

Measuring Municipal Audit Quality: Focus, Findings, Avenues

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ABSTRACT: It is often difficult to establish determinants of governmental audit quality. This discussion explores the motivations of municipalities to invest in auditing and for auditors to deliver quality services within this specialized market. This paper provides a review of governmental audit quality research findings, including measurement of audit quality proxies. The paper also discusses potential future research avenues and suggests several lines of audit-focused research remain open for exploration.

Keywords: governmental audit markets; governmental audit quality; auditor specialization; non-Big N auditors.

I. INTRODUCTION

Public sector auditing is a specialized area of assurance services and offers opportunities to address questions not ordinarily addressed through research involving public companies. Municipal markets are large, comprising approximately 36,000 municipal units and 3,000 county governments ([U.S. Census 2017](#)). This provides a broad research setting including many public policies to explore. The governmental audit markets also have a unique set of questions and policies not normally seen in other markets. My objectives in this discussion are to (1) enhance interest within this sector of research; (2) encourage further governmental audit research; (3) suggest further pathways for research addressing governmental audit quality; (4) inform standards setters of the current state of research findings; and (5) enhance the practice of independent auditing.

Since actual audit quality is largely unobservable, research models rely upon proxies in estimating adherence to auditing standards. This paper summarizes examples of many common

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proxies and the published work utilizing their measurement. For example, [DeAngelo \(1981\)](#) suggests audit quality is the probability an auditor both discovers a material breach of reporting standards and has the independence to report that breach. Under this definition, audit quality is assumed to be increasing with an audit firm's overall size. In the context of audit failures and litigation, [Palmrose \(1988\)](#) suggests audit quality is defined by the reliability of a set of audited financial statements. These definitions only provide broad guidance, so it is important to understand the specific audit quality measures used in governmental research and the direction of results found.

Financial reporting quality refers to the completeness, neutrality, and usefulness of a financial statement in illustrating the financial position of an entity ([DeFond and Zhang 2014](#)). [DeFond and Zhang \(2014\)](#) suggest audit quality is "intertwined with financial reporting quality," making both audit and financial reporting quality heavily reliant upon each other.

An important dimension of the governmental markets is the lack of a central regulator. Reporting and audit requirements vary by state and even by type of governmental unit within a state (e.g., county, municipality, special purpose government).¹ Not only is this likely to affect underlying financial statement quality, but it is also likely to influence auditing, including its quality. No single measure can provide a complete picture of audit quality. Agreement across quality measurement is not always consistent and oftentimes, identifying and utilizing a unique audit market can aid interpretation of findings.

Nationally, wide variation in the quality of assurance has raised concerns with regulators who have identified deficiencies in audited governmental financial statements. As a result, these regulators have encouraged municipal finance officials to seek quality audit services ([GAO 1986, 1987](#); [PCIE 2007](#)). The AICPA has also released reports discussing their concern with the substandard attestation work found in audits of governmental units and has proposed several recommendations, including enhanced staff training and practice monitoring ([AICPA 1987, 2017](#); [Tysiac 2015](#)).² The AICPA has also formed a Governmental Audit Quality Center (GAQC), an organization promoting audit quality, including training material for members. Ultimately, governmental audit quality remains a topic of interest to regulators, standards setters, and practice groups alike.

This paper contributes to the literature by providing readers with a review of how governmental auditing research has developed and potential avenues to advance the literature. Section II includes a background of the audit markets and discussion of factors influencing demand for governmental auditing. This includes discussion of the major regulatory distinctions between governmental auditing and commercial auditing. This is followed by discussion of the major areas of governmental audit quality research in Section III. The paper concludes with a summary and additional opportunities for future research in Section IV.

¹ As an example, research by [Patrick \(2010\)](#) notes adoption of GAAP mandates for Pennsylvania counties while other units in the state remained unregulated with voluntary disclosure.

² Throughout this paper, the terms municipality or governmental unit (unit) are used interchangeably.

II. GOVERNMENTAL AUDIT DEMAND

Background of Governmental Audit Demand

Issues distinguishing governmental audit markets and the nature of audit services delivered through them are important.³ Wallace (1986) finds the benefits of governmental auditing are not substantially different from those in the corporate sector. She concludes that the audit monitoring function is sufficient incentive for a unit to contract for audit services, even if doing so voluntarily. That said, evidence of deficiencies in audited governmental financial statements suggests there may not be sufficient demand for elected officials to approve investment in accounting systems, including its internal controls and subsequent independent auditing (GAO 1986, 1987; PCIE 2007). Some have even argued lower levels of litigation risk within governmental markets contribute toward audit quality shortfalls (Brown and Raghunandan 1995).

In a study exploring the political and economic incentives behind municipal reporting, Zimmerman (1977) indicates municipal governance differs from commercial markets in both monitoring and control. The election of officials serves as one monitoring function. In addition, citizens normally assess the fiscal operations of their government positively if the unit operates at break even; budgeting and realizing no material surplus or shortfall in the taxing of residents (Pridgen and Wilder 2013; B. Apostolou, N. Apostolou, and Dorminey 2014). Therefore, for many taxpayers, the delivery of satisfactory public goods without the significant over- (under-) taxation is sufficient indication of the financial management of their government. This may negate taxpayer demand for investment in full GAAP financial statement disclosure and extensive internal control systems, and its subsequent auditing.

Research findings suggest value in accounting disclosure and an association between it and, for example, political competitiveness. Political competitiveness has been measured using proxies such as winning party vote (Ingram 1984) or percentages of legislative seats held by a political party (Marks and Raman 1987). Other evidence suggests elected officials, and finance officers, gain little value from investment in auditing and evaluate audit services through a cost/benefit analysis (Wallace 1981; Ingram 1984; Evans and Patton 1987). The most significant disciplinary action that can be taken toward a politician is through elections, and it is not clear the extent to which financial statements, including their auditing, impact voter decisions (Ingram and Copeland 1981; Baber 1983, 1990, 1994; Ferraz and Finan 2011).

Fund accounting is a primary control used in managing a municipality (Zimmerman 1977). Its methodology provides constraints and oversight. However, fund accounting may be difficult for users to understand (Lu 2007).⁴ In addition, the auditing of fund accounting is of a specialized nature and not consistent with what auditors normally experience in commercial sector auditing (Tysiac 2015, 2016). For example, municipal financial statements may include parts, or all, prepared under methodologies such as full accrual, modified accrual, and cash based. Collectively, the presentation of governmental financial statements may be difficult for an interested party to understand, and it is not clear how auditing increases the value of a governmental financial statement to users.

³ For a review of public sector audit demand, readers should refer to Rubin (1987).

⁴ As a separate note, research by Parsons (2003) suggests financial statements in the nonprofit sector are equally difficult to interpret.

