Political Accountability and
Real Authority of Government Bureaucracy*

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Preliminary version

Abstract

In a country with weak institutional constraints on the executive, the real power might belong to the government bureaucracy rather than to an autocratic leader. We combine the Aghion-Tirole definition of formal and real authority and Barro-Ferejohn model of political agency to study the relationship between accountability of elected officials and the extent to which their subordinate bureaucrats have real decision-making power. Normatively, we show that the lower is the level of political accountability; the lower should be the level of real authority at the bottom of the government hierarchy. Positively, we distinguish between different accountability - bureaucratization political regimes.

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1 Introduction

In any political regime real authority over policy decisions resides in hands of the political elite. Even in mature democracies relatively few decisions are made directly by the public; typically the decision-making power is delegated to political representatives. In an institutionalized autocracy a more narrow body, e.g., a ruling party, might have not only real, but also formal authority over most policy decisions. However, in any regime the political bodies carry out a policy through the multi-tiered government hierarchy. The crucial issue is whether the political bodies have the effective control over policy decisions that are implemented actually by appointed bureaucrats.

Our paper contributes in studying the scope of the real decision-making power with which politicians endow their bureaucratic subordinates. It has been recognized by Aghion and Tirole (1997) that whereas a principal formally has a right to take decisions she may often rubber-stamp the propositions of her agent because of information asymmetry. We consider this phenomenon in the political agency and argue that politicians are more tempted to rubber-stamp the decisions of their appointed bureaucrats if they care more for rent seeking resulting in that under low political accountability real decision authority is expanded downward along the government hierarchy.

The discretion of an agent and related phenomena of empowerment and delegation have been extensively studied in both organizational and information economics literature. These issues also constitute a growing research subfield in political economy, although it rarely considers power over decisions of politicians and bureaucrats through the prism of both political and organizational economy. Furthermore there is a scarce literature focusing on the internal multi-tier structure of the government bureaucracy controlling for agency problems expanded along the hierarchy of appointed bureaucrats. For example, Dixit (2006, 2008) mentions that "the need to operate through intermediate layer or layers of administration creates the usual agency problems for the rulers" (2006, p. 4) but "most models of democracy as well as dictatorship, by ignoring this aspect, implicitly assume that the policy chosen at the top level will be implemented efficiently by a Weberian bureaucracy" (2008, p. 2). In this sense our paper gains a better understanding of the constraints the top-level decision-makers confront at the stage of policy implementation because it takes into account the complex internal structure of the government bureaucracy.

Political agency theory suggests that providing politicians and bureaucrats with incentives to act in the public interest is a non-trivial problem. It comprises such important issues as incentives of politicians and their accountability to citizens as well as incentives of bureaucrats within the multi-tiered government bureaucracy. We appeal to both these questions. We emphasize that politicians are agents for citizens and principals for bureaucrats while bureaucrats of intermediate layers are agents for higher tiers and principals for lower tiers. Hence to study the incentives of bureaucrats we should allow for intentions of their principals i.e. political representatives.

Acting on behalf of their constituency politicians have not only formal authority over policy decisions but also a range of administrative instruments to extract rents for benefiting themselves. We argue that the level of benevolence of a ruler, or on the contrary the level of extracted rents, strongly affects the nature of agency problems within and the structure of the government bureaucracy.

We focus on a more or less benevolent ruler and not on the distinction between different government forms. We state that in any political regime political representatives may be more or less benevolent and this may define some specific features of government bureaucracies. The basic premise is that information asymmetry creates agency problems between politicians and bureaucrats. Hence the capability of politicians to control and

stimulate bureaucrats is crucial for inducing them to implement policy decisions. In fact not only the capability but also the actual concern of politicians for bureaucrats' activities are important.

The point is that politicians have to trade off economic efficiency of the policy outcome against the loss of rent for themselves. In reality a policymaker may be more interested in rent seeking than in policy efficiency thus distorting incentives of his bureaucrats. We imply that in contrast to politicians who can be benevolent, bureaucrats are strongly selfish and along with non-benevolent politicians they aim to extract rents from administration activity. Then subject to the policymaker's intention bureaucrats have different rent potentialities. When politicians are concerned more in rent seeking bureaucrats get greater discretion which they might use to enrich themselves. Moreover they have a strong incentive to increase this discretion often resulting in greater chances to participate in policy decision-making. Otherwise, politicians control bureaucrats more carefully and thus reduce their possibilities to extract rents. In this case bureaucrats find favorable for themselves to expand their formal administrative charges because it puts more administrative resources and barriers of influence at their disposal. The study of formal and real authority within the government hierarchy undertaken in this paper arises from this basic insight.

Our approach follows Aghion and Tirole's (1997) notion that formal authority to take a decision does not always imply real authority "that is an effective control over decisions" (p. 2). The authors note that "the president of a country really controls only a small number of the decisions made by the executive branch". Similarly "shareholders have limited control over their board of directors, which itself may be subject to the domination of the top executives, who in turn often rubber-stamp the divisions' projects, and so forth" (Ibid, p. 2). The crucial point underlying for this phenomenon of rubber-stamping is asymmetric information. A principal who has formal authority over decisions or activity can override her subordinate's proposal but very often under a comparative uniformity of their goals a poorly informed principal refrains from doing so. Thus a principal places real authority over decisions at the disposal of an agent.

Formal authority resides as a rule at the top of any hierarchy since the boss at any level may overturn the subordinate's actions (Baker, Gibbons and Murphy, 1999). Nevertheless actually real authority does not necessarily pertain to the top. Yet Max Weber (1968) mentions that "officials, employees and workers attached to the administration staff of a bureaucracy do not themselves own the nonhuman means of production and administration, yet they may exert substantial control over the bureaucratic machinery" (p. 217-225).

We consider the government hierarchy composed of a politician accountable to citizens through elections and the two-tier bureaucratic structure. We include only two levels of bureaucrats in our model but such a scheme can be easily extended to the multi-tiered government bureaucracy. The politician is elected to conduct policy which provides for citizens a certain level of public welfare. The politician has a two-tier bureaucracy which helps him to take policy decisions by acquiring information about different outcomes. The policy course is defined through implementing projects on each level of bureaucracy. However, except benefits from implementing policy projects a politician may benefit himself by extracting rents. Thus a politician has a trade off between extracting rents and controlling his bureaucratic agents. A non-benevolent policy-maker may prefer not to make effort on implementing policy projects but extract the maximum possible rents. The decision rights mainly are not contractible and in fact such elected officials may rubber-stamp their appointed bureaucratic subordinates' decisions and proposals without effective control. An example may be a president or a mayor who are responsible for too many bureaucratic units and so able to control only a small part of decisions of his bureaucratic subordinates. More often such phenomena are observed in low political accountability countries where

politicians care more for rent seeking or there are weak institutional constraints on the executive.

With regard to the political accountability concept that has been widely developed in the literature we address to Fearon's (1999) definition that "relations involving accountability are agency relationships in which one party is understood to be an "agent" who makes some choices on behalf of a "principal" who has powers to sanction or reward the agent"[1]. In this sense politicians are accountable to their constituency.

Elections are one of the mechanisms to hold politicians accountable. This paper focuses on retrospective-voting models that are based on work by Barro (1973) and Ferejohn (1986) and imply that a political incumbent will be reelected on the satisficing principle. They display elections as a discipline device as well as embody rent-seeking behavior of politicians.

Our approach inherits the main building blocks of Barro/Ferejohn political accountability and Aghion/Tirole authority models. On the one hand, we extend Aghion/Tirole's analysis by considering the three-level hierarchy of both strictly vertical and flat structure[2]. However we keep to the positive approach and neglect the case of the agent's formal authority considered by Aghion and Tirole because a span of formal authority is fixed for each level of the hierarchy.

On the other hand, we combine this authority model with Barro/Ferejohn accountability model by assuming that except benefits from implementing projects within the government bureaucracy a politician may be engaged in activities benefiting himself like rent seeking. We use the model of retrospective voting for demonstrating how the level of rents extracted by a policy-maker influences on initiatives of bureaucratic agents to acquire information and implement government projects.

Our analysis suggests two main patterns of the disposal of authority and incentives of bureaucrats. First, we argue that the more a politician pursues rent seeking behavior, i.e. the lower is the level of political accountability in a country; the more often the bureaucrats-superiors rubber-stamp propositions of their bureaucrats-subordinates and thus the more real authority is expanded downward along the hierarchy. As a result of rent seeking behavior of policymakers, the bureaucrats dispose of more real authority and actually affect more on decisions being formally made by politicians. Normatively, we state that in low accountability countries the lower should be the level of real authority at the bottom of the government hierarchy. Second, we demonstrate that in countries with high political accountability one can observe more often the process of bureaucratization. The point is that under high accountability the government bureaucracy tends to enlarge because it gets optimal for the higher-level bureaucrat to expand his formal authority and be in greater overload.

As a result we reveal two important features of the government bureaucracy subject to the level of the policymaker's benevolence. Firstly, under lower accountability the government bureaucrats are more likely to participate in policy decisions in comparison with higher political accountability regimes. Secondly, in higher accountability regimes the government bureaucracies are bigger than in lower accountability regimes in terms of government employment. The cross-country data on institutional development in democratic countries from the World Bank and French Ministry of Finance[3] allows to corroborate our theoretical predictions. We find that indeed in low accountability countries the bureau-

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[1]Fearon (1999) in Przeworski, Stokes and Manin (1999), Chapter 2, p. 55.

[2]Within the flat hierarchy a higher-level bureaucrat hires several agents, so that each of them is charged with its own range of projects.

[3]The dataset "Institutional profiles" is presented on the site of the Center of perspective studies and international information www.cepii.fr

cratic machinery is likely to be smaller but have a greater weight in policy decisions.

The paper proceeds as follows. Section 2 describes political agency problems and contains a literature review. Section 3 presents the model. Section 4 contains some empirical evidence and discusses implications for different accountability - bureaucratization political regimes. Section 5 concludes.

2   Related Literature

Throughout history there are a lot of examples when a ruler controls only a part of all policy decisions and outcomes. Moreover such extreme cases are known when almost all real authority over decisions pertained to the appointed bureaucrat rather than the official ruler. Sometimes they are named power brokers in honor of well-known Cardinal Richelieu who was the chief minister of Louis XIII and was really in charge of the main political course in France in the first half of the seventeenth century. Other examples include such political figures as Manuel de Godoy under Charles IV in Spain, Henry Alfred Kissinger under Richard Nixon in USA as well as Mikhail Suslov, the chief ideologue of the Soviet Union. However, along with these great notorious examples there are numerous petty phenomena of rubber-stamping and placing real authority downward within the government bureaucracy. This can be partly explained by the specific features of the institutional environment of government administrations. As Aghion and Tirole (1997) show real authority increases in the environment where reputation effects matter and there are performance measurement difficulties, as well as in cases of urgency or great overload by formal responsibilities. Government administrations possess such institutional peculiarities in full measure.

Even in earlier times authority or power was an important matter inducing people to dethrone the incumbent and venture on a betrayal. One can cite the great German philosopher Friedrich Nietzsche who wrote a seminal book "The Will to Power" in which he asserted that any human behavior is driven by the will to power. In this sense by the example of the government one can see a clear demonstration of development of this instinct. Politicians struggle for power and bargains to each other, and civil servants on each hierarchical level climb to power. So the literature emphasizes career concerns as the main incentive for bureaucrats and reelection – for politicians (Alesina and Tabellini, 2007a,b).

Reelection also serves as a means to discipline politicians. In this sense it not only creates an incentive to stay in power but also provides a mechanism to be accountable to citizens. We focus on the case when voters are retrospective and an incumbent is re-elected if she has performed well relative to some benchmark (Gehlbach, 2006). The seminal investigation was conducted by Barro (1973) who analyzed elections as a means to control political representatives when their interests do not coincide automatically with those of their constituents. One of the fundamental conclusions of his work is that this "electoral control is only partially effective as a mechanism for inducing the officeholder to advance the interest of his constituents" (Barro, 1973, p. 20) i.e. politicians will never be perfect agents of citizens and voters support the incumbent on the basis of the satisficing principle[4].

