Accounting Choices and Capital Allocation: Evidence from Large Private U.S. Firms*

Petro Lisowsky
University of Illinois at Urbana-Champaign and
Norwegian Center for Taxation
lisowsky@illinois.edu

Michael Minnis+
University of Chicago Booth School of Business
michael.minnis@chicagobooth.edu

First draft: August 2013
This draft: December 2016

The online appendix is available at the end of this manuscript.

* We thank Mary Barth (Editor), Philip Berger, Michael Donohoe, Merle Erickson, Nemit Shroff, Doug Skinner, Ross Watts, Joe Weber, Teri Yohn, two anonymous reviewers, and participants at the University of Illinois at Urbana-Champaign, University of Illinois at Chicago, University of Michigan, University of Missouri, Penn State, Michigan State, and Yale University workshops, the University of Chicago Booth Accounting brownbag, the FASB/PCC Summer 2014 meeting, the 2014 University of Minnesota Empirical Conference, the 2014 American Accounting Association Annual Meeting, and the 2014 FARS conference for comments. This paper was previously titled, "Financial Reporting Choices of U.S. Private Firms: Large-Sample Analysis of GAAP and Audit Use" and "Which Private Firms Follow GAAP and Why?" Confidential tax return information was provided to Lisowsky by the Internal Revenue Service (IRS) Large Business & International (LB&I) Planning, Analysis, Inventory, and Research Division (PAIR). Because tax data are confidential and protected by data non-disclosure agreements under the Internal Revenue Code, all statistics are presented in the aggregate so that no specific taxpayer can be identified from this manuscript. Any opinions are those of the authors and do not necessarily reflect the views of the IRS. Lisowsky gratefully acknowledges support from the MIT Sloan School of Management, as well as the PricewaterhouseCoopers Faculty Fellowship and the Professor Ken Perry Faculty Fellowship at the University of Illinois at Urbana-Champaign. Minnis gratefully acknowledges support from the ARAMARK Faculty Research Fund at the University of Chicago Booth School of Business.
+ Corresponding author. 773.834.5965.

Accounting Choices and Capital Allocation: Evidence from Large Private U.S. Firms

Abstract

We provide new evidence on the relation between capital allocation and firms' accounting choices. Using confidential data on the production of audited GAAP financial statements by large privately held U.S. firms, we focus on an economically important setting that controls approximately $10 trillion of capital, but is not subject to financial reporting mandates. Our main findings are threefold. First, we find the majority of firms (over 60%) do *not* produce audited GAAP financial statements, which publicly held firms are mandated to produce. Second, in contrast to prior literature focusing on debt contracting in the setting of private firms, the evidence reveals that capital allocated via equity and trade credit is more strongly related to the decision to produce audited GAAP financial statements compared to debt. Third, exploiting variation across firm, industry, and time, we find characteristics such as growth opportunities, firm youth, and the presence of intangibles are positively related to audited GAAP statements. Our findings have implications for the future use of accounting as the economy shifts to firms with softer assets and fewer firms turn to public equity markets for capital.

Keywords: audit; private firms; accounting choice; financial reporting; capital formation
JEL codes: M41; M44; M49

I. INTRODUCTION

Most of our understanding about the use of accounting to allocate capital comes from one of two sources: U.S. small businesses and firms with a public financial reporting mandate.[1] However, the inferences from these settings may not generalize to *larger* firms *without* public reporting mandates because distinguishable economic forces affect these firms' accounting decisions differently. Findings from U.S. small businesses are likely not representative of the accounting choices of larger private firms because both the costs and benefits of financial reporting differ across the settings. For example, economies of scale relating to financial reporting and auditing substantially decrease the relative cost of financial reporting for large firms, while less separation between management and ownership, smaller amounts of externally supplied capital, and alternative information sources and mechanisms (e.g., small business credit scoring and relationship lending) reduce the benefits of preparing audited financial reports for small firms.

Likewise, firms with financial reporting mandates—such as most European public and private firms and registrants with the U.S. Securities and Exchange Commission—have less discretion over their accounting decisions, such as their choice of financial reporting standards or whether to purchase an audit. Furthermore, the role of financial reports may be altered for firms with publicly traded shares of stock as investors have financial incentives to gather private information, altering the role of financial reports in public firms (Ball and Shivakumar 2008; Ball et al. 2008). Our study extends prior research by examining the role of financial reporting decisions on capital allocation in larger privately held U.S. firms.

While little is known about the financial reporting of larger private U.S. firms, this lack

[1] Research on U.S. small businesses includes Allee and Yohn (2009), AICPA (1976, 2013), Blackwell et al. (1998), Cassar et al. (2015), Minnis (2011), and Minnis and Sutherland (2016). Research on private firms with public reporting mandates includes Ball and Shivakumar (2005), Badertscher et al. (2013), Dedman et al. (2013), Lennox and Pittman (2011), Burgstahler et al. (2006), Hope et al. (2011), and Kausar et al. (2016). For more general reviews of the literature on the accounting choices of private firms, see Botosan et al. (2006) and Bradshaw et al. (2014).

of knowledge is not because of insignificant economic magnitude. With the exception of the extreme largest firms in the economy, we find that private firms are more numerous than public firms across the entire size distribution of firms. Moreover, while private firms account for 50 percent of non-governmental GDP in the U.S. (Allee and Yohn 2009; Minnis 2011), the majority of this activity is not derived from small businesses, but rather larger private firms. For example, firms with less than $1 million in receipts (which are 90 percent of the commonly used Survey on Small Business Finances data set) collect less than 5 percent of total receipts in the economy (U.S. Census Bureau, Statistics of U.S. Businesses). By contrast, the average private firm in our study has more than $70 million in revenue, and collectively these firms control $10 trillion in capital.[2] Ultimately, little is known about the accounting choices made by such economically substantive private firms (Bradshaw et al. 2014).

To understand the economic forces shaping accounting choices in the setting of larger private firms and how these choices are related to capital allocation, we use a comprehensive panel data set of U.S. tax returns for all such firms with at least $10 million in assets over the years 2008 to 2010. Specifically, the Schedule M-3 reports each firm's *financial* accounting standard (i.e., Generally Accepted Accounting Principles [GAAP], International Financial Reporting Standards [IFRS], tax basis, other), as well as whether the firm's financial statements were audited. The advantage of using tax returns is not only can we observe firms' *financial* accounting choices, we can also measure firm-level characteristics (e.g., revenue) using a consistent basis of accounting (i.e., tax) across all firms that does not confound our inferences. As important, we have a sufficient time-series to exploit not only firm-level cross-sectional variation, but also changes within a firm over time, as well as variation across industries.

Our results reveal several important findings. First, we find that only 37% of larger pri-

[2] Eliminating entities with foreign ownership reduces the amount of capital controlled to approximately $7 trillion.

vate firms produce audited GAAP financial statements, the same standard used by comparably sized publicly held firms.[3] Even after conditioning on firms having both external debt and ownership dispersion, the audited GAAP rate increases to only 40%. Thus, the production of audited GAAP statements is far from a necessary condition for capital allocation. Many firms with millions of dollars in external debt do not produce audited GAAP statements, while many smaller, single owner firms with no debt do.