Regulation and External Sources Impacting Governmental Auditing

Municipal financial reporting is exempt from most federal level audit regulation such as that applicable to issuers under the Securities Act of 1933 and the Securities and Exchange Act of 1934. Regulation often falls to the purview of individual states. Many states do not even require that municipalities submit financial statements to state agencies, let alone audited GAAP financial statements.⁵ The reasons underlying these policies are not fully understood but appear to be rooted in cost/benefit trade-offs or the result of negotiations or legislative agendas at the state level (Carpenter and Feroz 1990, 1992; Carpenter 1991; Baber and Gore 2008). In addition, applicable state-based audit requirements may range from no assurance to an attested report with variation in reporting nuances across the states.

Research findings suggest state-specific regulations may impact disclosure, audit demand, audit market structure, and quality (Copley 1989; Gore 2004; Baber and Gore 2008; López and Peters 2010; Khumawala, Marlowe, and Neely 2014; Yebba and Elder 2019). Common examples of state regulations include GAAP disclosure mandates, documentation of auditor selection and competitive bidding, and options to engage with either a governmental or independent auditor. Research generally supports an association between enforcement of state reporting and auditing regulations with auditing demand and even with quality, including the extent of auditor specialization (Hackenbrack, Jensen, and Payne 2000; Jensen and Payne 2005; López and Peters 2010; Yebba and Elder 2019).

The governmental audit markets in the United States include external factors that contribute to audit demand. For example, financing arrangements, such as bond debt, may require independent auditing as a form of insurance (Wallace 1980). Other research finds a direct association between the value investors, public interest groups, and rating agencies place on municipal financial statements and the audit reports on those statements (Rubin 1987; Ingram, Raman, and Wilson 1989; Wilson and Kattelus 2001; Plummer, Hutchison, and Patton 2007; Vermeer, Styles, and Patton 2012; Harris and Neely 2016; Edmonds, Leece, B. Vermeer, and T. Vermeer 2020). Therefore, research findings generally suggest auditing plays a crucial role within governmental finance markets. However, the quality of governmental auditing and factors incentivizing quality remain open topics.

Participation in federal programs, such as those under the Single Audit Act of 1984, may provide incentives for municipalities to build sufficient reporting and control systems in compliance with federal program regulations.⁶ These programs normally require audits, and while federal program-specific requirements contain expanded disclosure and targeted independent auditing, it is not certain regulators are satisfied with the quality of audited

⁵ For example, in Michigan, local units with populations less than 4,000 may elect to contract for biannual independent audits under Michigan laws (Michigan State Legislature 1996).

⁶ According to the OMB, over \$400 billion in grants are provided to non-federal entities each year. The Single Audit Act of 1984 and more recently OMB Title 2 U.S. Code of Federal Regulations Part 200, "Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards," commonly referred to as "Uniform Guidance," which incorporated provisions of Circular A-133, oversee the reporting and regulations of these entities (GAO 2018).

financial statements.⁷ As evidence, the GAO has documented quality concerns with audited financial statements of federal program recipients, and these issues have remained virtually unchanged over time (GAO 1986, 1987; PCIE 2007).

Highlighting the extent of deficiencies identified in municipal financial statements, in one of the first inspections of reports, the GAO found evidence of a deficiency rate of 34 percent in audited reports of entities receiving federal assistance (GAO 1986). Later, in a 2007 report titled “National Single Audit Sampling Project,” the Presidents’ Council on Integrity and Efficiency (PCIE) found a similar level (about 35 percent) of deficiencies within single audits. The PCIE also found evidence entities receiving greater federal award expenditures tended to have a more reliable audit presentation (PCIE 2007). More recent findings by the AICPA (2014) find a deficiency rate of approximately 48 percent. In sum, despite the attempts of federal agencies and practice groups to encourage improvements in governmental auditing, there is little evidence of such improvement in the governmental audit markets.

III. PUBLIC SECTOR AUDIT QUALITY RESEARCH

Measurement of audit quality has been difficult for researchers, and there is no consensus on which measure is best within the governmental sector. Audit quality measures broadly fall within two categories: (1) inputs to the audit process, and (2) outputs from the audit process.⁸ Table 1 presents a summary of selected audit quality research on inputs to the audit process. This table is sorted by year of publication and includes summaries of each paper’s research purpose, methodology, and tabulated findings.

Inputs to the Audit Process

Evidence from Auditor Type

Auditor type and specialization is a large area of governmental audit research. The public company audit market is dominated by the Big N firms and use of these auditors is normally interpreted as a signal for audit quality.^{9,10} Governmental studies also present evidence of an association between Big N usage and audit quality. Examples of these studies include Copley

⁷ A single audit is required under the Single Audit Act of 1984 for entities expending greater than \$750,000 in federal awards. The objective of the single audit expands upon a GAAP financial statement in the sense its main focus is on compliance with fund use in accordance with Federal program level guidelines. Expenditure levels triggering A133 audits have been adjusted upwards over time; this helps eliminate administrative burden for smaller recipients and signals the cost/benefits inherent of heightened disclosure while still capturing approximately 99 percent of total federal dollars within the underlying statutory audit requirements (OMB 2013).

⁸ Research by DeFond and Zhang (2014) provides an extensive description of the input/output measures of audit quality. Their discussion is largely centered upon application of the measures throughout the archival commercial audit literature.

⁹ For ease of reviewing the literature, this paper uses the term Big N as many of the studies reviewed examined periods when there were more than four of these firms. When research is discussed in the tables to this paper, the terminology used by the authors of each study is used. I also point out that in many of the studies discussed, the Big N served as a control variable and may not have been the focus of a particular research model.

¹⁰ For example, a report from the GAO suggests that approximately 98 percent of the nation’s 1500 largest public companies are audited by the Big 4. Though the report suggests concern market concentration may impact quality, the GAO’s findings indicate no clear evidence of quality differences based on auditor size (GAO 2003, 2008).

TABLE 1
Selected Studies Addressing Inputs to the Audit Process, Sorted by Year of Publication

Research Citation	Research Purpose	Methodology	Summarized Findings
Beck and Barefield (1986)	Investigate fee-based competition within the audit markets.	Analytical model of audit pricing.	<ul style="list-style-type: none"> • Variability among audit bids is not indicative of an impact on audit quality.
Baber et al. (1987)	Models audit fees around financial and political characteristics.	Using North Carolina County governments, the authors test financial, political, and auditor-related factors that may impact audit fees paid by a county.	<ul style="list-style-type: none"> • Association between audit pricing and auditor size (Big 8 or a firm with four or more office locations) and with municipalities submitting a single audit.
Rubin (1988)	To further develop a model of municipal audit fees.	The author uses an audit fee regression model to estimate significant pricing determinants.	<ul style="list-style-type: none"> • Fee reductions in the year of auditor changes. • Auditor specialization is associated with pricing. • Big 8 pricing is significant in large city audit pricing. • Fee reductions from periodic competitive bidding of audit work.
Copley (1989)	To develop a model of municipal audit fee determinants.	Using a sample of city and county governments, the authors develop an audit fee model and explore determinants including auditor size and state regulations.	<ul style="list-style-type: none"> • Greater audit fees associated with Big 8 auditor use. • Lower audit pricing with state-level GAAP reporting regulations.
Roberts et al. (1990)	To investigate determinants of auditor changes.	Using data (archival and survey) for Texas school districts, the models test auditor changes as a function of audit and school district level variables.	<ul style="list-style-type: none"> • Audit fee reductions associated with auditor changes. • Internal control deficiencies reported in a prior year are associated with subsequent year auditor change.

