

# The Effects of State-Level GAAP Regulation on Municipal Audit Markets, Reporting Quality, and Audit Fees

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**ABSTRACT:** We examine the effects of financial statement disclosure regulation on auditor market concentration, reporting quality, and audit pricing. We compare auditor industry concentration levels for municipalities reporting under the Single Audit Act in the state of Michigan, which requires GAAP reporting, with concentration rates in Pennsylvania, which has unregulated reporting. We find an association between a comprehensive GAAP disclosure policy and auditor concentration. The disclosure-regulated state also has higher demand for auditor specialization and reporting quality, as evidenced through lower reporting of material weaknesses and shorter reporting lags. Specialist auditors in both environments are associated with greater reporting of control exceptions, but specialization is only associated with shorter reporting lags with disclosure regulation. Using a small sample of survey data for one year, we find evidence that audit pricing is lower in the regulated state, and that specialist pricing varies based on regulation and each specialist audit firm's market positioning.

**Keywords:** governmental reporting regulation; auditor concentration and specialization; single audit quality; audit fees.

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## I. INTRODUCTION

The effect of audit market structure on governmental audit quality has been of interest to the profession and regulators for some time (GAO 1986; AICPA 2017). Similarly, standard setters have been interested in the effect of financial statement disclosure regulation on governmental reporting (GASB 2008). Exempt from federal disclosure mandates under provisions of the Securities Acts of 1933 and 1934, the disclosure requirements of governmental units are largely delegated to state lawmakers. This provides an opportunity to use governmental auditing markets to examine consequences of variation in state-based disclosure mandates on audit firm market structure, reporting and audit quality, and audit engagement pricing.

Regulation is a defining feature of audit markets, and globally the trend is toward increasing oversight of the financial reporting and auditing processes (DeFond and Zhang 2014). Studying the association between reporting regulation and the auditing markets is an important element of understanding the market positioning, reporting quality, and audit pricing characteristics of independent auditing firms. Governmental audit markets provide a unique setting for examining this relationship, as governmental accounting is not only a complex process that should lend itself to high levels of auditor specialization (Hogan and Jeter 1999; Bills, Jeter, and Stein 2015), but the differences in required disclosure between states also make it difficult for auditing firms to serve governmental units in multiple states (Chase 1999). Therefore, in many ways, each state is a unique audit market, with different determinants of auditor contracting and differences in reporting quality incentives as a result of both the state's underlying regulatory climate and the predominant auditor types found in each environment.

Differences in state disclosure requirements, combined with the GAO (1986) findings of "lowest bid" auditor selection preferences, yield fragmented auditing markets that historically have little Big 4 presence. Most governmental units are served by local auditors, providing geographically bounded audit markets useful in conducting an interstate market comparison (López and Peters 2010). In addition to altering the contracting incentives for independent auditors, state-level disclosure regulation may also affect the underlying reporting quality of their governmental units. When state policy requires full disclosure and effective enforcement of reporting standards, these policies are likely to impact the structure of the audit markets, including the demand for auditor specialization and audit pricing, as well as measures of reporting quality such as the reporting of material weaknesses and audit reporting lag.

We conduct our study in a disclosure regulated and a voluntary disclosure market during the period 1997–2010 using two states that share a similar design of local governments but that exhibit significant reporting differences.<sup>1</sup> One state (Michigan) has a long-standing enforcement of comprehensive GAAP disclosure requirements; the other state (Pennsylvania) has similar characteristics except it does not have a statutory GAAP reporting requirement.

We select our sample from the Federal Single Audit Clearinghouse (hereafter, A-133 or Single Audit) database of the U.S. Census Bureau. Under the Single Audit Act of 1984 (U.S. Department of Housing and Urban Development 1984), any recipient organization expending federal awards exceeding a specified dollar threshold must undergo an independent audit in accordance with requirements of the Office of Management and Budget's (OMB)

<sup>1</sup> We follow Gore (2004) in defining a state with GAAP-mandated disclosure as being "regulated," and a state without a statutory GAAP requirement as being disclosure "unregulated" or "voluntary."

Circular A-133.<sup>2</sup> A-133 reports include an opinion on the financial statements and compliance with provisions of federal grants or contracts, as well as reports on internal control and federal program compliance. Using a sample of 4,425 single audit observations drawn over 14 years, we find state-based disclosure regulation is associated with increases in auditor concentration levels as well as the extent of auditor specialization. Although related constructs, concentration is a market measure of the share of the market held by a small number of firms, while specialization is a measure of an individual firm's decision to focus on an industry as measured by market share.

We find that annual measures of audit firm market structure and concentration levels are higher in the GAAP-regulated market than in the unregulated market. Auditor specialization is also higher in the GAAP-regulated market, a finding based on annually calculated continuous and binary measures of specialization. Our results also provide evidence that measures of auditor market concentration and specialization are increasing over time. This effect is greater in the unregulated market, as our evidence suggests a long-standing GAAP requirement contributes to a more stable and specialized auditor market structure. Notably, during the period of our study, there was a regulatory change made effective in 2005 resulting in a GAAP requirement for county form governments within the unregulated state. Following this change, we find an increase in auditor concentration for county governments as compared with other unregulated governmental units within Pennsylvania. As a result, we provide evidence both between states and within one state suggesting that state-level reporting regulation impacts auditor market concentration levels.

[Bentley-Goode, Newton, and Thompson \(2017\)](#) suggest that reporting material weaknesses is a measure of audit quality for public companies. Studies such as [Rubin \(1992\)](#) and [McLelland and Giroux \(2000\)](#) find differences in audit report lag for governmental entities audited by external auditors compared to state auditors. We examine consequences of disclosure policies on two proxies for reporting and audit quality and find that disclosure regulation is associated with fewer material weaknesses and timelier single audit reporting. Consistent with the argument that auditors with dominant market shares are more effective in examining internal controls ([DeAngelo 1981](#); [Ashbaugh-Skaife, Collins, and Kinney 2007](#)), we find greater reporting of internal control exceptions by specialist auditors, regardless of the level of state-mandated disclosure policy. However, our results also suggest that audit efficiency, proxied by shorter reporting lags ([E. Bamber, L. Bamber, and Schoderbek 1993](#); [Knechel and Payne 2001](#); [Payne and Jensen 2002](#)), is significantly associated with state reporting policies and with use of specialist auditors in the disclosure-regulated environment.

Using survey data, we find that audit fees are lower in the GAAP-regulated state, which is evidence of economies of scale in the regulated environment. We also find evidence suggesting that the effect of disclosure regulation on specialist audit firm pricing may be a function of both regulatory characteristics and the market positioning of each specialist audit firm, as we find varying levels of specialist auditor fee premiums with disclosure regulation. In the regulated environment, the established market leader earns a fee premium, consistent with benefits to specialization due to regulation ([Eichenseher and Danos 1981](#); [Danos and Eichenseher 1982](#);

<sup>2</sup> For our sample period, the threshold was \$300,000 for fiscal years ending before December 31, 2003 and \$500,000 after that date. In December 2014, the OMB released "Uniform Administrative Requirements, Cost Principles, & Audit Requirements for Federal Awards," referred to as the Uniform Guidance, which superseded Circular A-133 and seven other circulars. The provisions of Circular A-133 are now found in Subpart F of the Uniform Guidance. The revised guidance also raised the threshold for a single audit to \$750,000 in funds expended for fiscal years beginning in 2015.

Hogan and Jeter 1999). Other market leaders within the regulated environment also earn a fee premium; however, that premium is not as significant as that of the established leader. In contrast, we find evidence of fee discounting associated with the market leader in the nonregulated state. These results suggest auditor specialization is valued in the regulated environment, and that premiums associated with specialist auditing are also a function of individual audit firm characteristics (or market positioning). However, these fee results are limited as they are based on a small sample for one year from the two states.

Our study contributes by demonstrating that state-level disclosure regulation is a factor impacting the structure of independent audit markets, including the use of specialist auditors. The GAO has been concerned with variation in the extent of specialized auditor use and audit quality in the governmental sector for an extended period of time (GAO 1987; President's Council on Integrity and Efficiency [PCIE] 2007). Our study addresses these public policy concerns. While single audits are regulated at the national level, comprehensive disclosure regulation at the state level can enhance single audit reporting as evidenced through greater use of specialist auditors, more effective control environments, and timelier financial statements. GAAP regulations have traditionally been viewed as costly for governmental entities to implement, with little perceived value to voters (Zimmerman 1977). In addition to finding enhanced control environments and timelier single audit reporting with state-level GAAP regulations, we find overall lower audit costs. Specialist auditors, especially the market leader, can earn significant premiums with state-enhanced disclosure regulation, suggesting that not all specialist auditors are perceived similarly or price comparably.

The remainder of this study proceeds as follows. Section II presents background information, followed by development of the research hypotheses in Section III. We then describe the research design in Section IV and sample composition in Section V. This is followed in Section VI with our hypothesis testing, including an analysis of the structure of the local audit markets and the effects of regulation and specialization levels on measures of audit quality and audit fees. We finish with a conclusion and discussion of study limitations in Section VII.

## II. BACKGROUND

### State-Based Reporting Regulation

State legislatures establish the minimum financial disclosure requirements for their governmental units. These requirements may range from full disclosure GAAP-based financial statements through unregulated or voluntary disclosure, with many states adopting their own hybrid methods of reporting financial information. We refer to governments required under state statute to follow pronouncements of the Governmental Accounting Standards Board (GASB) as following GAAP and governments in states exercising voluntary disclosure as non-GAAP states.<sup>3</sup>

The extent of GAAP reporting followed by governmental units is largely unknown but is of concern to regulatory bodies that encourage its adoption (GASB 2008).<sup>4</sup> The high

<sup>3</sup> GAAP states typically mandate full disclosure financial statements filed on an annual or semi-annual basis based on state laws. Non-GAAP states have no formal disclosure requirements and, outside of any confounding factors, those municipalities are free to issue financial statements on a fund basis, cash basis, hybrid basis, etc.

<sup>4</sup> Studies sponsored by the GASB (2008) estimate that nationally, approximately 43 percent of county governments and 13 percent of local municipalities are required under statute to report on a GAAP basis. Research conducted by Baber and Gore (2008) examines state reporting mandates and finds approximately 27 states require GAAP, 14 follow state-specific disclosure, and nine states have unregulated disclosure.

administrative cost of GAAP compliance has likely limited uniform GAAP requirements, and the value that voters place on municipal financial information as a monitoring tool is also likely minimal and contributes to the differing disclosure requirements across states (Zimmerman 1977). Despite the inherent complexity of governmental accounting and reporting under GAAP, the GASB has continued to issue standards (e.g., GASB 34; GASB 45) aimed at addressing the usability and informativeness of governmental financial statements. However, unless there are larger incentives for voters and elected officials to monitor government finances, lower levels of accounting information and audit assurance will voluntarily be disclosed, absent disclosure mandates under state regulations (Zimmerman 1977; Ingram 1984; Ingram and DeJong 1987).

Empirical evidence suggests state-based GAAP policies are significant determinants impacting financing outcomes. Gore (2004) finds evidence that municipalities issuing debt have bond market incentives to comply with GAAP, regardless of state mandate. Baber and Gore (2008) find evidence of lower municipal borrowing costs associated with states having GAAP disclosure mandates. Other studies also find benefits associated with GAAP mandates. For example, Vermeer, Styles, and Patton (2012) find greater compliance with pension disclosures and Baber, Gore, Rich, and Zhang (2013) find evidence of fewer accounting restatements associated with states requiring GAAP financial statements. Our study proposes that not only does enforcement of a comprehensive GAAP reporting requirement impact municipal disclosure levels, but it may also impact structural characteristics of governmental audit markets.

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### **Auditing Markets of Governmental Units**

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The reporting complexities found in governmental accounting should result in greater use of specialist auditors (Hogan and Jeter 1999). However, unlike the auditing of publicly traded entities, the vast majority of governmental auditing is performed by state-based or regional independent auditing firms (Bandyopadhyay and Kao 2004; López and Peters 2010). Research suggests it is common for local auditing firms to perform anywhere from one single audit per year up to auditing the majority of governments within a state (Chase 1999; Lowensohn, Johnson, Elder, and Davies 2007)—a market structure causing quality-focused concerns (AICPA 2014). Despite the complexities of governmental auditing, the audits are typically charged at lower rates than for comparable engagements for public companies (Copeland and Ingram 1979; GAO 1986; Petrovits, Shakespeare, and Shih 2011), making this market less attractive to the Big 4 and large national auditing firms.

Since the GAO's (1986) initial findings of substandard reporting, subsequent GAO reports began encouraging governmental units to consider audit firm expertise and training as signals of audit quality in auditor procurement decisions (GAO 1987; PCIE 2007). However, the level of specialization within governmental auditing markets continues to vary. GAO analyses of audit quality have historically focused on the auditing process (i.e., compliance with professional fieldwork standards) rather than with the extent of financial statement disclosure mandates, leaving the association between required disclosure levels under state policy and auditor market structure largely unknown.