Second, while much of the literature examining private firm accounting focuses on debt contracting implications of financial reporting, we find *equity* and *trade credit* are more highly related to a firm's accounting choice. For example, in the cross-section we find that ownership dispersion and accounts payable have more explanatory power for audited GAAP financial statements than does debt. In addition, we exploit the panel structure of our data and find that firms increasing ownership dispersion have a significantly higher likelihood of beginning the production of audited GAAP statements, but we do not find this same relation with changes in debt—in either the intensive or extensive margins. This result suggests that verified financial accounting information is particularly important for equity capital allocation in private firms for both stewardship and valuation roles, but less so for debt contracting. These findings suggest the results from the small business literature that alternative mechanisms to financial reporting, such as relationship banking and collateral (Berger and Udell 2006; Cassar et al. 2015), hold for even large private firms; however, they contrast with findings from the setting of comparably sized public firms that the debt market drives financial reporting (e.g., Ball et al. 2008). These results also contrast with the view that takes as "given that lenders [are] the main users of private com-

[3] We view accounting choices along a continuum, going from firms which neither follow GAAP nor receive an audit, to firms indicating that they follow GAAP but do not receive an audit, to firms which follow GAAP and receive an audit. For parsimony, most of the results discussed in this paper compare firms with audited GAAP financial statements to those that do not because we find that the results are similar to a more explicit evaluation of the continuum of accounting choices. Please see the discussion in Section IV and the online appendix for additional results.

pany financial statements" (Bradshaw et al. 2014, p. 183). Finally, the findings support recent research that trade credit plays a particularly important role in shaping accounting choices (e.g., Costello 2014).

Third, in contrast to studies on public firms suggesting that financial statements are less relevant for knowledge-based, intangibles-based, growth opportunity firms (e.g., Lev and Gu 2016), our results suggest the opposite. We find young, high-growth firms in knowledge-based industries with intangible assets are *more* likely to produce audited GAAP financial statements; whereas firms with physical capital are *less* likely to have audited GAAP statements. That is, firms with growth opportunities—as opposed to assets-in-place—appear to find audited GAAP statements most net beneficial. This result highlights a potential issue if one generalizes results from firms with public stock prices to private firms. While growth opportunities and soft assets (such as human capital, software, R&D, etc.) may lead to less informative financial statements in the presence of speculators with incentives to gather private information (e.g., Grossman 1976), our findings suggest that audited GAAP financial statements play a particularly important role when such channels do not exist. Equity investors in private firms generally benefit less from collecting timely, private, firm-specific information, but at the same time they must monitor the performance of their investments. In firms with less physical assets to observe, our results suggest highly verified and standardized financial reports become more important and informative mechanisms for capital allocation.

Finally, while we have a very limited time series during a specific period (2008 to 2010), we provide an initial assessment of the population use of audited GAAP statements over time. We find no evidence that the use of accounting has declined over the period of our study, in contrast to regulatory assertions and findings in alternative settings (FAF 2011; Dedman et al. 2013).

Indeed, we find that the market share of audited GAAP statements has slightly increased. While we caution that any inferences about trends should be tempered given our limited data, this is the first evidence of which we are aware that attempts to measure the actual use of accounting by private U.S. firms over time and may serve as a useful baseline for future research.

Collectively, our study provides new evidence to accounting researchers and standard setters on which private firms produce audited GAAP financial statements and how this choice relates to capital allocation. Identifying these firms in the absence of a government mandate reveals the economic equilibrium of when the benefit of verified accounting information exceeds its cost in facilitating capital allocation in the economy. Moreover, it furthers our understanding of when regulatory mandates on the production of GAAP accounting and auditing shift some portion of firms from their optimal level of accounting production.

Understanding which factors are related to the net benefit of accounting is also important because standard setters are altering the accounting landscape for private firms. The Financial Accounting Foundation (FAF) established a new board in 2012 that proposes alternatives to GAAP for privately held firms, while the American Institute of Certified Public Accountants (AICPA) recently initiated a competing set of accounting standards for private firms. However, our current understanding of accounting use by private firms is based mostly on stated preference surveys which can be prone to error and bias (e.g., FAF 2011), or datasets of small businesses that omit larger firms that generate a substantial portion of the U.S. economic activity and are more likely to benefit from the use of GAAP (e.g., Allee and Yohn 2009).[4] At least two recent academic reviews commissioned by the American Accounting Association recognize the current lack of evidence about private firms' use of accounting (Botosan et al. 2006 and Bradshaw et al.

[4] See Esplin, Jamal, and Sunder (2015) for survey evidence from the field. Also, Zimmerman (2015, 498) notes that, "To date, there is no largescale systematic evidence regarding whether audited financial reports are more or less important in valuing twenty-first century [firms]."

2014), yet this lack of data has not prevented strong opinions from developing.[5]

Our paper contributes to the literature by providing new evidence about the equilibrium level of accounting in the U.S. economy in a setting with no government mandates. We build directly on prior literature, particularly Blackwell et al. (1998), Allee and Yohn (2009), Minnis (2011), Dedman et al. (2013), and Kausar et al. (2016). Our primary contribution relative to these papers is threefold. First, we focus on much larger private U.S. firms. Firm size in Allee and Yohn (2009), Dedman et al. (2013), and Kausar et al. (2016) are upper bound constrained by design, and most firms in those studies are very small and lack the scale or complexity of larger firms. In contrast, our study has a lower bound on firm size (at least $10 million in assets), so while our paper is also not an unbiased sample of all private firms, our estimates suggest that a majority of the private firm assets and activity in the economy are controlled by the larger firms in our setting that have not been previously examined. Moreover, medium-to-large private firms are much more similar to the commonly examined setting of public firms that face a mandate to produce audited GAAP reports.

Second, conditional on firms having at least $10 million in assets, our study encompasses the *population* of tax filing firms in the U.S., allowing us to provide population estimates unconstrained by major sample selection concerns. Finally, the panel structure of our data permits us to examine how firm characteristics co-vary with changes in their accounting choices, which is not possible with the one year of cross sectional data used in Allee and Yohn (2009) and avoids selection bias concerns in the data from Minnis (2011).[6] In sum, our study extends prior literature

[5] For example, Billy Atkinson, Chair of the Private Company Council directly suggested that, "GAAP is broken as it relates to private companies" (AICPA 2010); and Robert Herz, former chairman of the FASB stated, "[Private company accounting is] a very important, long-standing, controversial, and challenging issue in U.S. accounting standard setting and financial reporting" (Herz 2013).

[6] The Sageworks data used in Minnis (2011) has selection bias concerns in that most of the data is supplied by accounting firms; therefore, firms that terminate their relation with their accounting firm drop out of the sample. Moreover, that sample excludes firms using larger accounting firms, therefore effectively truncating on firm size.

by examining larger firms in a panel dataset explicitly omitted from previously used datasets, and for whom the cost-benefit trade-off of generating audited GAAP financial statements is likely significantly different than small businesses or publicly traded firms.