The concept of political accountability has been used for analyzing a wide range of economic problems. Benhabib and Przeworski (2005) examine the extent to which political accountability matters for economic growth. They consider two accountability mechanisms based on elections and legal norms and stress the great magnitude of their significance on

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[4]In accordance with Simon's principle of satisficing.

growth rate. Fox (2000) studies the link between the civil society and accountability. He asserts that civil society role both frames and is framed by the interaction between the vertical (electoral) and horizontal (checks and balances within the state) dimensions of accountability. Ellman (2006) and Athias (2007) analyze the positive influence of political accountability on the effectiveness of public-private partnerships. Especially a lot of literature discuss an important role of mass media in political accountability (Besley, Prat and Burgess 2002; Besley and Burgess 2001, 2002; Besley and Prat 2001; Arnold 2005).

2.1 Politicians, Bureaucrats and Policy Making

The bureaucratic power in the political decision-making process has been broadly discussed in the literature, especially in a variety of case studies. Johnson (1982) describes the case of Japan and mentions the great role of bureaucrats in policymaking. Whereas Pempel (1984) argues that this country has developed an effective balance between the extremes of total bureaucratic control and total political control. In the case of the United States, Hugh Heclo (1984) argues that the balance has not yet been found[5]. In France it has also been recognized that top-level bureaucrats affects policy decisions considerably. Suleiman (1972) described the relationship between the French higher civil servants and the French politicians as a complex ritual structured dance.

The conflict of interests between politicians and bureaucrats is a classic topic in political economy. One of the main problems distinguished by many scholars is information asymmetry between them which gives bureaucrats the possibility to manipulate political outcomes. To inform themselves about costs and benefits from different alternative policies politicians rely on bureaucrats as experts. In a principal-agent framework politicians are intended to convey public interests and tastes and thus they are accountable to their constituency. Bureaucrats, on the other hand, are appointed by politicians and so they are accountable to politicians. Because bureaucrats are better informed than politicians about the true necessary budgets and policy outcomes they may manipulate this to their advantage by proposing policies that suit better their own ends. At the same time under hard pressure, urgency and overload politicians often have to rubber-stamp propositions of their bureaucratic subordinates. Thus they places real authority over policy decisions to bureaucrats.

Such phenomena of rubber-stamping lead to at least two effects. On the one hand, policymakers aim to buy loyalty of bureaucrats by doing them a favor (e.g. Gregory and Lazarev, 2003). On the other hand, rulers prefer loyal rather than capable viziers (Egorov and Sonin, 2006). The authors argue that the more competent viziers weigh costs and benefits from dethronement and so they count better the benefits from betrayal. This is consistent with our model where policymakers have to trade off benefits from relying on bureaucrats' proposed information against value to stay in office. These distinguished effects partly explain coalition formation around considerable political figures. In terms of our model countries with the strong government bureaucracy where most policy decisions are shaped by bureaucrats are characterized by a proactive role of political groups and coalitions.

There are different treatments of the information asymmetry problem in the political agency literature. One of the interesting approaches belongs to Boadway and Sato (2006) who consider a model of bureaucratic advice to compare the efficacy of centralized versus decentralized modes of governance. The simple framework includes a representative

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[5]These essays are a part of the book edited by Ezra Suleiman (1984) that contains several essays studying the degree of influence that civil servants exert on the political process in the United States, Italy, Japan, France, Britain, Germany, Norway, and Chile.

bureaucrat who knows the relevant characteristics of a project or policy choice and recommends to a representative politician whether to adopt this project or policy. As the authors argue politicians may find it useful to decentralize the bureaucracy so that different dimensions of the project or policy are examined by different bureaucrats and policy advice comes from more than one source. Unlike in this model where bureaucrats provide advice while the politician retains decision-making power, there are a lot of models of delegation of authority. For example, Li and Suen (2004) focus on the benefit of delegating decision-making on a given project to an expert in nonmarket organizations. They consider delegation as a result of similar preferences of decision-makers and experts.

Alesina and Tabellini (2007 a,b) examine more closely the delegation of tasks from politicians to bureaucrats. They are interested in criteria, which should guide the allocation of responsibilities between politicians and bureaucrats. Their consistent question is whether the division of tasks in reality is appropriate and which type of tasks the politician would prefer to retain and which they would delegate to bureaucrats. Alesina and Tabellini argue that the allocation of tasks depends on the different motivation of politicians and bureaucrats (reelection versus career concerns) originating from different accountability mechanisms.

Our main focus of the effective control of elected officials over actions and effort of appointed officials is connected with the analysis of Alesina and Tabellini (2007 a,b). Regulatory policies are implemented by both elected and appointed officials. And we share their argument that "the rise of the regulatory state has made the bureaucracy a key player in both the decisions and the execution of a large amount of legislation" (p. 170). Not only our starting points but also our conclusions are consistent. Alesina and Tabellini find that "when there is more uncertainty over the policy maker's ability ... or when tasks are become more difficult, the variance in the level of ability is likely to go up, and bureaucrats are preferable to politicians" (p. 179). As well time inconsistency leads to that bureaucrats are better than politicians. But such features as time inconsistency, uncertainty over the politician's ability inhere rather in low accountability countries. This corresponds to our conclusions that bureaucrats are more influencing in decision making than politicians in countries with low political accountability.

2.2 Size of Government

Our second result about greater bureaucratization measured by the higher government employment in high accountability governments concerns the issue of the scope and size government and is consistent with other earlier empirical evidence in this field. Persson and Tabellini (1999) examine government spending under presidential and parliamentary regimes and Lassen (2000) consider the link between political accountability and the size of government measuring the latter by the level of tax revenue. They show that "as presidential regimes *empirically* are associated with less political accountability voters have less control on politicians and leading to *smaller* governments" (Lassen 2000, p. 5), in particular smaller government spending and tax revenue. We focus on the government employment in countries with low and high accountability so our conclusion does not contradict to their findings and fill in the gap in the comparative analysis of regime types: less accountability along with smaller government spending and smaller tax revenue is associated with smaller government employment.

Furthermore our conclusions are consistent with the result of Enikilopov (2006) who demonstrates that the level of public employment is likely to be higher in those local governments that are headed by elected chief executives rather than appointed chief executives because the former are more likely engaged in vote buying activities one form of which is

the excessive level of public employment. We suggest that the lower political accountability; the more influencing appointed officials and the smaller the size of government bureaucracy. So we confirm his result by stating that in countries with the powerful bureaucracy, where appointed officials play a larger role in decision-making, the level of the government employment is lower.

Another interesting result related to our prediction belongs to Brown, Earle, Gehlbach (2007) who study the relationship between the size of bureaucracies and reform results in Russian regions. In particular, they find that privatization has a more positive effect on firm performance in regions with relatively large state bureaucracies. This supports our conclusion that larger bureaucracies are likely to be in the higher accountability regimes. Thus we contribute to an emerging literature arguing that economic performance may be positively related to the size of the bureaucracy. As well Acemoglu and Verdier (2000) assuming that bureaucrats can be corruptible, come to the conclusion that the optimal size of government in this case is greater than in case when corruption is not possible in the economy. They focus on government intervention and the extent to which we should correct market failures by government regulation. And they stress that government intervention requires the use of agents, bureaucrats, who may be corrupt and demand bribes. Acemoglu and Verdier (2000) normatively show that "when monitoring of bureaucrats becomes more difficult, they should receive higher wages, and government intervention should become relatively rare. But if government intervention continues to be required despite the increased difficulty of monitoring, the number of bureaucrats and their wages should increase, very much as if the bureaucracy were expanding to seek additional rents".

There is a growing evidence that the size and other features of government bureaucracies prove crucial for economic growth (Mauro, 1995; Evans and Rauch, 1999; Rauch and Evans, 2000). For example, Schiavo-Campo, de Tomasso, Mukherjee (1997) demonstrate that employment in government administration is greater in richer countries with higher gross domestic product per capita that is a good proxy for the level of political accountability. However, Brym and Gimpelson (2004) show that this is true only for countries with a certain level of democracy. So for countries of Eastern Europe and Former USSR one may observe the negative relationship between the size of the bureaucracy and economic growth.

A particular body of the literature related to the size of government bureaucracy and the level of political accountability concerns the effects from decentralization within government. For example, the study of Gurgur and Shah (2000) suggests that decentralization supports greater accountability in the public sector and reduced corruption. As well Treisman (2000) finds that countries with smaller first-tier jurisdictions tend to be perceived as more corrupt.

However there is little literature, which ties the behavior and incentives of elected officials with agency problems within the government bureaucracy as well as there is little known about the informal authority of bureaucrats over politicians in policy decision making. We shed light on the impact of the scope of real effective control in the political agency with political accountability. Furthermore our work contributes to the literature which emphasizes the features of government bureaucracies as crucial for economic performance. At the same time our main predictions and results are consistent with the conclusions of earlier political economy studies about the size of government, political accountability and economic performance.

3   Model

This section presents a simple model of the two-layer government hierarchy. The sequent assumptions of the strict vertical and flat hierarchical tiers allow to demonstrate the two important incentive patterns of top bureaucrats subject to accountability regimes; in particular the expansion of rubber-stamping phenomenon downward along the hierarchy as well as the expansion of formal span of control. The model allows to formulate the testable predictions.

3.1   General set up

Let an elected politician (she) (e.g. president, mayor) appoints a higher-level bureaucrat (he) (e.g. premier, deputy mayor) for collecting information about and implementing the project. A higher-level bureaucrat hires a lower-level bureaucrat, (e.g. minister, headquarter) for executing the project of the lower order that can be connected or not with the upper project. The upper project is set to be of type r and the lower-level project is of type f. Below we consider the case of independent projects r and f because bureaucrats at each level perceive them in such a way[6].

Hierarchy. Thus the politician is the principal for the higher-level bureaucrat who is an agent for the politician but a principal for the frontline bureaucrat. The latter is simply an agent. We first consider the case of the vertical hierarchy with one frontline bureaucrat and then we examine the case of the flat hierarchy with m frontline bureaucrats. We proceed from incomplete contract theory and assume that projects cannot be described and contracted ex ante. We suppose that the politician has a formal authority to choose the project of type r and the higher-level bureaucrat has a formal authority to take a decision over the project of type f.

Projects. Suppose that at each level $j = r, f$ agents (higher-level and frontline bureaucrats) screen among $n_j \geq 3$ identical projects on behalf of the principals (politician and higher-level bureaucrat). Each project $\lambda_j \in 1, ..., n_j$, where $j = r, f$ is the level of the hierarchy, is associated with a verifiable monetary gain or profit B_{λ_j} for the principal of the corresponding level, and a private benefit b_{λ_j} for the agent of this level (e.g. perquisites on the job or valuable experience). If no project is implemented, the benefits of both the principal and agent come to zero.

At least one project for each party produces a negative payoff. This implies that an uninformed agent may prefer inaction rather than a specific project. As well an uninformed principal would not choose to undertake a project.

Suppose that among all the projects at each level there are the principals' preferred projects, which if they are chosen, yields the benefits $B_j > 0$ for principals at each level. These principals' preferred projects bring the agents the expected benefit of $\beta_j b_j$ (the expectation refers to the ex ante uninformed situation in which all projects look alike). Similarly, at each level there are the agents' preferred projects, which if they are chosen, yields for agents the private gains of $b_j > 0$ and the principals receive expected benefits of $\alpha_j B_j$. Thus $\alpha_j, \beta_j \in (0, 1]$ are congruence parameters. We also assume that the preferred projects yield positive payoff not only for this party but also for the other party.

Information. Suppose that the nature of projects r and f is unknown to both the principals and agents. The agents at private cost $g_k(e_j)$, $k = HB, FB$, perfectly learn the payoffs of all candidate projects with probability e_j. With probability $1 - e_j$ the agents learn nothing and still look at the projects as identical.

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[6]The analysis of nesting projects is presented in Section 3.5.

Similarly, the principals choose how much time or effort to expend for learning payoffs. At private cost $g_k(E_j)$, $k = P, HB$, the principals become perfectly informed about the payoffs with probability E_j and learn nothing with probability $1 - E_j$. We focus on the simultaneous case of acquiring information by principals and agents[7].

