

Auditors and Corporate Governance: Evidence from the Public Sector

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ABSTRACT

Corporate auditors review and evaluate financial statements. To enhance independence the selection process and mandatory auditor rotation requirements have been debated intensively. The available empirical evidence is not conclusive and suffers from serious endogeneity problems. We propose learning from the public sector in which auditors play a similar role and present empirical evidence on the impact of auditor term length and rotation requirements on government performance at the US State level. We find evidence indicating that relatively short as well as extended auditor terms have a negative, and rotation requirements have a positive effect on state credit ratings. (98 words)

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1. Introduction

Corporate auditors are assigned to review financial statements and evaluate the accuracy of the information provided, which is crucial for investors and other stakeholders of a firm. It seems obvious that auditors evaluating financial statements should be independent from the firms' management who is providing exactly this information. However, the lack of auditor independence is one of the major issues in the recent history of corporate governance. After the huge accounting scandals (e.g. Enron, Tyco, Worldcom, Parmalat, etc.),¹ which culminated in the collapse of Arthur Andersen, there has been a growing call for tougher corporate governance provisions in general and specifically for improved auditor independence. In the United States these developments resulted in the 'Public Company Accounting Reform and Investor Protection Act of 2002' better known as the 'Sarbanes-Oxley Act'.

Our main interest lies in provisions requiring the auditor to be appointed independent from management and rules calling for mandatory auditor rotation, which compels a company to change the audit firm at regular predetermined intervals. The Sarbanes-Oxley Act together with other corporate governance rules installed at e.g. the New York Stock Exchange (NYSE), the American Stock Exchange (AMEX), or the NASDAQ require the board committee appointing the auditor to be composed entirely of outside directors. Although the Sarbanes-Oxley Act did not establish mandatory auditor rotation, it required the Government Accountability Office (GAO) to analyze such procedures (GAO 2003). Mandatory auditor rotation is heavily debated among audit experts, academics, policy makers, and management boards. Proponents of mandatory auditor rotation argue that long term relationships between auditors and their clients

impede auditor independence. Therefore, auditors should only have limited mandates. Opponents of such rotation point out that rotation would make things worse because new auditors need time to acquire the relevant information and know-how to effectively audit a firm. They argue that audit failures typically occur in the first few years of a mandate.

It is an empirical question to determine the effect of mandatory auditor rotation. There have been only a few systematic empirical attempts to answer this question and most studies encounter heavy selection bias, because typically troubled firms change auditors more often than sound companies. Furthermore, there seems to be incentives for managers to switch to ‘incompetent’ auditors (e.g. auditors new to the industry) the moment problems occur. We argue that it is extremely difficult to determine the impact of mandatory auditor rotation by analyzing the corporate sector, because endogeneity and selection effects are serious threats to valid inference.

Therefore, we propose examining the influence of predetermined auditor terms, term length, and rotation requirements in the public sector, where the fundamental agency problem is similar, but the empirical hurdles are less daunting. In order to obtain useful insights from the public sector, we need to analyze the similarities of the agency relationship in the public and the corporate sector, and discuss critical issues. Our empirical investigation focuses on the US State level, where state auditors are often elected or appointed for a fixed term. We take advantage of the fact that auditors are elected or appointed for a different term length or sometimes face term limits. We estimate the impact of such differences on Moody’s state credit ratings for US long term state bonds. We find evidence of a U-shape relationship indicating that auditor performance is weak for very short and very long terms. This is consistent with theories pointing towards audit failure due to a lack of expertise in the beginning of a mandate as well as with theories suggesting

¹ For an overview of the most significant recent US accounting scandals see Patsuris (2002) at

problems associated with diminishing independence with extended auditor-client relationships. Furthermore, our results indicate beneficial effects of term limits, which can be interpreted as being in favor of mandatory rotation requirements.

We propose that auditors should be elected or appointed by either the shareholders or an independent board of directors for a fixed term with the possibility of reelecting or reappointing the auditor. We advocate a term limit restricting the auditor from serving too long. Such a design is related to auditor rotation requirements, but is much more flexible and preserves auditor expertise for an extended period of time.

Section 2 introduces corporate auditors and discusses problems associated with auditor independence and auditor tenure. Furthermore, we present the main pros and cons of mandatory auditor rotation and review the empirical evidence on corporate auditors. After comparing the similarities between the public and the corporate sector, Section 3 introduces the US public sector, which we use to conduct the empirical study. The institutional variance across US state auditors makes it possible to analyze several issues related to auditor design. In Section 4 we present the data and analyze the influence of fixed auditor terms, term length, and mandatory rotation requirements in the form of term limits. Section 5 summarizes and concludes.

2. Auditor Independence and Mandatory Auditor Rotation

The agency problem between the owners and the management of a firm is at the heart of the corporate governance literature.² The main question is how investors (the principals) can make sure that they are not expropriated by the management (the agents). Disclosure requirements,

<http://www.forbes.com/2002/07/25/accountingtracker.html>

independent review, and legal enforcement are key factors to reduce this principal-agent problem. Without accurate and timely information, shareholders, creditors, and any other stakeholder groups will find it difficult to make adequate decisions. However, if the management is unconstrained and in sole charge of providing information, there is a high risk that this information serves management interests and is not necessarily accurate. Therefore, disclosure requirements must be backed by independent review and legal rules allowing private litigation in the case of non-compliance.³

2.1. Auditor independence

Review of financial information is usually conducted by independent and certified private auditing firms, which are supposed to verify and certify financial statements issued by a company's management. Review by a corporate auditor only reduces the agency problem between the investors and the management if collusion of the management and the auditor is not likely.⁴ A first step towards reducing the risk of collusion is to keep the auditor independent from the management, eliminating the most obvious channels for side-payments and reciprocal behavior. In order to provide an unbiased and impartial view on financial statements, legal provisions usually require that financial reports are audited by some external professional body, not directly linked to the company. However, independence is not guaranteed by the requirement

² Important contributions stretching this view are e.g. Jensen and Meckling (1976), Fama and Jensen (1983), Prendergast (1999), or more recently Bebchuk and Fried (2003). Shleifer and Vishny (1997) and Becht, Bolton and Röell (2002) provide excellent surveys of the field.