We note that our paper is primarily descriptive. The equilibrium use of accounting is dictated by a cost-benefit tradeoff. The variables in our study inevitably factor into both the cost and benefit sides of financial reporting decisions and we do not separately identify the costs from benefits. Instead, we focus on providing broad evidence of the incidence of accounting in the U.S. private firm economy. As such, our goal is not directly focused on providing causal factors in financial statement production *per se*, but rather identification of which firms produce audited GAAP reports and their associated characteristics. Furthermore, our study serves to reinforce the economic magnitude of this setting—it is important to know when and why larger firms use accounting. These results also provide an important baseline with respect to recent regulatory initiatives to alter the accounting landscape for private firms. As Zimmerman (2015, 2016) highlights, the changing economics of private firms suggests that the accounting landscape will also change. As more firms in the economy are driven by intangible, knowledge-based assets and are more frequently funded through private, rather than public, market channels (Zingales 2000), our findings suggest that accounting choices will play an increasingly important role.

II. MOTIVATION AND PRIOR RESEARCH

Privately held U.S. firms select the type of financial reporting along two dimensions: accounting standards and assurance level. GAAP is the set of standards publicly held U.S. firms are required to follow; however, alternative rules including tax (rules set by the IRS), cash (measuring the amount of cash paid and collected during the period), IFRS (rules set by the International Accounting Standards Board), statutory (rules specific to insurance companies), various hybrid

methods, and others are available to private U.S. firms. The second dimension is whether to have the financial statements audited by an independent accountant.[7] Technically, these two dimensions are independent choices. That is, any basis of accounting recognized as having a standard set of rules can be audited. Likewise, firms can compile their financial reports according to any accounting basis without an audit. Because privately held U.S. firms face no public reporting or audit requirements, the choices they make along either dimension are the result of market forces dictating the supply and demand for financial reports and their characteristics.[8]

Jensen and Meckling (1976, 338) motivate a role for financial statements within an agency framework and state that "it would pay [the manager] to agree in advance to incur the cost of providing such reports and to have their accuracy testified to by an independent outside auditor." Watts (1977) and Watts and Zimmerman (1978) apply this framework and derive multiple hypotheses for the production of financial statements and auditing. Their fundamental prediction is that financial statement production is an increasing function of agency costs, i.e., it increases in (outside) equity owners, lenders, and suppliers subject to the costs of production. Therefore, economic theory suggests that firms will generate audited GAAP financial statements even in the absence of regulatory mandates, but *the extent* and *conditions* under which firms actually prepare audited GAAP statements are the key empirical questions that we examine.

Ours is not the first study to empirically assess the equilibrium outcome of market forces on accounting decisions in the U.S.[9] Initial analyses examine public firms' financial reporting practices prior to the passage of the 1933 Securities Act and 1934 Securities Exchange Act,

[7] An audit is the highest level of assurance that an independent accountant can provide. Other report types include reviews (which provide negative assurance) and compilations (which provide no assurance regarding the financial report). The tax forms we analyze do not collect information on reviews or compilations.

[8] See Benston (1985), Botosan et al. (2006), and Kothari et al. (2010) and references therein for more details.

[9] Ours is also not the first study to suggest that economic forces create accounting differences for public and private firms. Focusing on characteristics such as conservatism and earnings management, Ball and Shivakumar (2005), Burgstahler et al. (2006) and Hope et al. (2013) all find reporting differences between public and private firms, reinforcing that inferences from public firms may not generalize to private firms.

which established the Securities and Exchange Commission (e.g., Benston 1969; Chow 1982; Barton and Waymire 2004).[10] More recent studies take an explicit interest in examining the accounting choices of private firms by using surveys and accessing new datasets. Blackwell et al. (1998) randomly select 212 revolving loan agreements from two bank holding companies and study the extent of independent auditor involvement in the financial statements collected by the banks. They find that 37% of the financial statements collected by the banks are audited. Minnis (2011) uses a larger dataset of private firms collected from accounting firms by Sageworks, Inc., and finds that just under 25% of firms receive financial statement audits. However, his study explicitly selects firms that follow accrual basis accounting and so does not analyze the accounting basis decision *per se*. Moreover, because the Sageworks dataset is derived primarily from accounting firms, the level of accounting use is not an unbiased estimator for the population. Finally, these studies exclusively take a debt contracting perspective and ignore potential links to other types of capital, such as trade credit or equity, or the role of intangibles.

Most closely related to our paper, Allee and Yohn (2009) use the 2003 Survey of Small Business Finance (SSBF) to provide one of the first systematic studies on the accounting choices of small private businesses in the U.S. In order to generate data for the SSBF, the U.S. Federal Reserve conducted phone interviews with owners and managers about their firms' finances. The survey asked the respondent what documents were used to answer the survey questions, including financial statements, and whether the financial statements followed an accrual basis and were audited, conditional on the documents being used to answer questions for the survey.[11] The firms

[10] Watts and Zimmerman (1983) take an even broader historical lens and find evidence of the existence of auditing in 13th century English merchant guilds.

[11] Unfortunately, the SSBF survey question does not ask what type of financial statements the firms actually produce or whether they are audited; instead it asks what records the survey respondent used to answer the survey questions. Specifically, the survey asks the respondent, "Do you have records available to help you answer questions about the firm's income, expenses, and balance sheet, such as tax records, statements, worksheets, or any other records?" The follow-up question is "What records are you using?" It is unclear whether the question refers to the records being

included in the study are small by design, given the objective and title of the survey, with the average firm reporting assets of approximately $350,000. In a key finding relevant to our study, Allee and Yohn (2009) find that 80% of the small business respondents report that they do not use *any* financial statements. Of the 20% of the sample that uses financial statements, only 27% have those statements audited, while 49% follow accrual accounting, which could encompass any number of non-cash basis accounting approaches such as GAAP, tax, IFRS, or other hybrid methods. Moreover, because Allee and Yohn (2009) are restricted to a small sample of firms using financial statements, the power to generate significant inferences is limited (e.g., see their Table 6). The one year of SSBF data also prevent the authors from exploiting differences across industries or examining firms' decisions to change their accounting choices. Nevertheless, while the SSBF sample is small and contains only one year of data, Allee and Yohn (2009) provide the literature with an important first assessment of accounting practices for small U.S. private firms.