Function $g_k(\cdot)$ is increasing and strictly convex and satisfy $g_k(0) = 0$, $g_k'(0) = 0$, $g_k'(1) = \infty$, where $k = P, HB, FB$.

In the model we assume that information is soft, that is it cannot be verified by the other party. The communication is thus interpreted as a pure suggestion to choose a specific project.

Furthermore it is realistic to suppose that the bureaucrat who is principal over one type of projects f, and agent over the other type r, is limited in his physical capabilities to acquire information in both directions, so that $e_r + E_f \leq 1$.

Authority. The formal authority gives the right to the politician over projects of type r and to the higher-level bureaucrat over projects of type f to overrule the agents, i.e. the higher-level and frontline bureaucrats, respectively. The principal at each level override the agent's suggestion if she is informed and the agent's recommendation is not "congruent". In this case the principal has both the formal and real authority over the choice of project. Otherwise, she rubber-stamps the agent's proposal since $\alpha_j > 0$. And then the agent has real authority.

Accountability. Along with the gain from the project of type r, the politician benefits from the upper project (r) implementation and in addition she can extract the rents for benefiting herself (ρ). Furthermore if she will be reelected she receives a value of holding office in the next period (δR), where δ is the discount factor[8]. Thus we assume that citizens can control the politician through elections[9]. The voters coordinate on the same retrospective voting strategy $\overline{w}$, punishing the incumbent for bad behavior and rewarding him for good behavior by reelection.

There is a continuum of identical voters of mass 1, where each produces the same income y. They finance the government through proportional income taxes τ. Thus the voters receive the income available after taxes and some benefits from the state's activity, $H(e_r + E_r, e_f + E_f)$. And the citizens vote for the incumbent if their utility will be no less than a certain level of the reservation level $\overline{w}$.

We suppose that the incumbent and the challenger have identical preferences, so that citizens are indifferent between the incumbent and challenger. But they weakly prefer to vote for the incumbent if the utility she provides them will be no less than $\overline{w}$. We assume that this reservation utility is equal for all voters. This proposition is strict because we require the full homogeneity of voters but $\overline{w}$ can be interpreted like a certain "focal" threshold that is the most expected from the incumbent (Gehlbah 2006).

We focus on the subgame perfect Nash equilibrium: voters choose $\overline{w}$ to maximize their utility, anticipating that the incumbent will then choose ρ to maximize her expected utility, given the constraint that she will be re-elected if and only if she provides voters with the utility no less than the reservation level $\overline{w}$.

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[7]The sequential model of acquiring information yields essentially the similar result. "Sequential investigations usually are less time-consuming for the principal, who can already build on an existing report. On the other hand, the principal may not want to wait until the report accrues to start her investigation, since otherwise she may be forced to accept the agent's proposal by lack of time" (Aghion and Tirole 1997, p. 7).

[8]R is taken as the exogenous future payoff from holding office. Below by following the strategy of Persson, Roland and Tabellini (1997) we relax this proposition by endogenizing R as the expected present value of rents ρ and benefits from r projects in future periods.

[9]The cited variant of model of political accountability is based on Gehlbah (1996) and Persson and Tabellini (2000), Chapter 4.

Preferences. The politician and higher-level bureaucrat are risk-neutral in projects r and f, respectively. The agents in projects r and f are protected by limited liability, and they receive not only the benefits from projects but also the wages w_j, $j = r, f$.

Thus the politician's utility is composed of the extracted rents ρ, value from holding office δR in the case of reelection, and the payoff from chosen project of type r less the wage paid to the higher-level bureaucrat w_r: $\rho + p_I \delta R + B_{\lambda_r} - w_r$. The higher-level bureaucrat's utility is then $u(w_r) + b_{\lambda_r} + B_{\lambda_f} - w_f$, if at each level project λ_j, $j = r, f$, is approved. The frontline bureaucrat's utility is $u(w_f) + b_{\lambda_f}$, where $u(\cdot)$ is increasing and concave.

We do not focus on the impact of government wages, so for simplicity assume that the higher-level and frontline bureaucrats as agents are infinitely averse to income risk in projects r and f, respectively, so that they receive a constant wage equal to their reservation wage of zero.

Timing. We consider the two-period game. In the first period a politician receives the sum of rents and benefits from the implemented project r subject to the reservation utility of voters. Then bureaucrats define the levels of their effort. Politician and bureaucrats communicate to each other about the structure of projects' payoffs, and the controlling party at each level r and f finally chooses the project. In the end of the first period elections are held. In the second period, if the incumbent wins, she receives an exogenous payoff R from holding office that is discounted to the factor δ.

The timing is as follows:

Period 1.

Stage 1. Voters set a reservation utility for reelecting the incumbent;

Stage 2. The incumbent chooses ρ and so E_r;

Stage 3. The bureaucrats choose e_r, E_f, e_f for gathering information at each level r and f;

Stage 4. The parties who do not have formal authority communicate to the controlling parties a structure of the relevant projects' payoffs;

Stage 5. The controlling parties (politician and higher-level bureaucrat) approve the projects at each level r and f;

Stage 6. Voters choose between the incumbent and challenger.

Period 2.

Stage 7. The incumbent receives the value from holding office R discounted to δ, if she wins reelection; otherwise R is captured by the challenger.

3.2   Real authority under high and low accountability

Firstly we consider the strict vertical hierarchy as depicted in Figure 1 to examine the real authority expansion. The citizens vote for the only politician who appoints the bureaucrats for implementing government projects. There are two-levels of bureaucrats and the higher-level bureaucrat is an agent for the politician and a principal for the frontline bureaucrat.

The politician's utility is composed of rents, the value of holding office in the next period and benefits from implementing the project of type r:

$$u_P = \rho + p_I \delta R + E_r B_r + (1 - E_r) e_r \alpha_r B_r. \tag{1}$$

The politician's efforts are financed through proportional income taxes τ. The government's budget constraint is the following

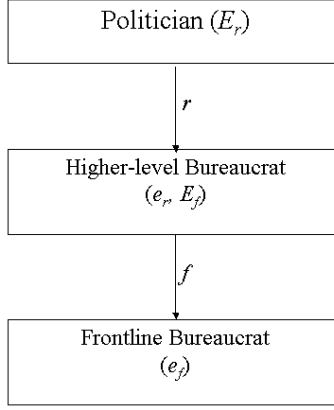$$\tau y = g_P(E_r) + \rho^{10}. \tag{2}$$

Figure 1: Vertical Hierarchy

The reelection probability is based on the retrospective strategy, so it equals one if the utility of citizens will be no less than the reservation level $\overline{w}$:

$$p_I = \begin{cases} 1, & \text{if } W(g(E_r), \rho) \geq \overline{w}; \\ 0, & \text{otherwise.} \end{cases}$$

As mentioned before, we define identical citizens' preferences as the sum of income available after taxes and benefits from the adopted projects within government. Then using the budget constraint (2) it can be written as:

$$W(g_P(E_r), \rho) = (1 - \tau)y + H(e_r + E_r, e_f + E_f) = y - g_P(E_r) - \rho + H(e_r + E_r, e_f + E_f). \quad (3)$$

The voting strategy of the constituency creates a trade-off for the politician between rents and benefits from reelection. Thus the politician has two alternatives. One is to please the voters to win reelection. Then taking into account (2) and (3), we get the optimally chosen rents extracted by her as:

$$\overline{\rho} = y - g_P(E_r) - \overline{w} + H(e_r + E_r, e_f + E_f). \quad (4)$$

We call this case by the high accountability regime.

The other alternative of the politician is not to please voters. The best policy in this case of low accountability is to extract rents fully in the first period and forget about reelection, i.e. to follow the Leviathan-like policy that is

$$\rho = y, \quad \tau = 1, \quad E_r = 0 \quad \text{and so } g_P(E_r) = 0. \quad (5)$$

The politician chooses to satisfy the voters if her utility under high accountability is no less than the utility under low accountability:

$$\rho + \delta R + E_r B_r + (1 - E_r) e_r \alpha_r B_r \geq y + e_r \alpha_r B_r, \quad (6)$$

$$\rho \geq y - \delta R - E_r B_r (1 - e_r \alpha_r). \quad (7)$$

Given this politician's strategy, it will be optimal for voters to announce the maximal possible level of the reservation utility and the rents to be as small as possible that is in equilibrium $\rho^* = max[0, y - \delta R - E_r B_r (1 - e_r \alpha_r)]$.

To define completely the equilibrium let us consider the strategies of bureaucrats. The higher-level bureaucrat is an agent over projects of type r and principal over projects of type f. We assume that he is limited in his physical capabilities to acquire information in both directions. The frontline bureaucrat is simply an agent in implementing the project of type f. The higher-level and frontline bureaucrats' utilities can be written as

$$u_{HB} = E_r \beta_r b_r + (1 - E_r) e_r b_r - g_{HB}(e_r) + E_f B_f + (1 - E_f) e_f \alpha_f B_f - g_{HB}(E_f), \quad (8)$$

$$u_{FB} = E_f \beta_f b_f + (1 - E_f) e_f b_f - g_{FB}(e_f), \quad (9)$$

s.t. $e_r + E_f \leq 1$ is the physical constraint of the higher-level bureaucrat.

The second component in (8) $(1 - E_r) e_r b_r$ describes real authority of the higher-level bureaucrat over the choice of the r project whereas the fifth component $(1 - E_f) e_f \alpha_f B_f$ indicates his action of rubber-stamping of the frontline bureaucrat's proposal of the f project.

The reaction curves of the politician and both bureaucrats under two regimes of accountability will be following
under high accountability

$$(1 - \alpha_r e_r) B_r = g_P'(E_r), \quad (10)$$

$$g_{HB}'(e_r) - g_{HB}'(E_f) = (1 - E_r) b_r - B_f(1 - \alpha_f e_f), \quad (11)$$

$$(1 - E_f) b_f = g_{FB}'(e_f). \quad (12)$$

under low accountability[11]

$$\rho = y, \quad \tau = 1, \quad E_r = 0 \quad \text{and so } g_P(E_r) = 0,$$

$$g_{HB}'(e_r) - g_{HB}'(E_f) = b_r - B_f(1 - \alpha_f e_f), \quad (13)$$

$$(1 - E_f) b_f = g_{FB}'(e_f). \quad (14)$$

The equations (11) and (13) show that the higher-level bureaucrat increases effort on the r projects over which he has real authority relative to efforts on the f projects of formal authority if his benefit from implementing the project of type r is higher, the politician's effort is lower, the benefit from implementing the project of type f is lower and the effort of the frontline bureaucrat is higher as well as the higher is the congruent parameter α_f.

We assume that two systems of equations (10)-(12) and (13)-(14) have unique stable intersections (E_r, e_r) and (E_f, e_f). Taking into account the properties of function $g_k(\cdot)$, that $g_k'(\cdot) \geq 0$, $g_k''(\cdot) > 0$, where $k = P, HB, FB$, one can see that the higher is the level of rents and the lower is the politician's effort on the project activity, the higher is the higher-bureaucrat's initiative on projects of type r and the lower is his initiative on projects of type f.

From equation (10) and $e_r + E_f \leq 1$ we obtain that

$$\frac{\partial e_r}{\partial E_r} < 0, \quad \frac{\partial E_f}{\partial E_r} > 0, \quad \text{and so} \quad \frac{\partial(e_r - E_f)}{\partial E_r} < 0. \quad (15)$$

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[11]Under low accountability when the politician extracts the higher rents the system of equations (10)-(12) similarly holds until $E_r \to 0$ is very small. Nevertheless as there is no need for the politician to care for reelection we assume that it is optimally for him not to make effort for projects so that $E_r = 0$.

We get the first result that for the higher-level bureaucrat the difference between efforts for screening projects of type r and f is greater under low accountability than under high accountability regime. Thus in low accountability government the higher-level bureaucrat cares more for projects over which he has real authority (r) and is tempted more to rubber-stump the projects over which he has formal authority (f). The fact that the politician pursues rent-seeking behavior increases the higher-level bureaucrat's initiative in implementing projects of type r that crowds out his effort in acquiring information about the lower-level projects over which he has formal authority (f).

