Robustness: Extended control group

A potential objection to our identification approach might be the low variation in the number of third party and independent candidates in Illinois. Based on the descriptive evidence reported in Table 3.3 and Figure 3.1, one could argue that our approach comes close to comparing the variation in the number of candidates in the treatment districts to a variable which is constant over time in most districts belonging to the control group. In that case the difference-in-difference approach could be misleading, as the variation in electoral competition in Illinois might simply be suppressed by the very special circumstances of this particular state, namely its highly restrictive ballot access law. To address this point, we extend our analysis by expanding the control group by congressional districts from three additional states: Indiana, Kentucky and New Jersey. We selected these states based on two criteria: Firstly, we can only make use of districts from states that did not change their ballot access laws during at least a substantial part of the time period under consideration. Secondly, in order to induce more substantial variation in electoral competition within the control group, the ballot access laws of the additional states should be significantly less restrictive than those in Illinois.

Table 3.5: Average number of congressional candidates per district, extended control group including Illinois, Indiana, Kentucky and New Jersey

	1952-1968			1970-1984		
	Nob	Mean	S.D.	Nob	Mean	S.D.
IL, IN, KY & NJ						
Overall number of candidates	518	2.35	0.83	400	2.53	0.99
Major-party candidates	518	1.96	0.17	400	1.98	0.15
Third-party & independent cand's	518	0.38	0.80	400	0.55	0.98

Sample includes electoral races for the US House of Representatives from Illinois (1952-1984), Indiana (1952-1980), Kentucky (1952-1976) and New Jersey (1952-1984).

Table 3.5 displays descriptive statistics of electoral competition as measured by the number of minor party candidates within the extended control group. A quick inspection reveals that the number of third party and independent candidates now exhibits substantial variation both before and after 1968. Difference-in-difference estimations based on the extended sample should therefore provide us with a valid point of reference for the results discussed above. Note that we cannot employ all observations in our estimations since Indiana and Kentucky altered their ballot access rules towards the end of the period considered. We therefore restrict attention to the period from 1952 to 1976.

The results based on the extended sample are reported in Table 3.6. Column 1 again shows the baseline specification including a full series of state dummies, while Column 2 repeats the estimation with a full series of year effects instead of a single indicator for post-shock-periods. We obtain highly significant estimates of the treatment effect in both cases, with slightly lower point estimates compared to the estimations with only districts from Illinois forming the control group. Following the example of the results presented in Table 3.4, Column 3 replaces the single treatment effect by year specific interactions. Again, we find all estimated parameters to be positive, and three out of four effects are significant at least at the 5% level. Finally, Column 4 demonstrates that adding a time trend specific to districts in Ohio does nothing to our main results.

We conclude that adding congressional districts from three additional states to extend the control group and to induce higher variation in electoral competition within this subsample confirms the results derived from estimations where the control group comprises only districts from Illinois.

Table 3.6: Effectiveness of ballot access rules, difference-in-difference, extended control group including Illinois, Indiana, Kentucky and New Jersey

Dependent variable: Number of third party and independent candidates				
	(1)	(2)	(3)	(4)
Ohio	-1.21***	-1.21***	-1.21***	-1.24***
	(0.105)	(0.105)	(0.105)	(0.138)
Illinois	-1.22***	-1.22***	-1.22***	-1.22***
	(0.106)	(0.105)	(0.105)	(0.106)
Indiana	-0.951***	-0.952***	-0.952***	-0.952***
	(0.120)	(0.118)	(0.118)	(0.118)
Kentucky	-1.05***	-1.05***	-1.05***	-1.06***
	(0.118)	(0.116)	(0.117)	(0.117)
1970-1976	0.071	-	-	-
	(0.063)			
Ohio time trend	-	-	-	0.007
				(0.013)
Ohio×1970-76	0.318***	0.321***	-	-
	(0.105)	(0.102)		
Ohio×1970	-	-	0.317***	0.284***
			(0.099)	(0.110)
Ohio×1972	-	-	0.486***	0.446**
			(0.177)	(0.188)
Ohio×1974	-	-	0.058	0.011
			(0.217)	(0.229)
Ohio×1976	-	-	0.421**	0.368
			(0.213)	(0.231)
Adjusted R^2	0.345	0.371	0.372	0.371
Years	1952-76	1952-76	1952-76	1952-76
Nob	1048	1048	1048	1048
Year effects	No	Yes	Yes	Yes

All regressions include a constant. Standard errors (robust to heteroscedasticity and clustering on districts) in parentheses. 'Ohio', 'Illinois', 'Indiana' and 'Kentucky' are indicators for districts located in the respective state. See text for details regarding the extended control group. '1970-76' is an indicator for post-shock periods, 1970-1976. Significance levels: ** 5%; *** 1%.

3.4.3 Robustness: Placebo-treatment Georgia[13]

One might still question the effectiveness of ballot access laws since it certainly was not accidental that citizens of the State of Ohio went to court in order to get access to elections as political candidates. Partly, the strict ballot laws itself was probably a

[13]This subsection is not part of the joint work with Johannes Rincke, LMU Munich.

motivation, however, it might also be that minor political parties and other political groups were especially active in Ohio at that time. If the potential candidates were persistent enough to appeal the Supreme Court, they also might have overcome Ohio's stringent restrictions in case the court had ruled differently. Accordingly, the observed differential development of the number of candidates in Ohio in comparison to the control states used in our study might be at least partly due to the strong political pressure from minor parties and independents particular to Ohio. Ideally, we should compare the situation in Ohio after the suspension of its strict ballot access requirements to a hypothetical situation in which these requirements remained effective.

To counter this objection, we analyze the pattern of electoral competition in Georgia where a similar attempt of potential candidates to gain access to elections failed in 1971. Georgia required a minor party or independent candidate to produce a nominating petition signed by not less than 5% of those eligible to vote at the last election for the office he was seeking. Since these demands were almost insurmountable, the Socialist Worker Party filed an action in 1970 asking the Supreme Court to suspend Georgia's strict requirements. Winger (2002) shows that the regulation in Georgia was at least as stringent as in Ohio and argues that the US Supreme Court should have struck down the ballot access laws of both states equally. Nevertheless, in 1971 the Supreme Court upheld Georgia's strict ballot access requirements in Jenness v. Fortson.

To check whether a high level of political activism is sufficient to overcome strict ballot access rules, we exploit the fact that the Supreme Court decided differently in the two very similar situations as described above. Instead of using Ohio as the treatment state, we now compare Georgia to Illinois by means of a difference-in-difference analysis. Though Georgia is slightly smaller (15 congressional districts), Illinois and Georgia are quite similar in economic and social terms. Since congressional elections take place in uneven years, the post-treatment period is unambiguously determined. Apart from adapting the beginning of the treatment, we keep the same time period as before (1952 to 1984).[14] If ballot access rules are really effective, we should observe no increase in the number of candidates in Georgia after 1971 in comparison to Illinois.

The descriptive statistics of electoral competition as measured by the number of minor party and independent candidates for Georgia and Illinois are displayed in Table 3.7. The numbers already indicate that Georgias's strict ballot access laws even deterred the presumably politically very active minor party candidates who went to the Supreme

[14]Without affecting the results substantially, one could also exclude the early years.

Table 3.7: Average number of congressional candidates per district, Georgia vs. Illinois

	1952-1970			1972-1984		
	Nob	Mean	S.D.	Nob	Mean	S.D.
GEORGIA						
Overall number of candidates	100	1.50	0.67	68	1.63	0.49
Major party candidates	100	1.39	0.51	68	1.63	0.49
Third party & independent candidates	100	0.11	0.40	68	0.00	0.00
ILLINOIS						
Overall number of candidates	245	2.00	0.11	164	2.06	0.33
Major party candidates	245	1.99	0.06	164	1.97	0.17
Third party & independent candidates	245	0.01	0.09	164	0.09	0.31

Sample: Congressional districts of Georgia and Illinois in Congressional election years from 1952 to 1984 (577 observations).

Court. Before 1971, on average only 0.11 minor party candidates participated in Georgia's congressional elections. After 1971 the situation of these political newcomers does not seem to have improved since no such candidates could be observed any more.

The intuition provided by the descriptive statistics is confirmed by the results of the difference-in-difference estimations which compare Georgia and Illinois before and after 1971. The corresponding results are depicted in Table 3.8. The dependent variable is again the number of third party and independent candidates. However, there were only 577 congressional electoral races in Georgia and Illinois between 1952 and 1984. Column (1) depicts the baseline specification of our difference-in-difference model which as before only accounts for a Georgia state effect and an indicator for post-shock periods. The estimator of the interaction term Georgia×1972-84 reveals that the number of third party and independent candidates in Georgia even decreased slightly after 1971 compared to the control state. The magnitude of the treatment effect is estimated to be -0.16 and significant at the 1% level. This result does not change in any significant way when adding year effects (Column (2)) or a time trend (Column(3)).