More recently, Minnis and Sutherland (2016) examine a proprietary dataset of monitoring activity from 35 U.S. banks and approximately 4,500 small commercial loans to examine the frequency with which banks request financial statements from their borrowers. They find that while financial statements are the single most frequently requested document by banks, they are requested for only half of the loans, complementing evidence in Allee and Yohn (2009) and Cassar et al. (2015) that financial statements are not a necessary condition for small firm debt financing. Again, firms in these studies are small and the authors caution against generalizing inferences to larger firms. In addition, there is no relative examination of debt to other capital (e.g., equity or trade credit). Policy oriented studies (e.g., Abdel-khalik 1983) use survey approaches,

used to answer the survey, or the records being used in the business itself. Allee and Yohn (2009) report that of the 4,004 firms responding, 790 responded as using financial statements, but 1,682 responded as having used memory. Therefore, it is uncertain whether the findings in Allee and Yohn (2009) refer to the actual production of financial statements, or simply the use of financial statements in answering the SSBF survey.

focusing on preferences for financial reporting rather than the type of reporting produced by firms. These studies generally report that capital providers prefer GAAP basis financial reports.

Non-U.S. settings also provide an opportunity to investigate the accounting practices of private firms. Dedman et al. (2013) find that small U.K. firms (i.e., assets of £2.8 million or less) are more likely to voluntarily continue receiving audits after the audit mandate was lifted in 2004 if they exhibit greater agency costs, risk, and desire to raise capital. Lennox and Pittman (2011) find that those small U.K. firms that maintain an audit obtain higher credit ratings. Kausar et al. (2016) use the U.K. setting to highlight a signaling role of a voluntary audit. Hope et al. (2011) report that firms perceive lower financing constraints with higher levels of financial statement verification. These studies have advanced our understanding of the role of an audit, but are generally limited to smaller firms with differing mandates regarding accounting and disclosure rules (for both public *and* private firms) relative to the U.S. In particular, the U.K. setting initially required small private firms to obtain an audit, while U.S. private firms, no matter the size, never had such a mandate. In addition, all U.K. firms—public or private—must file financial reports under mandated accounting rules, while the U.S. setting has no such mandate. As a result, the cost-benefit trade-off of financial reporting decisions is likely different between the U.S. and U.K. settings, so the results may not be comparable.

An additional crucial difference between our study and previous studies is the nature of the setting. Specifically, while large private U.S. firms are similar to the more commonly studied small businesses in the U.S. in that they lack an accounting mandate, they are in many ways more similar to public firms in terms of size, economics, and organizational complexity. Because the economics, agency, capital allocation, and financial reporting issues are different between small businesses, larger private firms, and public firms, examining the large U.S. private firm

setting adds to our understanding of how firms make their accounting choices.

There is also a lack of understanding in the literature regarding the economic size of private firms and the setting. Prior research has typically omitted larger private U.S. firms because they are not frequently included in data sets, leading to imprecise conclusions. For example, Asker et al. (2011) is cited for providing descriptive evidence on the characteristics of private firms.[12] Unfortunately, the data set used in that paper (Sageworks) does not include most of the largest private firms, which leads to the false impression that all private firms are typically small and cannot be readily compared to public firms in the U.S. However, we find three times as many firms in the U.S. with more than $100 million in revenues that are private compared to the number of similarly sized firms in the U.S. that are public. Moreover, the majority of private U.S. firm economic activity is not in small businesses, but in larger firms omitted from typical analyses. For example, while 91% of firms in the SSBF data have less than 20 employees, firms of this size pay only about 14% of overall wages (Bureau of Labor Statistics). Second, the legal formation and economic substance of small firms is also substantially different from larger private firms. For example, 45% of SSBF firms are sole proprietorships (i.e., not separate legal entities from their sole owners) and 90% have less than $1 million in assets (in fact, nearly one-third of the firms have less than $25,000 in assets). As such, it is unclear to what extent agency-related issues, such as separation of ownership and control, generalize to more complex firms, which have more substantive legal formation issues, broader dispersion of ownership, and more complex capital considerations.[13] In sum, larger private U.S. firms do not face financial reporting mandates, but they also have complex capital allocation issues.

[12] For an example of a paper that relies on Asker et al. (2011), see Bradshaw et al. (2014, p. 185).
[13] Although studying small, entrepreneurial firms is important for a variety of reasons, our point is simply that "private firms" include not only small businesses, but also large, complex organizations with significant agency concerns and external capital demands which are typically omitted from previously used data sets.

III. DATA

Our study relies on panel data from the population of private U.S. firms with at least $10 million in assets. These data are sourced from Schedule M-3 of the U.S. federal income tax returns of Subchapter C corporations (Form 1120), Subchapter S corporations (Form 1120S), and partnerships (Form 1065). Since 2004, Schedule M-3 has required companies with assets of $10 million or more to disclose to the IRS a detailed reconciliation from financial to taxable income known as book-tax differences. It has also required firms to disclose whether the financial statements have been audited by an independent accountant. In 2008, the IRS further required firms to report on Schedule M-3 which set of accounting standards they use for financial reporting. Thus, this latter disclosure allows the IRS to understand firms' starting point for financial reporting—whether GAAP, IFRS, tax basis, statutory, or other, and whether the financials have been audited—to then better evaluate where, how, and why differences arise between financial and tax reporting for purposes of the reconciliation. We use these Schedule M-3 disclosures to identify whether a firm undergoes a financial statement audit and what set of accounting standards it follows for financial reporting (see Figure 1 for the first page of the 2010 Schedule M-3). We take several steps to ensure the validity of the data, including both internal and external validity checks (see online appendix A for a discussion).

For the purposes of this study, the IRS has generously provided access to one of the authors all Schedules M-3 for entity type filers of Forms 1120, 1120S, and 1065 for fiscal years 2008 to 2010 at the consolidated U.S. parent level. By definition, because filers of Schedule M-3 report assets of $10 million or more, our sample begins with medium-to-large firms in the population; there are no IRS disclosure requirements on financial statement audits or GAAP usage for firms with assets less than $10 million. Despite this truncation, Table 1 reports that the initial da-

taset provides 644,426 firm-year observations across all three entity types. Because this initial sample includes both public and private firms, we drop 14,350 publicly traded firm-years. Next, we remove (1) financial firms (NAICS code 52) because their accounting and audit choices are affected by regulation and (2) real estate and management firms (NAICS codes 53 and 55) because there are many instances of firms with significant assets, but no revenues or expenses, suggesting these are non-operating holding companies or companies established to anonymously purchase real estate (e.g., Story and Saul 2015). We also drop firms with foreign ownership greater than 25% because these entities may face alternative regulatory regimes or may be subsidiaries of publicly traded foreign firms. This step leaves a sample of 216,898 observations.[14]

The sample of 216,898 observations includes firms that file their tax returns electronically (e-filers; *n*=91,410) or on paper (paper filers; *n*=125,488). One constraint of the IRS data is that the Schedule M-3 disclosures on audit and GAAP usage are available to us only for e-filers and not for paper filers. As a result, for all regression analyses, we use the 91,410 e-filing observations for which actual reporting choices are identified. In later analyses, we re-incorporate the paper filers to estimate the population production of audited GAAP statements.