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TABLE 1 (continued)

Research Citation	Research Purpose	Methodology	Summarized Findings
Deis and Giroux (1992)	Explores determinants of audit quality among local audit practices in Texas.	Using a quality measure based upon Texas Ed. Agency inspection reports, the authors explore quality as related to auditor characteristics.	<ul style="list-style-type: none"> Decreasing audit quality with auditor tenure. Increasing quality with the number of audits an audit practice performs.
O’Keefe and Westort (1992)	To explore the extent to which auditor knowledge and competition impacts audit quality.	Uses CPA exam performance and audit firm size as surrogates for knowledge. Quality is a binary variable if the Oregon State Board of Accountancy determined the audit report to be acceptable.	<ul style="list-style-type: none"> CPA examination performance and audit firm size are associated with audit quality.
Raman and Wilson (1992)	Determine effects of single audit participation on audit pricing.	Using survey data, the authors develop an audit fee model testing whether implementation of the Single Audit Act impacted audit pricing.	<ul style="list-style-type: none"> Single-Audit-related variables are not significant in explaining audit pricing. Factors such as auditee size, bond rating, busy season work, and bidding are associated with audit pricing. The more bids a municipality received for their audit contract, the greater overall quality.
Copley and Doucet (1993a)	To explore the impact of competition on governmental audit quality.	Using a measure of compliance with professional standards as a proxy for audit quality, models test for an association with the number of bids a municipality received for their audit contract.	<ul style="list-style-type: none"> Audit quality decreases with auditor tenure and with fixed fee audit contracts.
Copley and Doucet (1993b)	To explore the relationship between governmental audit quality and auditor tenure and audit contract type.	Using data on quality control reviews, the authors explore its association with auditor tenure and fixed fee audit contracts.	<ul style="list-style-type: none"> Audit quality decreases with auditor tenure and with fixed fee audit contracts.

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TABLE 1 (continued)

Research Citation	Research Purpose	Methodology	Summarized Findings
Copley et al. (1994)	Explores the extent to which audit quality and audit fees are jointly determined.	Tests the supply and demand for audit quality with a simultaneous equations method.	<ul style="list-style-type: none"> Municipal auditees contract for a desired level of audit quality.
O'Keefe et al. (1994)	To explore how audit fees and auditor specialization are associated with GAAS reporting standards.	Using reporting deficiencies in California school district audits, the authors test impacts on audit fees and audit specialization.	<ul style="list-style-type: none"> GAAS violations are decreasing with audit fees and auditor specialization.
Raman and Wilson (1994)	To test the association between audit procurement (competition, RFP, technical evaluation, written agreement) and bond yield premiums.	Using survey findings for 539 city-years, the authors explore bond yield premium with audit procurement as a test variable.	<ul style="list-style-type: none"> Bond yield premiums have an inverse association with auditor procurement practices.
Ward et al. (1994)	To develop expanded models of audit pricing.	Surveys Michigan municipalities collecting variables including: audit fees, audit bidding, auditor type, and audit adjustments.	<ul style="list-style-type: none"> Fee premium was found for a large regional specialist auditor. Audit pricing is associated with the number of audit adjustments. Audit contracts competitively bid are associated with lower audit pricing.
Sanders et al. (1995)	To explore accounting industry competitiveness on audit fees.	The authors test for CPI adjusted increases in audit fees around a time period of increased competition in public accounting.	<ul style="list-style-type: none"> After adjustment for CPI, there was a real decline in municipal audit fees for the period during 1985–1989.

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TABLE 1 (continued)

Research Citation	Research Purpose	Methodology	Summarized Findings
Deis and Giroux (1996)	Tests the relation between measures of auditor effort and quality.	The authors use data on audit fees, audit hours, and a quality measure based upon inspection reports to explore audit markets with a focus on auditor changes.	<ul style="list-style-type: none"> • Lower initial audit fees but greater audit hours for first year audit clients. • Audit quality is not necessarily impacted by lowball first-year audit pricing. • Big 6 firm premium. • Non-Big 6 discount.
Chase (1999)	To explore auditor changes and type with audit pricing.	Using a sample of 95 county governments in Virginia and survey data, the author develops a model of audit fees testing for differences in auditor type.	<ul style="list-style-type: none"> • When audit bidding is restricted, audit fees are higher and larger firms participate in the municipal audit markets.
Hackenbrack et al. (2000)	To explore the impact of auditor bidding restrictions on audit markets.	Tests the removal of a bid restriction statute and test for impacts on audit firm type and pricing.	<ul style="list-style-type: none"> • Competition decreases overall audit pricing. • Big 6 auditors retain fee premiums over non-Big 6 audit firms.
Bandyopadhyay and Kao (2001)	To explore consequences of increased competition on the municipal audit markets.	Using a regulatory change in the Ontario municipal audit markets, the authors test for an audit fee reduction between periods with/without audit competition.	<ul style="list-style-type: none"> • An auditor's market power is associated with non-Big 6 audit fees but not with fees of the Big 6. • Municipalities with well-developed auditor procurement procedures tend to hire auditors with greater levels of expertise.
Bandyopadhyay and Kao (2004)	To explore auditor market structure and audit fees.	The authors use survey data to test for pricing power of audit firms within the Canadian markets.	<ul style="list-style-type: none"> • Municipalities with well-developed auditor procurement procedures tend to hire auditors with greater levels of expertise.
Jensen and Payne (2005)	To explore impacts of competitive bidding on audit fees.	Tests consequences of increased bidding in an audit market for impacts on auditor type and pricing.	<ul style="list-style-type: none"> • Municipalities with well-developed auditor procurement procedures tend to hire auditors with greater levels of expertise.

