

Schelker, Mark

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# **Public Auditors: Empirical Evidence from the US States**

Mark Schelker

Working Paper No. 2008 - 4

# Public Auditors: Empirical Evidence from the US States

MARK SCHELKER \*

*University of Fribourg, Switzerland and CREMA*

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## ABSTRACT

Public auditors should reduce agency problems and improve transparency. We address the question of whether auditors should be elected by the citizens or appointed by either the legislature or the executive, and explore the influence of conducting performance audits. We construct a unique dataset at the US State level capturing differences in the institutional design of state auditing institutions. We estimate the influence of auditor characteristics on different outcome variables reflecting government performance and implement an alternative identification strategy relying on citizens' electoral decisions. We examine whether citizens use divided government – a costly mechanism to control the government – as a substitute, when other effective, but less costly mechanisms are not available. Even if the empirical results are sometimes difficult to interpret, we generally find that (1) performance audits tend to be beneficial and (2) elected auditors with a strong mandate to conduct performance audits seem to outperform other institutional arrangements. (150 words)

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Keywords: Public auditors, audit courts, political institutions, political economics

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\* Corresponding Address: Mark Schelker, Center for Public Finance, University of Fribourg, Blvd. de Pérolles 90, CH-1700 Fribourg, Switzerland, Email: [mark.schelker@unifr.ch](mailto:mark.schelker@unifr.ch)

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## 1. Introduction

Public auditing institutions aim to reduce the agency problem between citizens and government. This paper studies a completely neglected question and analyzes which *factors of the institutional design* of audit agencies impact on public sector performance. In the limited literature available auditors serve as watchdogs of the executive and the bureaucracy to improve transparency, fight misappropriation, fraud, corruption, wasteful usage of public funds, and general inefficiencies. Even though supreme auditing institutions such as the American ‘Government Accountability Office’ (GAO), the ‘European Court of Auditors’ or the German ‘Bundesrechnungshof’ etc. exist in nearly all democratic government systems, there is almost no academic economic literature on the influence of auditing institutions. The scarce economic literature unanimously underlines the importance of these institutions in providing vital information to the legislature, political parties, the media, the citizens, and other organizations to control the government and its bureaucracy, and points to its value in serving the public interest. Although the focus of recent empirical studies has not been explicitly on the impact of auditors on public sector performance, the evidence suggests that the existence of independent review by an auditing institution significantly reduces corruption and wasteful spending (e.g. Olken 2007, Ferraz and Finan 2005). These empirical studies illustrate that independent review is important per se, but they do not analyze the influence of different institutional auditor regimes on public sector performance. However, it seems that the design of the audit agency is important. From economic literature related to our main questions we identify factors, such as appointing procedures and the scope of audits (financial vs. performance audits) that might impact on auditor effectiveness. Also the recent discussions among leading members of supreme auditing agencies and the declarations of the International Organization of Supreme Auditing Institutions (INTOSAI) indicate that the design and competences of the auditing agency are important. The ‘Lima declaration’ of the INTOSAI underlines the importance of auditor independence and proposes a stronger focus on performance evaluations.

In the following we discuss the theoretical influence of auditing institutions. Subsequently we analyze the impact of various institutional regimes on public sector performance empirically. Our main focus is on the auditor selection mechanism, the scope of audit as well as several other specific features that might impact on auditor independence or its efforts to trace inefficiencies. We then discuss some essential theoretical aspects and formulate testable hypotheses. Our hypotheses predict more independent auditors and a strong mandate to conduct performance audits to exert a positive influence on government performance. We test these hypotheses by studying a completely new dataset on US state auditing institutions. We have constructed a unique dataset analyzing the institutional design of state auditors. In order to evaluate auditor effectiveness we cannot rely on fiscal variables, which are associated with some serious conceptual problems. These problems do not make it possible to follow this rather standard approach in testing institutional factors. Instead we use alternative measures independent from fiscal data but closely associated with policy outcomes, such as state credit ratings and a new set of government performance measures. We furthermore propose an alternative identification strategy not directly relying on government performance measures. In general, the empirical evidence points towards more effective auditors if they are endowed with a strong mandate to conduct performance audits. The estimates on whether auditors should be elected or appointed are not conclusive, but estimates suggest that auditors with strong mandates to conduct performance audits should be elected rather than appointed.

Section 2 presents the various theoretical aspects important to our analysis and summarizes the more recent economic literature on the influence of public auditing institutions. In Section 3 we formulate testable hypotheses. Section 4 discusses some conceptual difficulties related to estimates relying on fiscal variables and presents alternative identification strategies. We further present some alternative empirical identification strategies. In Section 5 we present our unique dataset at the US State level. Section 6 presents the results of our various estimation specifications and Section 7 summarizes and concludes.

## **2. The Impact of Public Auditors**

### *2.1. The fundamental role of auditors*

The fundamental agency problem between citizens and their agents in government positions is well established. In order to control the agent, the principal requires information. In the political system the government must issue financial reports that inform the legislature and the citizens about all relevant financial aspects of government activity. However, such reports are superfluous if the reported information is inaccurate. Because governments face incentives to misreport, independent review of the financial statements is crucial. Therefore, independent auditing institutions are well established in modern democracies. The economic contributions so far emphasize the important functions of auditors in controlling the government and the bureaucracy by providing information to policymakers and citizens, and in exposing waste and corruption. Frey (1994: 196) argues that “[w]ithout the collecting, processing, and interpreting of information and the publication of the corresponding reports by the staff of the accounting office, members of parliament and the opposition parties would find it difficult or even impossible to supervise and criticize the workings of government [...]”. Hence, auditors are an instrument to control the government and improve transparency in the policy process.

The related literature on the influence of budgetary transparency highlights the importance of transparency in the budget process (e.g. von Hagen 1992, Alesina and Perotti 1996, Ferejohn 1999, Alt, Lassen and Skilling 2002, and Alt and Lassen 2006). Improved transparency in the budget process reduces the agency problem and enhances government performance. Alt and Lassen (2006) present a career concerns model that takes fiscal transparency into account. In this model voters want more competent policy makers, i.e. policy makers that provide more public goods given a certain level of taxation. Politicians want to appear competent by providing more public goods to enhance their electoral chances. If transparency is very low voters cannot extract a reliable signal about the state of public debt. As the politicians’ competence is not

directly observable to voters, politicians can appear competent by financing public goods by issuing debt. Obviously, the scope for politicians to issue public debt in order to appear competent is reduced, if fiscal transparency improves. Alt and Lassen (2006) construct a transparency measure for the OECD countries in which an item of the index focuses on the role of independent review and includes a dummy whether financial reports and economic assumptions are audited. They provide empirical evidence on the effects of transparency on deficits and public debt accumulation and report that increasing fiscal transparency dampens budget cycles. In light of this literature auditors could be important determinants of transparency. They provide information about government activity, reduce information asymmetries between government and citizens, and enhance transparency so that voters can extract more information about an incumbents' competence. Hence, auditors could be a key component in order to improve transparency.

Only a few studies analyze the impact of auditors empirically and they mostly focus their attention on the influence of auditors in fighting corruption (Ferraz and Finan 2005, Olken 2007).<sup>1</sup> Even though the empirical studies by Olken (2007) and Ferraz and Finan (2005) do not primarily focus on the effect of independent audits, they provide interesting insights for our purposes. Olken (2007) analyzes different methods of reducing corruption using a randomized field experiment in Indonesia. He studies public expenditures on road construction projects in Indonesian villages. He compares the actual construction expenditures with an estimate of construction costs by a group of experts that evaluate each project. The difference between the actual and the estimated expenditures, the 'missing expenditures' are his measure of corruption. One treatment of the experiment is to ex ante announce a certain probability of a government audit between 4 and 100 percent. He finds that an increasing audit probability reduces missing expenditures significantly. Ferraz and Finan (2005) analyze the impact of randomly assigned

audits that expose corrupt governance on the likelihood of a mayor being reelected. They take advantage of the exogenous difference between municipalities that were audited before and municipalities that were audited after elections. If audits that happened before elections revealed corrupt mayors, reelection chances were dramatically reduced, whereas corrupt mayors that were only audited after elections did not suffer the same electoral problems. This clearly indicates that without the audit voters lack information, which prevents them from fully anticipating corruption and punishing incumbents. Both studies suggest that independent audits can provide important information and increase transparency, which is necessary to effectively control the agents. This in turn has real effects on the use of public resources and voting behavior.