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### **Selection of the Sample States**

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To explore the consequences of differences in disclosure policy on audit markets, we selected two states (Michigan and Pennsylvania) as a basis for performing a market comparison. Interstate

comparisons have been used in similar studies examining the effects of public policy on audit market behavior. These studies (Hackenbrack, Jensen, and Payne 2000; Jensen and Payne 2005) used geographically similar states in their analysis, and while the states were not perfectly similar, the studies controlled for other potentially confounding factors.<sup>5</sup>

The selection of Michigan and Pennsylvania as sample states provides many empirical strengths in addition to shared proximity. First, Michigan has required GAAP reporting since 1968.<sup>6</sup> Through nearly 50 years of GAAP enforcement, the Michigan governmental audit market provides an opportunity to examine the market, quality, and pricing consequences emerging from a setting that may have altered auditee/auditor contracting incentives, resulting in increased levels of audit specialization and audit firm market share over time as a consequence of regulation (Danos and Eichenseher 1982, 1986). Pennsylvania is a suitable comparison state, as local governments within Pennsylvania are not required under statute to report on a GAAP basis.<sup>7</sup> Also, during the period of our study, Pennsylvania Commonwealth County Code was amended requiring county governments to report on a GAAP basis, providing the opportunity to also test the market concentration hypothesis within one state.<sup>8</sup>

The two states share many common characteristics making them suitable comparison states focused upon in prior studies (Gore 2004; Vermeer et al. 2012). For example, the reporting of governmental units within each state does not overlap, meaning each government (county, city, etc.) reports on and is audited on its own financial operations. Second, the two states share a similar design of their governments in that both states utilize county, city, township, and other local government forms such as villages and boroughs. Additionally, both states require governmental units to undergo audits, and the majority of these audits are performed by independent CPA firms, and none of the CPA firms report on governmental units in both states.<sup>9</sup>

Variation in the financial monitoring of the governmental units comes in the administration of the GAAP requirement. In Michigan, oversight of GAAP compliance is centralized and regularly reviewed and tested by state auditors, and governments not found to be reporting in accordance with GAAP are required to submit corrected financial statements. In Pennsylvania, a summary of selected financial data is to be submitted to the Department of Community & Economic Development (DCED) on an annual basis, but full disclosure is not required nor is there a strong

<sup>5</sup> Gore (2004) notes that as the number of states in an analysis increases, the possibility of correlated omitted variables rises, as states are unique (Chase 1999) in their specific reporting requirements.

<sup>6</sup> Michigan Public Act 2 of 1968 (MCL 141.421 to 141.440a) formalizes the adoption of GAAP (GASB standards) to be followed by governmental units and charges the State Treasurer with providing implementation guidance to the governmental units. Michigan has issued uniform reporting formats for the financial statements of governmental units and routinely updates this manual for major changes in GASB pronouncements (e.g., GASB 34). A sample of the requirements are available at: [https://www.michigan.gov/documents/unifrepformatgasb34\\_47528\\_7.PDF](https://www.michigan.gov/documents/unifrepformatgasb34_47528_7.PDF)

<sup>7</sup> Approximately 97 percent of Pennsylvania's local governments are not required under law to submit full GAAP-based financial statements. These governments may submit the required information using any reporting basis, including the cash basis (Patrick 2010).

<sup>8</sup> Pennsylvania Commonwealth County Code 2002 (Section 1705, P.L. 323, No. 130), enacted by the General Assembly of the Commonwealth of Pennsylvania (2002), requires the adoption of GAAP reporting for county governments to take effect the third full fiscal year (in 2005) after enactment of the legislation.

<sup>9</sup> Although it is not unusual for local government audits to be performed by state auditors, in the single audit sample drawn from these two states, independent CPA firms provide the majority of auditing. In addition, boroughs and townships in Pennsylvania may be audited by elected auditors, an elected controller, or independent CPAs. The elected auditor form is most common in smaller governmental units. Neither state specifies procedures for auditor selection.

enforcement mechanism to ensure compliance with state or GASB requirements (Patrick 2010).<sup>10</sup>

### III. HYPOTHESIS DEVELOPMENT

We make several assumptions in framing our hypothesis. First, in the absence of disclosure regulation, municipal reporting may revert to the most cost-effective means possible (Watts and Zimmerman 1986). Additionally, the demand for independent auditing is reduced as substitute mechanisms of information (news, voting, and taxes) also provide signals of municipal fiscal stability (Wallace 1980; Ingram and Copeland 1981). Finally, we assume the goal of independent auditing firms is to maximize firm profits in competitive markets while providing the level of services contracted for by auditees. And, as audit firm profits are unobservable, we use audit firm market share and audit engagement pricing as units of analysis and assume both determinants interact with state-level regulation and adjust to equilibrium through competition (Weiss 1989).

#### Disclosure Regulation and Auditor Market Structure

The complexity of governmental accounting lends itself to an audit market that research findings suggest should be highly concentrated and containing specialized auditors (Eichenseher and Danos 1981; Danos and Eichenseher 1982, 1986; Hogan and Jeter 1999). However, variation in the minimum disclosure regulations established by state legislatures may impact audit contracting preferences, resulting in variation in market concentration (Zimmerman 1977). As a result, we propose state disclosure regulation influences the development of audit markets and in the absence of a uniform enforcement of a national GAAP reporting mandate, differences in the structure of the audit markets may be found between states where greater enforcement of GAAP regulation may be associated with more concentrated audit markets.

DeFond and Zhang (2014) suggest regulation places a floor on the demand for certain types of reporting and assurance services. In governmental markets, that floor may be established at the overall national level (i.e., OMB Circular A-133), but also through state-level enforcement of reporting standards, which, in addition to impacting concentration levels, may further influence the extent of auditor specialization within a given state. With demand for product differentiation, the economics literature suggests supplier concentration may increase (Bain 1956); Gramling and Stone (2001) suggest a similar result may occur within the audit markets. Copley, Doucet, and Gaver (1994) study the supply and demand for audit quality in governmental audit markets. Although they do not directly study regulation, it is likely regulation is one source of demand for quality audits. Collectively, the intervention of regulatory bodies and enforcement of more comprehensive GAAP reporting mandates may result in fewer auditors participating in the market. Larger, more specialized auditors are likely to maintain established market shares through demand for a differentiated level of knowledge of state reporting mandates. Therefore, we propose our first hypotheses:

**H1a:** Disclosure regulation influences the concentration of auditors in a market.

**H1b:** Disclosure regulation influences the extent of auditor specialization in a market.

<sup>10</sup> Pennsylvania requires local governments to submit their financial information using a form (DCED-CLGS 30—Municipal Annual Audit and Financial Report). The form is substantially less detailed than a typical CPA-prepared report, as the form's main objective is to provide state regulators and local taxpayers with key budgetary information on local governments and summaries of these forms do not contain disclosure.

Although concentration and specialization are related, they represent different constructs. Concentration reflects the number of participants in the market, and therefore the extent of auditor choice available to market participants. In contrast, specialization reflects the choice of individual audit firms to develop expertise in that audit market as part of its client portfolio. Because much of a firm's client portfolio is unobservable, specialization measures are normally based on market shares. As a result, in a more concentrated market, individual audit firms are likely to have higher levels of specialization when measured using market share.

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### **Disclosure Regulation, Market Concentration, and Audit and Reporting Quality**

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We argue that disclosure regulation will result in greater concentration in governmental audit markets. High auditor concentration levels presently exist among the Big 4 firms in the public company audit markets, and regulators have expressed concern about its association with audit quality. In a study of audit market concentration covering 42 countries, [Francis, Michas and Seavey \(2013\)](#) find that increased Big 4 concentration is associated with higher audited earnings quality—however, their results also find increased concentration *within* the Big 4 is negatively associated with earnings quality.

[Francis et al. \(2013\)](#) report a Big 4 market share of 61 percent in the U.S. public company audit market, which is similar to the average of 59 percent across the 42 countries they studied. Because the largest market shares are typically held by local/regional firms, concentration in governmental audit markets is likely lower than in public company audit markets. As such, increased concentration in governmental markets is less likely to reflect the negative effects of a lack of competition and more likely to reflect higher quality due to increased specialization.

Regulation may impact the internal control and reporting environments of auditees. For governmental entities subject to single audit requirements, OMB Circular A-133 should homogenize the reporting and auditing practices of recipient organizations, including the uniform auditing guidance in the “Yellow Book,” which provides auditors with attributes of quality auditing and reporting procedures ([GAO 2011](#)).<sup>11</sup> This guidance occurs outside any state reporting laws or oversight performed by state regulators. As a result, differences in state disclosure regulation may not significantly impact reporting quality.

However, A-133 is focused on compliance with regulations associated with federal awards. State-level disclosure mandates encompass all of a government's financial reporting. State inspection of financial reports and enforcement of reporting standards may alter investment in reporting and assurance. This investment may increase the effectiveness of an entity's control environment, including fewer findings of control deficiencies and timelier reporting. As such, we expect fewer control findings and shorter audit report lag in the regulated environment.

**H2a:** Disclosure regulation is associated with reporting quality measured by reporting of material weaknesses and audit report lag.

Consistent with audit quality indicators proposed by the [PCAOB \(2015\)](#), [Bentley-Goode et al. \(2017\)](#) argue that timely reporting of internal control weaknesses is a measure of audit quality. They also find the client's business strategy is associated with internal control quality. In the nonprofit sector, [Petrovits et al. \(2011\)](#) suggest that higher-quality auditors have more training, experience, and exposure to litigation risk, making these audit firms more likely to discover internal

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<sup>11</sup> We refer to A-133 since this was the guidance in effect during the period of our study. The guidance in A-133 is not included in Subpart F of the Uniform Guidance.



control deficiencies. However, they note that these firms are more likely to contract with less risky nonprofits. They find that Big 4 auditors and specialist auditors are associated with fewer control deficiencies, but regional auditors are associated with the greater reporting of deficiencies. These two studies suggest that large or specialized auditors are more likely to report control deficiencies, but the extent and reporting of control deficiencies also depend on client characteristics.

Our governmental setting differs from the settings in Bentley-Goode et al. (2017) and Petrovits et al. (2011). Unlike public companies, governmental entities are not required to make their own assessment of control effectiveness. Petrovits et al. (2011) argue that large and specialized firms provide higher audit quality, but may be associated with high-quality clients that are less likely to have control deficiencies. Our sample is more homogenous, making it less likely that differences in reported control deficiencies reflect client characteristics. Our measure of specialization is also more industry specific than the measure used in Petrovits et al. (2011). They define specialists as firms other than the Big 4 or regional firms that conducted more than 100 A-133 audits in their sample period, while we base our measures upon activity within the firm's local market.

The inherent reputational risk to auditing firms that service or specialize in this niche market results from federal review and inspection of single audit reports for compliance, and regulatory findings suggest increased professional exposure.<sup>12</sup> The effects of GAAP disclosure regulation on specialist audit quality in the government audit market remains largely unknown and is of interest to federal regulators who encourage the procurement of specialist auditors as a means of ensuring quality (GAO 1987; Deis and Giroux 1992; Copley and Doucet 1993; O'Keefe, King, and Gaver 1994; PCIE 2007). In our study, we anticipate specialists have more experience in following Yellow Book guidance. Further, their larger client base may increase their independence and accordingly, regardless of state disclosure mandate, we predict greater reporting of control deficiencies by specialist auditors.

Bamber et al. (1993) find that audit report lag for public companies measures the extent of audit effort, incentives for providing timely reporting, and audit guidance (structure) used in completing an engagement; we argue these factors may vary between state audit markets as a consequence of disclosure regulation. Payne and Jensen (2002) find that high-quality financial reporting is associated with lower governmental audit report delay, and auditors that perform multiple municipal audits are associated with timelier audit reports. A study conducted by the GASB (2011) highlights concerns over timely governmental reporting and discusses the limitations these delays present users, while a study by Henke and Maher (2016) finds evidence of lower bond ratings associated with delayed reporting. Collectively, these research findings suggest unknown factors may influence reporting lag. Reporting that is more structured as a result of a comprehensive GAAP mandate should be more efficient to audit and be evidenced through more timely reporting. Those efficiencies should be even greater for specialist auditors. In the absence of enforcement of reporting mandates, an unregulated disclosure environment would not provide similar quality-based incentives. As a result, we expect that the effect of specialization on the reporting of material weaknesses and audit report lag will be greater in the regulated environment. Therefore, we propose the following hypothesis:

<sup>12</sup> In addition to the inspections routinely performed by federal agencies, governments and not-for-profits comprise a significant portion of investigations completed by the AICPA's Professional Ethics Division, which periodically compiles a listing of common quality issues found in their investigations (see AICPA 2015). A sample of these issues is available at: <https://www.aicpa.org/interestareas/professionalethics/resources/ethicsenforcement/downloadabledocuments/governmentnotforprofitreport.pdf>.