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TABLE 1 (continued)

Research Citation	Research Purpose	Methodology	Summarized Findings
Elder et al. (2015)	To investigate whether auditor rotation impacts audit quality.	Using a sample of Florida municipalities who follow rotation policy, models test whether rotating units are associated with incidents of reporting deficiencies.	<ul style="list-style-type: none"> • Auditor rotation policy is associated with specialist auditor selection. • Rotation policy is associated with quality.
Deis and Byus (2016)	To explore movement of municipal clients within audit markets.	Using a descriptive analysis of patterns in audit firm retention, the authors explore market shifts from 1997 through 2012.	<ul style="list-style-type: none"> • Results suggest a client realignment from both Big N auditors and other top audit firms to smaller audit practices.
Elder and Yebba (2020)	The authors examine impacts of an auditor retendering policy on market structure.	Using a sample of New York school districts, the models explore shifts in auditor specialization and pricing.	<ul style="list-style-type: none"> • Findings suggest movement from smaller auditors toward fee premium specialist audit practices associated with policy mandating auditor retendering.

(1991), O’Keefe, King, and Gaver (1994), and Hackenbrack et al. (2000). Efficiency and effectiveness within the Big N rely on a relatively standardized auditing process under a centralized quality control program. This may contribute toward the stronger quality associations commonly found with Big N use. However, the Big N audit approach might not fit within the broader context of municipal markets that have varied state-level reporting and audit requirements. This potentially explains the limited market penetration of these firms in most municipal markets and mixed results as to whether the Big N provide higher quality in governmental audits.

Some research suggests the Big N might not signal quality or even be perceived as quality providers of governmental audits (Samelson, Lowensohn, and Johnson 2006; Cziffra, Singer, and Zhang 2021). One potential explanation for inconsistent results in governmental studies may be variation in the extent of Big N market share in sample populations.¹¹ For example, in O’Keefe, et al. (1994), the Big N represented 2.7 percent of the sample, and they find higher quality with Big N auditors. The Big N represented 17.0 percent of the sample in Hackenbrack et al. (2000), and they found a positive association with quality measures. The Big N represented 12.9 percent of the sample in Lowensohn, Johnson, Elder, and Davies (2007), and they find generally lower levels of perceived quality with Big N auditors. Elder and Yebba (2020) find no Big N representation in the New York school district audit market. Collectively, these results suggest local-level factors (e.g., the regulatory environment), may influence Big N involvement and quality in municipal markets. These factors likely shift over time or even between states (Jensen and Payne 2005).

The governmental sector is mostly audited by local firms with a few national firms participating and marketing themselves as specialists (Elder 1997; López and Peters 2010).¹² The lack of a non-Big N auditor with extensive market share (comparable to the Big N in commercial markets) results in auditors who develop local reputations and specialization, but without the economies or staff training of a firm with a national client base.

Factors incentivizing an audit firm to focus on governmental markets remain unknown and previous arguments suggesting governmental work supplemented an auditor’s “slow season” may have disappeared (McLelland and Giroux 2000).¹³ Research by Lowensohn and Collins (2001) finds evidence audit firm partners are driven toward municipal auditing when there are intrinsic/extrinsic benefits available and desired by individual audit partners. Examples include opportunities for public service or recognition for serving needs of the greater public. Lowensohn and Reck (2004) also recognize the importance of issues such as education and standards enforcement in ensuring governmental audit quality. These issues may be more salient in smaller audit firms (Colbert and O’Keefe 1995) who participate in governmental markets but may not have extensive quality control programs, and it is unclear why these smaller firms would participate in a specialized attestation market.

Research findings suggest some audit firms may perform as few as a single governmental audit (Lowensohn et al. 2007; Elder and Yebba 2020). Other local settings may contain one firm

¹¹ Several streams of research involving public companies suggest the Big N markets exhibit factors such as city and industry leadership among the Big N (Ferguson, Francis, and Stokes 2003).

¹² A few examples of national firms marketing themselves as governmental auditing specialists include Baker Tilly LLP, CliftonLarsonAllen LLP, and CohnReznick LLP. It should also be noted these auditors are also members of the AICPA’s Governmental Audit Quality Center.

¹³ For example, in the nonprofit sector, research by Feng and Elder (2017) suggests downward movement in nonprofit clients from the Big N toward second and third tier auditors in the post SOX period. A similar trend is likely occurring in the governmental market and was explored by Deis and Byus (2016). These findings suggest enhanced market opportunity for audit firms seeking 6/30 (or other non 12/31 fiscal year end) engagements.

with a very large market share in a particular state, which may be the result of a differentiation strategy (Chase 1999). Collectively, the governmental audit markets offer settings where auditor concentration levels are not consistent. Research opportunities may include exploring factors that influence market structure and the incentives underlying a firm's decision to specialize, or perhaps more consequentially, to choose to audit only one or just a few governmental clients.¹⁴

It may be difficult to infer quality associated with an audit report based upon the identity, or perceived reputation of an issuing audit firm in the governmental markets. An example of this is described in a study by Elder and Yebba (2020) where there was a large specialist auditor. Audit clients likely believed they were purchasing quality audit services due to this firm's perceived expertise. However, the auditor discounted fees and provided poor quality audit services.

Governmental audit markets are substantially less concentrated than the public company audit markets. Analysis of market structure is commonly used to identify a specialist auditor, if any, within a market.¹⁵ For example, using a continuous measure (number of clients), in a sample of Texas school districts, Deis and Giroux (1992) find evidence of fewer deficiencies associated with auditor expertise, or competence. Similar to Copley and Doucet (1993b), they also find evidence quality decreases with auditor tenure, suggesting decreased auditor independence over time. In a study of school district auditing in California, O'Keefe et al. (1994) use a similar measure to capture audit specialization and find evidence of an association between auditor specialization and fewer violations in GAAS reporting standards. Lowensohn et al. (2007) and Johnson, Lowensohn, Reck, and Davies (2012) use market-based weighted proxies (such as sum of revenue audited) and generally find perceptions of audit quality increase are positively associated with the auditor's market share.

Other authors measure specialization using unique proxies. For example, Payne and Jensen (2002) use the staff size of the audit firm and find evidence of higher audit quality with increased staffing. Grein and Tate (2011) use an external measure of auditor size based upon whether the auditor was classified in the top 50 of audit firms reported by *Accounting Today* and argue these recognized firms are associated with quality. On a similar note, Yebba, Elder, and Lulseged (2021) develop a measure based upon an audit firm's membership in the AICPA's Governmental Audit Quality Center (GAQC). They generally find evidence of an association between member auditors and audit quality.

Collectively, these research findings addressing auditor type in governmental markets indicate that local-level factors are important determinants of associations between findings of quality and auditor size and other characteristics, including specialization. The appropriate measure of specialization seems to vary by market. In addition, there appears to be no clear evidence on the association between Big N auditors and audit quality in government audit markets.