³ For evidence on the role of disclosure requirements and private litigation see La Porta, Lopez-de-Silanes and Shleifer (2006). They examine securities laws that improve transparency, make contracting between firms and investors easier, reduce costs of resolving disputes and, thus, encourage financing through equity. They analyze disclosure requirements and liability standards in securities laws in a cross-section of countries and find strong evidence that disclosure requirements and liability standards promote financial market development.

⁴ E.g. Antle (1984), Tirole (1986), Baiman, Evans and Nagarajan (1991), Kofman and Lawarrée (1993), Aghion and Tirole (1997), Bolton and Dewatripont (2005), and Khalil and Lawarée (2006) analyze the problem that there are incentives for the supervisor/monitor (e.g. auditor) to collude with the agent (e.g. management).

that the auditor must come from an outside company. There are numerous additional threats to auditor independence, starting with the entanglement of audit and non-audit services provided by an accounting firm to the same client, appointing and removal procedures as well as psychological ties to the appointing body.

Audit and non-audit services

Providing audit and certain non-audit services (e.g. consulting services) to a client at the same time has been prohibited by the Sarbanes-Oxley Act. Prior to that prohibition accounting firms were able to offer audit services below cost, because lucrative consulting services compensated for the incurred losses from audit services (e.g. Levitt 2000). Such entanglement obviously impairs independent review of financial statements by the auditing and consulting firm.

Appointing and removal procedures

Auditor independence is heavily influenced by the appointing procedure of the corporate auditor (e.g. Acemoglu and Gietzmann 1997, Mayhew and Pike 2004). Independence is difficult to achieve if the management is appointing the auditor – its own supervisor – or if it has a big stake in the (re)appointment process. Permitting the management to appoint its auditor, increases the risk of collusions because the appointing process introduces a direct channel for side-payments and reciprocal behavior. Even though this risk is well understood, in many companies the top management is heavily involved in the appointing process. Even if the CEO does not choose the auditor single-handedly, he frequently nominates the corporate auditor, and the board of directors can only confirm or reject the CEOs' choice (although rejection almost never actually happens).

This is an additional reason why the board of directors should be dominated by independent outside directors instead of inside directors or the CEO himself.⁵ Klein (1998) confirms this view and provides evidence that firm performance is positively correlated with the dominance of outside directors in the audit and compensation committee. Recently, the Sarbanes-Oxley Act together with corporate governance rules imposed by the NYSE, the NASDAQ, and the AMEX require that the board of directors of companies with stocks listed in the United States be composed of a majority of outside directors. They further impose that the audit committee consists entirely of outside directors with at least one having financial expertise (Agrawal and Chadha 2005).⁶

As important as hiring, is firing. Thus, removal procedures might also influence auditor independence. If the management is authorized to change the auditing firm at will, auditors' incentives become aligned with the management and audit services might be biased in favor of the agent that is being monitored. If the management is able to influence both hiring and firing, the threat to dismiss the auditor can have considerable effects on auditor independence. In the extreme case the management actively searches for a 'friendly' auditor, which is sometimes referred to as 'audit shopping' (e.g. Davidson III, Jiraporn and DaDalt 2006). Therefore, a natural device to reduce agency problems might be to let investors directly choose the auditor. Mayhew and Pike (2004) analyze auditor selection and its influence on auditor independence in an experimental framework. They specifically analyze if investor selection of the auditor enhances independence. In their experimental framework they are able to manipulate who hires the auditor and they measure the influence of the selection mechanism on auditor objectivity. They find

⁵ On the influence of the composition of the board of directors see e.g. Weisbach (1988), Hermalin and Weisbach (1998), Klein (1998), or Shivdasani and Yermack (1999)

strong evidence for increased objectivity of the audit report if auditors are directly chosen by investors. This experimental approach is especially interesting because such a setting does not exist in the ‘corporate world’.

Psychological ties to the appointing body

Another less discussed threat to auditor independence comes from psychological ties between the auditor and the appointing body. Behavioral economists Bazerman, Loewenstein and Moore (2002) argue that people are vulnerable to unconscious bias in favor of the appointing body. “Psychological research shows that our desires powerfully influence the way we interpret information, even when we’re trying to be objective and impartial.” (Bazerman, Loewenstein and Moore 2002: 98). In a series of experiments they show that individuals evaluate the same facts systematically different if tied (e.g. hired) to different bodies. Individuals do not even need to have strong ties to some party. In order to observe such bias it is sufficient that they are loosely connected (e.g. a hypothetical professional relationship is sufficient). They ran experiments with professional auditors asking them to evaluate the accounting of five reports. Half of the group were told that they should assume they were hired by the company to be audited and the other half should assume they were hired by some different company doing business with the firm under audit. Auditors assuming they were hired by the firm under review attested full compliance with GAAP with a 30 percent higher probability in all five cases. The authors conclude that “[...] even the suggestion of a hypothetical relationship with a client distorts an auditor’s judgments.” (Bazerman, Loewenstein and Moore 2002: 101). They underline that reforms must target auditors’ incentives to please a client. From this perspective they are in favor of the provision of the Sarbanes-Oxley Act prohibiting consulting services to companies under audit. The authors go

⁶ Agrawal and Chadha (2005) provide empirical evidence that boards containing outside directors with financial

much further and propose that auditors should be hired for a predetermined period with no possibility of rehiring.