**H2b:** The effect of auditor specialization on reporting quality measures is greater in the regulated environment.

### **Disclosure Regulation and Independent Audit Pricing**

It is not fully understood to what extent disclosure regulation impacts audit engagement pricing. Using oligopolistic theories, traditional economic arguments suggest pricing rises with concentration (Weiss 1989). Eshleman and Lawson (2017) find that greater auditor concentration in U.S. metropolitan statistical areas is associated with higher audit fees. However, the auditing markets included in our study are competitive, and similar to findings of regulators (GAO 2003, 2008), do not contain levels of concentration sufficient to suggest evidence of collusive pricing. Governmental research has demonstrated mixed findings on the relationship between auditor concentration and audit pricing (Chase 1999; Bandyopadhyay and Kao 2001, 2004), indicating that some unobserved characteristic may impact audit contracting outcomes. We hypothesize economies of scale generated as a result of state-level disclosure are a factor impacting engagement pricing.

The GAO has found evidence of lowest bid auditor selection within governmental audit markets and has expressed concerns that auditees select low fees as a tradeoff with GAAS compliance (GAO 1986; O'Keefe et al. 1994). However, the enforcement of a state-level GAAP regulation may provide an alternative explanation, as enforcement of these mandates may encourage higher quality while also impacting audit production. Over time, the production of auditing services may differ between governmental markets where all auditees report following a uniform GAAP mandate as opposed to markets where auditors report on multiple bases (i.e., cash, hybrid, GAAP) and economies of scale may develop under more comparable and regulated settings (DeFond, Francis, and Wong 2000; Bills et al. 2015). In disclosure-regulated settings, there should be established incentives for auditing services, as a defined set (GAAP) of reporting criteria must be followed. The nature of the GAAP requirements and inspections ensures greater GAAS compliance over time and therefore a more structured audit process, potentially yielding production economies. A nonregulated market may not benefit from this efficiency. Therefore, we propose our third hypothesis:

**H3:** Disclosure regulation results in audit efficiencies and economies of scale in audit engagement pricing.

### **Disclosure Regulation and Specialist Auditor Pricing**

The GAO recognizes that audit firms have organized along specialized industry lines, suggesting differentiation strategies have perceived value, especially in unique industries where industry knowledge creates a competitive advantage and can be priced (GAO 2003). Despite this trend, the extent of auditor specialization within governmental markets continues to vary and, we argue, may be impacted by state disclosure mandates. Economic arguments suggest that more efficient firms win both profits and market share (Demsetz 1974). However, auditors cannot unilaterally charge higher fees unless there is a corresponding increase in auditee demand for additional effort or industry knowledge. Our study suggests that state-level disclosure mandates create demand for fee premium audit specialization.

Audit fees represent the extent of audit effort a firm anticipates spending on a given engagement and are negotiated bilaterally between the contracting parties. In governmental audit markets, Chase (1999) finds that a large specialist firm discounts engagement fees, Ward, Elder,

and Kattelus (1994) find that specialist firms earn a fee premium, and Rubin (1988) and Lowensohn et al. (2007) do not find a relationship between non-Big 4 specialist firms and audit engagement fees. It is unclear under what market conditions specialist auditors receive a fee premium in the governmental sector. We predict that with disclosure regulation, the additional monitoring of governmental units creates demand for specialist audit firms that have experience in the disclosure-regulated environment, and these specialist firms can price that experience depending upon the firm's positioning within the market (Mayhew and Wilkins 2003; Numan and Willekens 2012). Therefore, we propose our fourth hypothesis:

**H4:** Audit specialization fee premiums are a function of disclosure regulation and characteristics of the auditing firms operating in a disclosure-regulated market.

## IV. RESEARCH DESIGN

### Multivariate Testing of Auditor Market Structure Determinants

To test the association between measures of auditor market structure (Equation (1)) and the demand for auditor specialization (Equation (2)) with disclosure regulation, we estimate the following OLS and logistic regression models, respectively. The market structure dependent variables used in Equation (1) are calculated separately by form of government and include measures of audit firm market share and concentration ratios. The identification of a specialist auditor used in Equation (2) is measured at the overall market level in each state. We include additional control variables that could influence auditor selection. A complete description of all variables is included in Appendix A.

$$\begin{aligned} \text{Market Structure (OLS)} = & \alpha + \beta_1 \text{Regulation} + \beta_2 \text{Time} + \beta_3 \text{Regulation} * \text{Time} + \beta_4 \text{InFedExp} \\ & + \beta_5 \text{CountyGov} + \beta_6 \text{CityGov} + \beta_7 \text{UrbanGov} + \beta_8 \text{AuditorChange} \\ & + \beta_9 \text{ReportType} + \beta_{10} \text{GoingConcern} + \beta_{11} \text{LowRisk} + \beta_{12} \text{InARL} \\ & + \beta_{13} \text{MaterialWeak} + \beta_{14} \text{Big4} + \varepsilon \end{aligned} \quad (1)$$

$$\begin{aligned} \text{Specialist Auditor (logistic)} = & \alpha + \beta_1 \text{Regulation} + \beta_2 \text{Time} + \beta_3 \text{Regulation} * \text{Time} \\ & + \beta_4 \text{InFedExp} + \beta_5 \text{CountyGov} + \beta_6 \text{CityGov} + \beta_7 \text{UrbanGov} \\ & + \beta_8 \text{AuditorChange} + \beta_9 \text{ReportType} + \beta_{10} \text{GoingConcern} \\ & + \beta_{11} \text{LowRisk} + \beta_{12} \text{InARL} + \beta_{13} \text{MaterialWeak} + \beta_{14} \text{Big4} + \varepsilon \end{aligned} \quad (2)$$

### Dependent and Test Variables

The dependent measures in the first equation are measures of auditor concentration calculated based upon activity within the local markets (Eichenseher and Danos 1981; Hogan and Jeter 1999). The dependent measure in the second equation is an indicator variable identifying whether the auditor is a specialist based on market share. This measure is similar to a Big 4 indicator variable for the demand for auditor reputation by governmental units (e.g., Copley, J. Gaver, and K. Gaver 1995). An indicator variable was used in a model of the demand for auditor specialization by colleges and universities in Fischer, Johnson, and Elder (2004).

Similar to Hogan and Jeter (1999) and Eichenseher and Danos (1982), we use an indicator variable *Regulation* to identify the GAAP-regulated state (Michigan) and predict that a comprehensive GAAP mandate will be associated with more concentrated auditor market structure and more extensive demand for specialization. *Time* is a continuous measure (1–14) representing the sample years used in our study, and following Hogan and Jeter (1999), we anticipate more concentrated market structure and more extensive specialization use over time. The interaction term *Regulation \* Time* represents the change in market structure (Equation (1)) and specialist demand (Equation (2)) over time for the GAAP-regulated state. A positive coefficient would reflect increasing market share, concentration, and specialization associated with the historically regulated environment; however, we make no formal prediction for this variable.

### Control Variables

Federal expenditure (*InFedExp*) dollars represent a measure of a government's size as well as the extent of federal funding and auditing complexities; we predict this variable is directly associated with auditors having greater experience in serving federal recipients. Larger government forms, such as counties and cities, have greater agency needs and we predict these government forms (*CountyGov* and *CityGov*) will be associated with the dependent measures. For brevity, other control variables, including variable sources, are defined in Appendix A and we make no directional prediction on their results.

### Disclosure Regulation and Reporting and Audit Engagement Quality

To test H2, we first estimate a logistic regression model of material weaknesses as a function of disclosure regulation levels and specialist auditor usage (Equation (3)). In robustness tests we use alternative measures of control deficiencies. Similarly, we also estimate an OLS regression model of audit report lags as a function of disclosure regulation levels and specialist auditor usage (Equation (4)). We then replace the audit report lag variable in Equation (4) with an indicator variable representing late single audit reports, since auditors may wait to file reports until the deadline (filed greater than nine months after fiscal year-end) and re-estimate Equation (4) using logistic regression. We include additional control variables that could influence incentives for audit quality. The empirical models used follow:

$$\begin{aligned}
 \text{Material Weak}(\text{logistic}) = & \alpha + \beta_1 \text{Regulation} + \beta_2 \text{MichiganSpec} + \beta_3 \text{PennsylvaniaSpec} \\
 & + \beta_4 \text{InFedExp} + \beta_5 \text{CountyGov} + \beta_6 \text{PACountyPost} + \beta_7 \text{CityGov} \\
 & + \beta_8 \text{UrbanGov} + \beta_9 \text{AuditorChange} + \beta_{10} \text{ReportType} \\
 & + \beta_{11} \text{GoingConcern} + \beta_{12} \text{LowRisk} + \beta_{13} \text{Big4} + \beta_{14} \text{InARL} \\
 & + \beta_{15} \text{YearIndicators} + \varepsilon
 \end{aligned}
 \tag{3}$$

$$\begin{aligned}
 \text{ARL}(\text{log})(\text{OLS}) = & \alpha + \beta_1 \text{Regulation} + \beta_2 \text{MichiganSpec} + \beta_3 \text{PennsylvaniaSpec} + \beta_4 \text{InFedExp} \\
 & + \beta_5 \text{CountyGov} + \beta_6 \text{PACountyPost} + \beta_7 \text{CityGov} + \beta_8 \text{UrbanGov} \\
 & + \beta_9 \text{AuditorChange} + \beta_{10} \text{ReportType} + \beta_{11} \text{GoingConcern} + \beta_{12} \text{LowRisk} \\
 & + \beta_{13} \text{Big4} + \beta_{14} \text{MaterialWeak} + \beta_{15} \text{YearIndicators} + \varepsilon
 \end{aligned}
 \tag{4}$$

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## Dependent and Test Variables for Regulation and Auditor Specialization

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Peterson (2018) models municipal internal control weaknesses as a function of auditee and auditor characteristics. Several studies (e.g., Payne and Jensen 2002; Johnson, Davies, and Freeman 2002) study audit report lag for governmental entities. We predict that a comprehensive GAAP mandate (*Regulation*) will be associated with higher reporting quality, indicated by decreased reporting of material weaknesses in single audits as well as timelier reporting. Consistent with Peterson (2018), we expect specialist auditors should be more experienced in governmental auditing and we predict specialists will be associated with greater detection of internal control exceptions. We predict specialist efficiencies will also be associated with timelier reporting, especially in the disclosure-regulated setting.

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### Control Variables

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We predict greater material weakness reporting and longer reporting lags associated with greater involvement with federal programs (*InFedExp*). Following Jakubowski (1995), we anticipate greater reporting of material weaknesses and longer reporting lags for county governments (*CountyGov*). We include an indicator variable to capture changes in quality for Pennsylvanian county governments in the years post-GAAP regulation (*PACountyPost*) and predict enhanced control systems associated with the time period after GAAP enforcement. We make no prediction on the relationship between city governments (*CityGov*) and reporting quality. We control for factors such as local-level population density and economic activity with an indicator variable (*UrbanGov*) if a local government is classified as an urban area as defined by the Office of Management and Budget (OMB) but make no directional prediction between urban governments and audit quality.

Auditor changes (*AuditorChange*) represent a fresh viewpoint on the financial statements, and we predict both greater detection of material weaknesses as well as greater reporting lags associated with a new auditor. Ashton, Willingham, and Elliott (1987) find an association between modified audit reports and audit delay; we predict the same relationship between our quality measures and the type of audit report issued (*ReportType*) as well as an indicator variable for going concern modified opinions (*GoingConcern*). Under OMB A-133, auditors are to assess whether an auditee qualifies as “low-risk” (*LowRisk*); we anticipate fewer material weaknesses and shortened reporting lags for these entities. Finally, as material weaknesses (*MaterialWeak*) and audit report lags (*InARL*) are both proxies for quality, we expect a positive association between these two variables. See Appendix A for variable descriptions and sources.

## V. SAMPLE SELECTION AND DATA

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### Data Used in Testing H1–H4

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We draw our sample from all local governments in Michigan and Pennsylvania reporting under the Single Audit Act. This environment holds the disclosure level comparable across sample entities, eliminating the confounding effects of disclosure choices of individual governmental units. In addition, all local governments are eligible to receive federal awards, and this is not limited by state policy. Further, the nature of auditing under the Single Audit Act (and dollar thresholds) results in a sample where all sampled governments receive additional audit focus addressing the administration of their federal programs. The dollar thresholds for single audit reporting eliminates

smaller governments from the study. Finally, the single audit data available from the Federal Audit Clearinghouse contain auditor-specific characteristics such as the auditor name, federal awards dollars, and a classification of internal control exceptions, as well as the auditee contact information necessary for administering survey instruments.<sup>13</sup>

Table 1, Panels A and B describe the sample selection for testing the market structure and audit quality hypotheses. We begin with 4,582 local governments submitting financial statements in accordance with the Single Audit Act for the years 1997—the first year that single audit data are available through the Federal Audit Clearinghouse—through 2010 (Panel A). We exclude 74 engagements completed by state auditors, as previous research by [López and Peters \(2010\)](#) finds differences in audit quality between engagements performed by independent CPA firms and those completed by state auditors.<sup>14</sup> After dropping outlier and missing observations (83), the final sample of 4,425 observations includes 2,007 observations from Pennsylvania and 2,418 from Michigan and represents 380 and 438 unique governments, respectively. In Panel B, we also report the breakdown of observations by type of government and audit year. Counties are the largest portion of the sample with 1,785 observations: 875 in Pennsylvania and 910 in Michigan. The sample contains 1,621 cities, including 505 in Pennsylvania and 1,116 in Michigan. Townships, boroughs, and villages comprise the remaining 1,019 observations in the sample, including 627 in Pennsylvania and 392 in Michigan.