Evidence from Audit Pricing

Audit work is typically priced considering three overall factors: (1) planned procedures, (2) profit, and (3) litigation risk (Simunic 1980). This suggests a positive association between pricing and auditor effort, or quality. However, some evidence suggests the governmental audit markets contain low audit pricing, including evidence of lowballing on initial audit engagements (Baber, Brooks, and Ricks 1987; GAO 1987; Rubin 1988; Raman and Wilson 1994). Other authors

¹⁴ In some markets, government audits may be performed by state auditors. The discussion in this paper is primarily focused upon auditing provided by independent CPA firms.

¹⁵ Research by Audoussert-Coulier, Jeny, and Jiang (2016) and Neal and Riley (2004) provide a background on common measures of auditor type within the broader context of the auditing literature.

suggest a municipality may contract for a desired level of quality (Copley and Doucet 1993a). Collectively, these findings might be interpreted as signaling low levels of quality in governmental markets.

There does not appear to be a clear indication of the association between audit fees, or fee-based auditor competition, with governmental audit quality. A study by Beck and Barefield (1986) provides analytical support that variation in audit bids is not indicative of audit quality. Copley and Doucet (1993a) document evidence that competition for a municipal audit client through audit bidding yields high-quality auditor selection. Their results suggest benefits from competitive bidding. A study by Sanders, Allen, and Korte (1995) documents that after adjustment for the Consumer Pricing Index and heightened pressure from regulators, net municipal audit fees decreased over the years 1985–1989. The authors attribute these findings toward an increasingly competitive audit market, although the association of the declining fees with audit quality remains unknown.

The lack of public data on governmental audit fees limits research in this area but also provides opportunity for those able to identify and collect the necessary variables (Vermeer and Styles 2020). Much of the research conducted explores pricing of factors including auditor specialization or pricing of first year audits. For example, Chase (1999) suggests low fees associated with a large specialist auditor in his sample may protect that auditor's market share and economies of scale contribute toward firm profit. Deis and Giroux (1996) find evidence of lowballing in school district audits but also find evidence of greater quality, again suggesting the link between audit pricing and quality is not clear. In a study of North Carolina governments, Baber et al. (1987) also found evidence of lowballing while noting a relatively efficient auditing process resultant from regulated reporting within the state may potentially yield auditor profits. Collectively, this evidence suggests some auditors will discount services if in a position to benefit through economies of scale.

In other situations, it appears auditors may be in positions to earn fee premiums. As an example, research by Ward, Elder, and Kattelus (1994) identifies a leading audit firm in Michigan with evidence of fee premium specialization. Yebba and Elder (2019) find evidence specialist fee premiums may be dependent upon GAAP disclosure regulation and also the extent of specialization within a particular market. Rubin (1988) finds no association between non-Big N auditors and audit pricing while research findings by Raman and Wilson (1992) suggest any premiums may be dependent on municipality size and the auditor's tenure. The overall evidence suggests that fee premia for specialization exists depending on market characteristics and other factors.

One way to analyze pricing is to identify a change in policy impacting a local market. Exploring regulatory policy, research by Hackenbrack et al. (2000) and Jensen and Payne (2005) analyzes the repeal of a Florida state law that had precluded competitive audit bidding. The authors' main findings suggest that once competitive bidding restrictions ended, non-Big N specialization emerged with cost savings and the Big N lost market share. On a similar path, in a study of the Ontario municipal audit market, evidence of a Big N premium was found to be associated with market concentration; the study also found evidence of overall fee reductions associated with passage of a policy encouraging auditor competition (Bandyopadhyay and Kao 2001, 2004). Recently, Elder and Yebba (2020) find evidence of inherently low fees, and quality, within an unregulated marketplace; once a retendering policy was implemented, the authors found that audit fees and quality increased as the markets became more specialized.

It is not entirely known under which conditions audit pricing is charged at a premium or discount. The governmental auditing markets are a setting where there is no clear relationship

established between auditor specialization and pricing, and identification of specialists is based upon local-level conditions. Markets associated with extensive auditor specialization appear state dependent, and some evidence seems to indicate state regulations are significant factors in audit quality and pricing.

Evidence from Initial Audit Firm Selection

Several studies examine whether auditor switches are associated with audit quality. Factors impacting a municipality's decision to voluntarily change auditors remain relatively unknown. We do not understand the motivations of municipal bureaucrats to engage high quality auditing, and the voters are largely uninformed as to auditor retention (Zimmerman 1977). In addition, most municipalities do not even have audit committees (Rich and Zhang 2014).

Since audit engagement is a private negotiation, evidence is scarce on the details of contracting. Research by Roberts, Glezen, and Jones (1990) suggests prior audit findings, such as the disclosure of internal control deficiencies, may result in subsequent auditor changes. Authors such as O'Keefe and Westort (1992) and Copley and Doucet (1993a) suggest benefits are derived from audit contracting. Benefits may include specialist auditor selection and quality. Copley and Doucet (1993a) also find evidence of lower audit fees and higher audit quality with competitive bidding. Collectively, these arguments are consistent with the idea municipalities are cost sensitive and specialist auditors have efficiencies that under some circumstances are returned to clients and this may depend on whether the audit is awarded by competitive bid.

Some evidence on audit changes and quality has presented mixed findings. For example, using an indicator variable for auditor selection, López and Peters (2010) find no relation between new auditors and quality as measured by the disclosure of internal control deficiencies. Raman and Wilson (1994) find associations between auditor procurement and bond yields, suggesting benefits of auditor changes. Rubin (1988) suggests municipalities regularly soliciting bids are associated with lower audit fees and argues of potential audit quality deficiencies associated with lower fees. Questions remain as to which factors are present within audit negotiation and when and why any positive or negative consequences are realized from an auditor change.

There have been unique research settings where authors have been able to utilize pieces of data or regulation targeted toward either required bidding or rotation of auditors. For example, Copley and Doucet (1993a) were able to obtain data concerning the number of audit firms bidding on an engagement and concluded competition for a governmental client was associated with selection of a quality auditor. In a study by Elder, Lowensohn, and Reck (2015), the authors were able to identify Florida municipalities with an auditor rotation policy. The authors conclude that auditor rotation policies are associated with selection of specialist auditors and better overall quality.

Also studying the impacts of auditor competition in Florida, Hackenbrack et al. (2000) and Jensen and Payne (2005) find evidence of a movement away from the Big N and toward local specialists with competitive bidding. This finding suggests that audit firms not able to compete within a procurement program leave municipal audit markets. In New York, Elder and Yebba (2020) explore a setting where a policy shift implementing a five-year retendering for all school district audits in the state was adopted. They find the retendering policy is associated with movement toward specialization and also find evidence of greater audit fees and quality.

Overall, the factors incentivizing a municipality to change auditors remain largely unknown. Most evidence seems to indicate benefits with auditor change and the competition for an audit client. A shift toward specialization seems to be a common finding with auditor changes and is likely associated with either actual or perceived quality.