Before proceeding to the analysis, we note a few points about our approach and the data. Throughout the study we follow Kothari et al. (2010) and classify the *joint* decision to follow GAAP *and* receive an audit (i.e., audited GAAP financial statements) as the key dependent variable. We do so primarily because, as suggested by Kothari et al. (2010), we can only be assured that a firm follows GAAP when it is audited, thus it is the joint decision that results in "following

[14] By only using consolidated parent tax returns, and by eliminating financial, real estate, and management firms, as well as all public companies and firms with substantial foreign ownership, we substantially reduce the risk of double-counting entities and assets, e.g., a private equity firm (perhaps with sovereign wealth investors) owning a fund that invests in a private company. Moreover, the author with confidential access hand-checked a random sample of firms to ensure we are identifying private equity owned companies. However, we caution that, much like the European or public firm settings, firms cross-own one another, which makes the ultimate ownership sometimes difficult to discern.

GAAP." Also, audited GAAP statements are required of public firms and our setting provides a useful comparison to these firms. One important shortcoming of the dataset is that we are unable to distinguish between unqualified and qualified audit opinions, or identify reviews and compilations. Because qualified opinions are frequently caused by departures from GAAP, understanding this variation is an interesting avenue for future research.

IV. ANALYSIS

Descriptive Statistics

Table 2 reports the descriptive statistics for our main regression sample of 91,410 e-filing firm-years. The variables used in our subsequent analyses are in all caps, while alternative (typically raw instead of logged) specifications are included to facilitate economic interpretation (see the Appendix for variable definitions). We find that 44% of our main sample reports audited GAAP financial statements (*GAAP_AUDIT*). This joint decision breaks down to 84% of firms using GAAP (*GAAP*) and 45% having their financial statements audited (*AUDIT*).[15]

The mean (median) firm has $72.5 ($35.4) million in revenue and $61.8 ($21.1) million in total assets.[16] These statistics emphasize that the firms in this sample are much different from the firms examined in prior studies of private firms where, for example, the average firm total assets are less than $0.4 million in Allee and Yohn (2009) and $6.5 million in Minnis (2011). In contrast, the firms in our dataset are much more similar to more commonly studied publicly held firms. To illustrate this comparison, Figure 2 plots the number of nonfinancial firms by Com-

[15] Note that the 44% audited GAAP rate is for e-filing firms only, which we examine in the regression analyses. We estimate an audited GAAP rate of 37% using *both* e-filing and paper filing firms in a subsequent section. Also, note that the 45% audit rate is slightly higher than the 44% joint audit-GAAP rate. This occurs because a very small portion of firms have their non-GAAP financial statements audited. In the online appendix, we tabulate all accounting choices separately. Of the 16% of firms not claiming GAAP as their set of accounting standards, 12.5% claim tax basis as their standard of accounting, while 0.2% follow IFRS, 0.6% follow statutory, and 2.9% follow an alternative set of standards (e.g., cash basis).

[16] We define *Revenue* as total income before all deductions and cost of goods sold—this data item is most similar to Compustat's "*sale*" variable, plus interest, rents, royalties, and gains.

pustat size quintile (based on the variable "*sale*") for both the IRS firms in our dataset and for Compustat nonfinancial U.S. firms for the year 2010. Although Compustat data are not directly comparable to tax return data because of consolidation and other accounting differences, this chart is intended to give a sense of the relative magnitude of the different settings.[17] As the bar chart indicates, while there are substantially more privately held firms in the bottom three quintiles (total of 69,563) compared to Compustat (total of 2,331), the number of privately held firms is similar in the fourth quintile (777 public firms versus 682 private firms). These four quintiles represent firms with revenues up to $2.4 billion each. It is not until the largest quintile (i.e., firms each with revenues greater than $2.4 billion) do Compustat firms substantially outnumber privately held firms (777 public firms versus 180 private firms). While strong inferences cannot be made comparing these two data sets, an important descriptive takeaway is that, broadly speaking, many of the private firms in our study are very comparable in magnitude to most public firms in Compustat, and there are many more private than public firms.[18]

Table 2 also reveals that the firms are unprofitable and have negative growth, on average, indicative of the economic conditions during this sample period. Average taxable income scaled by total income (*PROFIT_MGN*) is -1.1%, but this distribution is left skewed as the median firm has a *PROFIT_MGN* of 1.3% and only 33% of firms report net losses.[19] The average (median) firm in the sample that exists at least two years is decreasing (increasing) revenues by 1.1%

[17] At least two issues prevent a direct comparison between Compustat and tax return data. First, "Revenues" per the tax return are not an exact comparison to the "*sale*" variable in Compustat due to various differences in definitions, consolidation rules, and foreign versus domestic revenues. Second, Compustat does not cover all firms that have SEC registration requirements. Note that for the purposes of generating Figure 2, we use both e-filer and paper filers in 2010 since this simple size analysis is not dependent on also having M-3 data on the GAAP or audit decisions.

[18] If we condition that the private entity must be a C Corporation, which is the most common form of publicly traded entity, our distribution is as follows: 10,732 in Q1, 4,825 in Q2, 985 in Q3, 243 in Q4, and 66 in Q5, for a total of 16,851 private C Corporations. Note that the number of private C Corporations far surpasses the number of total firms in Compustat, as well as includes some very large private firms with revenues exceeding $2.4 billion.

[19] "Taxable income" is referred to as "Ordinary Business Income" for pass-through entities. We use the term "taxable income" for both types of entities for simplicity.

(0.2%) per year, but the sample also has wide variation in *GROWTH*. Growth in revenues ranges from -13% at the 25th percentile to +13% at the 75th percentile.

In addition to income items, we use a number of balance sheet variables from Schedule L. To capture two constructs—the extent of bank financing and the use of trade credit—we measure the level of debt and accounts payable. The mean (median) firm has almost $14.0 ($4.1) million in debt. Also, most firms in the sample use trade credit. The mean (median) balance of accounts payable is $4.8 ($1.4) million. The skewness in both debt and accounts payable is consistent with the skewness in firm size. To measure firms' asset intensity, we construct *PPE_TO_WAGES*, or net property, plant, and equipment (PPE) per Schedule L divided by total wages reported on page 1 of the tax return. The mean (median) firm has PPE that is 4.8 (0.6) times the amount of wages. We measure asset tangibility two ways. First, we measure net PPE as a portion of total assets (*PPE_TO_ ASSETS*). PPE makes up 21% (12%) for the mean (median) firm in the sample. Second, we construct an indicator variable, *INTAN*, equal to 1 if the firm reports a non-zero gross intangible assets balance on Schedule L, and 0 otherwise. We find that 53% of firms report non-zero intangible assets.

We caution that, unlike the income variables from page 1 of the tax return which follow tax rules, Schedule L variables are reported using the book basis of accounting. Therefore, the balance sheet variables could be mechanically related to firms' accounting choices. For example, if a firm chooses to use the tax basis of accounting, assets such as PPE (inventory) may be understated (overstated) relative to a firm that uses GAAP. This is a primary reason why we use revenues rather than total assets as our primary measure of firm size—revenues (because it is measured on the tax basis for *all* firms) is less prone to a mechanical relation issue with financial reporting choices than assets (which is measured on a firm's book basis). We also address this

issue by using different specifications that exclude balance sheet variables or substitute income variables as proxies for balance sheet variables, which we discuss in the next section.