### **Data Used Exclusively in Testing H3 and H4**

Our pricing hypothesis requires data not available through archival sources. Therefore, we surveyed fiscal year 2010 data from local governments within the two states. First, in February 2012, we electronically administered a pilot survey of the two states and performed an initial analysis. Then, in April of 2012, we did a formal mailing of surveys; this was followed with one final electronic mailing. Early versus late respondents were compared for response bias on the basis of audit fees, federal expenditure dollars, and population and no significant differences were identified. Additionally, respondents were compared to nonrespondents on the basis of federal expenditure dollars, as this information is available for all entities through the Single Audit Database and the difference was not significant.

Survey responses are summarized in Table 1, Panel C. The overall response rate was 39 percent and was similar across the two states (Pennsylvania 34 percent; Michigan 41 percent). By focusing on two states, we were able to increase the survey response rate to a level (39 percent) well in excess of that seen in most survey-based research.<sup>15</sup> Similar to other survey-based research, we received several surveys that did not contain useable data. The most common reason for an invalid survey response was the exclusion of audit fee data. Considering the research design used in H3 and H4, we were careful in wording the survey so that fees related to

<sup>13</sup> Audit Analytics also provides single audit data that include unique auditor keys for audit firms. We carefully reviewed the auditor names for the entire sample, and reviewed internet and firm websites to identify situations where audit firm name changes were due to firm acquisitions or mergers.

<sup>14</sup> We also note that in the Pennsylvania sample, only one government (Philadelphia) was audited by a state auditor. The significance of the research variables is unchanged when we include observations involving state auditors.

<sup>15</sup> Other survey-based studies and their response rates include [Ward et al. \(1994\)](#) 60 percent, [Krishnan, M. Yetman, and R. Yetman \(2006\)](#) 12 percent, [Lowensohn et al. \(2007\)](#) 28 percent, and [Vermeer, Raghunandan, and Forjione \(2009\)](#) 14.4 percent.

**TABLE 1**  
**Summary of Local Governments Included in Analysis**

**Panel A: Data for Longitudinal Analysis of Auditor Market Structure and Audit Quality Testing**

	<u>Pennsylvania</u>	<u>Michigan</u>	<u>Total</u>
Sample Selection Criteria, Partitioned by State			
Total local governments reporting under A-133 for 1997–2010	2,053	2,529	4,582
Less: A-133 reporting entities with atypical CPA firm contracting needs:			
Entities submitting reports prepared by state auditors	(13)	(61)	(74)
Missing observations and high leverage or outlier points	(33)	(50)	(83)
Total local governments included in the sample	<u>2,007</u>	<u>2,418</u>	<u>4,425</u>

**Panel B: Final Sample by Government Form and Audit Year, Partitioned by State**

Audit Year	<u>Pennsylvania</u>				<u>Michigan</u>				Total Sample
	County	City	Townships and Boroughs	Total	County	City	Townships and Villages	Total	
1997	62	33	19	114	61	62	4	127	241
1998	61	40	23	124	63	66	16	145	269
1999	63	37	25	125	63	82	15	160	285
2000	59	36	39	134	66	83	24	173	307
2001	62	40	60	162	62	88	32	182	344
2002	65	40	60	165	66	90	36	192	357
2003	64	43	55	162	69	89	37	195	357
2004	64	38	41	143	61	72	22	155	298
2005	64	35	49	148	64	73	28	165	313
2006	65	32	49	146	63	74	35	172	318
2007	65	37	61	163	64	78	31	173	336
2008	64	36	47	147	65	82	32	179	326
2009	65	32	56	153	69	75	37	181	334
2010	52	26	43	121	74	102	43	219	340
Total	875	505	627	2,007	910	1,116	392	2,418	4,425
Number of Unique Governments in the Sample:	67	51	262	380	77	191	170	438	818

*(continued on next page)*

the financial statement audit were reported separately from any fees for the single audit and any consulting services provided.

**Descriptive Statistics Used in Hypothesis Testing**

In Table 2, we present descriptive statistics of the variables used in testing H1 and H2. The first set of columns presents summary statistics for the entire sample ( $n = 4,425$ ). The next sets of columns present subsets of the sample by state and univariate testing of the differences between

TABLE 1 (continued)

## Panel C: Survey Responses Used for Audit Pricing Comparisons

	Pennsylvania				Michigan				Total Surveys
	County	City	Townships and Boroughs	Total	County	City	Townships and Villages	Total	
Governments Surveyed	52	26	43	121	74	102	43	219	340
Surveys Returned	17	9	15	41	29	45	16	90	131
Response Rate as a Percentage	33%	35%	36%	34%	39%	44%	37%	41%	39%
Useable Responses	17	7	14	38	27	42	15	84	122

Table 1 presents the sample selection obtained from the Federal Audit Clearinghouse Single Audit Database (<https://harvester.census.gov/facweb/>). Panels A and B summarize sample observations by state and type of local government over time. Panel C summarizes survey responses received by state and type of local government for the audit year 2010 used in testing audit pricing hypotheses.

the two states. We find greater auditor concentration and specialist use (*Audit Firm Market Share*, *Concentration Ratio*, and *Specialist Auditor*) associated with the GAAP-regulated state ( $p < 0.01$ ). Shortened reporting lags (*ARL*) and fewer late reports (*LateReport*) as well as lower reporting of material weaknesses (*MaterialWeak*) are also associated with the GAAP-regulated state ( $p < 0.01$ ). Additionally, we find more auditees qualified as low risk (*LowRisk*) and had larger proportions of unqualified audit reports (*ReportType*) in the GAAP-regulated state (at  $p < 0.01$ ). Finally, we find that Pennsylvanian governments are overall larger, as measured by federal expenditure dollars (*InFedExp*), and contain a greater proportion of county governments (*CountyGov*) as well as more usage of Big 4 auditors ( $p < 0.01$ ).

In Table 3, we present the Pearson correlation of variables used in testing H1 and H2. The greatest levels of correlation are between the measures of auditor concentration and specialization with the *Regulation* indicator variable, which occur because the specialization measure is defined by state.

## VI. EMPIRICAL RESULTS

### Disclosure Regulation and Auditor Market Structure

Table 4 summarizes the market structure of audit firms submitting single audits in Pennsylvania and Michigan over the period 1997–2010 and is used in regression testing of Equations (1) and (2). In Panel A, we present overall results for the markets in both states. Michigan, despite having more single audit observations than Pennsylvania, has fewer audit firms submitting those reports, evidence suggesting greater auditor concentration. In Panel A, we also present calculations of proxies of auditor market structure, including the average audit firm market share, concentration, and extent of specialization within these two markets. We use the number of single audit reports submitted by a given audit firm as the basis for these measures. This activity measures the involvement and experience an audit firm has in submitting reports under the federal requirements of A-133 as well as under any state-specific disclosure



**TABLE 2**  
**Descriptive Statistics and Tests of the Significance of Differences between Pennsylvania and Michigan for Single Audit Data Used in Testing Auditor Market Structure and Quality Regression Models (n = 4,425)**

Variable	Total Sample (n = 4,425)			Pennsylvania (n = 2,007)			Michigan (n = 2,418)			Test of Diff. p-value
	Mean	Median	Std. Dev.	Mean	Median	Std. Dev.	Mean	Median	Std. Dev.	
<b>Continuous Measures</b>										
<i>Audit Firm Market Share</i>	0.073	0.033	0.077	0.038	0.020	0.041	0.102	0.080	0.087	< 0.01
<i>Concentration Ratio-Four Firm</i>	0.429	0.430	0.136	0.304	0.300	0.034	0.554	0.550	0.057	< 0.01
<i>Concentration Ratio-Two Firm</i>	0.301	0.300	0.101	0.208	0.200	0.016	0.393	0.390	0.037	< 0.01
<i>ARL (Days)</i>	258	215	164	322	272	185	205	179	119	< 0.01
<i>InARL (Log)</i>	5.414	5.370	0.507	5.647	5.610	0.507	5.221	5.190	0.418	< 0.01
<i>InFedExp</i>	14.622	14.350	1.348	14.898	14.720	1.459	14.392	14.130	1.201	< 0.01
<b>Binary and Categorical Measures</b>										
<i>Specialist Auditor (&gt; 5%)</i>	0.418	—	0.493	0.258	—	0.439	0.546	1.0	0.498	< 0.01
<i>Specialist Auditor (&gt; 10%)</i>	0.335	—	0.472	0.168	—	0.369	0.479	—	0.499	< 0.01
<i>Material/Weak</i>	0.228	—	0.419	0.298	—	0.457	0.169	—	0.375	< 0.01
<i>LateReport</i>	0.259	—	0.439	0.452	—	0.498	0.101	—	0.301	< 0.01
<i>CountyGov</i>	0.403	—	0.491	0.436	—	0.496	0.376	—	0.485	< 0.01
<i>PACountyPost</i>	0.085	—	0.279	0.187	—	0.389	—	—	—	< 0.01
<i>CityGov</i>	0.366	—	0.482	0.252	—	0.434	0.462	—	0.499	< 0.01
<i>UrbanGov</i>	0.596	1.0	0.490	0.639	1.0	0.481	0.561	1.0	0.496	< 0.01
<i>AuditorChange</i>	0.062	—	0.241	0.067	—	0.249	0.058	—	0.234	0.22
<i>GoingConcern</i>	0.008	—	0.086	0.009	—	0.094	0.006	—	0.079	0.29
<i>LowRisk</i>	0.352	—	0.478	0.254	—	0.435	0.433	—	0.496	< 0.01
<i>Big4</i>	0.042	—	0.201	0.055	—	0.229	0.031	—	0.175	< 0.01
<i>ReportType (Categorical)</i>	3.723	4.0	0.492	3.581	4.0	0.558	3.841	4.0	0.392	$\chi^2 < 0.01$

This table presents summary statistics for the sample of local governments included in our audit market structure and audit quality regression testing and was drawn from the Federal Audit Clearinghouse Single Audit Database (<https://harvester.census.gov/facweb/>) for the years 1997–2010. Table 2 presents summary statistics for the entire sample of observations (n = 4,425) used in this study and also partitions the sample between states (Pennsylvania, n = 2,007 and Michigan, n = 2,418) and presents univariate testing between the two states. Variable descriptions are included in Appendix A.

**TABLE 3**  
**Pearson Correlation of Variables Used in Auditor Market Structure and Audit Quality Testing (n = 4,425)**

**Panel A: Correlation of Variables Firm Market Share to InFedExp**

	Firm Market Share		Concentration Ratio		MaterialWeak	InARL	Regulation 1 = MI; 0 = PA		MichiganSpec	PennsylvaniaSpec	InFedExp
	Share	Concentration Ratio	Ratio	Ratio			0 = PA	1 = MI			
Firm Market Share	1.00										
Concentration Ratio	0.44***	1.00									
MaterialWeak	0.07***	-0.06***			1.00						
InARL	-0.22***	-0.39***			0.17***	1.00					
Regulation	0.41***	0.93***			-0.15***	-0.42***	1.00				
MichiganSpec	0.84***	0.59***			-0.04**	-0.33***	0.60***	1.00			
PennsylvaniaSpec	0.14***	-0.35***			0.19***	0.21***	-0.40***	-0.23***	1.00		
InFedExp	0.08***	-0.13***			0.13***	0.23***	-0.19***	-0.07***	0.32***	1.00	
CountyGov	0.04***	-0.06***			0.09***	0.17***	-0.06***	0.02	0.21***	0.44***	
PACountyPost	-0.03**	-0.22***			0.20***	0.21***	-0.33***	-0.20***	0.35***	0.32***	
CityGov	0.16***	0.18***			-0.05***	-0.12***	0.22***	0.17***	-0.12	-0.16***	
UrbanGov	0.16***	-0.07***			-0.01	0.01	-0.08***	0.03**	0.08***	0.29***	
AuditorChange	0.02	-0.01			0.06***	0.05***	-0.02	-0.01	0.06***	0.01	
ReportType	0.20***	0.32***			-0.15***	-0.19***	0.26***	0.22***	-0.02*	0.11***	
GoingConcern	-0.02	-0.01			0.05***	0.07***	-0.02	-0.02	0.01	0.01	
LowRisk	0.13***	0.15***			-0.32***	-0.10***	0.19***	0.17***	-0.09***	0.04***	
Big4	-0.11***	-0.10***			-0.04**	0.14***	-0.06***	0.12***	0.07***	0.32***	

(continued on next page)

TABLE 3 (continued)

Panel B: Correlation of Variables CountyGov to Big4

	CountyGov	PACountyPost	CityGov	UrbanGov	Auditor-Change	ReportType	GoingConcern	LowRisk	Big4
CountyGov	1.00								
PACountyPost	0.37***	1.00							
CityGov	-0.63***	-0.23***	1.00						
UrbanGov	-0.24***	-0.04***	0.19***	1.00					
AuditorChange	0.01	0.01	0.04***	0.02	1.00				
ReportType	-0.10***	-0.03*	0.05***	0.19***	-0.03**	1.00			
GoingConcern	-0.03**	-0.02	0.06***	0.06***	0.01	-0.12***	1.00		
LowRisk	0.07***	-0.08***	0.03*	0.04***	-0.02	0.24***	-0.02	1.00	
Big4	0.09***	-0.01	-0.02	0.17***	-0.04***	0.04**	-0.01	0.01	1.00

\*, \*\*, \*\*\* Indicate significance of  $p < 0.10$ ,  $p < 0.05$ , and  $p < 0.01$ , respectively, (two-tailed).