## 2.2. *Factors determining auditor effectiveness: Independence and scope of audits*

The available theoretical insights and the empirical evidence discussed above suggest that independent review of government activities increases transparency, reduces agency problems, and hence impacts on fiscal outcome. However, we cannot learn anything about the *factors determining audit effectiveness* from these studies. They assume that auditors are independent and audits unbiased, and that the audits conducted are identical across the observed entities. This is probably true for both empirical studies we have briefly discussed (Olken 2007, Ferraz and Finan 2005). In both cases the auditor involved is dispatched by the central government, has no direct relationship with the local governments audited, and conducts standard financial audits. However, supreme auditing institutions such as the US Government Accountability Office, US State Auditors, the European Court of Auditors, or the German Bundesrechnungshof, etc. are not appointed by a higher level of government and they have strong ties to the

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<sup>1</sup> An exception is Eichenberger and Schelker (2007) who analyze the influence of a special form of local auditors on fiscal measures in Switzerland. However, the authors focus their attention on the impact of a non-standard audit



appointing agents. Therefore, the question of auditor independence is not at all trivial. Furthermore, not all auditors conduct the same audits. The two traditional forms of audit conducted by auditors are financial audits of government accounts for accuracy and compliance with laws and regulations, and performance audits in the form of economy and efficiency audits of government programs.<sup>2</sup> All auditors conduct financial audits, which are mostly standardized and adopt predetermined auditing and accounting standards, but the scope of the mandate to conduct performance audits typically varies considerably.

Hence, we address two different questions in our theoretical and empirical investigation: We analyze the influence of (1) auditor independence conditional on the selection mechanism and (2) performance audits on government performance.

#### *Auditor independence: Election vs. appointment of auditors*

Auditor independence is crucial in order to strengthen the incentives to expose unlawful accounting practices or wasteful policy implementation. Taking the principal-agent problem as a starting point, Tirole (1986) discusses a framework in which a principal hires a supervisor to control the agent. In this three-tier principal-agent problem between the principal, the supervisor, and the agent, the main problem arises if the supervisor and the agent collude. If they collude, the principal does not receive the desired information about the actions of its agent. Moreover, if the principal is naïve and does not anticipate such collusion, he could be even worse off than without hiring a supervisor (Antle 1984). In such a setting the principal wants to implement contracts that do not provide incentives for collusion between the agent and the supervisor. Models from contract theory assume that the principal herself writes the contracts with the agent as well as with the supervisor/auditor and that he tries to implement collusion-proof contracts (see Tirole 1986, Baiman, Evans and Nagarajan 1991, Kofman and

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mandate that includes the audit of the budget draft and individual investment projects ex ante to political decisions.

<sup>2</sup> For an extensive discussion of the different forms of performance audits and how they are applied throughout the OECD, see Barzelay (1997).

Lawarrée 1993, Bolton and Dewatripont 2005, or Khalil and Lawarrée 2006). However, in the public sector the auditor is often not even appointed by the principal herself. In many cases the auditor is directly appointed by the legislature or the executive that is under audit. Hence, if the auditor is appointed by the agent there is a high risk of collusion, because such appointment mechanisms facilitate side-payments and reciprocal behavior between agent and auditor. Consequently, if we would like to analyze the influence of auditors on government performance the question of auditor independence must be addressed.

Interestingly, there is not much literature on the influence of auditors taking into account the various appointing procedures.<sup>3</sup> Frey (1994) proposes the direct election of auditors by the citizens in order to enhance legitimacy and to hold auditors directly accountable for their actions. More generally, Besley and Coate (2003) show that elected public regulators more rigorously pursue consumers' interests.<sup>4</sup> In our framework we argue that the direct election of the auditor by the principal should increase an auditors' independence from the audited agencies and induce stronger incentives to expose inaccurate accounting practices and wasteful policy implementation. These arguments suggest that if the principal can directly elect the auditor, he should be better able to hold the auditor accountable and to reduce the risk of collusion. Hence, the intuitive prediction, which is reflected in most reform proposals, is that elected auditors have a positive effect on transparency and government performance.

However, holding public officials accountable might not be desirable per se. Ferejohn (1999) argues that accountability and responsiveness might be desired in circumstances when government actions are "[...] not a matter of justice or morality but depends on what cooperative projects citizens wish to undertake" (Ferejohn 1999: 132). But it might not be desired if it is in the "[...] administration of programs in which the dispensing of justice is

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<sup>3</sup> For a discussion of public auditing institutions drawing on principal-agent theory or Political Economics and Public Choice see e.g. Frey and Serna (1990), Frey (1994), Streim (1994), and van Brabant (1994).

concerned, and perhaps in the case of managing monetary policy [...]” (Ferejohn 1999: 132). Furthermore, drawing from Maskin and Tirole (2004) the direct election of the auditor might give the auditor incentives for ‘pandering’ to the electorate rather than independently assessing government performance. Pandering activities are associated with activities that are popular with the electorate in the short-run, but have adverse effects in the longer-run. In the model of Maskin and Tirole (2004), the main focus is on the judiciary, where the independent assessment of some facts and their evaluation by existing law is crucial. In such a model pandering distorts optimal decisions and reduces government performance. Even though Maskin and Tirole (2004) focus their attention on judges, they briefly argue that these effects might also be true for auditing institutions.<sup>5</sup> In the context of auditors, pandering might include e.g. extensive criticism of unpopular programs while assessing popular programs too optimistically, an extensive focus on easily perceptible charges but not on more hidden forms of taxation, etc. Similar to Ferejohn (1999) the conclusions drawn from the model are that appointment is “[...] most desirable when (a) the electorate is poorly informed about the optimal action, (b) acquiring decision-relevant information is costly, and (c) feedback about the quality of decisions is slow.” (Maskin and Tirole 2004: 1049). They conclude that technical decisions and decisions inflicting negative externalities on minorities are best allocated to judges or appointed bureaucrats. Considering these arguments, auditor appointment rather than a direct election could be reasonable if the main function of public auditors is to conduct financial audits, but not to put a strong emphasis on performance evaluations. Financial audits focus on auditing the accounts and are based on clearly established standards (such as e.g. GAAS and GAAP), require technical audit skills, and do not typically target policy implementation. In contrast, performance audits target policy

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<sup>4</sup> For more evidence on the effect of the direct election of regulators see also e.g. Fields, Klein and Sfiridis (1997). For evidence on the election of judges and judicial independence see e.g. Hanssen (1999, 2000), Berkowitz and Clay (2006), or Besley and Payne (2003, 2005).

<sup>5</sup> Maskin and Tirole (2004) mention that one should also consider the question whether monitoring institutions such as e.g. the US Government Accountability Office (GAO) or similar, should be elected or appointed. Even though they consider it a ‘challenging question’, their ‘tentative answer’ is that in contrast to elected public officials, such an institution should be appointed.

implementation and public goods provision, where, according to Ferejohn (1999), accountability, i.e. direct election is desired.

Hence, we find strong arguments in favor of electing auditors, but also against the direct election if pandering is an issue. An important distinction has to be made if we focus on auditor appointment. Auditors can be appointed by either the legislative or the executive. Taking into account that a direct link between the auditor and the agent subject to the audit (mostly the executive) seems to be detrimental due to the high risk of collusion and that the direct election of the auditor by the principal (the citizens) might induce incentives to ‘pander’ to the public, legislative appointment seems to be a reasonable alternative. Since financial audits mainly target the executive branch and the bureaucracy, the legislature is not the primary focus of the audits, and hence, reduces the incentives for collusion. However, when it comes to performance audits, which target also public goods provision, the legislature might also have incentives to collude with the auditor. Therefore, a strong mandate to conduct performance audits might also induce the trade-off between the risk of collusion and the risk of inefficiencies due to pandering.

### *Performance audits*

Generally it is assumed that a stronger focus on performance audits increases transparency and government performance, because there is a higher probability that wasteful policy implementation would be uncovered.