The case of Georgia clearly indicates that even politically active third party and independent candidates are not able to overcome directly the barriers set by strict ballot access laws. This result provides further evidence that the considerable deterrent effect of ballot access laws on third party and independent candidates needs to be taken seriously.

Table 3.8: Effectiveness of ballot access rules, difference-in-difference estimations, Georgia vs. Illinois

Dependent variable: Number of third party and independent candidates			
	(1)	(2)	(3)
Georgia	0.088**	0.102***	0.117**
	(0.036)	(0.037)	(0.047)
1972-84	0.055	-	-
	(0.022)**		
Georgia time trend	-	-	-0.003
			(0.005)
Georgia×1972-84	-0.160***	-0.192***	-0.170**
	(0.039)	(0.045)	(0.067)
Adjusted R^2	0.021	0.039	0.037
Years	1952-84	1952-84	1952-84
Sample size	577	577	577
Year effects	No	Yes	Yes

[a] All regressions include a constant. Standard errors (robust to heteroscedasticity and clustering on districts) in parentheses. 'Georgia' is an indicator for districts located in the State of Georgia. '1972-84' is an indicator for the post-shock period, 1972-1984. Significance levels: * 10%; ** 5%; *** 1%.

3.5 Conclusion

This paper investigates the effect of barriers to entry on electoral competition. In particular, we provide evidence on the impact of ballot access restrictions on entry decisions of third party and independent candidates. Building on recent contributions by Aghion, Alesina, and Trebbi (2004) and Trebbi, Aghion, and Alesina (2007) who claim that political institutions should generally be treated as endogenous, we suggest an identification approach which explicitly takes the potential endogeneity of ballot access requirements into account. Our identification strategy exploits exogenous variation in the stringency of ballot access requirements stemming from the US Supreme Court decision of 1968 to strike down Ohio's ballot access law. We exploit the resulting sharp decrease in the signature requirements for third party and independent candidates as a natural experiment. By means of difference-in-difference estimations using observations from electoral races in US House elections from 1952 to 1984, we study the effectiveness of ballot access restrictions.

Our results indicate that ballot access requirements as used in most US states can be highly effective in reducing the degree of electoral competition faced by major-party

candidates. Specifically, we find that after the forced abolishment of Ohio's prohibitive ballot access law, the number of independent and third party candidates appearing on its ballot rose by roughly 0.35 (in comparison to the control group). This result is significant at the 1% level and holds for a number of different specifications, in particular it is highly robust to changes in the control group.

Given the wide-spread use of ballot access restrictions until today and the salience of political competition for the accountability of governments, our study suggests taking seriously the costs of restrictions to the entry of new political candidates in general. Furthermore, the effectiveness of ballot access restrictions shows that political institutions can potentially be exploited by the parties in power to foster their own interests. This in turn highlights the necessity to understand political institutions as being subject to the strategic choice of influential actors such as governments and legislatures in empirical studies.

Chapter 4

The design of political institutions*

4.1 Introduction

The political economics literature has traditionally treated political institutions as exogenous constraints on policymakers. This view has only very recently been challenged by Trebbi, Aghion, and Alesina (2007) who provide evidence that the choice of electoral rules in US cities varies with the share of minorities in a way that effectively limits minority representation.[1] This finding suggests that political institutions should properly be understood as being subject to strategic choice of influential actors such as governments and legislatures which exploit these institutions for their own purposes. This in turn may have strong effects on the quality of governance and thereby economic performance as recent research by Besley, Persson, and Sturm (2006) indicates. Despite the fact that the design of political institutions by self-interested political elites has such potentially far-reaching consequences, there is little empirical evidence for endogenous institutional change.

This chapter explicitly addresses the endogeneity of political institutions by focussing on the design of rules governing ballot access for third parties and independent candidates in the United States. Using state-level variation in the definition of these rules between 1946 and 1976, we analyze how the degree of competition in gubernatorial elections faced by major parties has affected the design of ballot access requirements. To account for the endogeneity of observed levels of electoral competition, we exploit the federal Voting Rights Act (VRA) of 1965 as a source of exogenous state-level variation

*This chapter is based on joint work with Johannes Rincke, LMU Munich.

[1] See also Aghion, Alesina, and Trebbi (2004).

in electoral competition. In particular, we find that state policymakers did systematically tighten state ballot access laws in reaction to increased electoral competition by new political parties and independent candidates.

As explained in Chapter 3, ballot access laws define the requirements potential candidates need to fulfil in order to take part in general elections in the United Sates. Minor party and independent candidates are commonly required to file a petition signed by a certain number of eligible voters.[2] In Chapter 3 we have also shown in detail that these requirements have strong deterrent effects on third party and independent candidates. This result is confirmed by other studies: Ansolabehere and Gerber (1996) find that higher filing fees increase the frequency of uncontested races and decrease the frequency of retirements in congressional elections. In the same vein, Stratmann (2005) demonstrates that filing fees deter third party candidates in state level Lower House elections. As the tightening of ballot access restrictions entails an immediate impact on the effective level of electoral competition which could be exploited by established parties, these laws are an appropriate example of a (potentially) endogenous political institution.

As a first step of the analysis, we set up a simple theoretical model which illustrates the optimal choice of barriers to entry to the political arena from the point of view of a self-interested incumbent political party. The incumbent party is assumed to adjust the barrier to changes in exogenous conditions affecting the effective degree of electoral competition. The model thus treats the effective degree of competition as an endogenous variable which depends on exogenous conditions as well as the barrier set by the incumbent party. In a second step, we investigate whether the design of ballot access requirements in US states is systematically related to the degree of competition in gubernatorial elections. This exercise is complicated by the fact that the observable degree of electoral competition already reflects the deterrent effect of existing ballot access requirements on potential third party and independent candidates: in states with few such candidates, the major parties will face low competition even without any ballot access requirement, while in states with many active political parties a similar level of effective competition might be the outcome of more restrictive requirements. Naive estimates relating the stringency of ballot access rules to observed levels of electoral

[2]Despite the fact that a majoritarian voting system as in the US promotes the existence of two dominating political parties (Duverger, 1964), third-party as well as independent candidates frequently appear on ballots in state as well as federal elections. During the period considered here (1946-1976), 46% of the gubernatorial races saw three or more candidates, while 50% had two candidates and 4% were uncontested. In US House elections, the corresponding numbers were 28% (three or more candidates), 59% (two candidates) and 13% (uncontested).

competition are therefore likely to be misleading.

Our strategy to solve the endogeneity problem exploits the federal Voting Rights Act (VRA) of 1965 as a natural experiment. Before the mid-1960s, politics in the southern states[3] was characterized by a quasi-monopoly of the Democratic Party and the practical disenfranchisement of most black voters. The VRA effectively removed barriers to the political participation of blacks such as poll taxes and literacy tests and led to a rapid and significant increase in registration rates among black voters: taking all southern states together, registration among blacks jumped from 35.5% in 1964 to 64.8% in 1969.[4] The increased political participation of black voters had a substantial effect on the political supply side, i.e. on political parties and potential candidates for public office: while in all non-southern states the average number of candidates in gubernatorial elections showed a moderate change from 2.6 in the years immediately before the VRA (1958-1964) to 2.9 in the period 1966-1972, the respective figure considerably increased from 2.1 to 2.8 in the southern states.

When exploiting the variation in electoral competition induced by the VRA, we proceed in two steps. In the first step, we substantiate the claim that the VRA is a source of exogenous variation in the number of candidates in gubernatorial elections, and that this variation is strong enough to solve our identification problem. In particular, we estimate the treatment effect of the VRA on the number of candidates in states with a substantial black minority by a series of difference-in-difference estimations. The main finding across various specifications and robustness checks is that the federal intervention of 1965 indeed had a significant impact on the number of candidates. We check this result against a number of alternative explanations for the increase in the number of candidates in southern states. In particular, we show that the significant increase in electoral competition cannot be explained by the gradual catch up of the US South in terms of educational attainment, income, and urbanization.

Our main result is established in the second step of the empirical analysis, where we derive estimates of the impact of electoral competition on the stringency of ballot access laws in terms of signature requirements for third-party and independent candidates. To overcome the endogeneity problem, we construct an instrumental variable for the number of candidates which captures the variation in electoral competition induced by the VRA. We construct the instrument in such a way that the difference-in-difference

[3]We use the definition of the Census Bureau and treat as southern states Alabama, Arkansas, Florida, Georgia, Louisiana, Mississippi, North Carolina, South Carolina, Texas, and Virginia.