In order to strengthen auditor independence several proposals have been made:

Auditor election directly by shareholders: One straightforward approach would be to let shareholders directly choose the auditor in regular competitive elections at the general assembly (e.g. Schelker and Eichenberger 2003, Frey and Benz 2005, Bebachuck 2006, Benz and Frey 2007, and for experimental evidence e.g. Mayhew and Pike 2004). In order to enhance auditor independence the Sarbanes-Oxley Act made some progress by strengthening the board of directors and delegating the selection of the corporate auditor to the audit committee, which is required to be composed of a majority of outside directors. However, this is by no means equivalent to the direct election of the auditor by investors, because directors still have strong incentives to please management or at least not openly oppose it.

Mandatory auditor rotation: Mandatory auditor rotation is a much debated approach to enhance independence.⁷ Such provisions require companies to change the audit company at regular predetermined intervals. The Sarbanes-Oxley Act takes one step in this direction by requiring the rotation of the responsible lead partner within an auditing firm. The dispute on this issue among auditing experts, academics, and policymakers is indeed contentious. Since there are arguments in favor of mandatory auditor rotation as well as against it, we will briefly summarize the main points of these discussions.

expertise reduce the probability of earnings restatements.

⁷ Rotation requirements are also important in other situations in which a monitor is supposed to provide information to a principal who himself cannot obtain such information directly. E.g. Hertzberg, Libterti and Paravisini (2007) show that a bank policy typically requires some form of rotation of loan officers. They argue that the reassignment of loan officers to different borrowers provides incentives to disclose bad information.

2.2. *Mandatory auditor rotation: the main pros and cons*

Mandatory auditor rotation has been debated for years (recent contributions are e.g. Dopuch, King and Schwartz 2001, Gietzmann and Sen 2002, Myers, Myers and Omer 2003, Mansi, Maxwell and Miller 2004, Comunale and Sexton 2005, and Gosh and Moon 2005). At the core of the discussions is the trade-off between improving auditor independence and the associated costs of forgoing auditor expertise.

Proponents of auditor rotation emphasize the positive effects of rotation on auditor independence, which reduces agency problems and increases the credibility of financial reports. From this perspective mandatory rotation enhances auditor independence because managers cannot directly threaten auditors with dismissal and cannot promise future income due to reappointment. Because there is no direct link to potential income from future engagements of the auditor by the same client, mandatory auditor rotation increases independence. Furthermore, it is sometimes suggested that extended client-auditor relationships alone impede on auditor independence (e.g. Mautz and Sharaf 1961). The negative effect of extended auditor tenure stems from evolving ties between auditor and client.⁸ This argument is underlined by psychological evidence provided by Bazerman, Loewenstein and Moore (2002), who suggest stronger psychological bias with increasing ties between client and auditor. Moreover, ‘low-balling’ is also constrained by rotation requirements. ‘Low-balling’ refers to audit firms offering fees that are lower than the marginal costs of the initial engagement with a new client. Such an offer is interesting if the audit firm

⁸ Arel, Brody and Pany (2005: 36) describe the close relationship between Enron employees and the employees of its auditor Arthur Andersen: “Andersen auditors and consultants were given permanent office space at Enron headquarters here and dressed business-casual like their Enron colleagues. They shared in office birthdays, frequented lunchtime parties in a nearby park and weekend fund-raisers for charities. They even went on Enron employees’ ski trips to Beaver Creek, Colo.”

anticipates declining marginal costs of future audits if it is rehired (Dopuch, King and Schwartz 2001). Mandatory rotation would also be an easy fix for such practices.

Opponents argue that mandatory auditor rotation is not costless. They point out that changing the corporate auditor involves a loss of expertise because the new auditor does not know the company well and must first acquire the relevant company- and industry-specific know-how. This lack of expertise in the beginning of a mandate may lead to information asymmetries between auditor and client and increased audit failure. Such failure worsens the agency problem and weakens credibility of financial statements. Johnson, Khurana and Reynolds (2002) even argue that as audit-client relationships endure, auditors become more independent, because due to experience and client-specific knowledge, the auditor depends less on management information. Furthermore, it is argued that voluntarily changing the auditor contains information. Because there are a number of reasons why firing the auditor and engaging a new firm is beneficial to shareholders – if the change occurs because the auditor was e.g. not efficient, extremely conservative, or qualitatively inferior – the change of an auditor may provide information to the market. It could also be that a firm changes from a small audit firm to a big 6 audit firm, which is often considered a step towards higher quality audit.⁹

2.3. *Empirical evidence*

Independence seems to be crucial to ensure high audit quality, but so is expertise. It is, therefore, an empirical question to determine the effect of mandatory auditor rotation. The main question to address is how to preserve or improve independence without too big a loss of expertise. A straightforward implication is to let the principal, the investors elect the auditor. This would tie

the auditor more to the investors and less to the management without losing expertise due to mandatory rotation. Mayhew and Pike (2004) show in their experimental setting that investor-selected auditors indeed remain more independent. However, we still have to consider that over time the ties with management might become strong. Therefore, rotation might still be an issue.

Empirical evidence analyzing the influence of auditor tenure on outcome variables such as audit quality perception of investors, market valuation, the likelihood of earnings restatements, etc. emerged in recent years. In the empirical settings analyzing real-world data, one major drawback is that auditor rotation seems clearly endogenous to firm specific developments and not the result of exogenously determined rules such as mandatory auditor rotation. Bearing this in mind, we will briefly summarize some main findings of the existing literature.

At the heart of the mandatory rotation requirement lies the idea that extended auditor-client relationships lead to lower audit quality. Therefore, empirical studies focus on the impact of auditor tenure on outcome variables. Mansi, Maxwell and Miller (2004) report that longer tenure results in lower cost of debt financing, measured by S&P credit ratings and credit spreads. Furthermore, several recent studies report positive correlations between auditor tenure and real and perceived earnings quality (Johnson, Khurana and Reynolds 2002, Myers, Myers and Omer 2003, Gosh and Moon 2005). These results suggest that longer tenure increases expertise, and that the effect of potentially diminishing independence over time is compensated by that effect. These findings are consistent with earlier evidence suggesting that most audit failures occur at the beginning of a term.