However, while financial audits are usually not considered to be problematic to implement, because accounting standards are well established, performance audits are more so. Since the outcome of most policy programs is not easily measured and often the desired outcome is not well defined by decision-makers, it is difficult for auditors to objectively assess the performance of such projects. Furthermore, auditors are generally not endowed with judicial powers to sanction inefficient or wasteful program execution. They can only criticize the execution ex post and they carry the burden of proof. Proving inefficient program implementation is difficult

because of the above mentioned measurement problems. Moreover, it also induces unpleasant conflicts between the auditor and the auditee. Therefore, the main focus of audit activity is often de facto oriented towards standard financial audits examining the accuracy of the accounts and compliance with laws and regulations. This, however, undermines thorough evaluation of policy programs and procedures. From this perspective it remains unclear how effective de jure provisions to conduct performance audits really are. Nevertheless, most reform proposals focus on strengthening the mandate to conduct performance audits.

### *2.3. Testable Hypotheses*

The focus of this paper is directed towards empirically analyzing the impact of electing or appointing the auditor, and of the extent to which auditors conduct performance audits. From our previous discussion it becomes clear that we cannot formulate a straight-forward hypothesis on auditor selection (Hypothesis 1). The hypothesis concerning the impact of performance audits is unambiguous and is formulated in Hypothesis 2. The interaction between the selection process and performance audits is formulated in Hypothesis 3.

Hypotheses 1: Election vs. legislative appointment vs. executive appointment

- a) We expect auditor appointment by the executive to be the least effective selection mechanism due to the close ties between auditor and auditee and the high risk of collusion.
- b) Electing auditors reduces the risk of collusion between auditor and auditee to a maximum and enhances auditor independence, which is a precondition to effectively review official financial statements and evaluate government performance.
- c) If pandering of elected auditors is an issue, we expect that legislative appointment is more effective than direct election.

## Hypothesis 2: Performance audits

A stronger mandate to conduct performance audits should reduce waste and inefficiencies. Thus, we expect to find government performance to be higher if auditors are endowed with a stronger mandate to conduct performance audits.

In a general econometric framework we estimate the following equation:

$$y = \alpha + \beta_1 * legislative + \beta_2 * executive + \gamma * performance + \zeta * A + \lambda * X + \varepsilon \quad (1)$$

where  $y$  is a variable capturing government performance, the dummy variables *legislative* and *executive* reflect whether the auditor is appointed by the legislative or the executive branch respectively, and *performance* measures an auditor's scope to conduct performance audits.  $\zeta$  and  $\lambda$  are parameter vectors,  $A$  is a matrix capturing some additional features of the various auditing offices,  $X$  is a matrix including additional cross-section characteristics, and  $\varepsilon$  is of course the error term.

The effectiveness of performance audits might heavily depend on the selection procedure of the auditor and vice versa. On the one hand, if the selection procedure is important for how independent and how effective the auditor assesses government activity, then this should have an influence on how performance evaluations are implemented. On the other hand performance audits can as well impact on independence, most obviously also in the case of legislative appointed auditors. If performance audits also target legislative work by ex post assessments of policy programs, auditor independence is likely to be impaired. Therefore, we expect performance audits to be most effective if the auditor is directly elected by the principal, which reduces the risk of collusion between auditor and auditee to a minimum.

## Hypothesis 3: Interaction between auditor selection and performance audits

We expect *elected* auditors with a strong mandate to conduct performance audits to evaluate the accuracy of the data more rigorously and to reduce waste and inefficiencies more effectively relative to appointed auditors.

Thus, in an empirical setup we estimate an interaction term between the auditor selection mechanism and the performance audit indicator:

$$y = \alpha + \beta_1 * legislative + \beta_2 * executive + \gamma * performance + \delta_1 * (legislative * performance) + \delta_2 * (executive * performance) + \zeta * A + \lambda * X + \varepsilon \quad (2)$$

### 3. Hypotheses Testing: Conceptual Problems and Alternatives

#### 3.1. *Conceptual problems associated with fiscal variables*

The standard approach to analyzing political institutions is to estimate the impact of an institution on fiscal outcome variables such as expenditures, revenues, deficits, or debt. However, estimating the impact of auditor independence using official fiscal data has some major drawbacks and proves to be invalid in the context of auditing institutions. The main problem is that auditor independence is likely to be correlated with the quality and accuracy of the reported data. If auditor independence influences accounting practices, then we cannot hope that data quality and accuracy remain unaffected by auditor independence. This likely correlation hampers valid inference. Hence, an analysis focusing on the influence of auditor independence using official fiscal data is likely to be seriously biased.<sup>6</sup> Due to these conceptual difficulties occurring when analyzing fiscal data, we will focus our empirical analysis towards alternative measures independent from financial statements, but related to government performance.<sup>7</sup>

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<sup>6</sup> This correlation between data accuracy and the institutional setup might not only affect this study, but is likely to also affect other studies analyzing fiscal institutions. There is evidence that transparency affects the extents to which ‘creative’ accounting practices are adopted (e.g. Milesi-Ferretti 2004), which causes a similar problem as it is described above. Other institutional features might not be heavily affected by such problems. However, future research should seriously address this problem also in the context of other institutional features.

<sup>7</sup> Various additional problems related to the use of fiscal variables are discussed in Schelker (2007).

### *3.2. Alternative approaches*

We approach the problems discussed above by implementing different strategies. We analyze the influence of auditor characteristics on broad measures of government performance, such as State credit ratings provided by Moody's Investor Services and government performance ratings issued by the GPP (Government Performance Project). We then turn to a completely different identification approach by relying more heavily on revealed voting behavior. We analyze whether voters systematically divide government control – which is similar to allocating veto power to both major parties – if they face a more serious control problem, e.g. a lame duck governor or in the form of weaker institutional control mechanisms, such as low transparency or weak auditors.

#### *Moody's State credit ratings*

First, we estimate the influence of auditor characteristics on a variable reflecting a market evaluation of government performance. We collect state credit ratings, which are provided by Moody's Investor Service, and analyze the influence of the auditor design on these credit ratings. However, if these ratings depend mostly on official financial data, the ratings might be biased. Therefore, we will have to control for the influence of financial data by introducing fiscal variables such as expenditures and debt levels into our estimation model.

#### *Government performance ratings*

Secondly, we resort to a performance variable that much less depends on official data since the variable is constructed by a broad set of information on the structure of internal processes and 'real world' observations in several dimensions of public sector performance. We use the government performance ratings constructed and published by the 'Government Performance Project (GPP)', which is a non-partisan, independent research program housed within the Pew



Center on the States.<sup>8</sup> The efforts to rate government performance started in 1998 by reporters and researchers of the magazine ‘Governing’ and the Syracuse University’s Maxwell School of Citizenship and Public Affairs. The grading was conducted in the following five areas: Financial management, capital management, human resources management, managing for results, and information technology management. The rating was conducted combining a comprehensive survey requiring extended explanations and supporting material, with numerous interviews of decision makers, public officials, auditors, and citizen groups, etc. in all US States. E.g. ‘financial management’ contains information on the quality of revenue and expenditure forecasts, the structural balance of revenues and expenditures, the use of rainy day funds, the management of long term debt, accuracy of financial reporting, etc. ‘Capital management’ focuses on the management and quality of public infrastructure, the appropriateness of information justifying capital purchases, the planning of maintenance, etc.<sup>9</sup> We estimate the impact of auditors on the overall state rating as well as on the various subcategories. We only report the results for the overall rating, since we are interested in the influence of auditors on a broad set of dimensions reflecting government performance. If we estimate the impact of auditors on subcategories we consistently find results pointing in the same direction as the ones using the overall rating. Note, that the effects are typically larger if we only focus on the two categories financial and capital management. Such results could be expected since these are exactly the dimension in which the auditor should have the strongest influence.

The GPP issued government performance ratings for three different years (1999, 2001, 2005). Unfortunately, the ratings of the different years are not directly comparable. In the remaining of the paper we use the 1999 GPP rating (GPP 1999) that falls in the period we analyze.

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<sup>8</sup> A description of the project and more details about the rating procedures can be found in GPP (1999, 2001, 2005) and at <http://results.gpponline.org/>.

<sup>9</sup> For more details see GPP (1999).