This table provides the Pearson correlation matrices (coefficient) for all variables used in the audit market structure and quality models. The variables are defined as follows (full variable descriptions, including variable source, are included in Appendix A).

Variable Definitions:

*Firm Market Share* = a measure of an audit firm's involvement in a market;

*Concentration Ratio* = the proportion of audits submitted by the top four firms in the market;

*MaterialWeak* = 1 if the local government reported a material weakness within their A-133 submission, else 0;

*lnARL* = a log transformed continuous measure of the number of days between a local government's fiscal year-end and the date the independent CPA signed the government's audit opinion;

*Regulation* = a binary measure representing a local government in Michigan = 1, Pennsylvania = 0;

*MichiganSpec (PennsylvaniaSpec)* = a binary measure of a CPA firm's level of engagement within the Michigan (Pennsylvania) audit market where a specialist firm audits at least 5 percent of the market;

*InFedExp* = the natural log of a government's federal expenditure dollars that were reported under OMB Circular A-133;

*CountyGov* = 1 if the local government is a county form, else 0;

*PACountyPost* = an indicator variable that equals 1 if the local government is a Pennsylvania county in years where GAAP reporting is mandated;

*CityGov* = 1 if the local government is a city form, else 0;

*UrbanGov* = 1 if the local government is within an urban county, else 0;

*AuditorChange* = 1 in the year a government switched auditors, else 0;

*ReportType* = a categorical variable with 1 equal to an adverse opinion and 4 equal to an unqualified opinion;

*GoingConcern* = 1 if the local government received a going concern modified audit opinion, else 0;

*LowRisk* = 1 if the local government is a low-risk auditee, else 0; and

*Big4* = an indicator variable that equals 1 if the local government engaged one of the Big N audit firms, else 0.

**TABLE 4**  
**Auditor Industry Market Structure**

**Panel A: Analysis of Auditor Market Share, Concentration, and Extent of Specialization by State (n = 4,425)**

Audit Year	No. CPA Obs.	Audit Firm Firms	Market Share	Concentration Ratios			Specialist Auditor Use	
				Four Firm	Two Firm	Top Firm	> 5%	> 10%
Market Structure for Pennsylvania Auditing Firms (n = 2,007)								
1997	114	65	0.029	0.235	0.160	0.096	0.167	0.096
1998	124	70	0.031	0.252	0.173	0.112	0.177	0.113
1999	125	65	0.038	0.292	0.200	0.136	0.200	0.136
2000	134	67	0.034	0.288	0.180	0.104	0.246	0.157
2001	162	81	0.030	0.263	0.168	0.105	0.222	0.105
2002	165	82	0.031	0.260	0.183	0.109	0.188	0.109
2003	162	76	0.035	0.290	0.201	0.123	0.259	0.117
2004	143	71	0.038	0.313	0.204	0.133	0.279	0.133
2005	148	70	0.038	0.311	0.212	0.128	0.277	0.122
2006	146	76	0.041	0.322	0.230	0.123	0.301	0.239
2007	163	75	0.046	0.353	0.246	0.129	0.331	0.252
2008	147	66	0.049	0.360	0.253	0.156	0.318	0.256
2009	153	69	0.045	0.342	0.245	0.137	0.307	0.248
2010	121	56	0.051	0.374	0.260	0.132	0.331	0.265
Total/Mean	2,007	70	0.038	0.304	0.208	0.123	0.258	0.168
Market Structure for Michigan Auditing Firms (n = 2,418)								
1997	127	41	0.091	0.504	0.372	0.220	0.528	0.386
1998	145	44	0.089	0.510	0.359	0.200	0.429	0.483
1999	160	48	0.083	0.491	0.337	0.194	0.463	0.463
2000	173	50	0.082	0.489	0.341	0.191	0.457	0.457
2001	182	49	0.095	0.518	0.381	0.214	0.500	0.407
2002	192	53	0.091	0.500	0.380	0.224	0.464	0.413
2003	195	56	0.087	0.495	0.364	0.221	0.462	0.380
2004	155	44	0.112	0.576	0.424	0.245	0.594	0.445
2005	165	40	0.137	0.643	0.474	0.261	0.661	0.606
2006	172	51	0.110	0.603	0.408	0.221	0.613	0.535
2007	173	43	0.116	0.614	0.426	0.231	0.624	0.543
2008	179	45	0.113	0.601	0.415	0.223	0.615	0.542
2009	181	42	0.115	0.623	0.415	0.227	0.630	0.536
2010	219	50	0.108	0.595	0.409	0.224	0.598	0.516
Total/Mean	2,418	47	0.102	0.554	0.393	0.221	0.546	0.479
Diff./Sig.	4,425	23	0.064***	0.250***	0.185***	0.098***	0.288***	0.311***

*(continued on next page)*

TABLE 4 (continued)

## Panel B: Subset and Univariate Testing of Auditor Market Share and Concentration by Government Form between States for Years 1997–2010 (n = 4,425)

Variable	Pennsylvania (n = 2,007)			Michigan (n = 2,418)			t-stat/Sig.
	Mean	Median	Std. Dev.	Mean	Median	Std. Dev.	
County Governments (n = 1,785)							
<i>Audit Firm Market Share</i>	0.095	0.050	0.022	0.151	0.150	0.042	4.494***
Concentration Ratios:							
Four Firm	0.478	0.480	0.071	0.642	0.640	0.105	4.808***
Two Firm	0.356	0.350	0.057	0.472	0.470	0.080	4.402***
City Governments (n = 1,621)							
<i>Audit Firm Market Share</i>	0.054	0.050	0.014	0.159	0.150	0.026	13.046***
Concentration Ratios:							
Four Firm	0.326	0.320	0.059	0.624	0.620	0.054	13.917***
Two Firm	0.217	0.220	0.051	0.507	0.500	0.046	15.718***
Townships, Boroughs, and Villages (n = 1,019)							
<i>Audit Firm Market Share</i>	0.037	0.030	0.013	0.108	0.100	0.054	4.816***
Concentration Ratio:							
Four Firm	0.234	0.230	0.055	0.483	0.440	0.159	5.522***
Two Firm	0.139	0.140	0.025	0.340	0.310	0.091	7.942***

\*\*\* Represent significance level of 0.01 (two-tailed).

This table summarizes the market structure of independent audit firms sampled from Pennsylvania and Michigan using data obtained from the Federal Audit Clearinghouse Single Audit Database (<https://harvester.census.gov/facweb/>). In Panel A, we present descriptive data on the number of audit firms servicing the single audit markets in both states. We also present audit firm market share based upon the number of single audits submitted by each audit firm  $i$  for year  $t$  divided by the overall number of single audits submitted in the respective state for year  $t$ . The concentration ratios are calculated based upon the number of single audit reports submitted for the most active four, two, and one audit firm(s) for each year divided by the number of single audits submitted in the respective state for year  $t$ . Panel A also presents summary statistics of the binary market share measure of auditor specialization and is presented for audit firms servicing 5 percent (10 percent) or more of the state's single audit market for year  $t$ . A univariate comparison between the states is also presented. Panel B summarizes the market structure of independent audit firms in both states and presents measures calculated separately by the form of local government.

regulation, and is not influenced by a local firm submitting reports for a few large federal recipients.<sup>16</sup>

Table 4, Panel A presents audit firm market share, calculated as the number of single audits submitted by firm  $i$  divided by the number of single audits submitted in year  $t$  for each state. The results indicate greater market share in the GAAP-regulated state, as the average firm submitted single audit reports for approximately 10.2 percent of the market; the comparable figure in Pennsylvania is approximately 3.8 percent, a difference of 6.4 percent ( $p < 0.01$ ). The descriptive results also demonstrate a relatively level market share for Michigan audit firms but a gradual increase in market share for Pennsylvanian firms.

We also present auditor concentration ratios for the top four firms, top two firms, and top firm in Table 4, Panel A. We calculate this measure as the total number of single audits submitted by the four (two, and top) most active audit firms in the local markets divided by the

<sup>16</sup> Our results in Table 4 are substantially similar calculating the market structure measures using federal expenditure dollars audited per firm.

number of single audits submitted in each state for year  $t$ .<sup>17,18</sup> In all cases, the GAAP-regulated state (Michigan) is significantly more concentrated than the unregulated state ( $p < 0.01$ ). Over the 14-year sample period, mean values in Pennsylvania for the four-firm, two-firm, and top-firm concentration ratios are 0.304, 0.208, and 0.123, respectively. Comparable values are 0.554, 0.393, and 0.221 for Michigan—concentration levels nearly double those of the unregulated setting. Consistent with increasing auditor concentration over time (Hogan and Jeter 1999), our results demonstrate slight gains in the market shares of top firms in both states over time. Comparable results on auditor market share and concentration, partitioned by the form of local government, are presented in Table 4, Panel B, and provide similar findings as those of the overall markets.

Audoussert-Coulier, Jeny, and Jiang (2016) summarize auditor specialization measures noting the majority of research is conducted using market-share-based measures. Neal and Riley (2004) examine studies in markets served by the Big 4 and conclude specialist auditors distinguish themselves from other accounting firms and note that specialists are industry leaders if they audit about 10–30 percent of a given audit market. The governmental audit markets are substantially less concentrated than the commercial markets served by the Big 4. We therefore measure auditor specialization using two binary measures: first, an indicator variable for firms with a market share of at least 5 percent in a given year, and second, for firms with a market share greater than 10 percent.<sup>19</sup> Our choice of a market share measure based on number of clients ensures the identification of a specialist auditor is determined by the number of audits conducted in a given market and is not driven by the size of auditees since we argue that observed differences exist based on experience within the local regulatory system.

In Table 4, Panel A, we report the proportion of single audit reports submitted by specialist auditors and find more extensive specialization associated with the GAAP-regulated state where on average, 54.6 percent (47.9 percent) of the Michigan market is served by specialist auditors based on a 5 percent (10 percent) market share cutoff. In comparison, 25.8 percent (16.8 percent) of the Pennsylvanian market is served by specialists based on the 5 percent (10 percent) threshold; the differences of approximately 30 percent are significant at  $p < 0.01$ .

### Test of Regulatory Change

We utilize a change in Pennsylvania reporting regulation in order to provide further evidence on the association between GAAP reporting regulation and independent auditor

<sup>17</sup> The top four firm measure is typically used in the concentration literature (e.g., Eichenseher and Danos 1981). We expand on this in our pricing analysis and separately analyze the top firm and top two firms in further regression testing of our specialization pricing hypotheses and present the market concentration levels associated with those firms in Table 4.

<sup>18</sup> In untabulated results, we calculated the Herfindahl index (sum of squares of individual audit firm market shares) and found the mean Herfindahl index for Pennsylvania is 0.04; the comparable result for Michigan is 0.11, a difference of 0.07, significant at  $p < 0.01$ . The Herfindahl index (also called the Herfindahl-Hirschman index or HHI) is an indicator of the size of firms in relation to the industry as a measure of competition.

<sup>19</sup> We determine the cutoff points for the two binary measures through a review of a scatterplot of firms and their client bases. Specialization cutoffs at this level are common in the governmental auditing literature; Bandyopadhyay and Kao (2001) used a similar specialization measure in some of their testing. We also used continuous measures of specialization in all of our analyses and obtained qualitatively similar findings. The binary specification using a 5 percent cutoff point is presented in regression testing for brevity.

**TABLE 5**  
**Univariate Tests of Market Movement following a Regulatory Change Impacting Reporting Requirements of Pennsylvania County Governments (n = 595)**

Government Form	Pre-Regulatory Change Audit Year (1999–2001)			Post-Regulatory Change Audit Year (2005–2007)			Total Obs.	Difference	
	Concentration Ratio			Concentration Ratio				Four Firm	Two Firm
	Obs.	Four Firm	Two Firm	Obs.	Four Firm	Two Firm			
County	184	0.426	0.319	194	0.521	0.376	378	0.095***	0.057***
City	113	0.320	0.219	104	0.358	0.242	217	0.038***	0.023***
Difference	297	0.106***	0.100***	298	0.163***	0.134***	595	0.057***	0.034***

\*\*\* Represent significance level of 0.01.