[4]See Statistical Abstract of the United States (1970, p. 369).

estimations derived in the first step of the analysis can be interpreted as first stage regressions of our instrumental variable estimations. Based on data for the period 1946-1976, our findings point to a strong impact of electoral competition on the stringency of the states' ballot access laws. On average, an additional candidate on the ballot has triggered an increase in petition requirements in the order of 7,500 to 10,000 signatures. Again, we perform several robustness checks to validate our findings. Taken together, the empirical analysis suggests that the states have systematically tightened their ballot access laws in reaction to increased levels of electoral competition. Hence, ballot access regulations provide an example of endogenous political institutions.

Most of the literature on constitutional choice and electoral rules has treated political institutions as exogenous constraints on policymakers. For instance, an influential recent line of thinking comprising, among others, Rodrik (1999) and Persson and Tabellini (2003) has discussed institutions as predetermined factors driving key economic outcomes. Only very recently a positive approach to the choice of political institutions has been suggested. It seeks to explain why different societies have different political institutions, and tries to figure out the determinants of institutional change. Alesina and Glaeser (2004), for instance, deal with the strategic choice of electoral rules, focussing on the implications of alternative constitutional choices on the welfare state. Acemoglu and Robinson (2000) explain the extension of voting rights in western societies as the outcome of strategic choices of political elites to prevent social unrest. The tradeoff between delegation of power and ex-post control of politicians is analyzed in Aghion, Alesina, and Trebbi (2004). Finally, Trebbi, Aghion, and Alesina (2007) report evidence that the choice of electoral rules in US cities varies with the share of minorities in a way that effectively limits minority representation.

The paper is organized as follows. The theoretical model illustrating the behavior of an incumbent party in setting barriers to entry is presented in Section 4.2. Section 4.3 sheds light on the historical background of our empirical analysis in general and the VRA in particular. The empirical approach and the data are discussed in Section 4.4. Section 4.5 presents our results, and Section 4.6 concludes.

4.2 Setting optimal barriers to entry

This section provides a simple theoretical framework for the following empirical discussion. In particular, the model highlights the role of incumbent political parties which

choose optimal barriers to prevent the entry of political competitors.

Consider an economy with political parties competing for power. We focus on the choice of the 'rules of the game' by an incumbent political party, in particular, the setting of a barrier to entry, B. The barrier affects the degree of effective competition, described by the well-behaved function C according to

$$C = C(\tilde{C}, B), \tag{1}$$

where $\tilde{C}$ summarizes exogenous conditions that influence C. We call $\tilde{C}$ latent competition. Using subscripts to indicate partial derivatives, let $C_{\tilde{C}} > 0$ and $C_B < 0$. In addition, we assume $C_{BB} > 0$, meaning that increasing the barrier reduces its marginal impact on C, and $C_{B\tilde{C}} < 0$, saying that a given increase in B is more effective the more candidates are seeking access to elections.

To capture the idea that incumbent parties usually dislike a situation with strong electoral competition, we define a benefit function $V(C)$ with $V_C < 0$. However, setting higher barriers to entry comes at a cost, captured by a cost function $K(B)$ with $K_B > 0$ and $K_{BB} > 0$. In practical terms, one may think of negative effects on the incumbent party's general reputation, or of higher political effort needed to implement a more restrictive rule.[5] In total, the incumbent party maximizes the difference between the benefits and costs of setting B,

$$V - K = V(C(\tilde{C}, B)) - K(B). \tag{2}$$

From the first-order condition, $V_C C_B - K_B = 0$, we obtain

$$\frac{dB}{d\tilde{C}} = \frac{V_C C_{B\tilde{C}} + V_{CC} C_{\tilde{C}} C_B}{K_{BB} - V_C C_{BB} - V_{CC} C_B C_B}. \tag{3}$$

As long as the second-order condition holds (i.e. the denominator is positive), the sign of $\frac{dB}{d\tilde{C}}$ is positive unless V_{CC} is strongly positive. In particular, $\frac{dB}{d\tilde{C}} > 0$ will hold if the reduction in utility when competition increases is constant ($V_{CC} = 0$). Hence, for a wide range of benefit functions, our model predicts a re-design of rules defining barriers to entry in a way that an increase in latent competition triggers more restrictive regulations. Though being likely, the last assumption certainly depends on

[5] Ballot access laws have been challenged in court several times. In 1968, for instance, the Supreme Court declared Ohio's ballot access law unconstitutional, and the state had to reduce the requirements for third-party and independent candidates considerably.

the curvature of the incumbent's utility function. Therefore, we are going to test the relationship between B and $\tilde{C}$ empirically.

In the empirical part of the paper we test for an endogenous adjustment of B due to changes in electoral competition $\tilde{C}$, taking the ballot access restrictions of the US states as an example. This is complicated by the fact that the exogenous conditions $\tilde{C}$ driving the observed effective degree of electoral competition C are difficult (if not impossible) to capture. Whereas C can be approximated by the number of candidates seeking for office, $\tilde{C}$ can only be observed by the political actors themselves. The incumbent, for example, might know whether a group of voters is unsatisfied with his policy, or whether there is a popular activist or politician who is likely to run as an additional candidate (and adjust B accordingly). For us, these details of the political process are difficult (if not impossible) to capture. Therefore, our approach to estimate the effect of electoral competition on the stringency of ballot access restrictions rests on the idea to use a readily observable measure for effective competition (such as the number of candidates appearing on the ballot) as the key explanatory variable and to account for the endogeneity of this measure (i.e. the fact that $\tilde{C}$ itself depends on B) by instrumental variables. Intuitively, the instruments serve as a substitute for latent competition as the unobservable explanatory variable of interest. Before turning to the empirical part, however, we briefly review some key historical facts our identification approach is based upon.

4.3 Historical background

Our identification strategy builds on exogenous variation in state-level electoral competition that was induced by the abolishment of voting rights regulations in the southern states in 1965. In the following, we provide a summary of the relevant historical facts.[6]

Since the 1880s the Democratic Party had established a political quasi-monopoly in the US South with its representatives often remaining uncontested in elections. This position was partly built on the effective disenfranchisement of black voters. Among others, black citizens were refused their political rights by all-white Democratic primaries and so-called 'Grandfather Clauses' which limited the right to vote to those individuals whose grandparents had it before the Civil War. Moreover, political par-

[6]For more details, see, e.g., Lawson (1976) and Grofman, Niemi, and Handley (1992). Besley, Persson, and Sturm (2006) provide a related description of the historical background.

ticipation of blacks was obstructed by poll taxes and literacy tests. Though poll taxes were comparatively low, they discouraged many poor blacks from casting their vote. Literacy tests were used in an arbitrary manner to discourage black voters from registering. As a consequence, only a small fraction of black citizens registered for voting. In 1960 the average registration rate among blacks in the US South was only 29.1%, in contrast to 61.1% among white citizens. In some states, the asymmetry in registration rates was even more pronounced. In Mississippi, for example, in 1960 only 5.2% of the blacks, but 63.9% of the whites were registered.[7]

The attempts of the black citizens in the southern states to change their lot were largely unsuccessful for a long period of time. Only after the landmark decision *Brown v. Board of Education* by the Supreme Court in 1954, which struck down racial segregation in public schools, the black reform movements started to gain momentum. The Civil Rights Movement culminated ten years later in the 1963 'March on Washington' and Martin Luther King's 'I have a dream' speech. As a response to the growing discomfort among black citizens, the Johnson administration decided to support the reform movement by federal legislation, in particular by the Civil Rights Act (CRA) in 1964 and the Voting Rights Act in 1965. But whereas the black reform movement developed gradually, the cornerstones of the federal civil rights legislation were enacted in a quick succession of events. In particular, it seems that the actions taken by the Johnson administration were largely driven by unforeseen media coverage of a number of singular events.

One of the unforseen events that triggered legislative activity of the Johnson administration was the murder of three civil rights activists in Mississippi on June 21, 1964. The subsequent public outrage made the Republicans join the Northern Democrats against the Southern Democrats to pass the CRA which president Johnson immediately signed into law on July 2, 1964. Among other things, the CRA made voting restrictions in federal elections illegal, but the existing restrictions at the state level remained in place. It does not seem that the Johnson administration had any intention to amend the CRA after the 1964 elections.[8] Yet, further events, especially the attack by state troopers on peaceful demonstrators walking from Selma, Alabama, to the state capital Montgomery on March 7, 1965, received tremendous media attention and made president Johnson send a proposal for a strict enforcement of voting rights to Congress on March 17, 1965. The Senate and the House passed the bill at the beginning of

[7]For more details on voter registration in the US South between 1960 and 1970, see Statistical Abstract of the United States (1971, p. 365).

[8]See also Besley, Persson, and Sturm (2006).

August. On August 6, 1965, president Johnson signed the VRA into law.