### *Substitution of institutional control mechanisms*

Our third approach is fundamentally different from what has been proposed so far. We try to estimate how the influence of the design of auditing institutions affects the probability of divided government control.<sup>10</sup> The basic idea is as follows: Let us interpret divided governments as a way for voters to better control policymaking. Because the majorities are split between the two branches of government or the two houses of the legislature, it gives each party controlling one of the branches or houses a sort of veto power. If one party proposes policies too far away from the preferred policy of the other party, this other party can block the policymaking process and stop such policies from being implemented. Since divided governments are less able to react to fiscal shocks (Alt and Lowry 1994) and often experience obstructed decision making processes, this is a rather costly mechanism to control policymaking. The general idea is that if voters have less costly mechanisms at hand to control the government, the probability of resorting to divided government control should decrease. Thus, we expect that institutions enhancing voter control, such as more transparent budget procedures, access to voter initiatives, balanced budget requirements, and independent auditors, should reduce the probability of voters dividing government control. Conversely, institutions reducing the control of voters should increase the probability for divided government. For example term limited governors in their last office term (lame ducks) do not face reelection restrictions and, thus, enjoy more scope for actions furthering their own interests. Hence, lame ducks reduce voters influence and should therefore increase the probability that voters ‘install’ a divided government.

By this reasoning we expect that more independent auditors reduce the probability of divided government control. Furthermore, auditors with a strong mandate to conduct performance audits as well as the combination of both factors – elected auditors with a strong mandate to conduct performance audits – should yield the same outcome. In order to evaluate the consistency of our

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<sup>10</sup> More on divided governments see e.g. Fiorina (1992), Alt and Lowry (1994) and Alesina and Rosenthal (1995, 1996).

reasoning, we also report the influence of alternative institutional mechanisms and the influence of lame ducks on the probability of divided government.

## **4. The data**

The United States provide an excellent research laboratory, because individual States enjoy a relatively high degree of freedom in designing their institutions. This results in substantial variation in the design of state institutions and regulations that can be exploited econometrically. This is of course not only true for our auditing agencies, but also for various other institutions.<sup>11</sup> Compared with the institutional variation in a cross-country setting we find much less variation and more common features, which could be a drawback. For example we cannot estimate the influence of having an auditing agency per se, because all States feature some form of state auditor. However, having a common supra-state institutional setting reduces problems of unobserved heterogeneity, which in turn is a great advantage over cross-country studies. In the following, we do not repeat the discussion of our dependent variables but focus on our variables capturing the characteristics of state auditing institutions, and discuss our set of control variables.

### *4.1. US state auditing institutions*

To test our hypotheses we construct a unique dataset at the US State level. US state auditing agencies vary greatly in institutional design among the different States. More than one third of all state auditors are elected by the citizens. All others are appointed by either the legislative or, in some cases, the executive branch. There is also great variation in the audit scope. In addition to standard financial audits, most agencies conduct some form of performance audits, however, the emphasis on such audits vary. To construct our US cross-state dataset we consulted the reports on US state auditing institutions ('Auditing in the States: A summary') compiled and

published by the National Association of State Auditors, Comptrollers and Treasurers (NASACT). These reports are the product of extensive surveys of the state auditing agencies. We studied the available reports of the nineties (1989, 1992, 1996, 1999) as well as the recent reports dating from 2000 and 2002 through 2006 (NASACT 1989, 1992, 1996, 1999, 2000, 2002–2006). If possible we tried to reconstruct the data for the years in between the surveys, though this was only possible for some institutional variables that did not change over time. If we could trace back changes with a high degree of certainty, we also included this data in our panel. To clarify information or missing answers we contacted NASACT, the relevant auditing agency, or consulted state constitutions or state legislation. The result of this effort is a comprehensive dataset that spans roughly from 1990 to 2006. For many institutional details information was available for all years or could be reconstructed. Other variables were only available for the survey years, or only during some specific period. One drawback of the surveys is that the questionnaire partly changed over time. Therefore, some information is not available or comparable over the whole period. We take that into account and coded separate variables if necessary. Hence, we only use data that is consistent over time, which reduces our sample for some questions addressed.

Specifically, we construct a dummy variable taking a value of 1 if the auditor is elected and 0 if the auditor is appointed. Furthermore, to distinguish between legislative or executive appointment we construct two dummy variables each taking a value of 1 if the auditor is appointed by the legislative or the executive respectively. As previously mentioned, removal procedures might also be important, therefore, we construct a variable measuring how difficult it is to remove the chief auditor from office. We coded the variable as 0 if a single committee or public official can remove the agency head, 1 if a simple majority vote in both legislative chambers is required, 2 if a supermajority is required in both chambers or if special procedures

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<sup>11</sup> For an excellent survey of the literature on US state institutions and empirical evidence see Besley and Case (2003).

are required (e.g. impeachment procedures with supermajority in at least one house or involvement of the judicial branch), and 3 if the agency head cannot be removed during the official term. However, since removal procedures neither impacted on our dependent variables nor on the coefficients of our auditor variables, we will not report results including this variable. To capture the impact of different forms of performance audits, such as economy/efficiency audits, program audits, or compliance audits, we construct several dummy variables capturing whether the specific audit office conducts such audits or not. We summarize these various performance audits to an aggregated variable adding all these forms of performance audits.<sup>12</sup>

Since the scope of responsibilities is not exactly the same for all state auditing institutions we have to take these differences into account. For example, some auditors are also involved in audit activities at the local level and some auditors do not audit the legislature at all. In order to control for these differences we code separate dummy variables. We also observe that the auditor duties are split into two different offices. South Carolina and Utah split the auditor office into a state auditor and a legislative audit unit, one conducting the financial audits and the other conducting performance audits. Pennsylvania also features two different audit offices, one conducting audits of the executive and the bureaucracy and the other conducting audits of the legislature. We construct a dummy variable reflecting such a split of the audit duties into two offices. We also coded both state audit agencies separately and conducted all the empirical analyses taking both offices separately into account. For both settings we find qualitatively analogous results that do not seem to influence our main variables. Therefore, we omit the presentation of these last results.

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<sup>12</sup> For more details on our main auditor variables used in this paper see Table A1 in the appendix. For an overview of and details on all constructed auditor variables see Schelker (2007).

## 4.2. *Control variables*

There are a series of specific institutional mechanisms that have been analyzed by previous studies (for an overview see Besley and Case 2003). As far as possible we also try to take these institutional mechanisms into account. In order to do this we combine our auditor data with a dataset provided by Shanna Rose of NYU and James E. Alt of Harvard University, which basically stems from Alt and Lowry (1994), and Alt, Lassen and Rose (2006). The dataset includes variables describing the degree of fiscal transparency, the existence of binding balanced budget rules (no carry-over rule), gubernatorial term limits, the availability of voter initiatives, and measures capturing whether the government is unified or divided. Divided government describes the situation in which different parties control the legislature and the executive or constellations in which the control of the legislature is split between parties.

In order to control for other state specific economic and demographic factors we use a standard set of control variables stemming from Alt and Rose and including the total state population, population density, real per capita income (real 1982-84 USD), the unemployment rate, the fraction of the elderly population (>65), and the fraction of the school-aged population (5-17). Furthermore, we also include a dummy variable for 15 Southern states that have a reputation for distinctively conservative fiscal policies (Alt, Lassen and Skilling 2002).

Our entire dataset covers most of the period between 1990 and 2000. For some important aspects we do not have more recent data or we face a restriction in going further back in time. Further details and summary statistics are available in Tables A1 and A2 in the Appendix.

## 5. **Empirical Strategy and Results**

### 5.1. *Basic strategy and causality*

First, we analyze the influence of auditor selection mechanisms and the extent to which auditors conduct performance audits on the fiscal performance of the US States. We exploit the cross-

sectional and the often limited time variation in a panel of the 48 mainland States between 1990 and 2000. As in most other studies analyzing the US cross-section we exclude Alaska and Hawaii due to their special circumstances. Since our main explanatory variables do not significantly vary over time, and we only have cross-sectional variation for some dependent variable, we can generally not estimate cross-section fixed effects (FE) panel specifications controlling for unobserved time-invariant heterogeneity (e.g. Wooldridge 2002). Therefore, we usually rely on random effects (RE) estimators if panel data is available. Where possible we adjust our standard errors for clustering within the States (Moulton 1986).