This table presents descriptive statistics and univariate testing of auditor concentration levels for Pennsylvania county and city governments, partitioned based upon dates of a regulatory change. Using data obtained from the Federal Audit Clearinghouse Single Audit Database (<https://harvester.census.gov/facweb/>), this table summarizes the impact of Pennsylvania Commonwealth County Code 2002 (Section 1705, P.L. 323, No. 130) on auditor concentration levels for county governments within Pennsylvania. Pennsylvania city governments are used as a control group. The table analyzes concentration using four-firm and two-firm concentration ratios (calculated using audit firm market shares, i.e., number of clients) and three-year trend windows to test changes in auditor concentration within and between the two government forms over time.

concentration levels. Pennsylvania Commonwealth County Code 2002 (Section 1705, P.L. 323, No. 130; hereafter, the code) required all Pennsylvania county governments to submit their financial statements using GAAP presentation beginning in 2005. Using both four-firm and two-firm concentration ratios and using the city form of government as a control group, we calculated concentration ratios for a three-year period before and after passage of the code, leaving a three-year adjustment period, as dictated under the regulation. The choice of Pennsylvania city governments as the control group is suitable as both government forms operate within the same state, minimizing potentially confounding factors and enhancing the homogeneity of the sample (e.g., Payne and Jensen 2002; Giroux and McLelland 2003; López and Peters 2010).<sup>20</sup>

The univariate results in Table 5 indicate the increase in concentration for county governments was significantly greater than the increase in concentration for city governments for both concentration measures.<sup>21</sup> For example, the four-firm ratio for counties increased from 0.426 to 0.521, an increase of 0.095 ( $p < 0.01$ ). In contrast, the same ratio for cities only increased from 0.320 to 0.358, an increase of 0.038 ( $p < 0.01$ ). Testing the proportion means found in county governments to city governments, these results suggest a significant increase in concentration ( $p < 0.01$ ) reported in the post-regulatory change period for county governments as compared with

<sup>20</sup> Since the code applied to counties, the largest government forms in the sample, it was not practical to match individual county governments with comparably sized local governments.

<sup>21</sup> In sensitivity testing, Baber and Gore (2008) test the effects of regulatory changes through state-specific regressions. We further document our findings through the following OLS regression model sampled from counties and cities in Pennsylvania and find significant estimates for  $\beta_1$ ,  $\beta_2$ , and  $\beta_3$ . For brevity, our regression results are not tabulated.  $Concentration\ Ratio = \alpha + \beta_1 PostGAAPRegulation + \beta_2 CountyGov + \beta_3 PostGAAPRegulation * CountyGov + \Sigma Controls + \varepsilon$ .

rates of change for city governments, providing further support that local-level disclosure regulation impacts audit market concentration levels.

### **Regression Results for Tests of H1**

In Table 6 we present regression results for tests of the relation between disclosure regulation, auditor market structure, and specialization. All regression models are significant and model  $R^2$  values are 25.4 percent (85.2 percent) for the market share (four-firm concentration ratio), and 17.8 percent for the auditor specialization model using a 5 percent market share cutoff.<sup>22</sup> We cluster all standard errors at the government and year levels. We reviewed the variance inflation factors for all regression models and all factors were below 6 and 4 for tests of H1 and H2, respectively, indicating multicollinearity is likely not a problem. Approximately half of each model's  $R^2$  is associated with the variable *Regulation*, suggesting that even after controlling for other determinants of auditor choice, audit market concentration and use of specialist auditors are highly associated with the GAAP-regulated state.

The coefficients on *Time* are significantly associated with the measures of market structure and demand for auditor specialization, suggesting more demand for auditor experience and expertise over time. Results for other variables, including *InFedExp*, *CountyGov*, and *CityGov*, generally followed our predictions.

### **Regression Results for Tests of H2**

In Table 7, we present logistic regression results of the relationship between material weakness reporting and disclosure regulation and auditor specialization.<sup>23</sup> The model is significant at  $p < 0.01$  with an  $R^2$  value of 28 percent; standard errors are clustered by government and year. We find significantly fewer material weaknesses reported in the GAAP-regulated state ( $p < 0.05$ ). Specialist auditors detect and report more ( $p < 0.01$ ) material weaknesses, regardless of state regulation, providing evidence of the benefits derived from specialization.<sup>24,25</sup>

Federal expenditure dollars (*InFedExp*) and county governments (*CountyGov*) are both significantly associated with material weakness reporting ( $p < 0.05$ ). The indicator variable representing Pennsylvanian counties post policy change (*PACountyPost*) is inversely related to material weakness reporting and is marginally significant ( $p < 0.10$ ), providing further support for enhanced internal control quality associated with GAAP regulation. As expected, there are fewer material weaknesses ( $p < 0.01$ ) associated with the type of audit report (*ReportType*) as well as with engagements identified as low risk (*LowRisk*), and there is a

<sup>22</sup> Results using the two-firm concentration ratio and 10 percent auditor specialization measure as summarized in Table 4 are qualitatively similar and are omitted for brevity.

<sup>23</sup> We also tested the 10 percent binary measure of specialization as well as a continuous measure and obtained qualitatively similar results.

<sup>24</sup> We test several alternative measures of control deficiencies. We test reportable conditions separately from material weaknesses. We also test a binary measure that includes either control deficiency and an index measure following López and Peters (2010) and Peterson (2018). Specialization and regulation are both significant using the index measure. Results are directionally consistent but not significant using reportable conditions and the combined measure including any control deficiency.

<sup>25</sup> In an alternate specification, we test auditor tenure and the interaction of tenure with auditor specialization. Our tenure variable is limited because we do not have auditor data before 1997. We find little evidence of a significant association of tenure with the reporting of material weaknesses or audit report lag.



TABLE 6

Regression Results for Tests of the Relation between Auditor Market Structure and Specialization Measures and Disclosure Regulation (n = 4,425)

$$\begin{aligned}
 \text{Auditor Market Structure (Specialist Auditor)} = & \alpha + \beta_1 \text{Regulation} + \beta_2 \text{Time} + \beta_3 \text{Regulation} * \text{Time} \\
 & + \beta_4 \text{InFedExp} + \beta_5 \text{CountyGov} + \beta_6 \text{CityGov} \\
 & + \beta_7 \text{UrbanGov} + \beta_8 \text{AuditorChange} + \beta_9 \text{ReportType} \\
 & + \beta_{10} \text{GoingConcern} + \beta_{11} \text{LowRisk} + \beta_{12} \text{InARL} \\
 & + \beta_{13} \text{MaterialWeak} + \beta_{14} \text{Big4} + \varepsilon
 \end{aligned}$$

Dependent Variable	Pred. Sign.	(a)	(b)	(c)
		Market Structure (OLS) Dependent Variables	Four-Firm Concentration Ratio	Specialist Auditor (Logistic)
		Market Share		> 5% Market Share
Regulation	+	0.064*** (0.013)	0.222*** (0.020)	1.216*** (0.313)
Time	+	0.001* (0.001)	0.009*** (0.001)	0.042** (0.025)
Regulation * Time	?	0.001 (0.002)	-0.001 (0.002)	-0.011 (0.026)
InFedExp	+	-0.001 (0.004)	0.006*** (0.002)	0.106* (0.084)
CountyGov	+	0.075*** (0.012)	0.228*** (0.026)	1.847*** (0.273)
CityGov	+	0.047*** (0.009)	0.156*** (0.014)	1.221*** (0.231)
UrbanGov	?	0.050*** (0.009)	-0.001 (0.002)	0.646*** (0.205)
AuditorChange	?	-0.008 (0.007)	0.003 (0.004)	0.203* (0.179)
ReportType	?	0.017*** (0.005)	0.013*** (0.005)	0.527*** (0.152)
GoingConcern	?	-0.022 (0.020)	-0.016 (0.013)	-0.412 (0.490)
LowRisk	?	0.009 (0.006)	0.006* (0.004)	0.126 (0.135)
InARL	?	-0.023*** (0.005)	-0.005 (0.003)	-0.572*** (0.130)
MaterialWeak	?	0.035*** (0.008)	0.008 (0.006)	0.755*** (0.155)
Big4	?	-0.080*** (0.015)	-0.010 (0.007)	-1.128 (0.723)
Constant	?	-0.050*** (0.054)	0.042* (0.039)	-3.571*** (1.328)
Robust Standard Errors R <sup>2</sup> or Pseudo R <sup>2</sup>		Included 25.43%	Included 85.16%	Included 17.83%

(continued on next page)

TABLE 6 (continued)

\*, \*\*, \*\*\* Indicate statistical significance at the 0.10, 0.05, or 0.01 levels, respectively, two-tailed except where a prediction has been made.

This table presents OLS and logistic regression results testing the association between reporting regulation and auditor market structure and specialization. The two dependent variables used in measuring auditor market concentration are Column (a) *Audit Firm Market Share*, measured as the number of audit clients for firm *i* divided by the number of audit clients for each organizational form of local government for year *t*, and Column (b) auditor *Concentration Ratio* for the top four firms by organizational form of local governments, also measured as the sum of the number of audit clients for the top four firms divided by the number of audit clients by form of local government for year *t*. *Specialist Auditor* (Column (c)) is a binary market measure dependent on firm *i* serving at least 5 percent of the state's local market for year *t*. The variables of interest include *Regulation*, an indicator variable representing the GAAP-regulated state and *Time*, a continuous measure (1–14) of changes in concentration (specialist use) over the 14-year sample period and the interaction of the two variables (*Regulation \* Time*). Model coefficients are presented followed by standard errors clustered at the government and year levels in parentheses. Other variables are described in Appendix A.

direct association between material weakness findings and auditor changes (*AuditorChange*) and audit report lags (*InARL*).

In Table 7, we also present OLS regression results on the relationship between audit report lag and disclosure regulation and auditor specialization measures. We find a significantly shorter reporting lag (*InARL*) in the GAAP-regulated (*Regulation*) state ( $p < 0.01$ ). Specialist use in the regulated state (*MichiganSpec*) is associated with significantly shorter reporting lags ( $p < 0.01$ ), but specialists in the unregulated state (*PennsylvaniaSpec*) are not significantly associated with shortened reporting lags.

County (*CountyGov*) and city governments (*CityGov*) have longer report lag, as larger governments may require greater audit effort. As expected, the variables *AuditorChange*, *GoingConcern*, and *MaterialWeak* are all associated with longer reporting lags. Surprisingly, use of a Big 4 auditor is significantly related to audit report lag ( $p < 0.01$ ).

Using a binary variable to measure late single audit reports (i.e., submitted more than nine months after year-end), we re-estimate Equation (4) using logistic regression. Overall, our findings are similar; however, the indicator variable for Pennsylvania counties post-GAAP requirement (*PACountyPost*) is negatively associated with late filings, providing evidence that GAAP enforcement improves the timeliness of reporting.<sup>26</sup>

### **Disclosure Regulation and Audit Engagement Pricing**

To test our third and fourth hypotheses, we develop a model (Equation (5)) of municipal audit fees with determinants used in previous studies (e.g., [Baber, Brooks, and Ricks 1987](#); [Rubin 1988](#); [Copley 1989](#); [Ward et al. 1994](#); [Hackenbrack et al. 2000](#); [Jensen and Payne 2005](#)). The empirical OLS model used to test H3 and H4 follows:

<sup>26</sup> In untabulated results, we estimate regression Models 1–4 separately for county governments and for local municipalities. Results are qualitatively similar for each type of government. We find regulation is significantly associated with greater concentration and use of specialist auditors, although the effect is more significant for municipalities. Measures of the effect of regulation and specialization on the reporting of material weaknesses and audit report lag are also qualitatively similar between forms of government.