Generalizing this result we get that for any middle link within the hierarchy (in our case the higher-level bureaucrat) the increase of efforts of the higher-level actor reduces the initiative of the lower-level actor. This result is based on Aghion and Tirole's conclusion that at each level the agent demonstrates more initiative, the lower the principal's interference. The downward sloping of the agent's reaction curve contrary to the upward sloping of the standard monitoring model is crucial for this result[12].

Within the multilevel government hierarchy, if the highest-level actor places full discretion to the next-level actor (politician who extracts rents fully), she places him (higher-level bureaucrat) real authority over decisions and thus reinforces his initiative. Then the next-level actor increases efforts for projects over which he has real authority and decreases efforts for projects over which he has formal authority. This produces the same incentive trade-off for the next-level actor and so on. Thus the lower is the level of accountability, the more real authority is expanded downward along the hierarchy.

Taking into account the reaction curves we can define the level of equilibrium rents. The politician chooses the high accountability regime if

$$\rho \geq y - \delta R - E_r B_r (1 - e_r \alpha_r) = y - \delta R - E_r g'_P(E_r). \tag{16}$$

The voters prefer that rents will be as small as possible. Given this politician's strategy, the voters' best choice is to set the reservation utility so as to satisfy (16) with equality. The equilibrium rents will be equal $\rho^* = max[0, y - \delta R - E_r g'_P(E_r)]$. Thus the rents is extracted to a lower extent, the less is the income y, the more is the value from holding office R, the more is the value of future benefits δ and the more is the cost for supervision $E_r g'_P$. From the reaction curve of the politician (10), the rents are higher, the lower her benefit from implementing the r project B_r, the more the effort on this project of the higher-level bureaucrat e_r, and the more is the congruent parameter α_r.

Let us verify that giving up ρ^* leaves enough revenue for the optimal policy activities:

$$\rho < y - g_P(E_r),$$

$$y - \delta R - E_r g'_P(E_r) \leq y - g_P(E_r),$$

$$g_P(E_r) - E_r g'_P(E_r) \leq \delta R. \tag{17}$$

It holds always because $\delta R > 0$ and $g_P(E_r) - E_r g'_P(E_r) \leq 0$. The latter is always less or equal to zero under initially defined properties of function $g_k(\cdot)$, that $g'_k(\cdot) \geq 0$, $g''_k(\cdot) > 0$, $g_k(0) = 0$, $g'_k(0) = 0$, $g'_k(1) = \infty$, where $k = P, HB, FB$.

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[12]For details see Aghion and Tirole (1997), p. 10-11.

3.3 Overload by formal authority under high and low accountability

Regulation in large organizations is too bureaucratized and the headquarters are responsible for too many units. This leads to deterioration of regulation strategies and control loss (Aghion and Tirole 1997, p. 19). Furthermore it has been recognized that for government agencies this is a more crucial problem than for the private organizations because they function in the specific environment of the soft budget constraint and the absence of the market's pressure. In this subsection we consider the potential of bureaucratization in governments under high and low accountability regime.

Suppose that a higher-level bureaucrat appoints m identical agents for m sets of projects. Each frontline bureaucrat i screens in a set of tasks of type f_i as described earlier and learns the payoff structure with probability e_{f_i}. The higher-level bureaucrat's disutility of efforts is $g_{HB}(\sum_i E_{f_i})$ and E_{f_i} is the higher-level bureaucrat's probability of learning the payoff structure of subordinate i's activity. We assume that the frontline bureaucrats' tasks are independent. There is a fixed cost f per frontline bureaucrat.
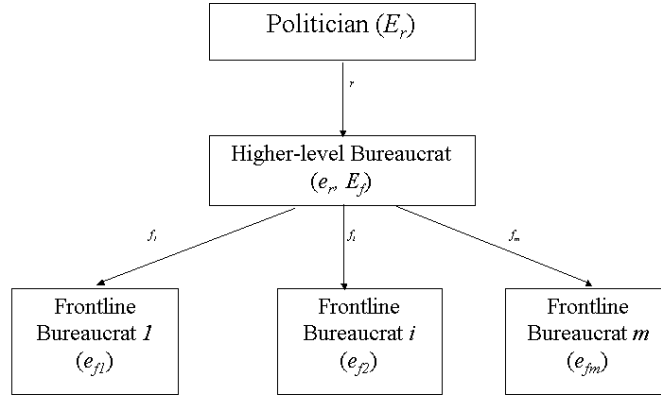

Figure 2: Flat Hierarchy

In this framework the politician's utility and strategies remain the same. Note that for the politician equations (1)-(7) hold, and the level of equilibrium rents does not change.

The higher-level bureaucrat's and frontline bureaucrats' utilities take the form

$$u_{HB} = E_r \beta_r b_r + (1 - E_r)e_r b_r - g_{HB}(e_r) + \tag{18}$$
$$\sum_i [E_{f_i} B_f + (1 - E_{f_i})e_{f_i} \alpha_f B_f - f] - g_{HB}(\sum_i E_{f_i}),$$

$$u_{FB} = E_{f_i} \beta_f b_f + (1 - E_{f_i})e_{f_i} b_f - g_{FB}(e_{f_i}) \quad \forall i, \tag{19}$$

subject to the physical constraint of the higher-level bureaucrat, $e_r + \sum_i E_{f_i} \leq 1$.

Each frontline bureaucrat's reaction curve is still given by:

$$(1 - E_{f_i})b_f = g_{FB}(e_{f_i}) \quad \forall i.$$

We assume that the equilibrium is symmetric and stable. In a similar manner to the previous section the equilibrium equations under high and low accountability can be written as:

under high accountability

$$g'_P(E_r) = (1 - \alpha_r e_r)B_r, \tag{20}$$

$$g'_{HB}(e_r) - \frac{g'_{HB}(mE_f)}{m} = (1 - E_r)b_r - \frac{B_f(1 - \alpha_f e_f)}{m}, \tag{21}$$

$$g'_{FB}(e_f) = (1 - E_f)b_f. \tag{22}$$

under low accountability

$$\rho = y, \quad \tau = 1, \quad E_r = 0 \quad \text{and so } g_P(E_r) = 0,$$

$$g'_{HB}(e_r) - \frac{g'_{HB}(mE_f)}{m} = b_r - \frac{B_f(1 - \alpha_f e_f)}{m}, \tag{23}$$

$$g'_{FB}(e_f) = (1 - E_f)b_f. \tag{24}$$

Similarly to the case of the single frontline bureaucrat from equation (21) and $e_r + mE_f \leq 1$ we obtain that

$$\frac{\partial e_r}{\partial E_r} < 0, \quad \frac{\partial(mE_f)}{\partial E_r} > 0, \quad \text{and so } \frac{\partial(e_r - mE_f)}{\partial E_r} < 0. \tag{25}$$

Our first result that the higher-level bureaucrat has more real authority in low accountability government holds as the difference between efforts for screening projects of type r and f is greater, the higher is the effort of the politician. It implies that in the high accountability regime the higher-level bureaucrat exerts efforts on projects of type f over which he has formal authority in a greater extent than in the low accountability regime. This is induced by that under high accountability the politician discourages the higher-level bureaucrat to devote more efforts for screening projects of type r by overruling his recommendations. So under low accountability for the higher-level bureaucrat it is optimal to expand formal authority rather than real authority. This effect can be demonstrated in a more visual way.

Suppose that $\{E_r^h, e_r^h, E_f^h(m), e_f^h(m)\}$ is the solution to the system of equations (20-22), and $\{E_r^l, e_r^l, E_f^l(m), e_f^l(m)\}$ is the solution of (23-24). Then the utilities of the higher-level bureaucrat under high and low accountability will be

$$u_{HB}^h = E_r^h \beta_r b_r + (1 - E_r^h)b_r e_r^h - g_{HB}(e_r^h) + mR_f(E_f^h(m), e_f^h(m)) - g_{HB}(mE_f^h(m)), \tag{26}$$

$$u_{HB}^h = b_r e_r^l - g_{HB}(e_r^l) + mR_f(E_f^l(m), e_f^l(m)) - g_{HB}(mE_f^l(m)), \tag{27}$$

where $R_f(E_f^\psi(m), e_f^\psi(m)) = E_f^\psi(m)B_f + [1 - E_f^\psi(m)]e_f^\psi(m)\alpha_f B_f - f$ is the revenue per frontline bureaucrat. We also know that the higher-level bureaucrat is constrained in his capabilities $e_r^\psi + mE_f^\psi \leq 1$, where $\psi = h, l$ signifies the high or low accountability regime. Then $e_r^\psi \leq 1 - mE_f^\psi$ and

$$u_{HB}^h = E_r^h \beta_r b_r + (1 - E_r^h)b_r(1 - mE_f^h(m)) - g_{HB}(1 - mE_f^h(m)) + \tag{28}$$
$$+ mR_f(E_f^h(m), e_f^h(m)) - g_{HB}(mE_f^h(m)),$$

$$u^l_{HB} = b_r(1 - mE^l_f(m)) - g_{HB}(1 - mE^l_f(m)) + \tag{29}$$
$$+ mR_f(E^l_f(m), e^l_f(m)) - g_{HB}(mE^l_f(m)).$$

After the envelope theorem is used and m is treated as a real number, one can obtain the optimal span of control from

$$\frac{du^h_{HB}}{dm} = (1 - E^h_r)b_r(-E^h_f(m)) + E^h_f(m)g'_{HB}(1 - mE^h_f(m)) + [R_f(E^h_f(m), e^h_f(m)) - \tag{30}$$
$$-E^h_f(m)g'_{HB}(mE^h_f(m))] + m\frac{\partial R_f}{\partial e^h_f}\frac{\partial e^h_f}{\partial m} = 0$$

$$\frac{du^l_{HB}}{dm} = b_r(-E^l_f(m)) + E^l_f(m)g'_{HB}(1 - mE^l_f(m)) + [R_f(E^l_f(m), e^l_f(m)) - \tag{31}$$
$$-E^l_f(m)g'_{HB}(mE^l_f(m))] + m\frac{\partial R_f}{\partial e^l_f}\frac{\partial e^l_f}{\partial m} = 0$$

Rearranging we get

$$[R_f(E^h_f(m), e^h_f(m)) - E^h_f(m)g'_{HB}(mE^h_f(m))] + E^h_f(m)[-b_r(1 - E^h_r) + \tag{32}$$
$$g'_{HB}(1 - mE^h_f(m))] + m\frac{\partial R_f}{\partial e^h_f}\frac{\partial e^h_f}{\partial m} = 0$$

$$[R_f(E^l_f(m), e^l_f(m)) - E^l_f(m)g'_{HB}(mE^l_f(m))] + E^l_f(m)[-b_r + g'_{HB}(1 - mE^l_f(m))] + \tag{33}$$
$$+ m\frac{\partial R_f}{\partial e^l_f}\frac{\partial e^l_f}{\partial m} = 0$$

The expression in first square brackets in (32) and (33) is a marginal profit from projects of type f associated with a unit increase in the span of control. An extra frontline bureaucrat brings revenue R_f but requires attention E^ψ_f, which increases the cost of supervision by $E^\psi_f g'HB$. The second components of (32) and (33) indicate that hiring an extra frontline bureaucrat decreases the cost of the effort for screening projects of type r and bereaves the upper project's benefit. Aghion and Tirole call the second term in $\frac{\partial R_f}{\partial e^\psi_f}\frac{\partial e^\psi_f}{\partial m} > 0$ by the "initiative effect" that measures the increase in the frontline bureaucrat's effort associated with a reduction in oversight. Note (32) differs from (33) by $E^h_r b_r E^h_f(m)$ that signifies the decrease of the higher-level bureaucrat's initiative because the politician can override his decision over the project of type r.

Following Aghion and Tirole we define that a higher-level bureaucrat is in overload if the marginal utility of an extra employee from projects of type f, i.e. the expression in first square brackets, with employee behavior held constant, is negative.