⁹ For evidence indicating higher audit quality provided by big auditing firms see e.g. Mansi, Maxwell and Miller (2004), or Davidson III, Jiraporn and DaDalt (2006)

However, if both aspects, expertise and independence, are important one could think of an inverse U-shape relationship between audit quality and tenure, where due to learning audit quality is first increasing with tenure and after a certain period of time is decreasing because of diminishing independence. However, such a quadratic relationship cannot be captured in the standard linear estimation model. There are no empirical studies known to us investigating such a quadratic relationship.

As we have mentioned before, studies on this topic conducted in the corporate sector suffer from some potentially important problems. Even though most studies carefully explore the data and try to address some sources of endogeneity (notably Mansi, Maxwell and Miller 2004) they cannot actually analyze auditor tenure in an environment with exogenously, predetermined, auditor rotation. If tenure is the main variable of interest we need to keep in mind that auditor tenure is determined or heavily influenced by the management under audit. Thus, if auditors are changed, the reasons behind the change are unclear and most certainly motivated by firm-specific developments and are hence endogenous. E.g. in the most optimistic case the auditor is changed because the management would like to have a more competent auditor. However, this suggests that the change occurs because auditor performance is weak. In contrast, scenarios in which troubled firms switch to incompetent auditors to hide shortcomings from investors could bias results in the other direction. In this case increasing audit failure would be wrongfully attributed to auditor rotation. The simple fact that managers can influence auditor rotation obstructs valid inference.

The severe endogeneity problems motivate Dopuch, King and Schwartz (2001) to conduct empirical research in an experimental setting. They analyze four different treatments: (1) one treatment does not require auditor rotation or retention, (2) one requires auditor retention, (3) one

requires rotation only, and (4) one treatment requires both rotation and retention of the auditor. They report that rotation requirements in the third (requiring rotation) and fourth treatment (requiring rotation and retention) impact positively on auditor independence. Church and Zhang (2006) address the problem of mandatory auditor rotation theoretically because they also acknowledge the severe empirical problems occurring when analyzing this specific problem. Similar to the experimental setting they find that mandatory auditor rotation can improve auditor independence. However, the results are sensitive “[...] to the rotation period, start-up costs, the costs associated with biased reports auditors’ learning, and the time span of managers’ incentives.” (Church and Zhang 2006: 3).

We conclude that the existing empirical evidence on the impact of auditor tenure suggests that longer auditor tenure impacts positively on outcome measures. However, the studies suggesting this positive relationship between auditor tenure and outcome measures do not take into account that the influence of tenure length might follow a non-linear relationship in which auditor performance is low in the beginning due to a lack of expertise and also for longer tenure because of diminishing auditor independence. Furthermore, there are serious caveats due to selection bias and endogeneity that restrict valid inference in the corporate sector. Therefore, we propose to learn from evidence in the public sector, in which auditors play a similar role but empirical hurdles are less daunting. However, before we present empirical evidence, we need to discuss the analogy between the corporate and the public sector.

3. Auditor Terms and Mandatory Rotation in the Public Sector

3.1. Analogies between the corporate and the public sector

The principal-agent problem is not unique to the corporate sector. By starting their article with the statement “Corporations are republics.” Gompers, Ishii and Metrick (2003: 107) make a strong statement highlighting the similarity between the corporate and the public governance systems. They continue their view of corporations as shareholder democracies, and write:

“[...] The ultimate authority rests with voters (shareholders). These voters elect representatives (directors) who delegate most decisions to bureaucrats (managers). As in any republic, the actual power-sharing relationship depends upon the specific rules of governance. One extreme, which tilts toward a democracy, reserves little power for management and allows shareholders to quickly and easily replace directors. The other extreme, which tilts toward a dictatorship, reserves extensive power for management and places strong restrictions on shareholders’ ability to replace directors.” Gompers, Ishii and Metrick (2003: 107)

Hence, the fundamental agency problem shareholders face is the same voters face in a democracy. There the agents also have considerable leeway to follow their own interests instead of maximizing the principals’ utility. The control problems are extensive in both the corporate and the public sector. Both delegate extensive powers to some few agents, whereas the principal consists of a large group of individuals facing a collective action problem to control the agents. Shareholders as well as voters are both required to take action through the voting mechanism, but individuals have only limited incentives to bear information costs and engage in costly actions

against the agent to protect the interest of all other principals as well. Thus, controlling the agents requires overcoming the free-rider problem, acquiring information, and orchestrating possible countermeasures, such as coordinated voting against decisions taken by the agents, etc.

Frey and Benz (2005) and Benz and Frey (2007) go beyond the pure resemblance and suggest that due to the existing similarities, corporate governance might learn from the rich literature on public governance. Agency theory is an important theoretical approach in both corporate and public sector economics and there are many institutional similarities. In addition to the ones already cited in the beginning (Gompers, Ishii and Metrick 2003), all public entities in developed countries are subject to disclosure requirements and independent review by an auditor. Disclosure is important because without such transparency the principal has no means of controlling the agent. Alt and Lassen (2006) provide evidence for the importance of disclosure requirements in the policy making process and show that increased fiscal transparency reduces public deficits and debt accumulation. Independent review of financial reports is also an important issue in the public sector. Olken (2007) presents evidence from a field experiment in Indonesia suggesting that an increase in audit probability reduces wasteful expenditure in the public sector. For the same reasons as in the literature on the corporate sector, the scarce literature on public auditing focuses much on auditor independence. Without an independent auditor it would be difficult for creditors and citizens to assess the quality of financial statements. Thus, auditors are required to verify and certify financial statements, which is crucial for credibility. All developed countries feature some form of audit institution reviewing financial statements provided by the government. In some federal countries such as the US the sub-federal governments, e.g. the states or municipalities, feature their own auditing institution. Thus, we believe that – regarding the role

of auditing institutions – the analogy is strong, and analyzing the public sector might provide useful insights. However, we need to control for structural differences as carefully as possible.