One of the major issues in all empirical research is determining causality. This is no different in our study and poses some serious problems. In order to identify causal relationships we need to be able to tease out clearly exogenous variation in our explanatory variables that we can attribute to changes in our dependent variable. Since institutions might be endogenous, we cannot be sure that the observed institutional variation is exogenous. While we argue that our institutions seem to be very stable over time, which reduces problems of reverse causation, simultaneity might still be an issue. A concern is that selection bias impacts on the results. In States with e.g. persisting deficits and high debt accumulation voters could resort to electing their auditors in order to control the government more effectively. However, it is especially difficult to abolish or establish the election mechanism, since all States requiring the direct election of the auditor feature constitutional rules defining the audit office that cannot be easily changed. Therefore, the selection mechanisms are quite stable over time and this effect is not likely to bias our estimates. However, this observation is the inspiration for an instrumental variable approach. The variable reflecting whether or not the auditor office has a constitutional basis is a natural instrumental variable candidate. The general idea is that constitutions were established long ago and changes to constitutions are extremely hard to implement. Therefore, constitutional rules tend to be seen as exogenous factors today. Our variable reflecting whether or not the audit office has some constitutional basis is a good predictor of direct auditor election.

Moreover, it is difficult to see a direct effect of the constitutional basis indicator on our outcome variables. However, in order to implement an instrumental variable approach, we require additional instruments.<sup>13</sup> Finding valid instruments is not trivial and estimating equations with more than one potentially endogenous explanatory variable hamper valid inference. Unfortunately, we could not find additional strong instruments and we are not aware of any established instrumental variables that could serve as additional instruments in our context. Therefore, we cannot implement a solid instrumental variable approach.

## 5.2. *Empirical results*

### *Moody's State Credit Ratings*

We estimate the influence of auditor characteristics on Moody's long term obligation bond ratings for the US States. These data reflect a market evaluation of state public finances. The data on state credit ratings stem from Moody's Investor Services. The state general obligation bond ratings are only available though for 39 US States, not including States that have no general obligation debt.<sup>14</sup> The States without a rating are AZ, CO, IA, ID, IN, KS, KY, ND, NE, SD and WY. Looking at the various States without a general obligation debt rating one should be worried about selection bias. When approaching this potential selection problem, we do not find a direct correlation between auditors and the excluded States. Furthermore, we cannot explain this selection with our auditor or any other institutional variables in a regression framework. Hence, it seems that selection bias is not a major concern.

In addition to a standard set of control variables we include the state debt level as an explanatory variable because we assume that the debt situation is an important factor in the rating procedure, which is confirmed by the following estimates. We present basic linear RE as well as ordered-

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<sup>13</sup> If we only instrument the variable on auditor election – for which the constitutional basis variable is a strong instrument – and estimate 2SLS we find consistent results. However, as soon as we distinguish legislative and executive appointment we require additional instruments. Taking into account that the mandate to conduct performance audits could also be endogenous we require at least another additional instrument.



probit estimates which take into account that the credit ratings have an ordinal scale. If possible we also estimate and present RE-ordered-probit estimates. However, for the RE-ordered-probit models we are not able to calculate the marginal effects properly and we face problems of non-convergence for some estimation specifications. There is actually not much literature implementing random effects estimates in a setting with an ordinal dependent variable. Therefore, in some specifications we have to rely on the linear and pooled ordered-probit estimators. Note that the marginal effects of interaction terms in non-linear models are conditional on the interacted independent variables and hence, we have to calculate the cross-partial derivatives (Ai and Norton 2003). Therefore, we cannot report a single relevant value for the marginal effect of an interaction term. Since our interaction terms always consist of a continuous variable (indicating the scope of performance audits) and a dummy variable (indicating whether the auditor is elected by the citizens or either appointed by the legislature or the executive), we illustrate the magnitude of our interaction terms by reporting the impact of the effect given a specific appointing procedure while holding the performance variable at the mean. If the marginal effects are statistically significant we report the estimated effects in the discussion of the results in the text.

In columns 1-3 of Table 1 we cannot find any apparent effects of *legislative appointment* on credit ratings. Only the estimate of our RE-ordered probit model reports some significant estimates. However, these estimates do not take clustering effects into account and hence, standard errors are likely to suffer from downward bias. States *appointing the auditor through the executive* feature significantly better credit ratings. However, it is essential to note that the credit ratings are only available for 39 States, which reduces our observations of auditors elected by the executive to only 2 States, California and Oregon. Therefore, we should not attribute much weight to this finding. The impact of *performance audits* can be estimated with some

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<sup>14</sup> This fact reduces our observations for states in which auditors are appointed by the executive to two States (CA, OR). Therefore, we should not attribute too much weight on these estimates.

precision in the RE models, but not in the simple pooled ordered probit specifications. The coefficient suggests better credit ratings for auditors having more scope for performance evaluations. A positive sign is to be interpreted as an increase in the credit rating because the highest rating (Aaa) is coded as -1 and the following lower ratings receive lower values. The estimates are though not extremely robust to variations in the specifications. To interpret the magnitude of the impact we would need properly estimated marginal effects, which are not available in the ordered-probit and the RE-ordered-probit setting because of highly insignificant estimates. Since the linear model cannot be estimated with high precision and the estimates are not extremely robust to variations in the specifications, we do not attempt to directly interpret the magnitude of the effect. Including the different *interaction terms* does not provide additional insights, since the only significant results stem from the variable coding executive appointed auditors, which only rely on two repeated observations (CA, OR). Looking at the various control variables we find in all specifications a negative and significant effect of *balanced budget requirements* and *state income per capita* as well as a positive and significant effect of the *state population*, the *unemployment rate*, and the *fraction of the elderly population*. In the next step, we thus focus on a variable closer to policy outcomes.

[Table 1 about here]

### *Government Performance Ratings*

Tables 2 and 3 present the basic estimates on the 1999 average rating from the 5 government performance sub-categories constructed by the GPP (GPP 1999), and the estimates of the two subcategories ‘financial management’ and ‘capital management’. Even though we only provide the results for our basic specifications, the results are fairly robust to variations in model specifications. Since government debt might be important to explain variation in government performance ratings, we control for this effect by including debt accumulation in all reported regressions. Furthermore, controlling for government expenditures makes an interpretation in

terms of variation in government efficiency possible. In this case a positive effect on performance ratings not only indicates better performance, but better performance for the same amount of government expenditures. We estimated all our specifications including government expenditures and find the same or even slightly stronger patterns in the data. However, government expenditures never have a statistically significant influence on performance ratings and conducting likelihood-ratio tests indicate that government expenditures can be omitted without losing information. Therefore, we do not present the results including government expenditures.

Auditor appointment by either the legislature or the executive has a negative and mostly significant impact, i.e. reduces average performance ratings (Table 2, columns 1 and 2). The negative sign indicates lower ratings because the highest possible rating (A) is coded as -1, whereas the second-highest rating (A-) is coded as -2, etc. *Appointing the auditor by the legislature* approximately yields a 6.3 percent, and *appointing the auditor by the executive* a 4.4 percent, lower probability for a top rating (the highest rating actually attributed in this survey is A-). Since the estimates are relative to the omitted category of directly electing the auditor, the interpretation is straightforward and suggests better government performance in States electing the auditor. However, as soon as we include the interaction terms between auditor selection and performance audits, the estimates of auditor selection no longer have a statistically significant influence on government performance ratings. *Performance audits* consistently have a positive and significant influence on average ratings. The marginal effects indicate a roughly 3 percent higher probability of a top rating with every one point increase in the performance audit variable, which ranges from 0 to 3. The results for the two *interaction terms between auditor appointment* by either the legislative or the executive branch and performance audits do not have a statistically significant influence. The coefficients for *fiscal transparency* come close to conventional levels of significance and indicate better ratings for higher values of fiscal transparency. The *state unemployment rate* impacts positively – indicating weaker government

performance – and is marginally significant in most specifications. Other factors do not seem to have a statistically significant influence.

[Table 2 about here]

In Table 3 we present the estimates of the two most relevant sub-categories ‘financial management’ and ‘capital management’. Focusing on the sub-categories we find similar results as when analyzing the total rating. The results are somewhat weaker for the sub-category ‘financial management’ than for ‘capital management’, but the effects point in the same direction. Auditors *appointed by the legislature* tend to decrease the ratings (column 1 and 3), but the coefficients do not quite reach conventional levels of statistical significance. The influence of *executive appointed* auditors is again negative but slightly stronger and statistically significant at the 10 or 5 percent level. Compared to auditors that are directly elected by the citizens *appointed* auditors tend to have a negative effect on the two sub-ratings financial and capital management. The magnitude can be interpreted as a 12 (8) percent lower probability of a top financial (capital) management rating when auditors are appointed by the executive. This finding is consistent with the findings reported above on the total government performance rating.