Outputs from the Audit Process

I now discuss several output measures commonly used in governmental audit quality research. Table 2 summarizes some of the more notable research in this area sorted by year of publication. The table includes the research purpose, methodology, and summarized findings for each study.

Evidence from Internal Control Reporting

A common proxy for government audit quality is the reporting of an internal control deficiency (ICW). This research normally uses samples drawn from single audit data; reporting thresholds ensure these samples contain larger entities (López and Peters 2010; Rich and Zhang 2014; Rich, Roberts, and Zhang 2018). Opportunities remain for research on internal control reporting and remain of interest to regulators. For example, PCIE findings indicate that auditors do not perform sufficient controls testing (PCIE 2007). Recently, the AICPA issued guidance regarding sample sizes in testing internal controls; the aim of the AICPA is toward a more accurate reporting of ICWs (Tysiac 2016; Ashenfarb 2018).¹⁶ Collectively, these findings suggest a greater understanding of internal-control-related matters is warranted.

The impact of ICW reporting on municipal auditing and quality is not straightforward. In the municipal setting, the consequences of ICW reporting may differ from those of larger commercial entities reporting as accelerated filers under provisions of the Sarbanes-Oxley Act of 2002. The association between identification of an ICW in a municipal financial statement and any adverse outcome (e.g., access to finance, going concern, etc.) for the government is still largely unknown. Incentives for a municipality to invest in extensive internal controls aimed at eliminating deficiencies are generally not understood, and remediation of ICWs has not been researched.

In an example of early work within this area, Wallace (1981) suggests municipalities weigh a cost/benefit in developing a control framework. Recently, a study by Waymire, Webb, and West (2018) suggests internal control deficiencies are more common in municipalities than in nonprofits. These authors also find that specialist auditors tend to report significantly fewer deficiencies for municipal clients as compared with nonprofit clients. Rich and Zhang (2014) find an inverse association between the existence of a municipal audit committee and reporting of internal control deficiencies, a finding indicating the importance of governance in ensuring quality. These authors also find evidence the Big N report lower frequencies of ICWs. Peterson (2018) presents similar findings and also finds the existence of a city manager and staggered elections play a role in reducing control deficiencies and hence, improving quality.

López and Peters (2010) study whether governmental auditors and independent auditors differ in their reporting of ICWs. They find evidence independent auditors disclose more deficiencies; their finding appears more pronounced for larger audit firms. Studies exploring internal controls reporting by auditor specialization (outside the Big N) are a bit more limited in the governmental markets, with a study by Yebba and Elder (2019) finding evidence that specialist auditors disclose more material weaknesses. Using ordinal regression, Peterson (2018) finds evidence of an inverse association between specialist auditors and the reporting of ICWs. She also finds greater reporting of ICWs by the Big N. Also using an ordinal model, Waymire et al. (2018)

¹⁶ The AICPA issued audit guidance in *Governmental Auditing Standards and Single Audits: Audit Guide*. This guide explains norms of auditor sample sizes needed to conclude control risk is low. Notably, though professional judgment is still applicable, extremely small samples sizes (e.g., 5 or 10 items) are generally not permissible (GAO 2018).

TABLE 2
Selected Exploring Outputs of the Audit Process, Sorted by Year of Publication

Research Citation	Research Purpose	Methodology	Summarized Findings
Wallace (1981)	To analyze internal control reporting of municipalities.	The author performs a content analysis on municipal disclosures.	<ul style="list-style-type: none"> • Municipalities use cost/benefit evaluations of findings to implement internal controls.
Dwyer and Wilson (1989)	To develop a model of audit report timeliness.	Using a sample of 142 city governments, the authors develop an audit report lag model exploring signals of management competence.	<ul style="list-style-type: none"> • Cities with strong financial viability tend to report more timely. • State-based reporting regulation is associated with longer reporting delay.
Rubin (1992)	To explore differences in audit fees and audit report lag between state auditors and independent auditors.	Using a sample of Ohio cities, the author develops a series of audit fee, audit report lag, and auditor demand models and tests for significance with auditor type.	<ul style="list-style-type: none"> • Independent auditors, as opposed to state auditors, are associated with timelier audit reporting and also with greater pricing.
Johnson (1996)	To test determinants of municipal audit report lag.	The author uses a sample of 289 municipalities and survey data to develop an audit delay model to explore determinants of municipal audit delay.	<ul style="list-style-type: none"> • Audit report lag is associated with audit quality. • Cities have shorter reporting lag than counties.
McLelland and Giroux (2000)	To analyze audit report lag of large municipalities.	Using a sample of 164 large cities (population > 100,000), the authors develop an ARL model exploring factor, which includes audit characteristics.	<ul style="list-style-type: none"> • Findings suggest the use of independent auditors is indirectly associated with audit report lag. • Component auditors are associated with reporting delays.

(continued on next page)

TABLE 2 (continued)

Research Citation	Research Purpose	Methodology	Summarized Findings
Johnson et al. (2002)	To explore the effects of municipal fiscal year end dates on audit pricing and audit report lag.	Using a sample of large cities and counties, the authors develop a fee model and an ARL model to test seasonal variation in audit pricing and reporting delay.	<ul style="list-style-type: none"> • Lower audit fees are associated with June 30th fiscal year ends. • Audit report lag is longest with June 30th and December 31st fiscal year ends. • Auditors experienced with municipal reporting are associated with shorter ARL. • Audit work performed during an auditor's busy season is associated with longer ARL.
Payne and Jensen (2002)	To examine audit report delay (ARL) within municipal markets.	Using an ARL regression model, the authors test whether reporting delay is affected by municipal and audit firm characteristics including specialization and seasonality of work.	<ul style="list-style-type: none"> • Independent auditors are more likely to report ICWs than state auditors, and the larger the CPA firm is, the greater the firm's association with ICW reporting.
López and Peters (2010)	To explore differences in internal control reporting between state auditors and independent auditors.	The authors sample single audits and develop an ordinal model of ICW reporting to test for differences between audit firm types including audits performed by state auditors.	<ul style="list-style-type: none"> • Relatively few municipalities (20 percent) within the sample have an audit committee. • Municipalities with audit committees are associated with fewer internal control problems.
Rich and Zhang (2014)	To investigate whether municipal audit committees are associated with internal control deficiencies.	Using survey data collected by the International City/County Management Association, the authors develop models regressing internal control deficiencies on variables for audit committees and other governance provisions.	<p>(continued on next page)</p>

TABLE 2 (continued)