3.2. US state auditors

In order to analyze the influence of auditor terms and rotation we take advantage of the decentralized US federal structure. The US States enjoy a high degree of autonomy and every State has its own constitution that defines the primary governance structures and processes. The main advantage in this setting is that States feature different regulations concerning the institutional details of the state auditing institution. Variation can be observed in many different dimensions, notably in the appointing mechanism, the term length, term limits, and removal procedures. The main advantage over evidence from the corporate sector stems from the fact that auditor terms and term limits are exogenously determined by either the state constitution or state law. Hence, the term length or a term limit is not endogenous to actual auditor performance.

Auditor selection mechanism

US state auditors are elected by the citizens or appointed by either the legislative or the executive branch. Executive appointment is relatively rare and we will exclude these few cases from our analysis. In the case of elected or legislative appointed auditors the agent (executive) can neither directly select the auditor nor influence it by promising future engagement. This should make auditors more independent.¹⁰

Let us evaluate whether the analogy is instructive for our purposes. Experimental evidence for the corporate sector indicates that investor (principal) selection improves auditor performance (Mayhew and Pike 2004). In our specific case this would correspond to the direct election of the

auditors by the citizens. Alternatively, the auditor could be selected by the legislature, which could somehow correspond to the selection of the auditor by an independent board of directors. However, the members of the board of directors are generally not elected in competitive elections. From this perspective it seems unclear whether we can directly learn from empirical findings in the public sector. Hence, this will not be the focus of our empirical investigation, although we will always control for this structural difference.

Auditor term length and mandatory auditor rotation

Our main focus of the empirical analysis is on the influence of fixed auditor terms, the length of such terms, and mandatory rotation requirements in the form of term limits on public sector performance. In contrast to corporate auditors, most US states auditors are not appointed for an open mandate, but for a fixed term that varies in length across States. Since it is often argued that longer auditor terms impede independence – the main argument for auditor rotation – we analyze the influence of different official term lengths on public sector performance.

Most commonly state laws define a fixed length of term after which the auditor-client relationship ends. Some States allow their auditor to reapply for the position and some States impose term limits. A term limit is comparable to mandatory auditor rotation, because the auditor cannot run for office after the predetermined fixed term is over, irrespective of its performance. More strictly speaking, an auditor term limit affects the head of the state auditing office and, hence, is comparable to a mandatory change of the lead partner of an audit firm. This is similar to the new requirement adopted with the Sarbanes-Oxley Act. Unfortunately, we cannot study the effect of a change of the entire audit apparatus.

¹⁰ For a discussion of auditor selection mechanisms and empirical evidence see Schelker (2007)

If the auditor can reapply for the job, but the selection process is open to challengers and not in the hands of the audited agent, the mechanism could preserve audit expertise without impeding independence too much. Of course it is also important whether the auditor can be dismissed during its term. Thus, we do not only analyze official term length but also removal procedures to dismiss the auditor. Removal procedures could be a mechanism to keep the auditor in line with the interests of the appointing body.

In the following empirical section we estimate the influence of a fixed auditor term, term length, and term limits on auditor performance. We have no clear-cut expectations for the influence of longer auditor terms on public sector performance, since there are arguments pointing towards inefficiencies due to lower independence as well as towards benefits from more expertise. Therefore, we also examine if there are non-linear (quadratic) effects of auditor tenure on performance. As we briefly discussed above, it is likely that auditor performance is weak in the beginning due to a lack of firm-specific expertise, then increases due to learning, and decreases with continuing engagement due to dwindling independence. Hence, we expect a quadratic relationship between term length and auditor performance.

4. Empirical Evidence on Auditor Tenure and Mandatory Auditor Rotation from the Public Sector

In order to conduct our empirical analysis we adopt a dataset that was constructed for the analysis of the influence of state auditing institutions on fiscal performance in the US states (see Schelker 2007). The dataset contains information on a variety of institutional details of US state auditing institutions and a standard set of controls (see also Alt, Lassen and Rose 2006). In addition to the information on various characteristics of the US state audit offices, the dataset contains a whole

battery of state specific variables ranging from information on fiscal performance, state institutions such as balanced budget requirements, voter initiatives, etc. to population and income data. Our panel dataset contains state-specific information between 1990 and 1999. More details and summary statistics can be found in the Appendix.

4.1. Empirical Strategy

Remaining close to previous studies in the corporate sector requires dependent variables directly reflecting audit quality aspects. Fiscal variables such as expenditures, revenues, deficits, or debt seem to be inaccurate, because they themselves depend on audit quality (see Schelker 2007). We resort to state long term credit ratings that reflect a market evaluation of state fiscal performance. This is comparable to the S&P credit ratings that have been used in the empirical literature on corporate auditors (e.g. Mansi, Maxwell and Miller 2004). In order to tease out the market evaluation of anticipated audit quality we have to control for the influence of the reported state of public finance and hence, we include real per capita state debt accumulation.

The data on state credit ratings stem from Moody's Investor Services. The state general obligation bond ratings are available for 39 US States for the entire period 1990-1999, but do not include States that have no general obligation debt. The States without a rating are AZ, CO, IA, ID, IN, KS, KY, ND, NE, SD and WY. Observing States without general obligation debt ratings one should be worried about selection bias. When approaching this potential selection problem, we do not find a direct correlation between auditor characteristics and the excluded States. Furthermore, we cannot explain this selection with our auditor or institutional variables in a regression framework either. Hence, it seems that selection bias is not a major concern in this study. Following the general practice for studies analyzing US States we also exclude AK and HI.