[Table 3 about here]

Even though the results are often not statistically significant at conventional levels *performance audits* tend to impact positively, which is again consistent with the previous results. Introducing the interaction effects in columns 2 and 4 we find negative influences for both *interaction terms*. We find a significantly estimated negative effect of the interaction term between legislative appointment and performance audits when focusing on capital management, while the same effect does not reach the standard levels of significance when focusing on financial management ratings. To provide an idea of the magnitude consider the case of capital management ratings. The marginal effect of the interaction term indicates a roughly 4 percent lower probability for a

top rating if the auditor is appointed by the legislature and the performance audit variable is held constant at the mean (1.8). Note, however, the marginal effect does not reach conventional levels of statistical significance.

Overall the results suggest that auditors directly elected by the principal positively influence government performance (Hypothesis 1a). The results indicate that problems associated with pandering of elected auditors might not be dominant. In contrary, the estimates suggest more effective governments if the auditor is elected rather than appointed. The impact of performance audits is consistently estimated as positive which is in accordance with Hypothesis 2. Usually the interaction terms do not reach conventional levels of statistical significance and, therefore, we do not attempt to draw final conclusions on Hypothesis 3. Note that we only estimate a cross-section in the year 1999, in which the sample is reduced to 47 observations. In order to check the robustness of these results, we also estimated the effects with the government performance ratings of 2001, while the controls stem from 1999. It would of course be preferable to estimate with all variables from the same year, but unfortunately we face a restriction on some variables. The results are much the same with elected auditors having a negative and significant impact, and hence raising government performance ratings. We also estimate a negative coefficient for the influence of performance audits but it does not reach statistical significance.

#### *Substitution among institutional features to control the government*

Our last approach entirely omits direct performance measures and exploits completely different variation in the data. As already discussed above we focus on the question whether elected auditors and more scope to conduct performance audits reduce the probability of divided government. We also analyze the impact of auditors appointed by the legislature or the executive on the probability of divided government. Again, the idea is that voters have a monitoring and control problem. If dividing the decision-making power is a possible, although

costly way to reduce the risk of undesired policies, then the availability of other institutional mechanisms might impact on the probability that divided government occurs. Thus, voters might substitute the costly control mechanism of divided government with other institutional mechanisms that improve monitoring of decision-makers. Such mechanisms could be independent auditors with a strong mandate to conduct performance audits or e.g. increased transparency. Contrary to these features, lame duck governors are much harder to control because they do not face a reelection restriction. Therefore, we expect a higher probability for divided government if the governor is in his last term.

In Table 4 we estimate linear RE and RE-logit models taking into account that the divided government indicator is a dichotomous variable. Typically, the linear models are fairly good approximations and the interpretation of the effects is straightforward. The simple OLS and logit models assume that the variance of the cross-section specific effects ( $a_i$ ) are zero ( $\text{var}(a_i)=0$ ). In our setting such an assumption is likely to be violated. In order to relax this assumption we estimate random effects models (RE) that assume that the  $a_i$ 's result from a random draw and follow a normal distribution. We also conduct Lagrange multiplier tests (Breusch/Pagan) which indicate that  $\text{var}(a_i) \neq 0$  and hence, the RE estimates are our preferred specification. Therefore, we only present our RE estimates. Since we do not estimate significant marginal effects in the RE-logit specifications we have to rely on the linear models to make conjectures on the magnitude of the estimated effects. Note, however, that the linear models can only be rough approximations to the non-linear logit specifications. Furthermore, the interpretation of the coefficient and statistical significance of the interaction effects in linear models is straightforward compared to non-linear models (Ai and Norton 2003). In Table 5 we also implement fixed effect (FE) estimators that eliminate unobserved time-invariant heterogeneity, a potential source of bias. In this case we can only analyze variables with some time variation. Hence, we are able to estimate the influence of performance audits and the various interaction terms between performance audits and auditor selection, i.e. executive or

legislative appointment respectively. The FE estimators in Table 5 produce some significant results, but we are unable to estimate meaningful marginal effects in the FE-logit specifications. We can again only compare the magnitude of the coefficients in the linear models, which is subject to the same limitations as described above in the case of the RE estimates.

In Table 4 we observe that the signs of the estimated coefficients and the statistical significance are generally very similar for the linear and the non-linear estimates. This makes us confident that the linear models are at least rough approximations for the non-linear relationships in the logit models. In column 1 and 3 we estimate the influence of *legislative and executive appointment* of the auditor and find statistically insignificant effects for both appointing procedures. When including the interaction terms in columns 2 and 4 we find more subtle effects. The basic effect of *appointing the auditor by the legislature* is significantly negative and amounts to a roughly 53 percent lower chance of divided government (column 4). *Appointing the auditor by the executive* has no statistically significant impact. Analyzing the *interaction terms* we find that auditors appointed by the legislature with an increasing mandate to conduct performance audits are less effective than elected auditors with the same mandate. The coefficient is positive and statistically significant. From the linear models we see that the magnitude of the coefficient of this first interaction term – which ranges from 0 to 3 – is large enough to compensate for the negative basic impact of legislative appointment. Executive appointed auditors with an increasing mandate to conduct performance audits tend to impact positively, but the coefficient is not quite reaching conventional levels of statistical significance in the logit specification.

[Table 4 about here]

Conducting *performance audits* per se generally has a negative effect, which reaches statistical significance in the settings controlling for interaction effects. The magnitude of the effect amounts to a roughly 14 percent lower probability of divided governments for every point

increase of the performance audit variable. Increasing *fiscal transparency* does not impact significantly on divided governments. We do not find significant specifications but all coefficients feature the predicted negative sign. Consistent with our theoretical prediction, *governors in their last term (lame ducks)* significantly increase the probability of divided government by approximately 15 percent. The effect seems to be robust to changes in the empirical specification. *Citizens' initiatives* also reduce the probability of divided government. The coefficient comes close, but does not reach conventional levels of statistical significance (not reported). Unfortunately, we cannot estimate the impact of initiatives in the FE regressions, because the variable does not feature any variance over time.

The FE estimates in Table 5 produce similar results as the RE estimates. *Auditors appointed by the legislature* with a strong mandate to conduct performance audits have again a positive and highly significant influence on the probability of divided governments, whereas we find no significant effect of the interaction term including *executive appointed auditors*. Note that the estimated coefficients tend to be higher in the FE specifications relative to our previous RE estimates. Unfortunately, our estimated marginal effects never even come close to conventional levels of statistical significance. All other estimates are widely consistent with our previous interpretations. This is also true for the results with respect to the influence of *fiscal transparency*, for which we again find no significant impact, and for *lame duck governors* that significantly increase the probability for division of government control. The effect of governors in their last official term is again statistically significant, robust, and similar in magnitude.

[Table 5 about here]

The interpretation of this set of results is that relative to the direct election of the auditor, legislative appointment does a better job if the monitoring mandate is weak and there is no additional mandate to conduct performance audits. However, if the audit office is endowed with a strong auditing mandate, elected auditors are more effective monitoring institutions, which



reduce the probability that voters split government power in order to control their agents. These results are in line with Hypotheses 1b and 3 indicating that auditor appointment by the legislative is beneficial for auditors mostly conducting financial audits (Hypothesis 1b). As soon as auditors have a strong mandate to conduct performance audits the direct election of the auditor is favorable (Hypothesis 3).

## **6. Summary and Conclusion**

Public auditors are important to mitigate the agency problem between citizens and government institutions and to improve transparency. They analyze the official financial statements and evaluate accuracy and compliance of these statements with laws and regulations. Furthermore, some auditing institutions are endowed with competences to conduct performance audits of policy programs. All these audits are important in order to inform citizens about the accuracy of the financial statements, to provide insights into the state of public finances, and to fight corruption, waste and misappropriation of public funds.

This paper aims to determine which factors of the office design impact on auditor effectiveness. Theoretical considerations suggest that auditor independence is important in order to reduce the risk of collusion between the auditor and the audited agent. From this perspective auditors should be directly elected by the principal, i.e. the citizens. However, direct election might have some negative effects if auditors tend to appeal to the electorate in the short run. Thus, an alternative hypothesis might predict that auditors should be appointed by the legislative, which is generally not subject to audit. But as soon as an auditor is endowed with a strong mandate to conduct performance audits, the legislature is also affected by the audits and, hence, the direct election of auditors should be the most effective institutional arrangement. Therefore, we empirically address the question whether the auditor should be elected by the citizens or appointed by the legislature or the executive, and we explore the effectiveness of conducting performance audits.