Research Citation	Research Purpose	Methodology	Summarized Findings
Peterson (2018)	To explore the relationship between municipal elections and internal control weaknesses.	Using a sample of single audits and data collected from CAFRs, the author builds models testing factors including elections, board structure, and auditor type.	<ul style="list-style-type: none"> Term limits and election of the finance official are associated with fewer ICWs.
Rich et al. (2018)	To study the textual content of municipal MD&A disclosures.	Using a sample of 362 MD&A disclosures, the authors develop a measure of municipal tone as the rate of positive to negative words within an MD&A.	<ul style="list-style-type: none"> MD&A tone is associated with subsequent year reporting of internal control deficiencies.
Sohl et al. (2018)	To study determinants of municipal reporting lags.	Using a sample of Illinois local governments, the authors develop an audit report delay model exploring municipal and auditor characteristics of the local government.	<ul style="list-style-type: none"> Municipal reporting delays tend to be at a recurring rate over time.
Waymire et al. (2018)	To explore single audit findings between nonprofits and municipalities.	Drawing from a single audit database, the authors develop a model to test how single audit findings differ between nonprofit and governmental entities.	<ul style="list-style-type: none"> A positive association between internal control deficiencies and governmental units compared with nonprofits.
Yebba and Elder (2019)	To examine the impacts of state-based GAAP regulation.	The authors explore the impacts of disclosure regulation on measures including internal control deficiencies and audit reporting lag.	<ul style="list-style-type: none"> Fewer control deficiencies and shorter reporting lags with disclosure regulation. Specialist auditors are associated with greater frequency of internal control deficiencies and shorter reporting delay with GAAP regulation.

find evidence of an inverse association between auditors performing ten or fewer single audits and ICWs.

The study of ICWs remains a topic of interest for regulatory agencies. Research findings exploring factors impacting the disclosure of ICWs appear to have mixed associations with audit quality.

Evidence from Audit Report Issuance Delay

The length of time required to issue an audit opinion is another area of governmental research and arguments point toward the benefits of timely information as a signal of quality. Similar to ICW research, most studies in this area tend to be drawn from the single audit database of federal award recipients as there are no known central databases representing extensive populations of municipalities.¹⁷ Though, in a concept statement, the GASB states the importance of report timeliness, the governmental markets have been plagued by notoriously late audit reports (GASB 1987, 2011). The lack of shareholders and enforceable due dates are likely two major reasons explaining most of the observed delay. Auditor-related pressures (i.e., profit, workload compression, etc.), and the lack of state-imposed deadlines may also contribute (McLelland and Giroux 2000).

Participation in federal awards programs appears to lengthen report delay. Delays seem to occur despite the fact involvement in the federal programs should enhance a recipient's internal controls, making reporting more efficient (Dwyer and Wilson 1989; McLelland and Giroux 2000; Payne and Jensen 2002). Some research suggests delay is caused largely on the auditor's side of the client/auditor relationship.¹⁸ This includes research by authors such as Payne and Jensen (2002) and Johnson, Davies, and Freeman (2002). Findings from this work suggest longer audit report delay (ARL) is associated with audit work conducted during an auditor's busy season. A study by Rubin (1992) finds evidence of a difference in reporting lag for units audited by an independent auditor as opposed to a state auditor, while a study by Johnson (1996) suggests ARL influences audit fees.

Exploring audit firm type and its association with ARL, Sohl, Waymire, and Webb (2018), find shorter ARL associated with their measure of auditor specialization. They also find evidence of longer delays associated with calendar year end audits. This evidence is consistent with findings of Payne and Jensen (2002) who, in addition to finding shorter lag with specialization, also find evidence a variable indicating audit firms with fewer than ten employees are associated with longer reporting delay. Yebba and Elder (2019) also find shorter delay with specialization but suggest the shorter ARL may be conditioned upon a state's GAAP-based reporting regulation.

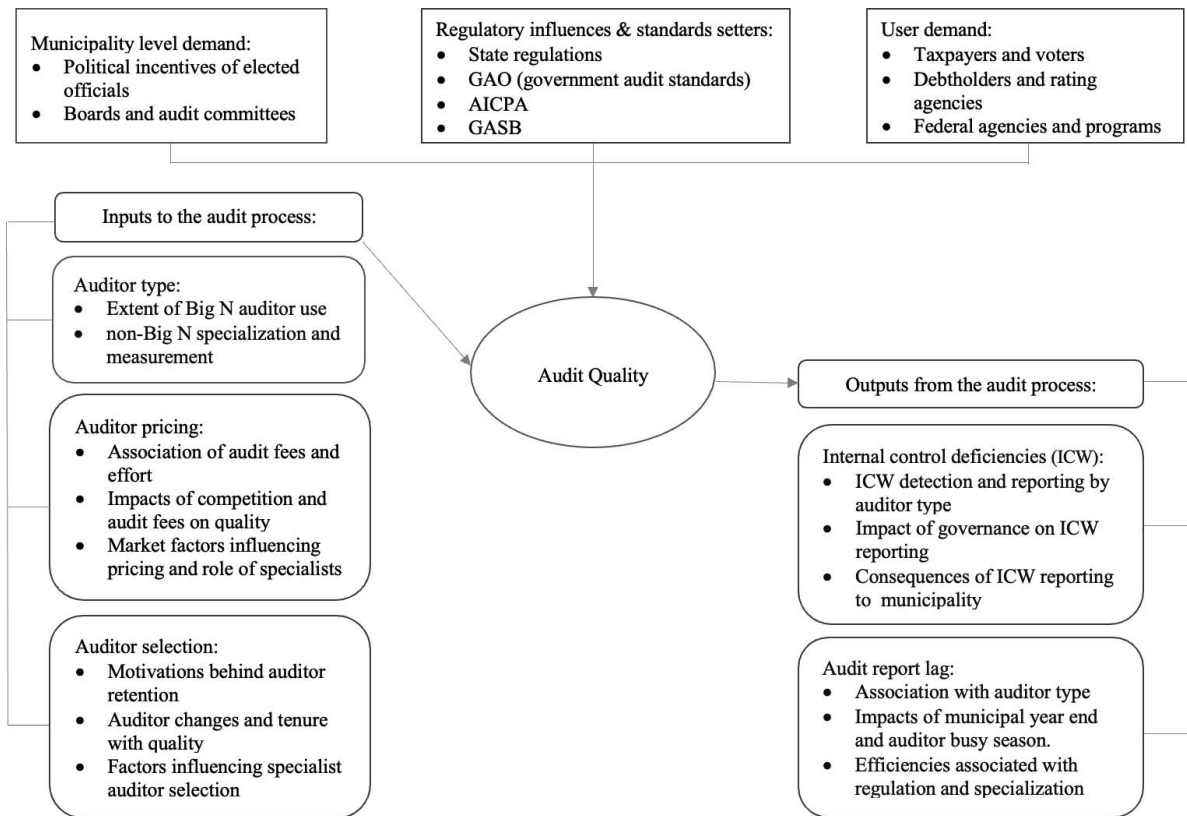
Demand for Governmental Audits and Measurement of Quality

Figure 1 provides a visual depiction of the major areas discussed in this paper. I start by summarizing audit demand at the municipality level, and these issues include the political

¹⁷ Despite the lack of a central database containing the entire population of municipalities, there are other sources of data available. For an example, interested readers may refer to data available through Merritt Research. In addition, researchers may also refer to data available through EMMA, which has been designated by the U.S. Securities and Exchange Commission as the official source for municipal securities data and disclosure documents (SEC 2012).