Furthermore, we exclude the remaining two States (CA & OR) where the auditor is appointed by the executive, which is the main target of the audits. Not excluding these States does not substantially impact on our results.¹¹

We start by estimating the difference between States defining a fixed term length versus States in which the auditor serves at the pleasure of the appointing body (in our case the legislature), and the impact of term limits on credit ratings. We then proceed to estimate the influence of term length, term length squared, and removal procedures on state credit ratings. It is self-evident that we always control for effects stemming from the various auditor selection mechanisms and for differences in the mandate to conduct performance audits.¹²

As a first approximation we start by estimating a simple linear model that abstracts from the fact that our dependent variable is of ordinal scale. Typically, these linear models are fairly good approximations and the interpretation of the effects is straightforward. In a next step we take the ordinal scale into account and estimate ordered probit models. The simple OLS and ordered probit 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 conduct Lagrange multiplier tests (Breusch/Pagan) which indicate that $\text{var}(a_i)\neq 0$ and hence, the random effects estimates (RE) are our preferred specification. Therefore, we only present our random effects estimates (RE) in Table 1. Due to the time persistence of our main explanatory variables we cannot further relax the

¹¹ When estimating all specifications including states in which the auditor is appointed by the executive branch, we find qualitatively similar or even slightly stronger results.

¹² Not all states require the auditor to conduct exactly the same types of audit. In addition to standard financial audits several state auditors also conduct performance audits. Financial audits follow standard accounting rules and are

assumption and estimate fixed effects models allowing for arbitrary correlation between a_i and the explanatory variables. Given the ordinal scale of our dependent variable and panel structure of our dataset our preferred specification is the RE ordered probit model.

Furthermore, all regressions include variables capturing real per capita state debt, auditor selection procedures, and a battery of standard covariates controlling for state specific heterogeneity. This is important in order to take structural differences between the States into account. First we always present a model that only contains the most standard control variables and then present a second specification controlling for a set of additional covariates that have proved to be influential in previous studies at the US state level.

4.2. *Empirical Results*

Table 1 presents the results of our regressions on Moody's state long term obligation bond ratings.

[Table 1 about here]

When estimating the influence of a predetermined *fixed auditor term* we do not find any robust and statistically significant difference to auditors that serve at the pleasure of the legislature (Columns 1-4). Only in the RE ordered probit model not including the full battery of controls (Column 3) we find a significant impact. The linear as well as the ordered probit estimates not including state random effects only produce insignificant results (not reported). Hence, it seems that defining fixed terms per se does not greatly influence outcomes.

comparable across states. The differences in the extent to which performance audits are conducted can be controlled for in our empirical model.

The influence of *auditor term limits* is negative and statistically highly significant in all estimated models (Columns 1-16). If a term limit constrains auditor tenure to a maximum of 8 years (2 consecutive terms of 4 years) we find significantly higher credit ratings. In order to assess the magnitude of the effect we can focus on the linear estimates that indicate an increase of the credit rating of roughly 0.75 rating categories on average. Such term limits could be interpreted as mandatory auditor rotation requirements, because the auditor cannot reapply for the job.

Because we do not find an influence of a fixed auditor term per se, we refine our specification by estimating the influence of *auditor term length*. We find that the length of the auditor term does not have a clear impact on credit ratings. The coefficient is not robust to the inclusion of additional control variables (Columns 5-8) and is sensitive to the inclusion of the quadratic term (Columns 9-16). As soon as the quadratic term is included we find a consistently positive coefficient of our term length variable, which is mostly statistically significant in our preferred RE ordered probit models. The positive sign must be interpreted as higher credit ratings for longer auditor terms, which is very similar to previous findings in the corporate sector.

The *squared value of auditor term length* has a consistently positive impact on credit ratings and is statistically significant in most of our preferred RE ordered-probit specifications (Columns 9-16). The coefficient of the squared term is fairly robust to the inclusion of additional variables and tends to be statistically significant if we control for the full battery of relevant covariates. The interpretation is that auditors tend to perform weakly for shorter terms as well as for long terms. This finding is consistent with the hypotheses that auditors lack expertise when beginning a mandate and might become less independent with longer tenure.

Removal procedures have a negative and significant influence on credit ratings. The easier it is to remove the auditor from office the higher are the credit ratings. A potential interpretation is that if

auditors are selected independently from the audited institution, the possibility to be removed from office might provide incentives to the auditor to exercise effort. However, we expect easy removal to be detrimental if the agency under audit can influence the removal process. We could evaluate this effect by estimating an interaction term between removal procedures and executive appointment of the auditor. Unfortunately, we cannot estimate such a specification due to an insufficient number of relevant observations.

Typically, we do not find a significant influence of auditor selection procedures in this setting. Higher levels of public debt significantly reduce credit ratings, which is exactly what we would expect. The other control variables yield consistent results for most of the specifications. Note that we do not report marginal effects in the ordered probit specifications, since it is unclear which category should be relevant for the interpretation of the results. Therefore, we do not attempt to calculate an optimal term length for auditors, given that we find a quadratic relationship between credit ratings and auditor term length. This will be the focus of future research.

4.3. Discussion and implications

In order to learn from the public sector we have focused on the influence of predetermined auditor terms and rotation requirements. We find that a fixed term per se does not have a particular influence on government performance measures. However, the term for which an auditor is appointed influences auditor performance. We find a quadratic relationship between auditor term length and Moody's state credit ratings. Short auditor terms might reduce auditor expertise, while long auditor terms impede independence. Controlling for a quadratic relationship we tend to find that generally slightly longer terms are preferred to shorter ones. The strong

evidence on mandatory auditor rotation indicates that auditor rotation could be beneficial. A term limit after the second term of 4 years increases credit ratings in most specifications, indicating beneficial effects if auditors do not remain in office for too long.

What can we learn from public sector evidence?