The VRA finally suspended the use of poll taxes and literacy tests by the states. Moreover, it authorized federal supervision of voter registration in states, or counties, where such restrictions had been used in the past and where less than 50% of the voting age population was registered. Accordingly, the implementation of the prescriptions of the VRA was very strict and highly effective. This stands in contrast to all previous attempts of federal legislators to abolish the political disenfranchisement of blacks in the US South. Until 1965 these efforts were largely unsuccessful as the southern Democrats persistently obstructed any federal initiative addressing the discrimination of blacks.[9] Due to the strict enforcement of the VRA, the registration of black voters increased substantially, and the political landscape of the US South was quickly and fundamentally transformed. As a consequence, the quasi-monopoly of the Democratic Party in the southern states came to an end. Already in 1966, the first Republican governors in the US South in the 20th century were elected in Arkansas (W. Rockefeller) and Florida (C.R. Kirk). Until the mid-seventies, Republicans became governors also in North Carolina (J.E. Holshouser, 1972), South Carolina (J.B. Edwards, 1974), and Virginia (L. Holton, 1969).

4.4 Empirical approach and data

In this section we discuss our identification strategy regarding the effect of electoral competition on the stringency of ballot access restrictions. We also briefly review our data and present summary statistics.

4.4.1 Estimation approach

Our analysis aims at providing evidence of the effect of electoral competition on the design of ballot access laws in the US The identification of this effect is complicated by the apparent endogeneity of variables that measure the effective degree of electoral competition. To overcome this problem, our estimation strategy exploits variation in electoral competition which was triggered by the VRA and, therefore, is exogenous to the states' ballot access regulations. In particular, we make use of the fact that the

[9]For a detailed account of the long and unsuccessful struggle against voting rights restrictions in the US South see Lawson (1976).

VRA considerably increased the overall level of political participation in states with a relatively high black population share, whereas it left states with relatively few blacks more or less unaffected.

Before explaining our identification strategy in detail, let us briefly discuss the structural equation of interest which reads

$$B_{it} = \alpha C_{it} + X_{it}\beta + \theta_i + \tau_t + e_{it}, \tag{4}$$

where B_{it} measures the stringency of ballot access restrictions in state i in year t, C_{it} is the degree of electoral competition, and X_{it} denotes a vector of state characteristics that potentially affect the stringency of ballot access requirements. Unobserved state effects and period-specific effects are captured by θ_i and τ_t, while e_{it} denotes a residual.

We use the number of petitions that minor-party and independent candidates need to submit in order to be placed on the gubernatorial ballot as a measure for B. As mentioned before, these signature requirements are often substantial and constitute a significant barrier to entry for third party and independent candidates. In general, the variation in the petition requirement is substantial, both across states and over time.[10] Note further that other restrictions like filing fees and tight deadlines during the application process seem to be less important in practice: filing fees for gubernatorial candidates are of negligible size in the majority of states, and where they are not, several Supreme Court rulings require that alternative means for gaining ballot access have to be specified. Similarly, due to a number of court decisions, the leeway to adjust deadlines that have to be met during the application process (like for filing petitions) is very limited in practice.

With regard to C, we use either the total number of candidates appearing on the ballot or the number of third-party and independent candidates. At first glance, the latter measure seems to be the better choice since it is more closely related to the stringency of ballot access restrictions for minor-party and independent candidates. Recall, however, that uncontested gubernatorial races were quite frequent prior to 1965 in the southern states. The significant increase in electoral competition faced by the southern Democrats in the aftermath of the VRA was to a considerable extent due to candidates of the Republican Party regularly appearing on gubernatorial ballots. This in turn might have triggered adjustments of ballot access requirements in general,

[10] See Bott (1990) for details on the states' ballot access laws and the following subsection for descriptive statistics on signature requirements.

and in particular for minor-party and independent candidates. We therefore use the total number of candidates as a measure for electoral competition in most estimations and report results based on the number of third party and independent candidates as a robustness check.

The prime role of the control variables is to account for a possible effect of key economic and social-demographic indicators on signature requirements. For instance, more populous states might choose higher signature requirements. Similarly, it might be that the leading parties are more likely to face significant competition in wealthier and more urbanized states. Therefore, we allow for an independent effect of total state population, per-capita income, educational attainment as well as urbanization.

The coefficient of interest in our structural equation is α. It captures the extent to which states re-design their ballot access requirements in response to changes in the degree of electoral competition. We expect a positive sign of α, indicating that states tend to make access to the ballot more difficult for third-party and independent candidates if major parties face more competition. However, recall from the discussion of the theoretical model that, because the effective degree of electoral competition already reflects the impact of B, estimating α from a naive regression is uninformative. Technically, the dependence of C on B induces correlation between our main explanatory variable and the residual, which renders parameter estimates from simple OLS regressions inconsistent. Our approach to solve the endogeneity problem is to identify a source of exogenous variation in electoral competition at the state level and to exploit this variation in order to derive instrumental variables for C. If the exogenous variation captured by the instruments is sufficiently strong, a two-stage least squares (2SLS) regression will identify the effect of interest. Intuitively, the instrumental variables are used as a substitute for $\tilde{C}$, the unobservable exogenous variable of interest in the theoretical model.

Our choice of instruments exploits the extraordinary impact of the VRA on the political participation of blacks in the US South. To the extent to which the resulting increase in black voter participation triggered an increase in electoral competition in those states which were affected by the federal legislative initiative, the intervention has the potential to provide us with variation in the number of candidates that is arguably exogenous to the states' ballot access requirements. A straightforward way to investigate the differential impact of the abolishment of impediments to black voter participation is to estimate the impact of the VRA on the number of gubernatorial

candidates by means of a difference-in-difference approach. In its simplest form, a corresponding estimation equation looks like

$$C_{it} = \gamma Black \times VRA_{it} + \tilde{X}_{it}\delta + \tilde{\theta}_i + \tilde{\tau}_t + u_{it}, \tag{5}$$

where C_{it} again represents the degree of electoral competition, i.e. either the total number of candidates or just the number of minor-party and independent candidates. $Black \times VRA$ is the interaction between an indicator for states which were affected by the federal intervention, *Black*, and a second indicator, *VRA*, which takes value zero for all years prior to 1966 and value one for the years starting from 1966 (the post-shock periods). $\tilde{X}_{it}$ is a vector of control variables, where the tilde indicates that the vector is allowed to differ from the corresponding vector X_{it} in Equation (4). As in our main estimation, we also include state effects, $\tilde{\theta}_i$, and period effects common to all states, $\tilde{\tau}_t$.

The purpose of the difference-in-difference estimations is to check whether (and to what extent) the VRA increased electoral competition in the subset of affected states. We will therefore focus on the coefficient of the interaction term, γ, which captures the differential impact of the federal intervention. With respect to the definition of *Black*, recall that most of the southern states were immediately affected by the VRA because they were forced to abolish impediments to black voter participation like poll taxes and literacy tests.[11] Note, however, that even in states that did use neither poll taxes nor literacy tests at the time of the VRA, the political participation of blacks rose considerably. Florida, for instance, had abolished poll taxes already in 1937 and did not use formal literacy tests. Notwithstanding, the registration rate of blacks increased from 39.4% in 1960 to 55.3% in 1970, while the registration rate among whites decreased from 69.3% to 65.5%.[12] In general, the available data on registration and voting behavior between 1960 and 1970 suggest that the VRA had substantial effects on the political participation of blacks in all states. To account for this, we use the size of the black minority in order to assign states to treatment and control group for the difference-in-difference estimations. In particular, we define all states with more than 10% black population in 1960 as *Black*.[13]

[11] These were Alabama, Arizona, Georgia, Louisiana, Mississippi, North Carolina, South Carolina, Virginia and Texas.

[12] Statistical Abstract of the United States (1971, p. 365).

[13] All our results are robust to moderate changes of this threshold. In particular, we checked whether the inclusion of states which were close to the 10%-threshold in 1960 into the treatment group (such as Kentucky with 7.1% blacks, Pennsylvania (7.5%), Missouri (9.0%), Michigan (9.2%), and Illinois (10.3%)) affects the results of the difference-in-difference as well as the 2SLS estimations.

Equation (5) suggests a straightforward way to derive instruments for the number of candidates in the main structural equation (4). The difference-in-difference estimation identifies the effect of increased voter participation induced by the VRA on electoral competition. If the states in the treatment group (those strongly affected by the federal intervention) experienced a significant increase in electoral competition, we should find positive and statistically significant estimates for γ, indicating a significant partial correlation between the interaction term and the degree of electoral competition. Thus, if γ is found to be statistically different from zero, our difference-in-difference estimation procedure would suggest to use $Black \times VRA$ as an instrument for the endogenous electoral competition measure C in our main structural equation.