In addition to the income and balance sheet variables, we use measures for firm ownership, age, and organizational form. The IRS dataset contains the number of firm owners, but firms are only required to report in this field if the number of owners is 100 or less. Thus, the IRS reporting requirement limits our ability to identify the number of owners if they exceed 100 as only a few firms voluntarily disclose this number; otherwise the disclosure is left blank.[20] Therefore, we handle the *Number of Owners* variable three ways: (1) we set missing values to equal 101 owners; (2) we exclude firms reporting more than 100 owners or missing values; and (3) we use indicator variables for various ownership levels, including if it exceeds 100 or is missing. The ownership variable is highly right-skewed, as the mean *Number of Owners* is 16.6 including all available observations (after setting the missing values to 101) and 7.7 after excluding firms with more than 100 owners or missing values. The variables reveal that 38% of our sample has just 1 or 2 owners (*OWNER_EQ_1* and *_2*), 25% have 3 to 5 owners (*OWNER_EQ_3to5*), and 9% have more than 100 owners or report missing values (*OWNER_EQ_101orMore*).

In terms of age, only corporations (Forms 1120 and 1120S) report the year of incorporation. The mean (median) corporation is 28 (24) years old. We also report the share of our sample firms that are C corporations, the dominant form of organization for public firms. We find that only 28% of our sample firms are C corporations. The remaining firms are split between S corporations (Form 1120S) or partnerships and limited liability companies (Form 1065).

[20] We use the term "Owners" to collectively indicate shareholders (for corporations), partners (for partnerships), or members (for limited liability companies). It is also important to note that the dataset has even more right tail skewness than we report in the descriptive statistics because, as with all of our continuous variables, we have winsorized the number of owners—when the data are available—at the 99th percentile. In fact, the dataset contains 233 observations that (voluntarily) report more than 500 owners (the 99th percentile is 176 owners). These firms are professional services partnerships, which are exempt from SEC rules that require public financial reporting for firms with 500 or more owners. We tabulate robustness tests for the number of owners in online appendix C which show that the specification of the number of owners does not affect inferences.

Firm-level Analysis

We begin by analyzing the relation between firm-level characteristics and audited GAAP production. We first take a closer look at three variables that likely have the most significant relation with financial statement production based on prior literature, Allee and Yohn (2009) in particular: firm size, ownership dispersion, and external debt. Because one contribution of our study is not only to extend the literature and assess the existence of a relation between firm characteristics and audited GAAP use in medium-to-large firms, but also to provide a descriptive sense of the magnitude, we provide an initial nonparametric analysis in Table 3. This table presents two different two-way sorts of size (revenues), ownership, and debt variables. Panel A partitions firm-years into size and ownership dispersion cells, whereas Panel B partitions firm-years into size and debt cells. Each cell reports the number of firm-years and proportion of those firm-years with audited GAAP financial statements. All three variables clearly have a strong positive relation with audited GAAP financial statements, both unconditionally (examining the outside rows and columns) and conditionally on the other variable (examining the interior rows and columns). As expected, the upper left cells have the lowest rates of GAAP use while the bottom right cells have highest.

We highlight two additional insights from this table. First, while the relation for each of the variables is mostly monotonic, it is not linear. The relation between financial statement production and ownership dispersion in particular flattens out after firms reach approximately 20 owners and, in fact, the strongest part of the relation occurs with fewer than 10 owners. Increases in ownership dispersion on the intensive margin after this point seem to have little relation with audited GAAP production. Debt has a similarly monotonic yet concave relation with an inflection point near $20 million. Data in Table 3 and Figure 2 (which reports the proportion of firms

producing audited GAAP statements by Compustat size quintile) show that size has a concave relation that begins to flatten near $200 million in revenues.

A second insight from Table 3 comes from observing the results more broadly. The results do not support corner solutions or "rules of thumb" about thresholds regarding the production of audited GAAP financial statements.[21] While these three variables have a relatively strong relation with audited GAAP use, many firms do not meet standard expectations. For instance, we condition on firms with at least $20 million in revenue in Panel B and compare all cells with at least $5 million in debt to those with no debt. This comparison results in relatively small differences in the rate of audited GAAP statements: 58% for firms with significant debt levels versus 48% for those with no debt. This difference suggests that many firms with relatively high levels of external debt do not produce audited GAAP statements while many firms with no debt at all do produce audited GAAP statements. Consistent with the findings of Cassar et al. (2015), the former result suggests that lenders to private companies rely on alternative mechanisms to safeguard their loans, such as relationships or appraisal reports—even for the large private firms in the economy. The latter result suggests that private companies may hire external auditors to serve in a control capacity over management behavior (Watts and Zimmerman 1983). Unfortunately, our data are too coarse to fully examine these possibilities. Nevertheless, our results demonstrate several of the key messages of this study: audited GAAP statements are not a necessary condition for external capital allocation, there is significant heterogeneity in this setting, and no single rule of thumb addresses the actual use of audited GAAP statements very well. The expected relations manifest, but the extent of these relations may not be as large as expected, and nonlinearities emerge.

[21] For example, Slee (2011) suggests $5 million in debt as a common threshold for borrowers to provide audited financial statements to banks.

We now use multivariate analyses to more thoroughly examine the relation between firm characteristics and GAAP production. We use the following OLS specification for firm *i* in industry *j* at year *t*:[22]

$$GAAP\_AUDIT_{i,j,t} = \sum_{k=0}^{m} \beta_k FIRM\_CHARACTERISTIC_{i,j,t,k} + \gamma_{i,t}^{j} + \lambda_i^t + \varepsilon_{i,j,t} \quad (1)$$

where $\gamma_{i,t}^{j}$ and λ_i^t represent industry and year fixed effects, respectively, for firm *i*. Table 4 presents the results. To gauge the relative contribution of each characteristic, industry, and year to explaining audited GAAP production, we report the Shapley (1953) values.[23] In brief, these values represent the contribution of each variable (or group of variables) to the total model R^2. We begin in column (1) with a baseline specification that includes variables for size, ownership, and debt, as well as industry and year effects. As expected, we find these three main variables to be strongly positively related to the propensity that a firm produces audited GAAP statements. The total R^2 in this model is 18.5%, which is the sum of the contribution of size (8.51%), ownership (1.98%), debt, (1.55%), industry effects (6.43%), and year effects (0.02%). Although size has the largest contribution to the model's total explanatory power, it is interesting that ownership contributes more than debt, which is our first piece of evidence suggesting a larger role for audited GAAP financial statements relating to ownership dispersion compared to bank debt.