Equations (32) and (33) show that it is always optimal for the higher-level bureaucrat to be in overload. Equation (33) differs from (32) by $E^h_r b_r E^h_f(m)$ that demonstrates that the marginal utility of an extra frontline bureaucrat is more negative in high accountability government. Under high accountability the politician can override the higher-level bureaucrat's decision and it reduces real authority of the higher-level bureaucrat and creates an incentive for him to exert more effort for his formal responsibilities. This leads to the conclusion that the higher-level bureaucrat has an incentive to expand his formal authority and to be in greater overload in the high accountability regime.

3.4 Infinite-horizon setting

Before we consider the payoff from holding office as exogenous. However it can be interpreted as the continuation payoff from reelection in an infinite-horizon model. In this subsection we thus endogenize the value from holding office and examine which model parameters increase the value for the politician to be in office.

Now the voters announce the reservation utility $\overline{w_t}$ each period $t = 1, 2, ...$ while the incumbent chooses a level of rents ρ_t and efforts for government activity E_{rt}. At the end of each period elections are held where the voters choose between the incumbent and challenger. The incumbent may stay in office infinitely but he is prohibited from returning after losing her position once. If in any period the challenger with identical preferences replaces the incumbent, then in the next period she becomes the incumbent. The discount factor is equal δ.

We focus on the stationary subgame perfect Nash equilibrium with $\overline{w_t} = \overline{w}$ and $\rho_t = \rho$, $E_{rt} = E_r$ for $\forall t$ and where the voters vote for the incumbent if and only if she provides them with the utility no less than the reservation level $\overline{w}$.

Each period the politician faces the tradeoff between pleasing the voters and thus staying in office or extracting maximum possible rents. The politician prefers to be reelected so long as

$$\frac{\rho + B_r E_r + (1 - E_r)\alpha_r B_r e_r}{1 - \delta} \geq y + \alpha_r B_r e_r \tag{34}$$

or

$$\rho \geq y - \delta(y + \alpha_r B_r e_r) - E_r B_r(1 - \alpha_r e_r). \tag{35}$$

From the politician's reaction curve $(1 - \alpha_r e_r)B_r = g'_P(E_r)$ we get that $e_r = \frac{1}{\alpha_r}\left[1 - \frac{1}{B_r}g'_P(E_r)\right]$. Then (35) can be written as

$$\rho \geq y - \delta(y + B_r - g'_P(E_r)) - E_r g'_P(E_r). \tag{36}$$

The voters choose the maximal possible level of the reservation utility. It corresponds to the case of equality of (36). In equilibrium the level of extracting rents will be $\rho^* = max[0, y - \delta(y + B_r - g'_P(E_r)) - E_r g'_P(E_r)]$ and thus $R = y + B_r - g'_P(E_r)$.

The politician prefers more to stay in office, the higher the voters' income and his benefit from government activity i.e. implementing the r project, and the lower the marginal cost of effort of screening projects of type r. The effect of the voters' income is in fact double. On the one hand, a higher income induces the politician to extract all the revenue in the first period. On the other hand, a higher income increases the value to stay in office in the next periods.

The higher value R implies the smaller level of equilibrium rents and thus is associated with the higher level of political accountability. On the basis of our earlier considerations one might assert that the higher the politician's value from holding office, the larger is the process of bureaucratization and the smaller role bureaucrats play in policy decision-making. On the contrary, the lower value from holding office is associated with the stronger but smaller government bureaucracy.

3.5 Dependence of projects of different tiers

Consider now the more realistic case when the choices of projects on different levels of the hierarchy are dependent. Suppose that the projects are nesting and the possible outcomes

of the r project depend directly on the choice of the f project. It is reasonable to assume that if the higher-level bureaucrat rubber-stamps the f project and so the frontline bureaucrat chooses the project preferred by him, it leads to the different set of available projects of type r, which yield the lower benefits for both the higher-level bureaucrat and politician. Denote this rate of decreasing benefits by ϕ. Then the matrix of benefits from implementing these nesting projects for the politician and higher-level and frontline bureaucrats can be written as:

	E_f	$1 - E_f$
E_r	B_r	ϕB_r
	$\beta_r b_r + B_f$	$\phi\beta_r b_r + \alpha_f B_f$
	$\beta_f b_f$	b_f
$1 - E_r$	$\alpha_r B_r$	$\phi\alpha_r B_r$
	$b_r + B_f$	$\phi b_r + \alpha_f B_f$
	$\beta_f b_f$	b_f

The reaction curves take the following form:
under high accountability

$$g'_P(E_r) = (1 - \alpha_r e_r)B_r(E_f + \phi(1 - E_f)), \tag{37}$$

$$g'_{HB}(e_r) - g'_{HB}(E_f) = b_r[(\phi - (1 - \phi)(e_r - E_f))(1 - E_r) - \tag{38}$$
$$E_r\beta_r(1 - \phi)] - B_f(1 - \alpha_f e_f),$$

$$g'_{FB}(e_f) = (1 - E_f)b_f. \tag{39}$$

under low accountability

$$\rho = y, \quad \tau = 1, \quad E_r = 0 \quad \text{and so } g_P(E_r) = 0,$$

$$g'_{HB}(e_r) - g'_{HB}(E_f) = b_r(\phi - (1 - \phi)(e_r - E_f)) - B_f(1 - \alpha_f e_f), \tag{40}$$

$$g'_{FB}(e_f) = (1 - E_f)b_f. \tag{41}$$

The equations (38) and (40) indicate that the higher-level bureaucrat increases effort on the r projects over which he has real authority relative to efforts on the f projects of formal authority if the rate of the waste due to his rubber-stamping of the f projects ϕ is not very high. It is important that under the significant worsening of available r projects i.e. the low rate of ϕ, the higher-level bureaucrat overrides the frontline bureaucrat's propositions more often.

Furthermore note that the politician makes more effort on implementing projects if the rate ϕ is high. It looks reasonable because if the waste from rubber-stamping of the higher-level bureaucrat is very high (e.g. ϕ is small) then the politician finds for himself more profitable to extract rents rather than care for implementing projects.

The equilibrium level of rents extracted is

$$\rho^* = max[0, y - \delta R - (E_f + \phi(1 - E_f))E_r B_r(1 - \alpha_r e_r)] = \tag{42}$$
$$max[0, y - \delta R - E_r g'_P(E_r)]$$

The rents are higher; the less is the rate of worsening of the set of available r projects, and the more the probability of rubber-stamping by the higher-level bureaucrat E_f. This extension of the model is important to understand how changes the politician's strategy in dependence of the higher-level bureaucrat's performance.

4 Evidence

We focus on two main predictions from our model. First in low accountability countries appointed bureaucrats are more influencing and the more real authority expands downward along the government hierarchy. Second lower political accountability is associated with the smaller size of the bureaucracy in terms of lower government administration employment in a country. This is connected, all else equal, with the larger control of appointed bureaucrats in policy decisions so that in such countries bureaucrats climb to real power rather than expand their span of formal authority. As a result the process of bureaucratization is likely to develop in higher political accountability regimes where appointed bureaucrats are limited in benefiting themselves from real authority.

In this section we present some empirical evidence verifying our predictions from the model. We confront our two predictions with cross-country data and present a general corroboration of the derived patterns of accountability - bureaucratization regimes.

We conduct the empirical analysis of these two predictions separately mainly because of data availability. First we analyze the significance of association between benevolence of government and power of bureaucrats over political representatives. Second we look at the cross-country correlation between the level of political accountability and government administration employment among democracies.

Measuring political accountability

Political accountability includes a lot of aspects and measuring it as electoral contestability is difficult. We use the data of two types to present political accountability in two different perspectives. First, we argue that what we name political accountability addresses the subject of general benevolence of government and includes different dimensions. To allow for the multilateral nature of political accountability we use the composite index of "political accountability and voice" constructed by Kaufmann et al. (2006, 2008) that combines a number of subjective surveys to cover different dimensions closely related to political accountability. It embodies "the extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association, and a free media" (p. 4). This measure is normalized so that it changes from -2.5 to 2.5, has a mean of zero and a standard deviation of one. The index embraces such components closest to our analysis and indicating the level of politicians' concernment in public interests as Democratic Accountability (Political Risk Service), Political Rights and Civil Liberties (Freedom House), Voice to Business to express concerns about policies (World Development Research).

Our main question is whether politicians are good agents of citizens to perform as benevolent principals for bureaucrats? If not, they extract rents fully, pursue rent-seeking behavior and they do not meet public needs and requirements. Then non-benevolent politicians distort the incentives of their subordinates and the latter get more discretion to pursue their private interests not only by expanding their real authority but also by being more corruptible. Thus the measures of corruption could show the level of political accountability. In light of this we use the data on "corruption" from Transparency International and the data on "control of corruption" from Kaufmann et al.'s dataset on indicators of governance to see whether our results with using Accountability and voice index are robust. To focus on democracies we select only those countries that have a degree of democracy no less than 4 according to Jaggers and Marshall's (2000) Polity score. [13]

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[13]In view of different dependent data availability we compose two samples of countries: 50 countries for the analysis of authority over government administration and 58 countries for the analysis of the size of government. Annex contains the list of countries considered.

Control variables and instruments

We allow for the cross-country variation by including variables traditionally considered as controls in the literature. We use the gross national income per capita based on the purchasing power parity to take into account that richer countries are characterized by higher accountability as well as bigger government.

Testing the proposition of larger bureaucracies in greater political accountability regimes we use the log of government administration employment and include the log of total population to control for two effects considered in the literature (Brown, Earle and Gehlbach, 1997). Along with the direct effect of larger bureaucracies in more populous countries the effect of economies of scale in public administration should be taken into account. As Alesina and Wacziarg (1998) argue economies of scale in supplying public goods lead to smaller government in larger countries.

In order to control for national differences and population heterogeneity we include the data on ethnical fractionalization (Easterley and Levine, 1997). We also use the distance from the equator to allow for colonization effects (Hall and Jones, 1999). Following Lassen (2000) we argue that ethnical fractionalization and latitude could be comparatively good instruments for political accountability which could be used to avoid the endogeneity problem. On the one hand, as Rauch and Evans (1999, 2000) state ethnic diversity generates "more competition for government-created rents, leading to greater corruption and poorer bureaucratic performance generally". In particular government patronage may be organized along ethnic lines, then ethnic diversity may promote corruption. Furthermore political interaction is more difficult in more fractionalized countries. On the other hand, Hall and Jones (1999) demonstrated that Western Europe colonization and influence were correlated with the distance from the equator. At the same time there seems to be no reason why these variables would influence the size of government.

On the basis of Polity dataset we take into consideration the level of democracy which points to higher political accountability. In the model of the size of government we also control for the degree of urbanization (Oates, 1985; North, 1985; Lassen, 2000; Rauch and Evans, 2000; Brown, Earle and Gehlbach, 2007), openness of the economy (Cameron, 1978; Rodrik, 1998; Lassen, 2000; Brown, Earle and Gehlbach, 2007) and the age dependency ratio which is a percentage of people younger than 15 and older than 60 years to people 15-64 (Lassen, 2000)[14].

Authority of government administration

For measuring the influence of bureaucrats in policy decisions we use the variable of authority of the political powers over the administration from the "Institutional Profiles" dataset assembled by the French Ministry of Finance in 2006. The data combines the results of experts' assessments and surveys of a representative population about the institutional situation in different segments. The assessments are ordered to form ranked qualitative variables which are integers from 1 to 4. Thus the measure of politicians' authority over bureaucrats represents a qualitative rating that changes from 1=low levels of authority to 4=high levels of authority.

Annex B contains the data description statistics, country coverage and our results. The analysis is conducted on the basis of OLS estimation and ordered probit model in view of the categorical nature of the dependent variable. We use accountability and voice index for 2006. As well we include the log of the gross national income per capita for 2006 to take into account the effect of country richness and economic development. Table 2 contains the results of these models. R^2 and the likelihood characteristics indicate the good fitness of models.

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[14]All variables and their sources are listed in Annex A.

According to OLS estimation political accountability has a coefficient of 0.7099 which is significant at the 0.1% level and explains about 30% of the variation of authority of the political powers over administration. Including the log of gross national income per capita lowers the estimate to 0.3268 as well as its significance to 12%. The income is strongly significant at the 1% level. Thus this confirms our prediction that the higher political accountability, the higher authority of politicians over administrations.