Of course, to obtain valid instruments for the degree of electoral competition, we do not only need to establish that the instruments are correlated with the endogenous explanatory variable, but also that the instruments are truly exogenous to the stringency of the states' ballot access provisions. As we have argued in the previous section, both the CRA and the VRA were imposed on the southern states by the federal government. Moreover, we have pointed out that the enactment and implementation of both acts was an unprecedented event. In particular, it seems to be highly unlikely that state policymakers did anticipate the federal intervention they experienced in the course of the 1964/65 events. Note furthermore that neither the CRA nor the VRA did address the use of ballot access requirements by the states. It therefore seems to be justified to treat the federal legislative intervention of 1964/65 as exogenous to the design of ballot access rules. Moreover, we account for the fact that ballot access laws in some states specify an absolute number of signatures, while in others the requirement is given as a percentage of registered voters or votes cast in the preceding general election. In states with a relative definition, an increase in turnout (or the number of registered voters, depending on the specification of the corresponding state law) will automatically increase the number of petitions required to get access to the ballot in the next election. To ensure that our instrument can still be validly excluded from the main estimation equation, we have to account for the direct effect of participation by appropriate explanatory variables. Therefore, we construct two indicator variables, one for states with a relative definition of the signature requirement and one for states with an absolute definition. In our main estimation, we include the interactions of both indicators with the number of votes cast in the preceding election as additional control variables. Finally, we also include the indicator for states with a relative definition.

We complete the description of the empirical approach by discussing the choice of

the control variables in the difference-in-difference regressions which are essentially the same as in the 2SLS estimations. In particular, we allow for an independent effect of per capita income, educational attainment and urbanization in order to account for the possibility that an increase in the number of candidates for governor in southern states might be due to the economic catching-up of the US South. For example, higher levels of educational attainment might induce more citizens to participate in politics, thereby increasing the number of candidates. Furthermore, we account for the possibility that more populous states may see more candidates by including state population as an additional regressor.

4.4.2 Data

The cross-sectional dimension of our sample is given by the population of contiguous US states. Regarding the time dimension, we make use of the gubernatorial election years between 1946 and 1976. The group of states which are assumed to having experienced a significant shock in the overall level of political participation in 1964/65 is defined based on the population share of blacks in 1960, requiring a share of at least 10 percent. This definition gives a set of 14 states for which the indicator *Black* is set to one, consisting of Alabama, Arkansas, Delaware, Florida, Georgia, Illinois, Louisiana, Maryland, Mississippi, North Carolina, South Carolina, Tennessee, Texas and Virginia. Note that this list includes all southern states according to the definition of the Census Bureau.

Our measures of electoral competition are based on gubernatorial election outcomes as reported in ICPSR (1994). The data provide information on each individual candidate. Yet, especially for the early years, the assignment of party codes to individual candidates is imprecise in some cases. This is due to the fact that for some states the sources ICPSR (1994) is based on did not properly distinguish between minor-party candidates and write-in candidates. In all such cases, we checked and corrected the party codes by comparing the respective records in the ICPSR data to the information on individual candidates in various editions of the handbook on US election statistics by R.M. Scammon.

The main source for the preparation of data on signature requirements for third-party and independent candidates in gubernatorial elections were hard copies of the states' statutes for the whole period 1946-1976. In general, we define our measure of the strin-

gency of ballot access restrictions for minor-party and independent candidates as the number of signatures needed on a petition. In states where the election law specified requirements that differed between minor party and independent candidates, we chose the lower number. In case the number of petition was defined as a percentage of either the number of votes cast in the last general election or the number of registered voters, we calculated the implied absolute number of signatures using data on the number of votes cast from ICPSR (1994) and data on the number of registered voters from the Statistical Abstract of the United States (various editions). When the number of registered voters was unavailable for the respective election, we linearly interpolated using the numbers from the next available years. In a second step, we cross-checked the numbers obtained from the states' statutes, using the information on petition requirements in presidential elections in Winger (2006), Appendix F (in most states, ballot access requirements for presidential and gubernatorial elections are the same) as well as Bott (1990). In some cases, we were not able to figure out the precise signature requirement for gubernatorial elections, mostly because the respective state laws specified alternative ways to get on the ballot rendering it difficult to determine the exact signature requirement.[14] Note in particular that we had to exclude the following states from the analysis altogether: New York, Vermont, Ohio, Washington, New Jersey, and Wisconsin. For New Jersey, Washington and Wisconsin we had difficulties in deriving a consistent measure for the signature requirement because the respective state laws allow for various alternative means to get ballot access. In New York and Vermont, individual candidates in gubernatorial elections often represent multiple political parties. Our measure for electoral competition for these states is thus not comparable to the remaining states. Finally, Ohio's ballot access law was struck down by the Supreme Court in 1968 as being overly restrictive. Since our approach aims at identifying endogenous adjustments of ballot access rules, we do not want to make use of variation which is known to be driven by exogenous forces.

The data on state characteristics that serve as control variables come from the Bureau of the Census. They include total state population, per capita income (deflated to 1960 dollars), educational attainment (percentage of total population 25 years and over with a high school diploma or a higher degree), and urbanization (percentage of urban population as defined by the Census Bureau).

Table 4.1 entails summary statistics for petition requirements as specified in the re-

[14] For instance, some state laws offer minor parties the opportunity to hold a party convention with a certain minimum number of attendees that can nominate a candidate whose name will then appear on the ballot.

Table 4.1: Petition requirements for minor-party and independent cand's, 1946-1976

Period	Nob	Mean	Std. Dev.	Min	Max
1946-1976	410	8476	16034	0	103208
1946-1956	170	5477	11388	0	57306
1958-1966	135	9254	16987	0	74223
1968-1976	105	12329	19951	0	103208

Samples comprise states in gubernatorial election years in the respective period. Sources: Revised State Codes (various years) and Winger (2006).

Table 4.2: Summary statistics

Variable	Mean	Std. Dev.	Min	Max
Total # of candidates	2.72	1.20	1	9
# of minor-party & independent cand's	0.749	1.15	0	7
Vote cast$_{t-1}$ (1000's)	905	1067	40.7	6510
Signature requirement relative	0.368	0.483	0	1
Black	0.298	0.458	0	1
VRA	0.326	0.469	0	1
Black×VRA	0.110	0.313	0	1
Total population (1000's)	3111	3215	143	21173
Per capita income (in dollars of 1960)	6228	1767	2701	11360
Educational attainment	42.7	11.0	18.9	74.9

Sample comprises states in gubernatorial election years, 1946-1976 (Nob=410). Sources: ICPSR (1994) and Statistical Abstract of the United States (various years). Total # of candidates, # of minor-party and independent candidates and vote cast for general elections only. 'Black' is an indicator for states with a population share of blacks higher than 10% in 1960. VRA is an indicator for post-VRA periods, i.e. 1966-1976. Educational attainment is share of total population 25 years and over with a high school diploma or a higher degree. Urbanization is share of urban population as defined by the Census Bureau.

spective state election laws. We note that there is substantial variation in signature requirements both across states and across time. While in the period 1946-1956 the average number of signatures required to put a non-major party candidate on a gubernatorial ballot was about 5,500, that number more than doubled to reach more than 12,000 in the period 1968-1976. In addition, the standard variation increased considerably.

Table 4.2 shows summary statistics for the explanatory variables in our main structural equation. Our key explanatory variables are shown in the first two rows. Note in particular that minor-party and independent candidates appear on gubernatorial ballots quite frequently.

Table 4.3: Effect of VRA on electoral competition, difference-in-difference estimations

Dependent variable: Number of candidates in gubernatorial elections,	all parties			minor parties	
	(1)	(2)	(3)	(4)	(5)
Black×VRA	0.591**	0.583**	0.597**	0.518**	0.538**
	(0.235)	(0.219)	(0.241)	(0.216)	(0.233)
VRA	0.312**	-	-	-	-
	(0.117)				
Population	-	-	0.00007**	-	0.00006*
			(0.00003)		(0.00003)
Per-capita income	-	-	-0.0002	-	-0.0002
			(0.0002)		(0.0002)
Educational attainment	-	-	0.059	-	0.043
			(0.080)		(0.074)
Urbanization	-	-	0.014	-	0.011
			(0.016)		(0.016)
Year effects	no	yes	yes	yes	yes
State effects	yes	yes	yes	yes	yes
R^2	0.49	0.54	0.55	0.54	0.55

Sample includes gubernatorial elections from 1946 to 1976 (429 observations), see text for details. Standard errors (robust to heteroscedasticity and serial correlation) in parentheses. 'Black' is an indicator for states with a black population share exceeding 10% in 1960. 'VRA' is an indicator for elections taking place after the VRA, i.e. 1966-1976. Significance levels: ** 5%; * 10%.