In column (2) we add additional firm characteristics on profitability, trade credit, asset tangibility, and organizational form. The total R^2 increases slightly to 19.9% and the coefficients on size, ownership, and debt somewhat attenuate, but remain highly significant. Using OLS and log specifications eases the economic interpretation. For example, from the results in column (2), for each doubling in firm size, a firm's likelihood to produce audited GAAP financial statements

[22] All inferences are similar—statistically and economically—if we use logit models instead. These results are tabulated in online appendix C.
[23] See "shapleyx" command in Stata and http://wernerantweiler.ca/blog.php?item=2014-10-10 for SAS code.

increases by approximately 8%, or 18% of the unconditional mean. The coefficient on *PROF-IT_MGN* is significantly negative, suggesting that less profitable firms need external verification of their financial statements more frequently than more profitable firms. One result that is not the focus of much attention in the academic literature is the strong positive coefficient on accounts payable, which suggests that vendors heavily influence the production of audited GAAP reports, consistent with the predictions of Watts and Zimmerman (1978). The Shapley value of 4.39% on accounts payable is second only to size at 5.67%, but higher of ownership at 1.43% and debt at 1.04%. This result may indicate that debt providers and equity holders rely on alternative mechanisms, such as collateral, relationships, or control, in the event of default or losses, compared to vendors that are typically less protected (also see Costello 2014). The results also show that firms with a C corporation structure, which is the dominant organizational form for public firms, are more likely to produce audited GAAP financial statements relative to S corporations or partnerships. We do not find a strong relation between audited GAAP and asset intensity or intangibility, but these regressions include industry fixed effects and as we will see shortly, these characteristics matter between industries, more so than within industry.

In column (3) of Table 4 we add growth and age, although each of them further restricts the sample due to more limited data availability (i.e., growth requires two years and age is based on corporate formation). In column (3) we find that adding *GROWTH* (*AGE*) results in a strongly positive (negative) coefficient without altering our inferences. The result on *GROWTH* suggests that these firms are more likely to produce audited GAAP financial statements, perhaps to verify growth options and/or exercise managerial control. The result on *AGE* is consistent with mature firms having stronger relationships that reduce the need for audited GAAP statements. Indeed, in untabulated non-parametric tests, we find that the relation between *AGE* and *GAAP_AUDIT* to

be essentially monotonically negative. Collectively, Table 4 finds—from greatest to least explanatory contribution as inferred from the Shapley values—that industry membership, size, trade credit, equity ownership, organizational form, debt, growth, and age significantly contribute to explaining the variation in audited GAAP production.

We conduct a variety of robustness analyses to the Table 4 results, which we tabulate in online appendix C. First, we reconsider the dependent variable. In Table 4 *GAAP_AUDIT* is coded as 1 if the firm prepares audited GAAP financial statements and 0 otherwise. Recognizing that there is, in fact, a continuum of accounting choices, we use an ordered logit model in which the dependent variable is coded as 0 for unaudited, non-GAAP firms; 1 for unaudited GAAP firms; or 2 for audited GAAP firms. This specification does not alter the inferences from Table 4.[24] We also tabulate specifications controlling for size using assets (instead of revenues) and scaling debt and trade payables variables by total assets; eliminating firms with less than $5 million in revenues; using interest deductions instead of debt; excluding firms with missing ownership (instead of reclassifying them to having 101 owners); and using semi-parametric indicator variables for the number of owners (instead of the logged transformation of the number of owners). Again, the economic and statistical inferences are not substantively different. Finally, we estimate the regression from Table 4, column 2 by year to examine the stability of the coefficient estimates over time and find similar results each year, with the exception of the loss indicator, which is only significant in the year 2008.

While Table 4 presents our firm-level cross-sectional results, in Table 5 we exploit the panel structure of the data and examine within-firm variation. We seek to understand which firm

[24] We also re-estimate Table 4, column 2 simply using a logit model and also find similar results. As an exploratory analysis, we also re-estimate the regression for each industry and tabulate the results in online appendix C. The results are generally consistent across industry (e.g., the coefficients on size, ownership dispersion and debt are almost always of the same sign and statistical significance), but the signs for some variables differ.

characteristics are associated with *beginning* and *ending* audited GAAP statement production. As such, this analysis complements Dedman et al. (2013), which investigates changes for small firms in the U.K. To conduct this analysis, we start by creating a balanced panel of firms over the years 2008 to 2010. To avoid confounding the analysis of firms changing their accounting standards in addition to their audit choice, we focus only on firms that report following GAAP for all three years (i.e., we analyze the decision whether to produce *audited* GAAP statements). In addition, we focus on firms that change in 2009, giving us one year before and after the change in audit decision.[25]

In columns (1) and (2) of Table 5 we examine how GAAP firms that begin an audit in 2009 compare to GAAP firms that only prepare unaudited statements for all three years of the panel. The independent variables include both the initial (i.e., 2008) levels of each of the variables, as well as the changes (from 2008 to 2010). Consistent with our cross-sectional tests, we find that larger firms with more owners, debt, accounts payable, and growth are likely to initiate audits of their GAAP statements. Moreover, we find that firms initiate audits when they are younger or when the number of owners increases (i.e., sell equity).

Perhaps more interesting is the interaction between age and ownership. Young firms adding owners are substantially more likely to begin an audit. To illustrate the economic magnitude of the interaction between age and increased equity dispersion, in results tabulated in online appendix C we partition the sample along two dimensions: age (firms three years old or younger versus firms greater than three years old) and ownership increases (firms that increased ownership versus those that did not change or decreased the number of owners). Consistent with the results in Table 5, we find that the propensity to receive an audit is higher for older firms that

[25] We do not analyze the decision to begin the use of GAAP because we have only 48 instances in which a firm begins using GAAP conditional on maintaining no audit. However, we estimate the separate GAAP and audit decision at the population level; see the section below on population estimates and the online appendices B and C.

increase ownership (6%) relative to older firms that do not increase ownership (4%). However, this difference is much larger for young firms—15% of young firms initiated audits in 2009 when they did not increase ownership versus 40% for the young firms that *did* increase the number of owners. Young firms—which typically lack history, tangible assets, or management reputation—seem to use audited GAAP statements to credibly communicate with new equity owners, even when lacking a government mandate to do so.

Interestingly, we generally find *no* relation between initiating an audit and an increase in external debt. Future research with more precise debt contracting variables may further explore this relation, as we suspect that more variation in auditing with respect to debt is driven by extensive margins rather than intensive margins and likely is related to bank-specific relationship changes rather than the levels of debt, *per se*.[26] Moreover, while there is a strong positive relation between initiating audits and equity transactions, GAAP firms are also able to conduct such transactions in the absence of an audit. Consistent with our previous inferences, many firms do not appear to meet conventional expectations with respect to the use of audited GAAP financial statements.