We construct a unique dataset at the US State level that captures differences in the institutional design of state auditing institutions. Since identification is an important concern in this setting, we implemented a set of different strategies to identify the influence of various auditor characteristics on government performance. However, the standard approach using fiscal variables to assess the influence of political institutions to analyze the impact of auditor independence is not accurate in our setting. Auditor independence is most certainly directly correlated with the quality of the reported data. If auditors are not independent from the institution that issues the financial statements, it is likely that such data is more affected by ‘creative accounting’ practices etc. Since fiscal measures are not adequate dependent variables we resort to variables less or not at all dependent on official financial statements and try to move closer to ‘real’ outcome variables, such as credit ratings and government performance measures. Moreover, we analyze whether voters substitute a costly control mechanism (divided government) with some less costly mechanisms. The intuition is that voters systematically substitute the costly control mechanism of dividing government control if they dispose of other effective monitoring institutions. Hence, increasing auditor effectiveness should reduce the probability of divided government. This is a new approach to identify the effectiveness of institutional control mechanisms. These alternative strategies should provide insights on the influence of auditor characteristics on government performance and should circumvent the conceptual problems related to estimates relying on fiscal variables. Furthermore, establishing a causal relationship is difficult when the institutional environment is stable over time and the process generating the cross-sectional differences is not clearly random. In order to control for state-specific unobserved heterogeneity that could simultaneously drive institutions as well as outcomes we implement fixed effects specifications where possible. These estimates basically confirm our results from the random effects specifications. Reverse causation could also bias our estimates. However, we argue that institutions are quite stable over time and it seems unlikely that the various outcome variables somehow drive the institutional arrangements.

Nevertheless establishing causal relationships is a real concern and we try to find valid instruments. Unfortunately, we could not identify enough valid instruments and, thus, we cannot definitively establish causality. Therefore, we cannot draw definitive conclusions and further research is required.

The impact of our auditor variables on *Moody's credit ratings* does not yield clear results. The estimates analyzing *government performance ratings* produce results in line with some of our basic theoretical predictions. They suggest better government performance in states with elected auditors (Hypothesis 1a) and if auditors conduct performance audits (Hypothesis 2). Furthermore, there is some weak support for Hypothesis 3 that auditors with a strong mandate to conduct performance audits should be elected rather than appointed. Our last and most unconventional approach is not relying at all on performance measures but on the influence of auditors on the probability of *divided governments*. We tend to find beneficial effects of legislative appointed auditors (Hypothesis 1b), which is in contrast to the result on government performance ratings. Performance audits seem to have a beneficial impact per se (Hypothesis 2). Including interaction effects reveal more subtle effects. The results indicate that elected auditors with a strong mandate to conduct performance audits are in fact more effective monitoring institutions than appointed ones with the same extensive mandate to conduct performance audits (Hypothesis 3). Hence, overall we find some support for Hypothesis 2 and 3, but mixed results for our hypotheses summarized in Hypotheses 1a to 1c.

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## Appendix

**Table A1: Description of main auditor variables**

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<i>Auditor is elected by the citizens (elecaudi)</i> Selection procedure for office. Possibilities: Elected by the citizens; appointed by the legislature, legislative committee, the executive. Code: 1 if elected by the citizens; 0 if appointed. Years of survey: 1989, 1992, 1996, 2000, 2003, 2006 Data reconstructed: 1989-2006
<i>Auditor is appointed by the Legislature (appoileg)</i> Is auditor appointed by the legislature (or a special legislative committee)? Code: 1 if appointed by legislature; 0 otherwise Years of survey: 1989, 1992, 1996, 2000, 2003, 2006 Data reconstructed: 1989-2006
<i>Auditor is appointed by the Executive (appoiexe)</i> Is auditor appointed by the executive (governor)? Code: 1 if appointed by executive; 0 otherwise Years of survey: 1989, 1992, 1996, 2000, 2003, 2006 Data reconstructed: 1989-2006
<i>Auditor conducts performance audits (perform)</i> Index (0-3) adding all 3 sorts of performance audits: Economy & Efficiency, Program, and Compliance audits. Years of survey: 1992, 1996, 2000, 2003, 2006 Data reconstructed: 1991-1993, 1995-1997, 1999-2006

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**Table A2: Description and summary statistics of main variables**

Variable	Min. – Max.	Sample mean (Standard deviation)	Description
Auditor elected ( <i>elecaudi</i> )	0/1	0.341 (0.474)	Auditor elected by the citizens (Table A1)
Appointed by Legislature ( <i>appoileg</i> )	0/1	0.581 (0.494)	Auditor appointed by Legislature (Table A1)
Appointed by Executive ( <i>appoiexe</i> )	0/1	0.079 (0.270)	Auditor appointed by Executive (Table A1)
Performance audits ( <i>perform</i> )	0 – 3	1.799 (1.123)	Auditor conducts performance audits (Table A1)
Moody's state credit rating	-1 – -8	-2.939 (-1.549)	Moody's state long term obligation rating (highest rating Aaa = -1, Aa1 = -2, Aa2 = -3, etc.)
GPP 1999 rating	-2 – -10	-5.4 (-1.829)	Government Performance Project rating (highest rating A = -1, A- = -2, B+ = -3, B = -4, etc.)
Divided Government	0/1	0.347 (0.476)	Divided Government: either Legislative-Executive or Split Legislature
Balanced budget rule	0/1	0.560 (0.497)	Balanced budget requirement (no carry-over rule)
Voter initiative	0/1	0.460 (0.499)	Voter initiative available
Transparency	0.111 – 1	0.509 (0.197)	Index of state fiscal transparency
Lame duck governor	0/1	0.271 (0.445)	Governor in his last official term (lame duck)
Incumbent Party	-1 – 1	7.27E-3 (0.526)	Party affiliation of incumbent governor (-1 = Republican, 1 = Democratic)
State Population	453690 – 3.55e+07	5381696 (5865141)	Total state population
Population density	0.966 – 1148.517	173.591 (238.544)	Population density (per square mile)
State income	10023.860 – 22913.7	14692.86 (2249.402)	Real per capita state income
Unemployment	2.2 – 11.3	5.204769 (1.467)	Unemployment rate
Aged	0.084 – 0.188	0.128 (0.0174)	Fraction of the aged population (65+)
Kids	0.071 – 0.269	0.189 (0.0173)	Fraction of school-aged population (5-17)

**Table 1: Moody's state credit ratings**

Moody's state credit rating 1990 – 1999 (Best Rating Aaa = -1, Aa = -2, etc.)							
	1	2		3 <sup>a)</sup>	4	5	
Estimation Method	RE	Ordered Probit	marg. effects	RE-ordered Probit	RE	Ordered Probit	marg. effects
Elected auditor	omitted category	omitted category		omitted category	omitted category	omitted category	
Appointed by legislature	-0.127 (-0.34)	0.136 (0.41)	0.033 (0.42)	-0.377 (-1.84)*	-0.032 (-0.10)	0.173 (0.34)	0.035 (0.35)
Appointed by executive	0.918 (1.43)	1.307 (2.82)***	0.451 (2.52)**	0.989 (2.20)**	0.208 (0.24)	-1.557 (-1.30)	-0.142 (-2.78)***
Legislature * perform.	-	-	-	-	-0.051 (-0.38)	-0.040 (-0.16)	-
Executive * perform.	-	-	-	-	0.367 (0.73)	1.301 (2.22)**	-
Performance audits	0.133 (1.66)*	-0.074 (-0.54)	-0.018 (-0.55)	0.285 (2.70)***	0.155 (1.38)	-0.035 (-0.20)	-0.007 (-0.20)
Public debt	-2.21E-4 (-1.41)	-1.83E-4 (-1.25)	-4.4E-5 (-1.22)	-4.1E-4 (-3.77)***	-2.21E-4 (-1.40)	-1.89E-4 (-1.20)	-3.9E-5 (-1.16)
Institutional controls	included	included		included	included	included	
Socio-econ. controls	included	included		included	included	included	
Year effects	included	included		included	included	included	
Observations	301	301		301	297	297	
(Pseudo) R <sup>2</sup>	0.481	0.276		-	0.486	0.276	