The results of ordered probit estimation are reported in the same table. They support our first conclusion only for the forth rank: the higher accountability regime provides higher authority of the political powers over government administration. It is interesting to note that for the first three ranks the relationship is negative. Thus our prediction holds only in countries with relatively smaller accountability. It can be explained by that our predictions are true only for countries with relatively high level of democracy. Including the income level reduces marginal effects and their significance but does not change the main results. Note that the log of the income has the same relationship sign as the political accountability index.

To ensure that our results are robust, we apply different model specifications by using the other measures of accountability regimes. Instead the political accountability index of Kaufmann et al. we consider the control of corruption index of Kaufmann et al. and the level of corruption from Transparency International. We do not present these results in detail because they are very similar to those based on the accountability and voice index. They support that corruption is higher (i.e. accountability is lower) in countries where politicians have less control over government administration. The control of corruption and TI corruption indices are less significant in comparison with the accountability index. Whereas in models without the income level they are significant at 0.1%, in models including the log of the income per capita their significance is only at 32% and 36% levels. Nevertheless these model modifications let us to see that our prediction about higher independence of government administration in lower accountability countries holds.

Government administration employment

For measuring government administration employment and wage we took the data from the paper of Schiavo-Campo, de Tommaso and Mukherjee (1997) on government labor and wage. They extract these data through statistical yearbooks, yearly budget documents, personnel ministries or agencies, inquiries to embassy personnel. Government administration "includes executive and legislative administration by departments directly dependent on the Head of State or the Parliament, together with all other ministries and administrative departments. Consequently, government administration in their definition is general government less teaching and health personnel" (p. 47). The armed force is considered separately, so that the data we use concerns only the civilian government employment. We consider separately the central government employment which is by definition of Schiavo-Campo et al. a part of government administration which includes all employees paid by the central government budget.

From those countries for which the data on government administration employment is available, we select 58 countries that have a degree of democracy no less than 4 according to Jaggers and Marshall's (2000) Polity score.

Annex C contains the data description statistics and country coverage. Figure 3,5,6 plots different measures of political accountability against government administration employment for our sample of democratic countries. The data supports the positive association between political accountability and bureaucratization. The higher is the level of political accountability in a country, the higher is the level of government administration employment.

We find that the simple correlations between total government administration and the accountability and voice index, the control of corruption index and the transparency international corruption index are 0.6722, 0.6745, 0.6428, respectively. Central government employment is less correlated with these measures of accountability, 0.4601, 0.4129, 0.5013. Nevertheless, below we present the result on both total and central government employment.

In this model of the size of bureaucracy the simple method of ordinary least squares could give inconsistent estimates because of the endogeneity problem. Indeed the causal mechanism derived from our model is from accountability to the size of government. However, there could be a feed-back effect when the enlarging bureaucracies increase their influence on the economy and "a demand for greater electoral control could arise" (Lassen, 2000, p. 14). It becomes more difficult for the constituency to control public officials. Moreover the greater span of government influence could give more possibilities for bureaucrats to use administrative resources in pursuing private interests. To take into account this feed-back effect from the size of government to accountability we present the results of not only ordinary least squares but also two-stage least squares estimation.

Tables 4 and 5 contain our regression results. In the simple ordinary least squares (OLS) case with and without the log of income per capita political accountability is significant at the 1% level, and coefficients equal to 0.7262 and 0.5399. Political accountability explains 45% of the variation in total government employment in the model without income. Only a weak increase of the explanatory power to 47% is observed in the model with income. It is interesting to note that the income variable is not significant and its inclusion does not substantially improve the OLS model.

The two-stage least squares (TSLS) estimation yields the coefficient of 0.6782 which is significant at the 1% level. The inclusion of the log of income per capita increases the coefficient of accountability to 1.009 but reduces the level of its significance to 7%. The sign of the log of income is negative but it is not significant. The coefficient of political accountability is the largest in the TSLS case with income. These results support our prediction that the higher political accountability, the higher level of total government employment.

We report two characteristics of TSLS estimation. First, F-test statistics of the first stage regression is normally larger than 10 if the instruments are considered as not "weak". In our TSLS model without income this characteristic equals to 17.94, so that the instruments can be counted as sufficiently strong for the TSLS estimates to be reliable. Second, the hypothesis of "no overidentification" is usually tested for TSLS models. It should be examined for no overidentification because the number of instruments (ETHNIC, LATITUDE) is greater than the number of endogenous variables (POLAC). We list the "p-value" of this statistics to demonstrate whether the null hypothesis of no overidentification cannot be rejected.

Figure 4 plots central rather than total government employment against political accountability. As in our model we consider larger government bureaucracies with the elected official at the top, it is interesting to compare the results on total government employment with those on central government employment. Table 4 presents these estimates on the right hand side. OLS and TSLS outcomes confirm the positive association between political accountability and central government employment, showing a small drop in significance of estimates. Nevertheless, the qualitative results are unchanged.

Table 5 presents the results of OLS and TSLS estimations with a full set of control variables. Even after their inclusion, a strong positive relationship between accountability and government employment is evident. The coefficients of the political accountability index are statistically significant and positive. They are greater after TSLS estimation but

less significant than after OLS estimation. Just as before central government employment regressions yield less significant estimates of political accountability.

Our empirical results also support the conclusions of Rodrik (1998) and Lassen (2000) that more open economies have larger governments. Furthermore this relationship is much more stronger if we consider the size of central government. These models demonstrate the significance of coefficients on openness at 1% and 5% levels. The log of population size is negative. Thus in spite of its insignificance we confirm the finding of Alesina nd Wacziarg (1998) of the effect of economies of scale. This effect is also corroborated by the negative and strongly significant coefficient on urbanization. All model specifications reveal the effect of larger governments in countries with smaller fraction of urban population. The demographic structure of countries is not so significant but demonstrate the positive relationship: the greater number of older and younger people in an economy is associated with larger government. The log of average government wages enters negatively and significant more in total government employment cases. Its estimates is greater by value in TSLS estimation.

We test our results on robustness by two ways. First, we use the other measures of accountability regimes as in the case of authority of the political powers over government administration. The qualitative results remain the same. This model modification just decreases the significance of accountability measures but supports the positive relationship between them and the size of government.

Second, following Lassen (2000) we try to take into account the ambiguous triple relationship between accountability, the level of income and the size of government. In particular, at first because of the multicollinearity[15] we exclude separately the log of income per capita and the accountability index from our models. Excluding income does not change the sign of all variables but strengthens the significance of the political accountability coefficient. Excluding political accountability makes the coefficient on income significant at the 1% level, although it was insignificant in specifications with political accountability.

Then we allow for the feedback influence of the size of government on the economic growth by considering the log of income per capita as an endogenous variable, instrumented in the same was as the political accountability index. In models with total government employment the political accountability index is positive and significant at the 1% and 5% levels while the coefficient on income is insignificant. In models with central government employment as a dependent variable both accountability and income are insignificant.

Thus after the robustness analysis we corroborate that higher accountability countries have larger governments in terms of public employment. Furthermore it can be true also for the size of central government although the central government estimates are less significant.

5   Concluding Remarks

We discuss political agency problems with a focus on the real authority expansion within the government hierarchy under high or low political accountability. We argue that in low accountability countries bureaucrats have more real authority over policy decisions being formally made by politicians as the latter care more for reelection and rents and not for meeting true public needs. Since in low accountability countries elected politicians are more engaged in rent seeking, they are more likely to rubber-stamp the decisions and proposals of their bureaucratic subordinates. It increases their initiative and discretion. As a result at

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[15]The partial correlations between income and the size of government equals to 0.55 and income and the level of political accountability is 0.8.

the next level of the hierarchy the bureaucrats would devote more time and effort for upper projects over which they have real authority rather than to those over which they have formal authority. This effect is passed from level to level within government bureaucracy so that real authority is expanded downward along the hierarchy. Second, our paper demonstrates that in countries with higher accountability the bureaucratic machinery is likely to enlarge because it is optimal for the higher-level bureaucrat to be in greater overload. The politician's possibility to overrule the proposal of the bureaucrat under higher accountability decreases his initiative so that the latter is tempted to expand his authority horizontally rather than vertically.

Our empirical results support these claims and corroborates that the higher government employment is mainly observed in high political accountability countries. The paper drives to better understanding of existing regime types in the light of studies of political scientists. We extend the results of Persson and Tabellini (1999) and Lassen (2000) that less accountability leads to the more powerful bureaucracy but the smaller size of government in the terms of not only spending and tax revenue but also government employment.

However the type of political regime should be take into account to deepen our finding. Persson and Tabellini (1999) demonstrate that the size of government is lower under presidential regime, which empirically proves to be less accountable than parliamentary regime. However, theoretically the presidential regime is characterized by less rents for politicians. This is so, because one of the main features of presidential regimes is the separation of decision-making power among different elected officials that allows voters to limit the agency problem, but in practice such a formal system of checks and balances is undermined. Nevertheless, this regime implies lower taxes and a small size of government. Compared to presidential regimes, parliamentary regimes have less competition among the voters and are associated with larger governments. Thus it is quite possible that the incentives of bureaucrats to expand their formal or real authority are really shaped by constraints imposed by the political regime and the existing form of government in a country. Future work should emphasize the system of checks and balances and different constraints on the executive to take decisions and extract rents.

Furthermore as Persson and Tabellini (2000) argue political accountability should be lower in dictatorships than in democracies. It is another interesting question concerning different political regimes. It is recognized that authoritarian leaders employ repressions to remain in power and elections actually do not discipline political elites. In light of our predictions we should stress one normative and one positive points. First, autocratic leaders should exercise more effective control the lower is their accountability, as the bureaucrats at each level of the government hierarchy in such countries are more tempted to rubber-stamp most policy decisions. Then a surprising phenomenon can be observed when a dictator indifferent to the public welfare unknowingly loses his authority. This can be one of explanations why all rulers fear so much to be overthrown (Egorov and Sonin, 2006). Second, we predict that influencing but smaller government bureaucracies are more peculiar to low accountability countries. However patronage and vote buying activities reside in authoritarian regimes, so that the excessive government employment might become the way of preserving the power (e.g. Senegal, Acemoglu et al., 2007). Thus the future analysis of the size of government should take into consideration whether a country is an autocracy or democracy. We implicitly controlled for this by using a sample of countries with the degree of democracy no less than 4 according to the Jaggers and Marshall's database of political institutions. However, the detailed regard could allow to better understand the nature of expanding governments.

We add the literature on the size of government by considering the tendency of government bureaucracies to enlarge in regimes with the high and low level of extracting rents.

We corroborate that higher political accountability leads to larger governments measured by the government employment.

References

[1] Acemoglu D., Verdier T. The Choice Between Market Failures and Corruption // The American Economic Review, Vol. 90, No. 1, 2000, pp. 194-211.

[2] Acemoglu D., Ticchi D., Vindigni A. Emergence and Persistence of Inefficient States, Working Paper No. 0705, CREI Universita degli Studi Roma Tre, 2007.

[3] Aghion P., Tirole J. Formal and Real Authority // Journal of Political Economy, Vol. 105, No. 1, 1997, pp. 1-29.

[4] Alesina A., Tabellini G. Bureaucrats or Politicians? Part I: A Single Policy Task // American Economic review, Vol. 97, No. 1, 2007, pp. 169-179.

[5] Alesina A., Tabellini G. Bureaucrats or Politicians? Part II: Multiple policy tasks // Journal of Public Economics, 2007, forthcoming.

[6] Alesina A. and Wacziarg R. Openness, country size and government // Journal of Public Economics, Vol. 69, 1998, pp. 305–321.

[7] Arnold D. Congress, the Press and Political Accountability. Russell Sage Foundation. Princeton Paperbacks, 2005.

[8] Atthias L. Political Accountability, Incentives, and Contractual Design of Public-Private Partnerships: Demand Risk on Private Providers or Public Authorities? Working Paper, 2007.