4.5 Results

4.5.1 The effect of the VRA on electoral competition

Before we turn to our main results, we will first discuss the results of the difference-in-difference estimations regarding the impact of the VRA on electoral competition. The first set of results is displayed in Table 4.3. Column (1) shows the treatment effect for a baseline specification that accounts only for state effects and the indicator for post-shock years, VRA, as additional explanatory variables. Relative to the states in the control group, the effect of the VRA on the number of candidates in the states with a significant black minority is estimated to be about 0.6. Column (2) depicts the results if we account for a full set of year effects instead of VRA. The coefficient of the treatment effect is virtually unchanged and still significant at the 5% level. To account for an independent effect of state characteristics which might be related to the

number of candidates in gubernatorial elections, Column (3) reports a specification that includes total state population, per-capita income, educational attainment, and urbanization as additional explanatory variables. Among the control variables, only population proves to be significant. The coefficient indicates that if the population grows by 1 million, the number of candidates increases by 0.07. More importantly, the estimated effect of the VRA on the number of candidates is unaffected by the inclusion of the additional control variables and still significant at the 5% level.

Further evidence for the effect of the VRA on electoral competition is provided in Columns (4) and (5). Here, we have defined the dependent variable as the number of minor-party and independent candidates as opposed to the total number of candidates in the previous regressions. As expected, switching to this narrower definition does not have any sweeping effect on our estimates. The somewhat smaller point estimates for the treatment effect just reflect that part of the increase in electoral competition in the southern states after the VRA was due to candidates of the Republican Party now regularly appearing on gubernatorial ballots. To summarize, Table 4.3 confirms a strong effect of the VRA on the number of candidates in gubernatorial elections.

4.5.2 The effect of electoral competition on the design of ballot access laws

Let us now turn to the impact of electoral competition on the stringency of the states' ballot access requirements, i.e. the number of signatures required for minor-party and independent candidates to be placed on the ballot in gubernatorial elections. As discussed in the previous section, we identify this competition effect by means of 2SLS estimations accounting for unobserved heterogeneity at the state level. Drawing on the strong partial correlation between the interaction term $Black \times VRA$ and the number of candidates identified by the series of difference-in-difference estimations shown above, we use $Black \times VRA$ as an instrument for electoral competition.

As before, Table 4.4 reports estimated coefficients along with standard errors which are robust to both heteroscedasticity and serial correlation. While we use the same set of states as in the difference-in-difference estimations shown above, we now have only 410 observations (compared to 429 before). The reason is missing information on signature requirements for some state/year cells as mentioned before. Column (1) reports a baseline specification of our structural equation that accounts for the impact

Table 4.4: Effect of electoral competition on stringency of signature requirements, instrumental variable estimations

Dep. variable: Signature requirement for minor-party and independent candidates					
	(1)	(2)	(3)	(4)	(5)
Total number of cand's	9316**	8774**	9408**	9812**	9343**
	(4327)	(4081)	(4369)	(4688)	(4468)
Vote cast$_{t-1}$× signature	13.9***	13.4***	14.1***	14.4***	14.0***
requirement relative	(5.29)	(4.91)	(5.39)	(5.49)	(5.23)
Vote cast$_{t-1}$×signature	-0.401	-0.104	-0.405	-0.160	0.067
requirement absolute	(5.93)	(5.80)	(5.95)	(6.00)	(5.86)
Signature requirement	22093**	22142**	22115**	22183**	22245**
relative	(9074)	(9013)	(9079)	(9167)	(9090)
Population	0.227	-0.172	0.228	0.405	-0.007
	(1.56)	(1.42)	(1.56)	(1.57)	(1.42)
Population squared	-0.00008	-0.00006	-0.00008	-0.00009	-0.00007
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Per-capita income	-	2.55	-	-	2.42
		(2.07)			(2.20)
Educational attainment	-	-	110	-	171
			(718)		(719)
Urbanization	-	-	-	-153	-123
				(186)	(183)
Year effects	yes	yes	yes	yes	yes
State effects	yes	yes	yes	yes	yes
F-Statistic 1^{st} stage	10.28	10.51	11.91	8.39	9.78

Sample includes gubernatorial elections from 1946 to 1976 (410 observations). Standard errors (robust to heteroscedasticity and serial correlation) in parentheses. Educational attainment and urbanization measured in percent. 'Signature requirement relative' is an indicator for states with a signature requirement defined as a percentage of either the number of votes or the number of registered voters in the preceding election. 'Signature requirement absolute' is an indicator for states with an absolute definition of the signature requirement. Instrument for number of candidates is $Black \times VRA$. Significance levels: *** 1%; ** 5%; * 10%.

of electoral competition along with the gubernatorial vote cast of the preceding election, split into two separate effects depending on whether the petition requirement is defined relative or absolute, the indicator for states with a relative definition, state population and state population squared. The estimated coefficient of the total number of candidates points to a strong impact of electoral competition on the stringency of petition requirements. Our estimates suggest that an additional candidate in gubernatorial elections triggers an increase in the number of required signatures by more than 9,300. The F-statistic measuring the predictive power of the excluded instrument in the first-stage regression attains a value of 10.3, somewhat above the rule-of-thumb

threshold value of 10 suggested by Staiger and Stock (1997) to avoid the problem of weak instruments.[15] Recall that we use an instrument with is characterized by very limited variation: $Black \times VRA$ switches only once from zero to one for a subset of states and is constant and equal to zero for all others. Given that our identification strategy is extremely parsimonious in terms of the variation that is added to the system by the inclusion of the instrument, the performance of $Black \times VRA$ in the first-stage regression is remarkable. Note also that using the interaction term as the instrumental variable ensures that the difference-in-difference estimations discussed before are very similar to the actual first-stage regressions of our 2SLS approach.

The results also show that some variation in the signature requirement is explained by participation. As expected, however, participation is systematically related to the number of petitions only in states with a relative definition of ballot access requirements. On average, an increase in participation by 1,000 additional votes (holding population fixed) increases the petition requirement by about 14 signatures in the respective states. Furthermore, we also find that states with a relative definition of ballot access requirements are characterized by significantly higher barriers to the entry of minor-party and independent candidates. Evaluated at the sample mean of $Vote\ cast_{t-1}$, these states require about 34,700 signatures more than states with an absolute definition. This regularity is confirmed throughout our analysis and stems from the fact that most states with an absolute definition demand around 500 to 10,000 signatures, whereas even moderately populous states with a rule requiring one or two percent of the vote cast in the preceding election tend to have significantly stricter effective requirements.

Columns (2) to (4) each add one of the additional control variables, without substantially affecting the results. The estimated coefficients of the number of candidates range from 8,800 to 9,800 and are all significant at the 5% level. The coefficients of the remaining control variables are also robust to the changes in specification. Finally, Column (5) reports an estimation that includes all our control variables. The results almost duplicate the outcome from Column (1). Taken together, the inclusion of additional controls does not seem to have any significant effect on our main result.

[15]Note that with a single instrument our model is exactly identified and we therefore cannot run formal weak identification tests according to Stock and Yogo (2005).

4.5.3 Robustness: Instrumental variable estimation

As discussed above, the instrument used to identify the effect of electoral competition is extremely parsimonious as it captures only variation in electoral competition which comes from the effect of the VRA on states with a strong black minority. There are three southern states, however, which did abolish poll taxes as one important restriction to black voter participation already before 1965/66: South Carolina (1951), Tennessee (1951), and Arkansas (1964).[16] We therefore suspect that the design of our instrument, $Black \times VRA$, is suboptimal in terms of its predictive power in the first-stage regression. To exploit the variation induced by the abolishment of poll taxes prior to 1966, we construct a second IV from the interaction of an indicator for the existence of poll taxes, *Polltax*, with an indicator for South Carolina, Tennessee, and Arkansas, *Early Abolish*. By construction, our second IV accounts only for the variation in electoral competition that enters through the deviation of South Carolina, Tennessee, and Arkansas from the remaining southern states in terms of the timing of the abolishment of voting restrictions.

Table 4.5 reports the results of a series of 2SLS estimations using both $Black \times VRA$ and $Polltax \times Early\ Abolish$ as IVs. A quick inspection of the results reveals that the estimates for the effect of electoral competition on the stringency of the states' ballot access laws are now slightly higher, ranging from about 9,000 to 10,100. At the same time, the point estimates are more precise: across all five specifications, the effect is estimated to be different from zero at the 3% level of significance. Note also that the findings regarding the control variables are virtually identical to those in Table 4.4. With two IVs for one endogenous explanatory variable, we can now also test the overidentifying restriction. The Table reports p-values for the Hansen test, indicating for all specifications that the overidentifying restriction is not rejected at any reasonable level.