Notes: Regressions with standard errors adjusted to clustering within States. a) Standard errors not adjusted for clustering. z-values in parentheses. Institutional controls: Balanced budget requirement, voter initiative, divided government, transparency, lame duck governor, incumbent party. Socio-economic controls: state population, population density, state income per capita, unemployment rate, fraction of aged, fraction of school-aged, dummy for Southern States. Constant term not reported. Significance level: \* 0.05<p<0.1, \*\* 0.01<p<0.05, \*\*\* p<0.01. Source: Own calculations

**Table 2: Government Performance Ratings (GPP 1999)**

Average rating of government performance 1999 (Best Rating A = -1, A- = -2, etc.)						
	1	2		3	4	
Estimation Method	OLS	Ordered Probit	marg. effects	OLS	Ordered Probit	marg. effects
Elected auditor	omitted category	omitted category		omitted category	omitted category	
Appointed by legislature	-0.912 (-1.56)	-0.730 (-1.89)*	-0.063 (-1.34)	0.280 (0.19)	0.275 (0.31)	0.019 (0.30)
Appointed by executive	-1.806 (-1.67)	-1.415 (-2.19)**	-0.044 (-1.59)	-0.773 (-0.52)	-0.550 (-0.64)	-0.026 (-0.90)
Legislature * perform.	-	-	-	-0.591 (-0.86)	-0.507 (-1.21)	-
Executive * perform.	-	-	-	-0.585 (-0.72)	-0.509 (-1.06)	-
Performance audits	0.526 (1.66)	0.369 (1.78)*	0.029 (1.54)	0.980 (1.74)*	0.763 (2.01)**	0.055 (1.43)
Public debt	-3.6E-4 (-1.30)	-2.9E-4 (-1.59)	-2.3E-5 (-1.50)	-4.65E-4 (-1.67)	-3.8E-4 (-2.12)**	-2.7E-5 (-1.67)*
Institutional controls	included	included		included	included	
Socio-econ. controls	included	included		included	included	
Observations	47	47		47	47	
(Pseudo) R <sup>2</sup>	0.410	0.142		0.410	0.149	

Notes: Regressions with robust standard errors. t-values/z-values in parentheses. Institutional controls: Balanced budget requirement, voter initiative, divided government, transparency, lame duck governor, incumbent party. Socio-economic controls: state population, population density, state income per capita, unemployment rate, fraction of aged, fraction of school-aged, dummy for Southern States. Constant term not reported. Significance level: \* 0.05<p<0.1, \*\* 0.01<p<0.05, \*\*\* p<0.01. Source: Own calculations

**Table 3: Government Performance Ratings: Financial & Capital management**

	Financial management rating (Best Rating A = -1, A- = -2, etc.)				Capital management rating (Best Rating A = -1, A- = -2, etc.)			
	1		2		3		4	
Estimation Method	Ordered Probit	marg. effects	Ordered Probit	marg. effects	Ordered Probit	marg. effects	Ordered Probit	marg. effects
Elected auditor	omitted category		omitted category		omitted category		omitted category	
Appointed by legislature	-0.544 (-1.54)	-0.110 (-1.36)	0.488 (0.54)	0.099 (0.55)	-0.613 (-1.64)	-0.071 (-1.42)	1.143 (1.24)	0.125 (1.22)
Appointed by executive	-0.884 (-1.26)	-0.127 (-1.71)*	-0.366 (-0.35)	-0.067 (-0.40)	-1.362 (-1.98)**	-0.083 (-2.01)**	-0.058 (-0.05)	-0.007 (-0.05)
Legislature * perform.	-	-	-0.523 (-1.21)	-	-	-	-0.886 (-2.15)**	-
Executive * perform.	-	-	-0.250 (-0.49)	-	-	-	-0.713 (-1.61)	-
Performance audits	0.197 (0.96)	0.040 (0.94)	0.569 (1.56)	0.118 (1.41)	0.355 (1.63)	0.040 (1.44)	1.042 (2.70)***	0.123 (1.92)*
Public debt	-2.0E-4 (-1.00)	-4.1E-5 (-1.00)	-2.7E-4 (-1.41)	-5.7E-5 (-1.39)	-2.9E-4 (-1.80)	-3.4E-5 (-1.58)	-4.5E-4 (-2.76)***	-5.4E-5 (-1.99)**
Institutional controls	included		included		included		included	
Socio-econ. controls	included		included		included		included	
Observations	47		47		47		47	
(Pseudo) R <sup>2</sup>	0.088		0.096		0.141		0.159	

Notes: Regressions with robust standard errors. t-values/z-values in parentheses. Institutional controls: Balanced budget requirement, voter initiative, divided government, transparency, lame duck governor, incumbent party. Socio-economic controls: state population, population density, state income per capita, unemployment rate, fraction of aged, fraction of school-aged, dummy for Southern States. Constant term not reported. Significance level: \* 0.05<p<0.1, \*\* 0.01<p<0.05, \*\*\* p<0.01. Source: Own calculations

**Table 4: Auditors and divided government: Random effects regressions**

Divided government 1990 – 2000						
Estimation Method	1	2	3		4	
	RE	RE	RE-Logit	marg. effects	RE-Logit	marg. Effects
Elected auditor	omitted category	omitted category	omitted category		omitted category	
Appointed by legislature	-0.135 (-1.46)	-0.409 (-2.86)***	-0.758 (-1.35)	-0.184 (-1.39)	-2.487 (-2.70)***	-0.539 (-3.45)***
Appointed by executive	0.172 (1.01)	-0.231 (-0.79)	1.195 (1.09)	0.258 (1.36)	-1.349 (-0.67)	-0.317 (-0.78)
Legislature * performance	-	0.150 (2.49)**	-	-	0.941 (2.47)**	-
Executive * performance	-	0.258 (1.68)*	-	-	1.675 (1.54)	-
Performance audits	-0.006 (-0.19)	-0.092 (-2.03)**	-0.032 (-0.18)	-0.008 (-0.18)	-0.582 (-2.05)**	-0.143 (-2.04)**
Transparency	-0.044 (-0.19)	-0.082 (-0.35)	-0.551 (-0.40)	-0.136 (-0.40)	-0.756 (-0.51)	-0.186 (-0.51)
Lame duck	0.091 (1.68)*	0.084 (1.54)	0.602 (1.87)*	0.145 (1.94)*	0.600 (1.83)*	0.144 (1.89)*
Add. institut. controls	included	included	included		included	
Socio-econ. controls	included	included	included		included	
Year effects	included	included	included		included	
Observations	433	429	433		429	

Notes: z-values in parentheses. Additional institutional controls: Balanced budget requirement, voter initiative, incumbent party. Socio-economic controls: state population, population density, state income per capita, unemployment rate, fraction of aged, fraction of school-aged, dummy for Southern States. Constant term not reported. Significance level: \* 0.05<p<0.1, \*\* 0.01<p<0.05, \*\*\* p<0.01. Source: Own calculations

**Table 5: Auditors and divided government: Fixed effects regressions**

Divided government 1990 – 2000				
	1	2	3	4
Estimation Method	FE	FE	FE-Logit	FE-Logit
Legislature * performance	-	0.272 (3.46)***	-	1.961 (3.85)***
Executive * performance	-	0.431 (1.70)*	-	13.42 (0.02)
Performance audits	-0.036 (-0.89)	-0.153 (-2.97)***	-0.101 (-0.42)	-1.030 (-2.90)***
Transparency	0.462 (1.10)	0.479 (1.14)	2.352 (0.90)	2.408 (0.87)
Lame duck	0.121 (2.14)**	0.115 (2.05)**	0.909 (2.50)**	1.025 (2.69)***
Add. institut controls	included	included	included	included
Year effects	included	included	included	included
State effects	included	included	included	included
Observations	434	429	349	348

Notes: z-values in parentheses. Additional institutional controls: Incumbent party, state population, population density, state income per capita, unemployment rate, fraction of aged, fraction of school-aged, dummy for Southern States. Constant term not reported. Significance level: \* 0.05<p<0.1, \*\* 0.01<p<0.05, \*\*\* p<0.01. Source: Own calculations