[9] Baker G., Gibbons R., Murphy K. Informal Authority in Organizations // Journal of Law, Economics and Organization, Vol. 15, No. 1, 1999, pp. 56-73.

[10] Barro R. Control of politicians: an Economic Model // Public Choice, Vol. 14, 1973, pp. 19-42.

[11] Benhabib J. and Przeworski A. Economic Growth under Political Accountability, Working Paper, 2005.

[12] Besley T. and Burgess R., Political Agency, Government Responsiveness and the Role of the Media // European Economic Review, Vol. 45, 2001, pp. 629-640.

[13] Besley T. and Burgess R., The Political Economy of Government Responsiveness: Theory and Evidence from India // The Quarterly Journal of Economics, Vol. 117, No. 4, pp. 1415-1451.

[14] Besley T., Burgess R. and Prat A., Mass Media and Political Accountability. In Islam R. (ed.), The Right to Know: Institutions and the Media, the World Bank, Washington DC, 2002.

[15] Besley T. and Coate S. Elected versus Appointed Regulators // Journal of the European Economics Association, Vol. 1, No. 5, 2003, pp. 1176-1206.

[16] Besley T. and Prat A. Handcuffs for the Grabbing Hand? Media Capture and Government Accountability, Working Paper, 2001.

[17] Brym R. and Gimpelson V. The Size, Composition, and Dynamics of the Russian State Bureaucracy in the 1990s // Slavic Review, Vol. 63, No. 1, 2004, pp. 90-112.

[18] Brown D., Earle J. and Gehlbach S. Helping Hand or Grabbing Hand? State Bureaucracy and Privatization Effectiveness, mimeo, 2007.

[19] Boadway R. and Sato M. Bureaucratic Advice and Political Governance, Working Paper No. 1070, Queen's University, 2006.

[20] Cameron D. The Expansion of the Public Economy: A Comparative Analysis // American Political Science Review, Vol. 72, 1978, pp. 1203-1261.

[21] Dixit A. Predatory States and Failing States: An Agency Perspective, mimeo, 2008.

[22] Dixit A. Democracy, Autocracy, and Bureaucracy, mimeo, 2006.

[23] Easterly W. and Levine R. Africa's Growth Tragedy: Policies and Ethnic Divisions // Quarterly Journal of Economics, Vol. 112, No. 4, 1997, pp. 1203-1250.

[24] Egorov G. and Sonin K., Dictators and their Viziers: Endogenizing the Loyalty-Competence Trade-off, mimeo, 2006. http://ssrn.com/abstract=630503

[25] Ellman M. Does Privatising Public Service Provision Reduce Accountability? mimeo, 2006. http://ssrn.com/abstract=1002830

[26] Enikolopov R., Politicians, Bureaucrats and Patronage, mimeo, 2006.

[27] Evans P. and Rauch J. Bureaucracy and Growth: A Cross-National Analysis of the Effects of 'Weberian' State Structures on Economic Growth // American Sociological Review, Vol. 64, No. 5, 1999, pp. 748-765.

[28] Ferejohn J. Incumbent Performance and Electoral Control // Public Choice, Vol. 50, 1986, pp. 5-26.

[29] Fox J. Civil Society and Political Accountability: Propositions for Discussion, Working Paper, Presented at: "Institutions, Accountability and Democratic Governance in Latin America", The Helen Kellogg Institute for International Studies, University of Notre Dame, May 8-9, 2000.

[30] Gehlbach S., Retrospective-Voting Models, Lecture notes 8, 2006.

[31] Glaeser E. and Saks R., Corruption in America, Discussion Paper Number 2043, Harvard Institute of Economic Research, 2004.

[32] Gregory P. and Lazarev V. Commissars and Cars: A Case Study in the Political Economy of Dictatorship // Journal of Comparative Economics, Vol. 31, 2003, pp. 1-19.

[33] Gurgur T. and Shah A. Localization and Corruption: Panacea or Pandora's Box? OED, World Bank mimeo, No. 14, 2000.

[34] Hall R. and Jones C. Why Do Some Countries Produce so Much More Output Per Worker Than Others? // Quarterly Journal of Economics, Vol. 114, 1999, pp. 83-116.

[35] Jaggers K., Marshall M. Polity IV Project, Political Regime Characteristics and Transitions, 1800-2000, Database Codebook, 2000.

[36] Johnson C. MITI and the Japanese Miracle: The Growth of Industrial Policy, 1925-1975. Stanford: Stanford University Press, 1982.

[37] Kaufmann D., Kraay A., Mastruzzi M. Governance Matters V: Aggregate and Individual Governance Indicators for 1996-2005, World Bank Policy Research Working Paper No. 4012, 2006.

[38] Kaufmann D., Kraay A., Mastruzzi M. Governance Matters VII: Aggregate and Individual Governance Indicators for 1996-2007, World Bank Policy Research Working Paper No. 4654, 2008. http://ssrn.com/abstract=1148386

[39] Lassen D. Political Accountability and the Size of Government: Theory and Cross-Country Evidence, Working Paper, 2000.

[40] Li H. and Suen W. Delegating Decisions to Experts // Journal of Political Economy, Vol. 112, No. 1, Pt. 2, 2004, pp. S311-S335.

[41] Maskin E., Tirole J. The Politician and the Judge: Accountability in Government // American Economic Review, Vol. 94, No. 4, 2004, pp. 1034-1054.

[42] Mauro P. Corruption and Growth // Quarterly Journal of Economics, Vol. 110, No, 3, 1995, pp. 681-712.

[43] Moe T., The New Economics of Organization // American Journal of Political Science, Vol. 28, No 4, 1984, pp. 739-777.

[44] North D. The Growth of Government in the United States: An Economic Historian's Perspective // Journal of Public Economics, Vol 28, No. 3, 1985, pp. 383-399.

[45] Oates W. Searching for Leviathan: An Empirical Study // American Economic Review, Vol. 75, No. 4, 1985, pp. 748-757.

[46] Persson T., Roland G., and Tabellini G., Separation of Powers and Political Accountability // Quarterly Journal of Economics, Vol. 112, 1997, pp. 1163-1202.

[47] Persson T. and Tabellini G., The Size and Scope of Government: Comparative politics with Rational Policies // European Economic Review, Vol. 43, 1999, pp. 699-735.

[48] Persson T. and Tabellini G., Political Economics: Explaining Economic Policy. The MIT Press, 2000.

[49] Przeworski A., Stokes S., Manin B., Democracy, Accountability, and Representation, Cambridge: Cambridge University Press, 1999.

[50] Rauch J. and Evans P. Bureaucratic Structure and Bureaucratic Performance in Less Developed Countries // Journal of Public Economics, Vol. 75, No. 1, 2000, pp. 49-71.

[51] Rodrik D. What Drives Public Employment? NBER Working Paper, No. 6141, 1997.

[52] Rodrik D. Why Do More Open Economies Have Bigger Governments? // Journal of Political Economy, Vol. 106, No. 5, 1998, pp. 997-1032.

[53] Schiavo-Campo S., De Tommaso G., Mukherjee A., An International Statistical Survey of Government Employment and Wages, World Bank Policy Research Working Paper No. 1806, 1997.

[54] Suleiman E. Politics, Power and Bureaucracy in France: The Administrative Elite. Princeton, N. J.: Princeton University Press, 1972.

[55] Suleiman E. (ed.) Bureaucrats and Policy Making: A Comparative Analysis. New York: Holmes & Meier Publishing, 1984.

[56] Treisman D. Decentralization and the Quality of Government. Department of Political Science, University of California, Los Angeles, mimeo, 2000.

[57] Weber M., Economy and Society: An Outline of Interpretative Sociology. New York: Bedminster Press, 1968.

A Data

Because of data availability we use two samples of democratic countries different in year. The data on government administration employment and population is taken from Schiavo et al. (1997) for 1992-1994. However the first year of Accountability and Voice index calculation is 1996. Thus we use the data on this index for 1996. All figures are for 1994 - 1996. All control variables are for 1994. Models of authority of government bureaucracies are constructed on the data for 2006.

Variable	Description	Year(s)	Source(s)
POLAC	Voice and Accountability index (from -2.5 to 2.5)	1996, 2006	Kauffman et al. (2008)
CONTROLCORR	Control of corruption index (from -2.5 to 2.5)	1996, 2006	Kauffman et al. (2008)
CORR	Corruption perceptions index(from 0 to 10)	1996, 2006	Transparency International (TI)
A5102	Authority of the political powers over the administration (from 1 to 4)	2006	"Institutional Profiles" database, Ministry of Finance in France
CGOVEMPP	Central Government Administration Employment (in % of population)	1992-1994	Schiavo et al. (1997)
SUBGOVEMPP	Non-Central Government Administration Employment (in % of population)	1992-1994	Schiavo et al. (1997)
TOTGOVEMPP	Total Government Administration Employment (in % of population)	1992-1994	Schiavo et al. (1997)
LNGNI	Log of gross national income per capita (at PPP in current international $)	1994, 2006	World Development Indicators (WDI)
DEMOC	Level of democracy (from 1 to 10)	1994, 2006	Polity IV, Jaggers and Marshall's (2000)
ETHNIC	Ethnical fractionalization (from 0 to 1)		La Porta et al. (1999)
LATITUDE	Distance from the equator (from 0 to 1)		Hall and Jones (1999)
LNWAGE	Average government wages to GDP per capita	1992-1994	Schiavo et al. (1997)
OPEN	Trade (in % of GDP)	1994, 2006	World Development Indicators (WDI)
LNPOPUL	Log of total population (in thousands)	1992-1994	Schiavo et al. (1997)
URBAN	Urban population (in % of total population)	1994, 2006	World Development Indicators (WDI)
AGEDEPEND	Age dependency ratio (population <15 and >64 in % of population 15-64)	1994, 2006	World Development Indicators (WDI)

B Independence of government administration

Democratic country coverage (50):

Argentina, Benin, Bangladesh, Bulgaria, Bolivia, Brazil, Botswana, Canada, Chile, Colombia, Czech Republic, Germany, Dominican Republic, Spain, Estonia, France, United Kingdom, Greece, Guatemala, Hong Kong, Hungary, India, Ireland, Israel, Italy, Japan, South Korea, Sri Lanka, Lithuania, Madagascar, Mexico, Mali, Mozambique, Mauritius, Malaysia, Niger, Norway, New Zealand, Philippines, Poland, Portugal, Romania, Russia, Sweden, Taiwan, Turkey, Ukraine, United States of America, Venezuela, South Africa.

Variable	N.Obs.	Mean	Std.Dev.	Min	Max
A5102	50	3.06	.8429782	1	4
POLAC	50	.5484	.6490695	-.97	1.54
LNGNI	49^{ξ}	9.249021	1.175178	6.44572	10.82118
DEMOC	49^{ξ}	8.510204	1.569533	4	10

$^{\xi}$Without Taiwan

Table 1: Descriptive Statistics

	Authority of Politicians over Government Administration (A5102)			
	OLS $N{=}50$	OPROBIT $N{=}49$	OLS $N{=}50$	OPROBIT $N{=}49$
POLAC	.7099*** (.1569)	1.1352*** (.2836)	.3268† (.2067)	.6201† (.3532)
LNGNI			.3094** (.1153)	.4729** (.1987)
$cut1$		-1.3159 (.3258)		2.5683 (1.6604)
$cut2$		-.41528 (.24051)		3.6083 (1.7062)
$cut3$		1.2096 (.2777)		5.3458 (1.7845)

OLS regressions include a constant. Robust standard errors are in parentheses. ***, **, * and † denote significance at the 0.1%, 1%, 5% and 12% levels, respectively. For the ordered probit estimation we present marginal effects only for POLAC. LRI is the likelihood ratio index, which represent ratios of maximum likelihoods for each model estimated with and without the explanatory variable sets. This index indicates overall model fit. It is known as McFadden's R^2 or Pseudo R^2.