Most importantly the influence of term limits can be interpreted as mandatory auditor rotation of the chief auditor. In the case of corporate auditors, this is comparable to mandatory rotation of the lead partner in a firm. We will not draw conclusions about the optimal term length after which an auditor rotation requirement should be enacted in the corporate sector. We only note that we find effects similar to theoretical and experimental evidence from the corporate sector. We find a pattern in the data on term length that is consistent with theories for and against mandatory auditor rotation. It seems that indeed auditor performance is lower for short as well as for extended terms. This finding is consistent with the main argument of opponents who fear a lack of expertise in the beginning and the arguments of proponents who fear a lack of independence in extended auditor-client relationships. Since we cannot precisely determine the optimal term length, we abstain from making strong recommendations.

However, if the public and the corporate sector can be compared, the evidence suggests that auditor rotation need not be as detrimental as feared by its opponents. A combination of auditor rotation requirements with the possibility of reapplying for the assignment for an additional term might be an interesting alternative to a mandatory rotation requirement after a first fixed term. Such a procedure would make it possible to preserve expertise while providing the flexibility to investors or an independent board to replace an incompetent or corruptible auditor. The mandatory rotation requirement could then be installed after a second term for example, in order to prevent the negative effects of extended auditor-client relationships. It seems essential that the

auditor is evaluated and potentially reappointed by a body not subject to the audits, preferably the shareholders themselves, if the board of directors cannot be made entirely independent from management. Furthermore, in order to make the appointing process competitive, it should be open to all qualified candidates or candidate firms.

5. Summary and Conclusion

Reliable financial information is essential for investors and other stakeholders. Disclosure requirements are ineffective if the information provided is not accurate and timely. Therefore, disclosure requirements must be backed by independent review and legal rules enabling private litigation. Review of financial information is usually conducted by independent and certified auditing firms, which are supposed to verify and certify financial statements issued by a company's management. Obviously, if the auditor is not independent from the management, the audit of the financial statements loses its credibility. In the wake of the recent corporate scandals exactly this problem caused an uproar culminating in the collapse of Arthur Anderson, formerly one of the leading global accounting firms. In response to these scandals, corporate governance provisions such as the Sarbanes-Oxley Act impose tougher rules in order to enhance auditor independence. Auditing and consulting services have been separated, the audit and compensation committee in the board of directors has been made more independent from management, and provisions requiring mandatory auditor rotation have been debated.

We discuss these provisions and review the available evidence on various aspects of auditor independence, mainly auditor selection mechanisms and auditor tenure. Our main focus is on the influence of mandatory auditor rotation as a measure to reduce the evolving ties between auditor and management over time. The proponents argue that auditor rotation is an important

mechanism to secure auditor independence because the ties between management and auditor naturally become closer over time. Opponents in contrast argue that auditing requires firm- and industry-specific expertise and that auditor rotation destroys such know-how. They point to evidence that audit failure occurs with a higher probability in the beginning of a mandate.

The empirical evidence on auditor rotation in the corporate sector suffers from serious endogeneity problems. If firm auditors are changed, the reasons for doing so are often correlated with some performance aspects. Either the auditor is incompetent or it is competent but too conservative in the eyes of the management. The latter change is obviously not desirable from an investor's point of view. Thus, observed auditor rotation in the corporate sector is generally not exogenous to audit quality.

Hence, we propose analyzing the public sector in which auditors play a similar role by controlling the government agents on behalf of the principal, the citizens. We establish the crucial similarities between the corporate and the public sector and discuss our empirical test at the US State level. Every US State features a public auditing institution analyzing official financial statements. We take advantage of the exogenous variation in the institutional design of these auditors across the States. Some state auditors are elected and some are appointed, both typically for a predetermined fixed period of time. Some States even feature term limits. We specifically focus on the impact of fixed auditor terms, term length, and term limits that are similar to a mandatory rotation requirement. In the public sector we can estimate the impact of auditor terms and rotation without being too concerned about endogeneity of these characteristics, because they are usually determined in the state constitution or state laws and tend to be fairly stable over time.

We find that the influence of auditor term length and government performance basically follows an inverse U-shape relationship. Auditor performance is lower for short as well as for long terms.

This finding is consistent with the arguments brought forward by opponents and proponents of auditor rotation. Expertise seems to be important, but extended auditor-client relationships tend to impact negatively. Moreover, we find effects pointing towards higher credit ratings in States that adopted term limits, indicating that a mandatory rotation requirement after a maximum of two consecutive terms of 4 years is beneficial.

We propose taking the evidence from the public sector into account when evaluating mandatory auditor rotation in the corporate sector. Corporate auditors could be appointed for a fixed term with the possibility to be reappointed for one additional term. Such a design would be somewhat similar to mandatory auditor rotation, but it allows extended auditor-client relationships in order to preserve firm-specific expertise, while remaining more flexible and leaving more room in order to react to special circumstances.

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Appendix

Table A1: Variable description

<p>Term length Term of Office. Code: official term length in years; if the auditor serves 'at pleasure of legislature, legislative committee, etc.' then coded as 0 Years of survey: 1989, 1992, 1996, 2000, 2003, 2006 Data reconstructed: 1989-2006</p>
<p>Term limit Term limit. Code: 0 if no term limit; 1 if there is a term limit (some states have a limit of 2 terms of 4 years). Years of survey: 1989, 1992, 1996, 2000, 2003, 2006 Data reconstructed: 1989-2006</p>
<p>Remove Removal procedure for agency head. Code: 0 if single committee or public official can remove agency head, 1 if simple majority vote in both legislative chambers required, 2 if supermajority required in both chambers or if special procedures required (e.g. impeachment with supermajority in at least one house, or involving judicial branch), 3 if agency head cannot be removed during official term. Years of survey: 1992, 1996, 2000, 2003, 2006 Data reconstructed: 1990-2006</p>
<p>Auditor elected 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</p>
<p>Performance audits Index adding all 3 types of performance audits: Economy & Efficiency, Program, and Compliance audits.</p> <p>Economy & efficiency audits Economy & Efficiency audit. Code: 1 if economy and efficiency audit is conducted; 0 otherwise</p> <p>Program audits Program audit. Code: 1 if program audit is conducted; 0 otherwise</p> <p>Compliance audits Compliance only audit. Code: 1 if compliance audit is conducted; 0 otherwise</p> <p>Years of survey: 1992, 1996, 2000, 2003, 2006 Data reconstructed: 1991-1993, 1995-1997, 1999-2006</p>
<p>Notes: <i>Main source of data on US state auditing institutions:</i> <i>Auditing in the States: A Summary.</i> National Association of State Auditors, Comptrollers and Treasurers (NASACT). 1989, 1992, 1996, 2000, 2002 2003, 2004, 2005, 2006.</p>