TABLE 7

Regression Results for Tests of the Relation between Audit Quality Measures and Disclosure Regulation and Specialist Auditors (n = 4,425)

$$\begin{aligned}
 \text{Quality Measure} = & \alpha + \beta_1 \text{Regulation} + \beta_2 \text{MichiganSpec} + \beta_3 \text{PennsylvaniaSpec} + \beta_4 \text{InFedExp} \\
 & + \beta_5 \text{CountyGov} + \beta_6 \text{PACountyPost} + \beta_7 \text{CityGov} + \beta_8 \text{UrbanGov} \\
 & + \beta_9 \text{AuditorChange} + \beta_{10} \text{ReportType} + \beta_{11} \text{GoingConcern} + \beta_{12} \text{LowRisk} \\
 & + \beta_{13} \text{Big4} + \beta_{14} \text{QualityProxy} + \beta_{15} \text{YearIndicators} + \varepsilon
 \end{aligned}$$

Dependent Variable	Pred. Sign	(a)	Pred. Sign	(b)	(c)
		Material Weakness (Logistic)		Audit Report Lag (OLS)	Late Reports (Logistic)
Regulation	-	-0.444** (0.261)	-	-0.299*** <sup>a</sup> (0.047)	-1.511*** <sup>a</sup> (0.234)
MichiganSpec	+	0.707*** <sup>a</sup> (0.212)	-	-0.151*** <sup>a</sup> (0.031)	-0.994*** <sup>a</sup> (0.205)
PennsylvaniaSpec	+	0.719*** <sup>a</sup> (0.204)	-	-0.028 (0.045)	0.272 (0.228)
InFedExp	+	0.173** (0.079)	+	0.028** (0.014)	-0.080 (0.099)
CountyGov	+	0.490** (0.272)	+	0.158*** (0.044)	0.769*** (0.252)
PACountyPost	-	-0.374* (0.280)	-	0.003 (0.038)	-0.296** (0.187)
CityGov	?	0.206 (0.205)	?	0.085*** (0.033)	0.270 (0.188)
UrbanGov	?	0.042 (0.162)	?	-0.012 (0.029)	-0.256 (0.173)
AuditorChange	+	0.365* (0.268)	+	0.081*** (0.026)	0.336** (0.159)
ReportType	-	-0.823*** (0.137)	-	-0.065*** (0.027)	-0.411*** (0.142)
GoingConcern	+	0.691 (0.557)	+	0.246*** (0.085)	1.401*** (0.474)
LowRisk	-	-2.286*** (0.155)	-	-0.013 (0.025)	-0.319** (0.148)
Big4	?	-0.696 (0.441)	?	0.223*** (0.065)	0.922*** (0.359)
InARL	+	0.554*** (0.156)		- -	- -
MaterialWeak		-	+	0.109*** (0.032)	0.715*** (0.172)
Constant		-2.495* (1.473)		5.398*** (0.195)	1.192 (1.414)
Robust Standard Errors		Included		Included	Included
Year Indicators		Included		Included	Included
Pseudo or R <sup>2</sup>		28.01%		26.31%	25.43%
Test of equality of coefficients		$\chi^2 = 0.965^a$		$f < 0.034^a$	$\chi^2 = 0.054^a$

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TABLE 7 (continued)

\*, \*\*, \*\*\* Indicate statistical significance at the 0.10, 0.05, or 0.01 levels, respectively, two-tailed except where a prediction has been made.

<sup>a</sup> Test of equality of coefficients.

This table presents the results of the audit quality models. The dependent variables are two proxies for audit quality: auditor assessments of material weaknesses and audit report timing. Column (a) reports logistic regression results where material weakness reporting (binary variable = 1) is the dependent variable. Column (b) reports OLS results on the length of time (logged ARL) for an auditor to issue a report. Column (c) reports logistic regression results for audit reports submitted late (a binary variable where *LateReport* = 1 if the report was issued more than nine months after year-end). The main independent variables of interest are *Regulation*, a binary variable = 1 representing the disclosure-regulated state, and auditor specialization in each state (*MichiganSpec* and *PennsylvaniaSpec*) measured using the binary variable for audit firms serving at least 5 percent of the market. Model coefficients are presented followed by standard errors clustered at the government and year levels in parentheses.

Other variables are described in Appendix A.

$$\begin{aligned}
 \text{AuditFees}(\log)(\text{OLS}) = & \alpha + \beta_1 \text{Regulation} + \beta_2 \text{MichiganSpec} + \beta_3 \text{PennsylvaniaSpec} \\
 & + \beta_4 \text{InPopulation} + \beta_5 \text{InFedExp} + \beta_6 \text{CountyGov} + \beta_7 \text{CityGov} \\
 & + \beta_8 \text{UrbanGov} + \beta_9 \text{InternalAudit} + \beta_{10} \text{AuditComm} + \beta_{11} \text{AuditTenure} \\
 & + \beta_{12} \text{AuditorChange} + \beta_{13} \text{ReportType} + \beta_{14} \text{MaterialWeak} \\
 & + \beta_{15} \text{LowRisk} + \beta_{16} \text{InARL} + \beta_{17} \text{CPAFinOff} + \beta_{18} \text{BidsReceived} \\
 & + \beta_{19} \text{BidYear} + \varepsilon
 \end{aligned}
 \tag{5}$$

H3 predicts that disclosure regulation is associated with economies of scale, which would result in an inverse association between audit fees and *Regulation*. In H1 and H4, we predict that disclosure regulation increases demand for specialization, and specialist firms may be more likely to earn a fee premium. We test the effects of specialization in the two markets with the indicator variables *MichiganSpec* and *PennsylvaniaSpec*. In addition to using the binary measures of auditor specialization, to test whether specialists price differently, in further testing we also use an indicator variable to identify the top CPA firm (top two CPA firms) in each state. Control variables are described in Appendix A for brevity.

### **Descriptive Statistics Used in Hypothesis Testing**

Descriptive statistics for survey respondents are reported in Table 8 for the full sample of survey respondents, and are partitioned separately for respondents from Pennsylvania and Michigan, respectively. The univariate statistics indicate that logged audit fees (*InAuditFees*) and government size measured by population (*InPopulation*) are not significantly different between respondents in both states. Total federal expenditures (*InFedExp*) and reporting lags (*InARL*) are significantly higher in the unregulated state as is usage of an internal audit function. More audit bids (*BidsReceived*) are received in the regulated state, but overall auditor tenure (*AuditTenure*) is longer. Additionally, in the regulated state, more unqualified audit reports (*ReportType*) are issued, there are more *LowRisk* auditees, and the audit reports contain fewer material weaknesses (*MaterialWeak*). We reviewed a Pearson correlation matrix of the variables (omitted for brevity) and most correlation coefficients are similar in direction and statistical magnitude to those of prior studies that examine fee regression models in governmental audit research.

**TABLE 8**  
**Descriptive Statistics and Tests of Significance of Differences between Michigan and Pennsylvania for Survey and Single Audit Data Used in Testing Audit Fee Models (n = 122)**

Variable	Total Sample (n = 122)				Pennsylvania (n = 38)				Michigan (n = 84)				Test of Diff.	p-value
	Mean	Median	Std. Dev.	Mean	Median	Std. Dev.	Mean	Median	Std. Dev.	Mean	Median	Std. Dev.		
<b>Continuous Measures</b>														
AuditFees (dollars)	46,228	34,375	38,557	55,349	48,899	49,241	42,102	33,830	32,109	0.078				
InAuditFees	10.465	10.450	0.754	10.558	10.800	0.911	10.424	10.430	0.674	0.365				
InPopulation	10.033	9.970	1.467	10.251	10.610	1.731	9.934	9.950	1.329	0.271				
InFedExp	14.677	14.370	1.178	15.197	15.320	1.275	14.442	14.240	1.057	< 0.01				
BidsReceived	1.893	0.000	2.241	1.211	—	1.933	2.202	2.000	2.312	0.023				
InARL	5.219	5.200	0.294	5.407	5.560	0.297	5.135	5.160	0.252	< 0.01				
<b>Binary and Categorical Measures</b>														
Specialist Auditor (> 5% of market)	0.503	1.0	0.500	0.331	—	0.472	0.598	1.0	0.491	< 0.01				
Specialist Auditor (> 10% of market)	0.426	—	0.495	0.265	—	0.442	0.516	1.0	0.500	< 0.01				
CountyGov	0.361	—	0.482	0.447	—	0.503	0.321	—	0.470	0.183				
CityGov	0.402	—	0.492	0.184	—	0.393	0.500	—	0.503	< 0.01				
UrbanGov	0.582	1.0	0.495	0.579	1.0	0.500	0.583	1.0	0.496	0.964				
InternalAudit	0.180	—	0.386	0.395	—	0.495	0.083	—	0.278	< 0.01				
AuditComm	0.213	—	0.411	0.184	—	0.392	0.226	—	0.421	0.604				
AuditorChange	0.033	—	0.178	0.026	—	0.162	0.035	—	0.187	0.789				
MaterialWeak	0.393	—	0.491	0.579	1.0	0.500	0.310	—	0.465	< 0.01				
LowRisk	0.164	—	0.372	0.079	—	0.273	0.202	—	0.404	0.089				
CPAFinOff	0.254	—	0.437	0.157	—	0.369	0.298	—	0.460	0.102				
BidYear	0.328	—	0.471	0.236	—	0.431	0.369	—	0.485	0.152				
AuditTenure (Categorical)	3.114	3.0	1.449	2.868	3.0	1.491	3.226	3.5	1.426	$\chi^2 < 0.01$				
ReportType (Categorical)	3.951	4.0	0.217	3.868	4.0	0.343	3.988	4.0	0.109	$\chi^2 < 0.01$				

This table presents descriptive statistics for the sample of local governments responding to survey requests, as well as the subsamples of respondents partitioned by the state of local government origin. Table 8 presents summary statistics for the entire sample of survey respondents (n = 122) used in this study and also partitions the data between states (Pennsylvania n = 38 and Michigan n = 84) and presents univariate testing between the two states. Variable descriptions are included in Appendix A.

### **Regression Results for Tests of H3 and H4**

We report regression results in Table 9 using the binary measures of auditor specialization (*MichiganSpec* and *PennsylvaniaSpec*), and separate columns for measures based on the top firm and top two firms in each state. Significance levels are computed using White's (1980) correction for heteroscedasticity. The models are significant at  $p < 0.01$ , with model  $R^2$  values of approximately 83–84 percent. The explanatory power of the models is similar to other governmental audit fee research (e.g., Ward et al. 1994; Chase 1999). All variance inflation factors are below 4.0, indicating multicollinearity is not likely a problem.

The results indicate audit fees in the regulated environment (*Regulation*) are significantly lower (range  $p = 0.048$  through  $p = 0.078$ ) than fees in the unregulated environment, suggesting that regulated reporting and a concentrated market result in economies of scale, where fee discounts approximate 20 percent.<sup>27,28</sup> Auditor specialization carries a significant premium ( $p < 0.01$ ) of about 35 percent to those firms that can differentiate their services in a regulated market (*MichiganSpec*) and maintain market share. Similar returns are not found in the unregulated environment, suggesting that despite operating in an environment with higher overall fees, specialization strategies do not necessarily result in specialist fee premiums.<sup>29</sup>

Results for the control variables generally follow empirical predictions and results of previous studies. Longer auditor tenure (*AuditTenure*) is associated with higher audit fees. We find a significant positive coefficient for the type of audit report (*ReportType*) issued, indicating greater audit fees for unqualified opinions than for qualified opinions. Qualifications are common in governmental entities, and the issuance of a qualification may result in less audit effort.<sup>30</sup> Interestingly, measures of competition for an audit award (*BidsReceived* and *BidYear*) are not significant in any of the regression models.

In Table 9, Columns (b) and (c), we separately analyze the top two firms in each market.<sup>31</sup> In Michigan, the top two firms completed 41 percent of the engagements, while 26 percent of

<sup>27</sup> We follow Simon and Francis (1988) in calculating the percentage discount/premium for a binary variable through the following specification ( $e^a - 1$ ), where  $a$  denotes parameter estimates.

<sup>28</sup> As a robustness check, we examined whether differentials in auditor wages between states impact our results. Utilizing U.S. Census Bureau data (see, <https://www.census.gov/>) for Occupation Code 13-2011, "Accountants and Auditors," from 1997–2010, mean wages in Michigan and Pennsylvania were \$55,604 and \$53,771, respectively. Mean wages were marginally higher in Michigan during 1997–2004 and marginally higher in Pennsylvania for 2005–2010. The percentage difference in wages is significantly smaller than the percentage difference in audit fees, suggesting the difference in audit fees between the two states is not driven by salaries. As an additional test, we reviewed differences in overall audit fees for public companies reporting in the two states during 2001–2010. We found no state impact on audit fees after controlling for firm size (total assets) based on 2,413 firm year observations (704 Michigan; 1,709 Pennsylvania).

<sup>29</sup> To address the possibility of a joint effect of auditor industry specialization and client bargaining power impacting our results, in untabulated results, we included measures of client importance in our models. Corroborating several findings from Bandyopadhyay and Kao (2004), we found no significant effect of client influence on municipal audit fees.

<sup>30</sup> For example, many local governments continue to have difficulty implementing GASB 34, "Basic Financial Statements—and Management's Discussion and Analysis—for State and Local Governments." If infrastructure assets are not recorded, resulting in a qualification, less audit effort can be anticipated.

<sup>31</sup> To address the potential effects of office-level specialization, in untabulated results, we segregate the top two firms by office and perform multivariate testing and find no significant office-level effect.