To describe the degree of electoral competition, we have so far used the total number of candidates appearing on the ballot. As discussed above, one might argue that the total number of candidates is not a suitable measure for electoral competition in a regression with the stringency of ballot access requirements for minor-party and independent candidates as the dependent variable. Therefore, we repeat all estimations from Table

[16] Literacy tests were not abolished prior to the Civil Rights Act of 1965, i.e. all states with this kind of barrier to black voter participation were forced to remove the restriction immediately after the CRA. See also Ogden (1958) and Husted and Kenny (1997).

Table 4.5: Effect of electoral competition on stringency of signature requirements, instrumental variable estimations, refined instruments

Dep. variable: Signature requirement for minor-party and independent cand.'s					
	(1)	(2)	(3)	(4)	(5)
Total number of cand's	9567**	9044**	9671**	10090**	9660**
	(4125)	(3872)	(4143)	(4575)	(4293)
Vote cast$_{t-1}$× signature requirement relative	14.0***	13.5***	14.1***	14.6***	14.2***
	(5.21)	(4.85)	(5.31)	(5.44)	(5.17)
Vote cast$_{t-1}$× signature requirement absolute	-0.560	-0.276	-0.574	-0.308	-0.102
	(6.10)	(5.94)	(6.12)	(6.16)	(6.01)
Signature requirement relative	22080**	22129**	22100**	22175**	22236**
	(9091)	(9022)	(9101)	(9175)	(9094)
Population	0.237	-0.166	0.239	0.424	0.011
	(1.55)	(1.42)	(1.55)	(1.56)	(1.41)
Population squared	-0.00008	-0.00006	-0.00008	-0.0001	-0.00007
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Per-capita income	-	2.58	-	-	2.44
		(2.11)			(2.25)
Educational attainment	-	-	104	-	170
			(734)		(736)
Urbanization	-	-	-	-161	-132
				(188)	(184)
Year effects	yes	yes	yes	yes	yes
State effects	yes	yes	yes	yes	yes
F-Statistic 1^{st} stage	6.51	6.41	6.80	5.32	5.22
Hansen test (p-value)	0.82	0.78	0.82	0.80	0.76

Sample includes gubernatorial elections from 1946 to 1976 (410 observations). Standard errors (robust to heteroscedasticity and serial correlation) in parentheses. Educational attainment and urbanization measured in percent. 'Signature requirement relative' is an indicator for states with a signature requirement defined as a percentage of either the number of votes or the number of registered voters in the preceding election. 'Signature requirement absolute' is an indicator for states with an absolute definition of the signature requirement. Instruments for number of candidates are $Black \times VRA$ and $Polltax \times Early\ Abolish$. See text for details. Significance levels: *** 1%; ** 5%; * 10%.

4.5 using an alternative measure of electoral competition which excludes all major party candidates. As Table 4.6 indicates, our results are highly robust to this change in the definition of electoral competition. An additional candidate is found to trigger a tightening of the petition requirement by 9,600 to 10,800 signatures. As before, the coefficient of interest remains significant at the 5% level across all estimations.

So far our identification relies on a single explanatory variable in order to account for the direct effect of participation on the stringency of signature requirements in states

Table 4.6: Effect of electoral competition on stringency of signature requirements, instrumental variable estimations, minor party & independent candidates

Dep. variable: Signature requirement for minor-party and independent cand.'s					
	(1)	(2)	(3)	(4)	(5)
# of minor-party & independent cand's	10229** (4650)	9641** (4254)	10501** (4821)	10801** (5161)	10475** (4891)
Vote cast$_{t-1}$×signature requirement relative	14.9** (6.16)	14.3** (5.68)	15.2** (6.44)	15.5** (6.41)	15.2** (6.20)
Vote cast$_{t-1}$×signature requirement absolute	-0.980 (6.79)	-0.661 (6.55)	-1.01 (6.84)	-0.795 (6.90)	-0.548 (6.69)
Signature requirement relative	21105** (10024)	21214** (9880)	21135** (10007)	21137** (10155)	21274** (9973)
Population	0.061 (1.67)	-0.383 (1.51)	0.060 (1.65)	0.228 (1.67)	-0.225 (1.50)
Population squared	-0.00008 (0.0001)	-0.00005 (0.0001)	-0.00008 (0.0001)	-0.00009 (0.0001)	-0.00007 (0.0001)
Per-capita income	-	2.92 (2.28)	-	-	2.81 (2.44)
Educational attainment	-	-	286 (735)	-	347 (726)
Urbanization	-	-	-	-151 (198)	-129 (194)
Year effects	yes	yes	yes	yes	yes
State effects	yes	yes	yes	yes	yes
F-Statistic 1^{st} stage	5.66	5.68	5.61	4.63	4.34
Hansen test (p-value)	0.97	0.92	0.96	0.95	0.91

Sample includes gubernatorial elections from 1946 to 1976 (410 observations). Standard errors (robust to heteroscedasticity and serial correlation) in parentheses. Educational attainment and urbanization measured in percent. 'Signature requirement relative' is an indicator for states with a signature requirement defined as a percentage of either the number of votes or the number of registered voters in the preceding election. 'Signature requirement absolute' is an indicator for states with an absolute definition of the signature requirement. Instruments for number of candidates are $Black \times VRA$ and $Polltax \times Early\ Abolish$. See text for details. Significance levels: ** 5%; * 10%.

with relatively defined ballot access requirements. Of course, the respective coefficient can only capture the average of the changes in the dependent variable that are directly related to changes in participation. One might be worried that this way of controlling for the impact of relative definitions of signature requirements does not account for differences in actual regulations within the group of states with such relative rules. To the extent that part of the effective variation in B comes from imperfectly controlled changes in participation, one might still question the validity of the exclusion restriction with respect to our instruments. To cope with this problem, we construct an alternative

measure of the petition requirement for states with a relative definition that eliminates all variation that might be driven by participation. This is done by computing the effective number of petitions demanded when a state with a relative definition changes its percent-requirement and keeping this number in all following election years until the state actually changes the underlying rule. Thereafter, the new level is kept until the law is changed again, and so on. With the resulting adjusted series for the signature requirement, participation should lose its explanatory power even for the states where ballot access is defined in relative terms.

As Table 4.7 reports, the estimations based on the adjusted signature requirements do not alter our results in any significant way. However, the coefficient of interest is now estimated to be somewhat smaller. This might indicate that the previous approach slightly overstated the effect of electoral competition on the stringency of petition requirements. Yet, even with the adjusted signature series, an additional candidate is still estimated to trigger an increase in the barrier of about 7,600 to 9,000 petitions. Our conclusion regarding the strategic behavior of state policymakers when designing of the underlying state rules is thus confirmed. At the same time, the significance of the effect of interest remains at the 5% level for three out of four specifications. Furthermore, the vote cast in the preceding election is no longer significant. This is in line with our expectations, as the adjustment of the signature series ensures that the variation comes only from real changes in the underlying state regulations and is, therefore, not related to participation.

So far we have built on the implicit assumption that state policymakers have rational expectations and re-design ballot access requirements in anticipation of the level of electoral competition in the next election. Consequently, our empirical model has related the stringency of a state's petition requirements in any given election year to the current degree of electoral competition, i.e. the current number of candidates. One might question our results based on the argument that policymakers need a certain time to learn about changes in electoral competition, or that further legal restrictions prevent the state government from instantaneously adjusting the underlying state laws. To test the relevance of this objection, we repeated our IV estimations based on a model where electoral competition in period t refers to petition requirements in $t+1$. Thus, the current number of signatures required to gain ballot access is explained by the degree of electoral competition in the next preceding gubernatorial election. The corresponding estimation results showed a drastic drop of the F-statistic across all specifications hinting to a weak instrument problem. As a consequence, the point estimates were

Table 4.7: Effect of electoral competition on stringency of signature requirements, instrumental variable estimations, adjusted dependent variable

Dependent variable: Adjusted signature requirements in gubernatorial elections				
	(1)	(2)	(3)	(4)
Total # of candidates	7629**	8184**	-	-
	(3853)	(3924)		
# of minor-party & independent cand's	-	-	8365*	9037**
			(4465)	(4517)
Vote cast$_{t-1}$× signature requirement relative	5.85	6.15	6.72	7.12
	(4.61)	(4.78)	(5.54)	(5.68)
Vote cast$_{t-1}$× signature requirement absolute	-2.78	-3.08	-3.18	-3.54
	(5.02)	(5.19)	(5.44)	(5.78)
Signature requirement relative	21774***	21759***	21004***	20924**
	(8039)	(8035)	(8642)	(8783)
Population	0.961	0.993	0.777	0.797
	(1.28)	(1.28)	(1.32)	(1.33)
Population squared	-0.00014	-0.00014	-0.00013	-0.00014
	(0.00009)	(0.00009)	(0.0001)	(0.0001)
Per-capita income	2.32	2.36	2.63	2.69
	1.93	(2.01)	2.09	(2.20)
Educational attainment	374	372	515	525
	625	652	(624)	(647)
Urbanization	-116	-132	-117	-134
	181	188	192	(199)
Year effects	yes	yes	yes	yes
State effects	yes	yes	yes	yes
IV's: $Black \times VRA$	yes	yes	yes	yes
IV's: $Polltax \times Early\ Abolish$	no	yes	no	yes
F-Statistic 1^{st} stage	9.78	5.22	7.97	4.34
Hansen test (p-value)	-	0.53	-	0.68