¹⁸ Anecdotally, some auditors may choose to issue governmental audits not when they are completed but just prior to due dates since doing so would satisfy the deadline and there are few reasons to issue sooner. I thank an anonymous reviewer for pointing this out to me.

FIGURE 1
Summary of Governmental Audit Demand and Measurement of Inputs and Outputs of Audit Quality



incentives of elected officials and the governance of the unit. Although standards setters are continually working to enhance governmental accounting and its auditing, regulatory influences vary. Users also demand audit quality, and much user demand is dependent upon taxpayers, voters, and thorough financing arrangements.

The governmental markets also include at least three overall inputs contributing toward audit quality. These include factors such as auditor type, the pricing of auditor services, and auditor selection. Other research measures audit quality using outputs from the audit process. The most common output measures seen in today’s research include the frequencies of internal control deficiencies and audit report lag.

IV. SUMMARY AND CONCLUSIONS

This paper reviews governmental auditing research focused on measurement of audit quality and provides a review of the current state of evidence. The paper starts off by reviewing factors influencing the demand for governmental auditing. Outside the differences in reporting norms, including presentation format, there are notable regulatory differences between auditing in the governmental sector versus auditing in the commercial sector. While both governmental and for-profit auditing markets have taken steps toward enhancing quality, the underlying regulatory environment remains somewhat different. Audits of the municipal markets are delivered under

AICPA standards, and additional guidance often falls under provisions of the Single Audit Act of 1984, its subsequent amendments, and under the Yellow Book. This is contrary to research of the commercial markets, which are audited under PCAOB standards.

The governmental audit markets have developed differently from the commercial markets studied by most accounting researchers. The lack of standardized disclosure requirements between all municipalities within all fifty states, and variation in state-level audit requirements has formed an audit market not entirely bonded through a consistent reporting and audit approach. This may be further complicated by the fact that not all municipalities participate in federal programs, and many smaller units fall under federal audit reporting thresholds. While variation in reporting provides research opportunity, my objective in developing this paper is to encourage continued work exploring the governmental audit markets. The lack of a central repository of data, comparable to that for commercial entities, limits most governmental research teams and prevents application of commonly used proxy measures seen in the commercial literature. Regardless, the governmental setting provides authors with opportunities to find their own unique data and research setting and through this, be afforded the opportunity to demonstrate contribution.

Other themes have emerged from the review provided in this paper. For example, the municipal markets generally operate in markets with limited involvement by the Big N auditors, and there are examples of these auditors leaving municipal audit markets once competitive bidding emerges. Audit pricing is normally seen as a factor associated with effort and while the municipal markets have been known to contain overall low audit pricing, and lowballing, the association between pricing norms and quality is not necessarily clear. This paper presents evidence of both quality and deficiencies associated with both pricing and lowballing, and even with auditor selection.

One take-away that seems to be robust is the association between auditor specialization and audit quality, or even the perceptions of quality. Conditions warranting a fee premium associated with auditor specialization remain uncertain. On the positive side, there seems to be some evidence of benefits derived from tendering bids on municipal audits. Research findings seem to suggest when a municipality seeks competitive bid for its audit contract, a specialist auditor typically wins the work.

Identifying the optimal output measure of audit quality remains a challenge limited by sources of empirical data. The literature seems to suggest most of this research is moving toward samples drawn from units reporting under the federal programs. Many authors have focused on internal control deficiencies as a proxy for quality and have found an association with factors such as governance, audit pricing, and specialization.

Many questions relating to audit quality have not been fully addressed by published research, and I encourage authors to consider performing research in the following areas:

1. The AICPA encourages auditors to enhance the validity of the testing of internal controls for recipients of federal awards. What methods are auditors using in testing controls and how are populations identified by auditors? Are suggested minimum sample sizes being used and are sample sizes appropriately adjusted toward risk levels? How are auditors using prior audit findings in current year audit planning? To what extent does sampling impact audit pricing? Do sampling decisions vary by an auditor's degree of specialization?
2. Auditors normally apply a risk-based approach toward audit planning. How do auditors adjust sampling techniques and other evidence collection between a single (non-single)

- audit municipality engagement? Do risk assessments vary between municipal audits and comparable audits of other AICPA-performed attestation engagements?
3. During audit planning, an auditor will document their client's governance structure. Research by [Rich and Zhang \(2014\)](#) explores questions surrounding governance and audit outcomes. Future questions might focus on how auditors rely upon internal auditors, including how prior audit findings affect any reliance upon internal audit functions. Are there consequences of over/under reliance upon internal audit departments in the municipal sector? Are these issues impacted by auditor specialization?
 4. Agency problems exist within the context of municipal reporting, and auditing should help reduce many sources of information risk. Research could address how agency problems in the municipal sector influence audit quality. Are there any significant real-world consequences of governmental auditing and disclosure? How does auditing add value to municipalities? Do specialist auditors add more value?
 5. Auditor specialization is an important factor influencing the nature of auditors operating in governmental markets. How is audit specialization best defined? Is it possible to have a nonspecialist audit firm but a specialist audit partner? What are the consequences on audit quality? At what point does an audit firm (partner) become a specialist within this market?
 6. The preparation of all financial statements entails some degree of discretion. Who benefits from accounting discretion in municipal markets and to what extent does an audit reduce any harm from discretionary reporting?
 7. Variation exists between the quantity and quality of financial disclosures within the municipal marketplace. Research could explore to what extent audits are associated with budget forecasting accuracy. Are there any consequences for a municipality derived through stronger audit quality enhancing budgeting and forecasting? Are benefits conditioned on auditor type?
 8. Timely audits are generally preferable. Do municipalities take advantage of the delayed reporting lags within these markets and are there any associated costs with the delays? What role does auditing play in addressing these risks?

Many of these potential research questions could be addressed using empirical methods. Other questions might entail collection of field evidence or behavioral experiments. These questions are important within the overall context of governmental auditing. This paper presents evidence of deficiencies within audited financial statements. We do not understand the factors influencing auditor judgments that contribute toward auditing of financial statements. In addition to the GAO urging municipalities to select quality auditors, the AICPA has been committed toward enhancing auditors' quality. Much of the AICPA's work has targeted issues around staff training and this includes judgments regarding factors including sample selection and controls testing. In sum, there is very little evidence on how auditors actually develop and execute an audit program of municipal governments.

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