**TABLE 9**

**OLS Regression Results for Tests of the Relation between Audit Pricing and Disclosure Regulation and Auditor Specialization (n = 122)**

$$\begin{aligned} \text{Log Audit Fees} = & \alpha + \beta_1 \text{Regulation} + \beta_2 \text{MichiganSpec} + \beta_3 \text{PennsylvaniaSpec} + \beta_4 \text{InPopulation} \\ & + \beta_5 \text{InFedExp} + \beta_6 \text{CountyGov} + \beta_7 \text{CityGov} + \beta_8 \text{UrbanGov} + \beta_9 \text{InternalAudit} \\ & + \beta_{10} \text{AuditComm} + \beta_{11} \text{AuditTenure} + \beta_{12} \text{AuditorChange} + \beta_{13} \text{ReportType} \\ & + \beta_{14} \text{MaterialWeak} + \beta_{15} \text{LowRisk} + \beta_{16} \text{InARL} + \beta_{17} \text{CPAFinOff} + \beta_{18} \text{BidsReceived} \\ & + \beta_{19} \text{BidYear} + \varepsilon \end{aligned}$$

<b>Dependent Variable Specialization Level</b>	<b>Pred. Sign</b>	<b>(a) Audit Fees &gt; 5% Market Share</b>	<b>(b) Audit Fees Top Firm</b>	<b>(c) Audit Fees Top Two Firms</b>
<i>Regulation</i>	–	–0.165* (0.115)	–0.200** (0.104)	–0.229** (0.113)
<i>MichiganSpec</i>	+	0.326*** (0.081)		
<i>MITopFirm</i>	+		0.430*** (0.078)	0.494*** (0.089)
<i>MISecondFirm</i>	+			0.132* (0.088)
<i>PennsylvaniaSpec</i>	?	0.081 (0.150)		
<i>PATopFirm</i>	?		–0.430** (0.198)	–0.388* (0.213)
<i>PASecondFirm</i>	?			0.114 (0.178)
<i>InPopulation</i>	+	0.328*** (0.038)	0.324*** (0.039)	0.314*** (0.039)
<i>InFedExp</i>	+	0.078** (0.042)	0.083** (0.043)	0.074** (0.043)
<i>CountyGov</i>	+	0.019 (0.125)	0.147 (0.127)	0.148 (0.128)
<i>CityGov</i>	+	0.298*** (0.108)	0.414*** (0.094)	0.396*** (0.098)
<i>UrbanGov</i>	+	0.151** (0.089)	0.113* (0.086)	0.102 (0.087)
<i>InternalAudit</i>	+	0.146* (0.101)	0.091 (0.098)	0.080 (0.099)
<i>AuditComm</i>	+	0.108 (0.085)	0.099 (0.083)	0.096 (0.082)
<i>AuditTenure</i>	+	0.058*** (0.026)	0.048** (0.026)	0.048** (0.026)
<i>AuditorChange</i>	–	0.059 (0.095)	–0.124* (0.094)	–0.103 (0.270)
<i>ReportType</i>	?	0.628** (0.319)	0.720*** (0.281)	0.738*** (0.285)

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TABLE 9 (continued)

Dependent Variable Specialization Level	Pred. Sign	(a) Audit Fees > 5% Market Share	(b) Audit Fees Top Firm	(c) Audit Fees Top Two Firms
<i>MaterialWeak</i>	+	0.166*** (0.066)	0.164*** (0.070)	0.152** (0.072)
<i>LowRisk</i>	–	–0.242*** (0.077)	–0.163** (0.082)	–0.165** (0.082)
<i>InARL</i>	+	0.199* (0.142)	0.198* (0.130)	0.215** (0.129)
<i>CPAFinOff</i>	?	0.019 (0.068)	0.047 (0.074)	0.051 (0.072)
<i>BidsReceived</i>	–	–0.011 (0.023)	0.012 (0.026)	0.011 (0.025)
<i>BidYear</i>	–	0.001 (0.023)	–0.003 (0.025)	–0.001 (0.024)
Constant		1.996 (1.718)	1.662 (1.421)	1.754 (1.477)
R <sup>2</sup>		82.68%	83.98%	84.29%
Prob > F		0.000	0.000	0.000

\*, \*\*, \*\*\* Indicate statistical significance at the 0.10, 0.05, or 0.01 levels, respectively, two-tailed except where a directional prediction has been made.

This table presents the results of the audit pricing model. The dependent variable in all OLS specifications is the log of fiscal year 2010 audit fees obtained through survey collection. The main independent variables of interest are *Regulation*, a binary variable = 1 representing the disclosure-regulated state, and *MichiganSpec* and *PennsylvaniaSpec*, binary variables representing specialist auditor use in each state. In Column (a), a market share of at least 5 percent is used to identify a specialist auditor. Columns (b) and (c) include indicator variables to identify audit pricing associations for the top producing specialist auditor firm (or top two audit firms) in each state. Model coefficients are presented followed by robust standard errors in parentheses. Other variables are described in Appendix A.

engagements were completed by the top two firms in Pennsylvania.<sup>32</sup> In Michigan, firm *MITopFirm* maintained the top spot as the leading firm for all but four of the sample years; firm *MISecndFirm* maintained the second spot for the same time period but was the top firm in the four years not held by *MITopFirm*. Pennsylvania is a bit more complex, with one firm maintaining steady market growth during 1997–2010. In 2010, two Pennsylvania firms were tied for the top market producer as measured by number of clients. Therefore, we assigned *PATopFirm* to the firm that audited the most federal expenditure dollars.

Using indicator variables representing the top audit firms in each market, the results indicate that in the regulated state, the top specialist (*MITopFirm*) earns a highly significant fee premium ( $p < 0.01$ ), while specialist *MISecndFirm* also earns a premium but it is not as significant ( $p = 0.07$ ). In Pennsylvania, specialist *PATopFirm* receives significantly lower fees ( $p < 0.10$ ), while no significant effect is found for specialist *PASecndFirm*.

Although we find evidence of lower fees associated with the disclosure-regulated state, we find evidence of a fee premium associated with auditor specialization. The effect is strongest for the auditing firm with the largest market share and that has also been the industry leader for an

<sup>32</sup> After the top two firms in Pennsylvania, there is a drop in market shares of subsequent firms and it becomes difficult to identify additional specialists operating in the state.



extensive period of time. This result suggests that in a regulated setting, the contracting incentives between auditees and auditors is impacted by regulation, generating value and demand for reporting expertise that appears to be priced based upon market positioning.

In the unregulated disclosure state, specialization is associated with fee discounting by one of the specialist firms. This finding indicates that specialization may not be valued to the same extent as it is with disclosure regulation and therefore, a firm seeking a growth strategy within this industry must do so through fee discounting, and the market structure found in the unregulated setting makes such a competitive strategy conducive.

The audit fee results are based on a comparatively small sample of survey respondents from each state for one year, and therefore should be interpreted cautiously. However, the results for this sample support differences in overall pricing and specialist pricing in the regulated state compared to the unregulated state.

## VII. CONCLUSIONS AND LIMITATIONS

Our study explores the consequences of statutory GAAP disclosure mandates on the structure of governmental auditing markets, audit quality, and audit pricing. We draw a sample of single audits from two states—Michigan, which has required local governments follow GAAP for at least 50 years, and Pennsylvania, which has voluntary disclosure (non-GAAP). We find an association between a comprehensive GAAP disclosure mandate and auditor concentration and specialist auditor use. These findings are further supported by the effects of a policy change requiring GAAP reporting for Pennsylvanian county governments.

Using the reporting of material weaknesses and audit report timing as proxies for reporting and audit quality, we find evidence of higher quality based on fewer reported material weaknesses and shorter report lags and a comprehensive GAAP mandate. Interestingly, we find that specialist auditors detect and report greater levels of material weaknesses in single audits, regardless of state disclosure policy, a finding highlighting conclusions of the PCIE that audit firm experience and training are determinants of single audit quality. Despite more detection of material weaknesses by specialists, we find that shorter audit report lags are only associated with specialists in a GAAP state, evidencing the underlying auditing incentives and efficiencies present with enforcement of a comprehensive GAAP policy.

Using a small sample of survey data for the two states for one year, we find lower overall audit fees associated with the GAAP state, evidence indicative of economies of scale. Auditor specialization has been viewed as rational economic behavior on the part of a CPA firm, but the extent of auditor specialization varies between markets. Our results suggest that demand for auditor type is related to state-level reporting regulation. Additionally, we find that specialist auditors may price their expertise dependent upon a function of both the demand for specialist services driven through disclosure regulation, and also through their own positioning within a given market. More specifically, our results indicate that specialization is associated with varying levels of fee premiums between the top specialist firms within the GAAP markets. In the unregulated state, we find evidence of fee discounting associated with the market leader, suggesting that in the absence of disclosure regulation, specialist firms may compete on pricing rather than the value added in their services.

The results are based on findings from two states, and other characteristics of the two states such as differences in legal liability, enforcement actions against auditors, or other differences in the audit markets might explain the observed differences in auditor concentration, reporting of material weaknesses, and report timing. Our findings provide

evidence on the effects of state-level GAAP regulations on audit markets and the findings may be of interest to governmental regulators and standard setters. GAAP regulations have traditionally been viewed as administratively costly for local governments to implement, with little perceived value. We find that with GAAP regulations, benefits such as an overall stronger reporting environment may develop, including enhancements in quality while also facilitating audit efficiencies and the use of premium specialist auditors.

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**APPENDIX A**  
**Variable Descriptions and Source**

Variable	Description	Source
<b>Dependent and Test Variables</b>		
<i>Audit Firm Market Share</i>	A continuous measure calculated based upon the number of audit clients submitted by a firm divided by the number of single audits in the state's local audit market for a year. The measure is also presented and calculated separately by each government form.	Single Audit
<i>Concentration Ratio</i>	A continuous measure of the market size served by the top four, two, and one audit firm(s) in a state's local market for a year. Calculated using the number of audits submitted by the top <i>n</i> audit firms divided by the number of audits in the state's local audit market for a year. The measure is also presented and calculated separately by each government form.	Single Audit
<i>MaterialWeak</i>	An indicator variable equal to 1 if the government disclosed a material weakness in its A-133 financial statement, else 0.	Single Audit
<i>InARL</i>	Log transformed days between the government's fiscal year-end and the date the audit report was signed. Reports submitted greater than nine months after year-end are identified as <i>LateReport</i> .	Single Audit
<i>InAuditFees</i>	Log transformed sum of all 2010 audit fees paid by a government for auditing services (exclusive of any consulting charges).	Survey
<i>Regulation</i>	An indicator variable = 1 if the government is located in Michigan (GAAP) and = 0 if the local government is located in Pennsylvania (non-GAAP).	Single Audit
<i>Specialist Auditor</i>	A binary variable = 1 if the firm audits at least 5 percent or 10 percent of the A-133 audit market in a respective state in a given year.	Single Audit
<i>MichiganSpec</i>	A binary variable = 1 if the firm audits at least 5 percent or 10 percent of the A-133 audit market in Michigan in a given year.	Single Audit
<i>PennsylvaniaSpec</i>	A binary variable = 1 if the firm audits at least 5 percent or 10 percent of the A-133 audit market in Pennsylvania in a given year.	Single Audit
<i>MI (PA) Top (Second) Firm Time</i>	A binary variable = 1 if a firm submits the top (second) number of audit reports in Michigan (Pennsylvania) in a given year. A continuous measure (1–14) representing a year 1997–2010 in the time series.	Single Audit Single Audit
<b>Control Variables</b>		
<i>InPopulation</i>	Log transformed measure representing the overall size and services demanded of a government's tax base.	Survey
<i>InFedExp</i>	Log transformed sum of all federal funds required to be audited under OMB A-133.	Single Audit
<i>CountyGov</i>	An indicator variable = 1 if the government is a county form, else 0.	Single Audit

*(continued on next page)*

## APPENDIX A (continued)

Variable	Description	Source
<i>PACountyPost</i>	An indicator variable = 1 if the government is a county and is located in Pennsylvania and the audit year is after GAAP adoption (i.e., 2005 or later).	Single Audit
<i>CityGov</i>	An indicator variable = 1 if the government takes the city form, else 0.	Single Audit
<i>UrbanGov</i>	An indicator variable = 1 if the government is situated in a county classified as urban by the Office of Management and Budget (OMB).	OMB
<i>AuditTenure</i>	A categorical variable where 1 = (tenure one to three years) to 6 (tenure longer than 15 years).	Survey
<i>AuditorChange</i>	An indicator variable = 1 if the government engaged a new audit firm, else 0.	Single Audit
<i>ReportType</i>	A categorical variable where 1 = Adverse Opinion, 2 = Disclaimer, 3 = Qualified Opinion, and 4 = Unqualified Opinion.	Single Audit
<i>GoingConcern</i>	An indicator variable = 1 if the audit opinion includes a going concern modification.	Single Audit
<i>LowRisk</i>	An indicator variable = 1 if the A-133 audit was performed as a low-risk audit, else 0.	Single Audit
<i>Big4</i>	An indicator variable = 1 if the government engaged a Big N independent auditor.	Single Audit
<i>InternalAudit</i>	An indicator variable = 1 if the government has an internal audit function, else 0.	Survey
<i>AuditComm</i>	An indicator variable = 1 if the government has an audit committee, else 0.	Survey
<i>CPAFinOff</i>	An indicator variable = 1 if the government's finance officer is a CPA, else 0.	Survey
<i>BidsReceived</i>	The number of bids a government received in its recent auditor requisitioning.	Survey
<i>BidYear</i>	An indicator variable = 1 if 2010 is included in a multi-year fee arrangement.	Survey