Pr(y=1)	.0263	.0160
ME POLAC	-.0692†	-.0248
	(.0434)	(.0233)
Pr(y=2)	.1234	.1188
ME POLAC	-.1951**	-.1096†
	(.0745)	(.0684)
Pr(y=3)	.5717	.6019
ME POLAC	-.1169	-.0679
	(.0923)	(.0643)
Pr(y=4)	.2786	.2632
ME POLAC	.3812***	.2024†
	(.0979)	(.1167)
R^2	0.2988	0.3943
Adj. R^2	0.2842	0.3680
LRI	0.1508	0.2011
Log likelihood	-49.2946	-45.7826

Table 2: Regression Results for Authority of Politicians over Administration

C   Government administration employment

Democratic country coverage

For models including central government employment $N = 58$:

Albania, Argentina, Australia, Austria, Bangladesh, Belgium, Bolivia, Botswana, Bulgaria, Canada, Chile, Colombia, Czech Republic, Denmark, Ecuador, El Salvador, Estonia, Finland, France, Germany, Greece, Honduras, Hungary, India, Ireland, Italy, Japan, South Korea, Lebanon, Macedonia, Madagascar, Malaysia, Mauritius, Moldova, Netherlands, New Zealand, Nicaragua, Norway, Pakistan, Paraguay, Philippines, Poland, Portugal, Russia, South Africa, Slovak Republic, Spain, Sri Lanka, Sweden, Switzerland, Thailand, Turkey, Ukraine, UK, USA, Uruguay, Venezuela, Zambia.

For models using instrumental variables $N = 50$:

The data on ethnical fractionalization and latitude are lacking for Czech Republic, El Salvador, Estonia, Macedonia, Moldova, Russia, Slovak Republic, Ukraine.

For OLS models including total government employment $N = 52$:

missing Bangladesh, Czech Republic, El Salvador, Madagascar, Nicaragua, Paraguay.

For TSLS models including total government employment $N = 46$:

missing Bangladesh, Czech Republic, El Salvador, Estonia, Macedonia, Madagascar, Moldova, Nicaragua, Paraguay, Russia, Slovak Republic, Ukraine.

Variable	N.Obs.	Mean	Std.Dev.	Min	Max
LNTOTGOVEMPP	52	.7786067	.7506002	-.6931472	2.292535
LNCGOVEMPP	58	.0644466	.832376	-2.302585	1.410987
POLAC	60	.5558333	.6689919	-.717	1.59
LNGNI	60	8.773263	1.05762	6.429719	10.26221
LNPOPUL	60	11.38106	3.109305	7.01661	18.89702
LNWAGE	52	.5853817	.6050112	-1.104528	1.848954
ETHNIC	52	.2314096	.2478943	0	.831
LATITUDE	59	.3879792	.1843968	.0229111	.6690222
URBAN	60	62.36267	19.04931	16.56	96.72
OPEN	60	65.3404	33.65902	16.16609	179.9059
AGEDEPEND	60	.6023548	.1479284	.4178303	.9757223

Table 3: Descriptive Statistics

	Total Government Employment (LNTOTGOVEMPP)				Central Government Employment (LNCGOVEMPP)			
	OLS $N=52$	TSLS $N=46$	OLS $N=52$	TSLS $N=46$	OLS $N=58$	TSLS $N=50$	OLS $N=58$	TSLS $N=50$
POLAC	.7262*** (.1131)	.6782*** (.1865)	.5399*** (.1933)	1.009* (.5354)	.5643*** (.1455)	.4122* (.2345)	.4840** (.2345)	.4164 (.8035)
LNGNI			.1681 (.1417)	−.1462 (.3338)			.0672 (.1530)	.0641 (.4160)
R^2	0.4518		0.4671		0.2117		0.2144	
Adj. R^2	0.4409		0.4454		0.1976		0.1859	
F(first)		17.94		42.29		20.56		32.00
P(Over)		.4034		.4565		.1078		.0790

Table 4: Regression Results for Government Administration Employment

All regressions include a constant. Robust standard errors are in parentheses. ***, **, * and † denote significance at the 1%, 5%, 10% and 20% levels, respectively. For the two-stage least-squares (TSLS) estimation instruments are ETHNIC and LATITUDE. The included controls are also used as instruments. F(first) is the F-statistic with the first stage of the TSLS estimation. P-value (over) is the p-value associated with the null hypothesis of "no overidentification".

	Total Government Employment (LNTOTGOVEMPP)				Central Government Employment (LNCGOVEMPP)			
	OLS $N=49$	TSLS $N=43$	OLS $N=49$	TSLS $N=43$	OLS $N=52$	TSLS $N=45$	OLS $N=52$	TSLS $N=45$
POLAC	.5307*** (.2035)	.8742* (.48323)	.4913*** (.1907)	.6998† (.4690)	.4779* (.2527)	.5638 (.6788)	.43122* (.2234)	.4815 (.6374)
LNGNI	.1032 (.1435)	-.1651 (.2959)	.4649*** (.1821)	.2216 (.3590)	.0071 (.1741)	-.1559 (.3819)	.4462** (.2175)	.2576 (.4489)
LNPOPUL	-.0459† (.0348)	-.0041 (.0485)	-.0299 (.0329)	-.0016 (.0477)	-.0661† (.0407)	-.0660 (.0535)	-.0425 (.0366)	-.0416 (.0512)
LNWAGE	-.1544 (.1428)	-.3799** (.1845)	-.2182† (.1399)	-.3702** (.1753)	-.0737 (.1842)	-.3369† (.2407)	-.0960 (.1689)	-.3115† (.2166)
URBAN			-.0133** (.0056)	-.0110* (.0066)			-.0193*** (.0069)	-.0172** (.0082)
OPEN			.0021 (.0022)	.0026 (.0027)			.0065*** (.0026)	.0068** (.0034)
AGEDEPEND			1.5602* (.8235)	1.1294 (.9455)			1.4459† (.9998)	1.1012 (1.1139)
R^2	0.5374		0.6265		0.3304		0.5189	
Adj. R^2	0.4954		0.5628		0.2734		0.4424	
F(first)		26.94		16.16		22.98		13.93
P(Over)		.3371		.5348		.1965		.6583

Table 5: Regression Results for Government Administration Employment (with controls)

All regressions include a constant. Robust standard errors are in parentheses. ***, **, * and † denote significance at the 1%, 5%, 10% and 20% levels, respectively. For the two-stage least-squares (TSLS) estimation instruments are ETHNIC and LATITUDE. The included controls are also used as instruments. F(first) is the F-statistic with the first stage of the TSLS estimation. P-value (over) is the p-value associated with the null hypothesis of "no overidentification".
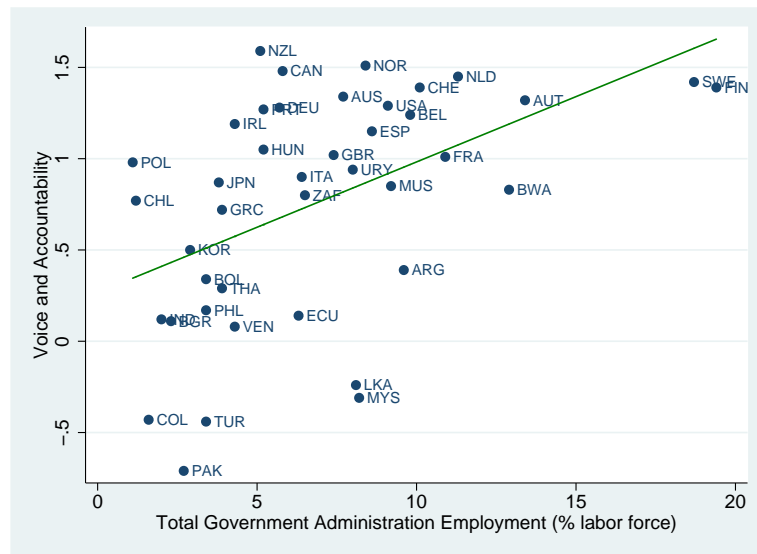
Figure 3: Voice and Accountability and Government Administration Employment
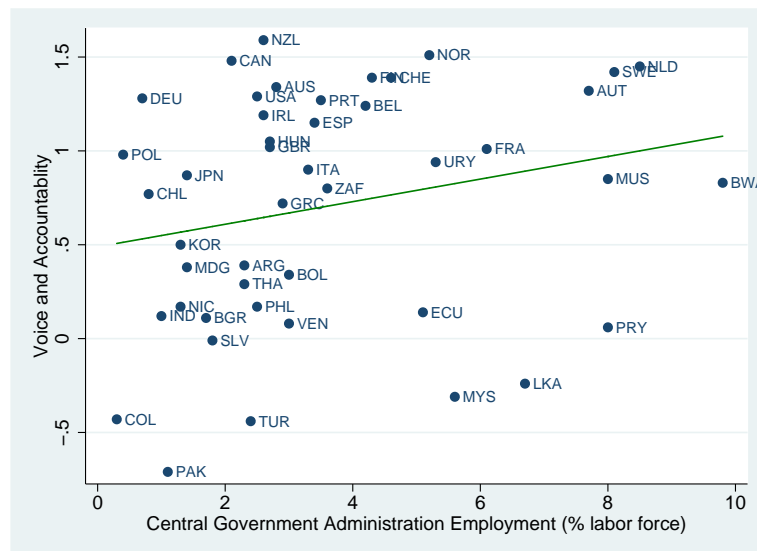

Figure 4: Voice and Accountability and Central Government Administration Employment
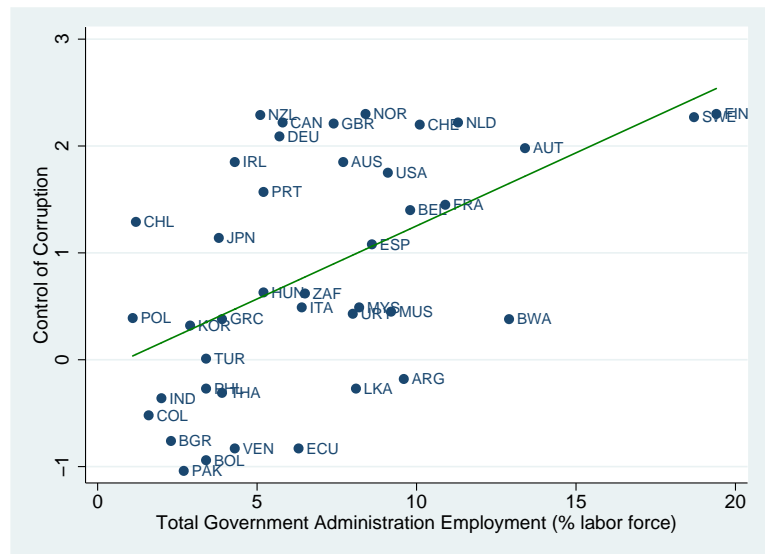
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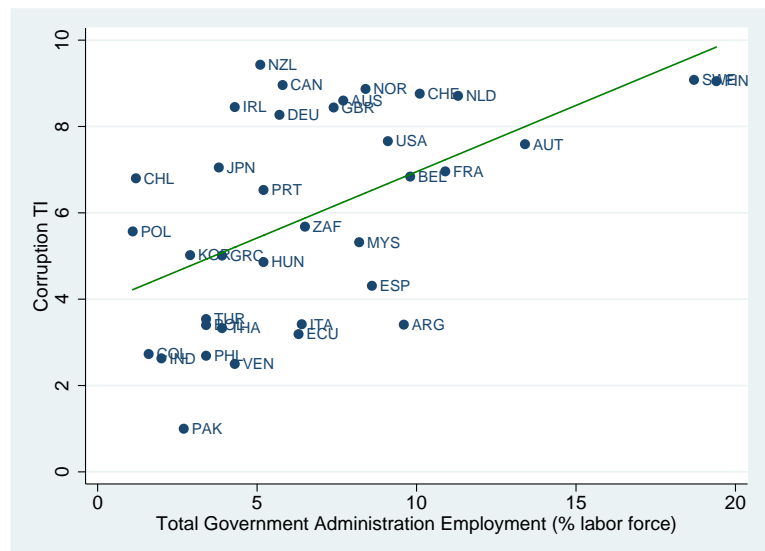Figure 5: Control of Corruption and Government Administration Employment

Figure 6: Corruption TI and Government Administration Employment

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