Sample includes gubernatorial elections from 1946 to 1976 (410 observations). Standard errors (robust to heteroscedasticity and serial correlation) in parentheses. Educational attainment and urbanization measured in percent. 'Signature requirement relative' is an indicator for states with a signature requirement defined as a percentage of either the number of votes or the number of registered voters in the preceding election. 'Signature requirement absolute' is an indicator for states with an absolute definition of the signature requirement. Regarding IVs, see text for details. Significance levels: ** 5%; * 10%.

no more stable across the different specifications. Hence, our assumption of rational expectations as used throughout our analysis seems to be well-justified. This finding is highly plausible given the long period of time between two elections, generally four years. Moreover, if ballot access laws are a suitable instrument for state policy-makers

with the intention to deter potential opponents, these restrictions need to be adjusted quickly in response to changing degrees of electoral competition.

4.5.4 Robustness: Difference-in-difference estimation

So far we have treated observations from 1966 as belonging to the post-shock period. One could argue, however, that with the VRA signed into law in August 1965, it is unlikely that its effect on the number of candidates in gubernatorial elections was already fully present at the time when the next regular elections took place in November 1966. While the impact of the federal legislation on black voter participation can be thought of being immediately effective, additional third-party and independent candidates might have appeared on the ballot with a certain time lag. To check the appropriateness of the definition of our instrument, we check the assignment from 1966. Columns (1) of Table 4.8 reports estimation results with 1966 defined as a pre-shock period and Column (2) the result when omitting 1966 altogether. In both cases we use the total number of candidates as a measure of electoral competition. The treatment effect is now estimated to be somewhat smaller. The picture that emerges from these estimations is again similar to that obtained when 1966 is defined as belonging to the post-shock-period, but both the point estimate and the level of significance are somewhat lower. The results suggest that the level of electoral competition increased quite rapidly after the implementation of the VRA in 1965. Hence, the definition which we have employed throughout our analysis is not only suggested by the timing of the events, but also empirically well justified.

The remaining columns of Table 4.5 provide a final robustness check. Bertrand, Duflo, and Mullainathan (2004) have recently pointed to the fact that the dependent variables in many studies relying on difference-in-difference estimations to identify treatment effects are strongly serially correlated, and that the potential bias resulting from this correlation has often been ignored. These authors recommend among others a simple procedure to test for the impact of serial correlation by ignoring time series information. Therefore, one needs to average the data before and after the shock and estimate the underlying difference-in-difference equation using the averaged outcome variable in a panel of length two. This procedure requires a clear-cut definition of "before" and "after" as well as a considerable sample size. In our case, with the VRA affecting all states at the same time and a sample comprising 42 states, both conditions are fulfilled. Column (3) and (4) reports the outcome of the two step procedure for both measures

Table 4.8: Effect of VRA on electoral competition, further robustness checks

Dependent variable	(1) # cand's, all parties	(2) # cand's, all parties	(3) Avrg. # cand's, all parties	(4) Avrg. # cand's, minor parties
Black×VRA	0.436*	0.506*	0.662***	0.590**
	(0.258)	(0.261)	(0.234)	(0.222)
VRA	-	-	0.302**	0.300**
			(0.123)	(0.116)
Assignment of 1966	pre-shock	omitted	post-shock	post-shock
Nob	429	399	84	84
R^2	0.56	0.55	0.87	0.88

Sample includes gubernatorial elections from 1946 to 1976. Estimations (1) and (2) a full series of year effects and a full series of state effects. Standard errors (robust to heteroscedasticity and serial correlation) in parenthesis. Sample in (3) and (4) entails the average numbers of candidates before and after 1965 (see text for details).
** 5% significance level.
*** Idem., 1%.

of electoral competition. The results almost duplicate the results from the baseline model and confirm the choice of our instrument.

Although the VRA is widely regarded as the single most important event that altered the political landscape of the US South (Trebbi, Aghion, and Alesina, 2007; Besley, Persson, and Sturm, 2006), the political science literature also discusses the relevance of other incidents. Timpone (1995), for example, provides evidence that the aggregate level of black registration in the US South already began to rise in 1962 due to the start of the Voter Education Project. Accordingly, one might argue that our instrument $Black \times VRA$ is misspecified since it captures the differential development in electoral competition of the two groups of states before and after 1965. To account for this objection, we repeated all estimations treating years until 1961 as pre-shock periods and years starting from 1962 as post-shock periods. Our 2SLS estimates proved to be highly robust to this alternative specification. Interestingly, in all difference-in-difference estimations with year-specific interactions the effects of 1962 and 1964 were insignificant, suggesting that the Voter Education Project from 1962 did not have a strong effect on electoral competition.

To summarize, our results reveal that an important institution governing the degree of electoral competition and minority representation in the US, namely petition requirements for third-party and independent candidates, is endogenously determined. In fact, the evidence reported here suggests that state policy makers have been actively engaged in re-designing ballot access regulations. The impact of electoral competition

on the design of ballot access rules is strong, and the direction is as expected: the more minor-party and independent candidates appear on the ballot, the more restrictive are, on average, the requirements to get ballot access. Based on the evidence reported here, it appears that the major parties have consistently used their power to frame political institutions in a way that protects their position as incumbents in a setting of duopolistic political competition.

4.6 Conclusion

This paper starts from the question to what extent political institutions can be regarded as exogenous constraints on political agents. To shed light on this issue, we have examined the design of state ballot access laws in the US from the post-war period to the mid-seventies. Our results suggest that state policymakers have systematically reacted to increased electoral competition by raising the petition requirements that have to be met in order to get access to the ballot in gubernatorial elections. Our findings thus relate to the evidence reported by Trebbi, Aghion, and Alesina (2007) on the re-design of electoral rules in cities in the US South in reaction to the increased political participation of blacks in the aftermath of the federal Voting Rights Act.

Our identification strategy rests on the idea that the Voting Rights Act has induced variation in electoral competition which is exogenous to the states' ballot access regulations. As a first step of our empirical approach, we have shown that the abolishment of limitations to black voter participation such as poll taxes and literacy tests has indeed significantly raised the number of candidates in gubernatorial elections. We have then provided evidence on the link between electoral competition and the stringency of ballot access restrictions. To overcome the endogeneity problem, we have used instrumental variables which capture the exogenous variation in electoral competition induced by the Voting Rights Act. Across various specifications, the increase in petition requirements triggered by an increase in electoral competition by one additional gubernatorial candidate is estimated to be in the order of 7,600 to 10,800 signatures.

Our results suggest that the endogenous adjustment of state laws governing the access of third-party and independent candidates to general elections has a depressing effect on actual levels of electoral competition. This may have far-reaching consequences, as electoral competition seems to positively affect the quality of governance and economic performance. Besley, Persson, and Sturm (2006), for instance, claim that the increase

in political competition induced by the Voting Rights Act raised long-run per capita income considerably. Together with their findings, our results suggest that the effort of state policymakers to dampen the increase in electoral competition by re-designing the political institutions under their control may have significant welfare costs.

However, a caveat is warranted regarding this interpretation. Lizzeri and Persico (2005), for instance, point to potential drawbacks of electoral competition, arguing that competition induces parties to focus on the interests of a narrower constituency. This in turn may lead to a stronger influence of special interests in politics implying substantial efficiency losses. Under this view the observed adjustment of petition requirements could also be viewed as a socially optimal response to a rising level of electoral competition. In our perspective, however, this rationale for limiting the number of active political parties is unlikely to be valid in the context of the US, where the majoritarian voting system already ensures the existence of two dominating political parties. Overall, it is hard to believe that the design of ballot access laws in US states is socially optimal, in particular with regard to the southern states and their pronounced tradition of political marginalization of large groups of voters.

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Eidesstattliche Versicherung

Ich versichere hiermit eidesstattlich, dass ich die vorliegende Arbeit selbständig und ohne fremde Hilfe verfasst habe. Die aus fremden Quellen direkt oder indirekt übernommenen Gedanken sowie mir gegebenen Anregungen sind als solche kenntlich gemacht. Die Arbeit wurde bisher keiner anderen Prüfungsbehörde vorgelegt und auch noch nicht veröffentlicht.

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