Table A2: Summary statistics

Variable	Min. – Max.	Sample mean (Std. Dev.)	Description
Moody's state credit rating	(-1) – (-8)	-2.945 (-1.598)	Moody's state long term obligation rating (highest rating Aaa = -1, Aa1 = -2, Aa2 = -3, etc.)
Fixed term	0/1	0.678 (0.468)	If office term length defined (1), if auditor serves at pleasure of appointing body (0)
Term length	0 – 10	3.037 (2.628)	Office term length of auditor in years
Term limit	0/1	0.088 (0.284)	Auditor term limit installed (1), otherwise (0)
Removal procedures	0 – 3	1.22 (0.934)	Index capturing various removal procedures for the State auditor.
<i>Basic controls:</i>			
Auditor elected	0/1	0.353 (0.478)	Auditor is elected by the citizens (1), auditor is appointed by the legislature (0)
Performance audits	0 – 3	1.853 (1.128)	Auditor conducts performance audits
Government debt	2366.41 – 23575.21	5053.18 (2483.51)	Real per capita government debt in USD
State Population	550000 – 2.00E+07	5343362 (4622413)	Total state population
State income	10023.86 – 22913.7	14677.58 (2371.28)	Real per capita state income in USD
Unemployment	2.7 – 11.3	5.725 (1.491)	Unemployment rate
Aged	0.084 – 0.188	0.128 (0.018)	Fraction of the aged population (65+)
Kids	0.153 – 0.269	0.187 (0.018)	Fraction of school-aged population (5-17)
<i>Additional controls:</i>			
Population density	0.966 – 1082.702	210.497 (257.882)	Population density (population per square mile)
Divided Government	0/1	0.542 (0.499)	Divided Government: either Legislative-Executive or Split Legislature
Balanced budget rule	0/1	0.569 (0.496)	Balanced budget requirement (no carry-over rule)
Voter initiative	0/1	0.380 (0.486)	Voter initiative available (1), otherwise (0)
Transparency	0.143 – 1	0.524 (0.184)	Index of state fiscal transparency
Lame duck governor	0/1	0.258 (0.438)	Governor in his last official term (lame duck)

Table 1: The effect of auditor term length and term limits on Moody's state credit ratings

Moody's state credit rating 1990 – 1999 (Best Rating Aaa = -1, Aa = -2, etc.)								
Estimation Methode	RE	RE	RE-ordered probit	RE-ordered probit	RE	RE	RE-ordered probit	RE-ordered probit
	1	2	3	4	5	6	7	8
Fixed term	0.578 (0.538)	0.507 (0.509)	1.766 (0.299)***	0.407 (0.291)	-	-	-	-
Term limit	0.792 (0.232)***	0.806 (0.238)***	1.105 (0.363)***	1.470 (0.420)***	0.812 (0.230)***	0.816 (0.235)***	2.048 (0.381)***	1.779 (0.433)***
Term length	-	-	-	-	0.022 (0.138)	-0.012 (0.127)	0.194 (0.044)***	-0.256 (0.051)***
Basic controls	included	included	included	included	included	included	included	included
Add. controls	-	included	-	included	-	included	-	included
Year effects	included	included	included	included	included	included	included	included
Observations	283	283	283	283	283	283	283	283
R ²	0.338	0.448	-	-	0.336	0.460	-	-
Estimation Methode	RE	RE	RE-ordered probit	RE-ordered probit	RE	RE	RE-ordered probit	RE-ordered probit
	9	10	11	12	13	14	15	16
Term limit	0.770 (0.231)***	0.792 (0.240)***	0.856 (0.368)**	1.538 (0.409)***	0.716 (0.251)***	0.746 (0.256)***	1.012 (0.378)***	2.305 (0.445)***
Term length	0.313 (0.357)	0.290 (0.343)	0.047 (0.121)	0.362 (0.128)***	0.521 (0.379)	0.476 (0.348)	0.383 (0.124)***	0.321 (0.136)**
Term length squared	-0.037 (0.055)	-0.039 (0.053)	-0.018 (0.014)	-0.051 (0.014)***	-0.048 (0.053)	-0.048 (0.049)	-0.037 (0.013)***	-0.036 (0.014)**
Remove	-	-	-	-	-0.633 (0.394)	-0.574 (0.395)	-1.021 (0.166)***	-1.154 (0.190)***
Basic controls	included	included	included	included	included	included	included	included
Add. controls	-	included	-	included	-	included	-	included
Year effects	included	included	included	included	included	included	included	included
Observations	283	283	283	283	283	283	283	283
R ²	0.346	0.463	-	-	0.399	0.517	-	-

Notes: Heteroscedasticity robust standard errors in parentheses. *Basic Controls*: Auditor election, performance audits, real per capita state debt, state population, state income per capita, unemployment rate, fraction of aged, fraction of school-aged, dummy for southern states. *Add. controls*: population density, balanced budget requirement, voter initiative, transparency, lame duck governor. States with auditors appointed by the executive excluded from the regressions. Significance level: * 0.05<p<0.1, ** 0.01<p<0.05, *** p<0.01. Source: Own calculations