In columns (3) and (4), we compare GAAP firms that choose to terminate their audit in 2009 to GAAP firms that continue preparing audited statements. To the best of our knowledge, this analysis is the first in the literature to examine a firm's choice to terminate audited GAAP statement production. These results are essentially the mirror image (though generally weaker) to the results in columns (1) and (2). That is, smaller, *negative* growth firms are more likely to *ter-*

[26] We conduct several additional analyses to further investigate the relation with debt changes. First, we consider whether investigating the extensive margin matters. We condition the sample only on firms with zero debt in 2008 and create an indicator variable for those with at least some amount of debt in 2010. We continue to find no significant results on the indicator (or with an interaction with firm age). Second, we generate a 2 x 2 contingency table partitioned by youth and increases in debt, similar to the ownership analysis. We find that while older firms have a slightly higher rate of beginning GAAP audits when increasing debt, young firms do not have a significantly different rate. These results remain when examining the extensive margin of debt only as well.

minate their audits. One coefficient in columns (3) and (4) that is significant and the same direction as columns (1) and (2) is the coefficient on *LOSS*. We suspect that the *LOSS* variable identifies two different types of firms. In columns (1) and (2), we hypothesize that the loss firms initiating an audit are growth-oriented firms making investments in future profitability, whereas the loss firms in columns (3) and (4) are distressed firms that are eliminating costly audits to reduce expenses. This observation suggests that future research can more closely investigate the role of auditing in distress situations. On the one hand, this may be precisely when capital providers demand an audit, but on the other hand, a firm in need of reducing costs may view the expense of an audit as discretionary, making the setting of distress interesting.

At this point it is worth contrasting our findings with prior research, in particular Allee and Yohn's (2009) Table 6, which is the most similar analysis to our Table 4. A&Y examine the sophistication of accounting with two different dependent variables in their Table 6: a count variable ranging from 0 to 3, representing company prepared, compiled, reviewed, and audited financial statements, respectively, and an indicator variable for whether or not the firm reports using an accrual basis of accounting. The first item to note from A&Y is the lack of significant results for most variables. For example, firm size (total assets)—the most significant variable in our study and others (e.g., Minnis 2011)—is not significantly related to whether the firm has an audit or follows accrual accounting. In addition, variables indicating new equity, the extent of leverage, the amount of sales growth are also insignificant. Ownership dispersion and trade credit is only significant in the accruals regression. In contrast to the results in our Table 4, firm age is positively associated with accounting sophistication. Ultimately, the lack of significance and mixed results of the A&Y table is likely driven in part by a small sample size (790 observations) and noisy data points generated by survey data. Our results in Table 4 allow for improved infer-

ences by demonstrating that small businesses are likely very different from large private firms in terms of financial statement production.

Industry-level Analyses

Recall that our cross-sectional tests in Table 4 find that, beyond specific firm characteristics, industry membership is a significant determinant of audited GAAP production. That is, the net benefit of accounting is related to the inherent nature of firms' capital allocation and operational characteristics. In this section, we investigate this result further. Table 6 sorts industries from highest to lowest rates of audited GAAP production; clearly there are substantial differences. The Information industry has the highest rate at 62%, which highlights the predictions of Zingales (2000) and Zimmerman (2015, 2016) that the economy is moving toward more knowledge-based firms and have interesting implications for the use of accounting. As the U.S. economy continues its evolution toward industries with substantial human capital—such as Information, Healthcare, and, more recently high-tech Manufacturing—the importance of audited GAAP statements could be increasing as a tool to verify or steward over these firms. Table 4 also reveals that industries with tangible assets (e.g., Mining and Agriculture) and cash-based businesses (e.g., Food Service and Retail Trade) have substantially lower rates of audited GAAP statements. Note that the lowest audited GAAP rate is in Agriculture at 25%. In a closer look, we find that almost half of the firms in this industry have less than $5 million in revenues (while having at least $10 million in assets to be reporting on Schedule M-3). Thus, firms in this industry hold significant amounts of land and have low asset turnover. These high-level descriptives by industry suggest that asset intensity, tangibility, and growth all vary across industry, in addition to varying across firms, which would drive the use of audited GAAP financial statements.

In Table 7 we examine the across-industry variation more formally using industry-level

regressions in which the dependent variable is the estimated fixed effect coefficients from the Model 2 regression of Table 4. The independent variables are various proxies for profitability (*ROA* and *ROA_DISP*), capital structure features (*%PUBLIC* and *LEV*), asset tangibility (*PPE_TO_ASSETS* and *INTAN_TO_ASSETS*), and growth opportunities (*GROWTH*, *R&D_TO_SALES*, and *MTB*). All variables are measured at the *industry* level as defined in the table. All 3-digit NAICS industries with at least three firms are included. Importantly, all variables (except the dependent variable) are calculated using U.S. *public* firm data from Compustat to mitigate spurious relations between variable measurement and accounting choices, and because some variables (e.g., research and development expense and market-to-book) are not available in our data set. Also, to facilitate the comparison of magnitudes across variables, they have been transformed to decile ranks—i.e., each coefficient's interpretation is the difference of moving between the top and bottom deciled industries.[27]

In contrast to the firm-level profitability results of Table 4, column 1 reveals little association between industry profitability and the use of audited GAAP financial statements.[28] However, we do find that in industries with high levels of profitability dispersion (*ROA_DISP* is measured as the interquartile range difference in ROA within the industry), which proxies for profitability volatility, we find higher rates of audited GAAP use.

Reinforcing our firm-level results that equity factors are at least as, if not more important as debt factors, we find that industries with more public firms (*%PUBLIC* is measured as the number of firms in CRSP divided by the number of firms in the private firm IRS dataset plus the

[27] Specifically, to transform the variable into decile ranks, we create deciles for each variable, subtract 1 from the decile rank value and divide the result by 9. As such, the variable values range from 0 to 1.

[28] However, the linear results mask a nonlinear relation. In untabulated results, when we include a second order *ROA* term, the first order coefficient is significantly negative and the coefficient on the second order term is significantly positive. Differentiating with respect to *ROA*, we find a minimum point outside of the *ROA* distribution, such that the relation between industry profitability and audited GAAP statements is monotonically negative through the sample distribution of *ROA*.

number of firms in CRSP in each industry) have higher rates of private firm audited GAAP production, whereas we see no relation between the typical amount of leverage in an industry and private firms' audited GAAP production. This latter result is likely driven by omitted variable endogeneity (e.g., industries with more leverage have more collateralizable assets), but then this is also part of the point—in debt contracting for private firms, alternative mechanisms exist outside financial statements, diminishing their importance. In fact, we do find evidence that the existence of tangible assets, which are more easily verified upon visual inspection (in contrast to assets which require accounting, such as accounts receivable, for example), mutes the use of audited GAAP statements as the coefficient on *PPE_TO_ASSETS* is significantly negative. Moreover, we find that industries with higher levels of recorded intangible assets (e.g., goodwill or intangible assets) have *higher* rates of audited GAAP production. This finding is particularly intriguing given the repeated calls that GAAP's treatment of intangible assets does not meet a cost-benefit threshold. Our revealed preference results suggest that these assertions should be revisited with more detailed empirical analyses.[29]

Finally, we find particularly strong evidence that firms in industries with growth opportunities are more likely to have audited GAAP statements. The coefficients on the level of growth (*GROWTH*), research and development (*R&D_TO_SALES*), and market-to-book (*MTB*) are all positive (and only the coefficient on *MTB* is insignificant at standard levels). These results are notable because audited GAAP statements are generally perceived as most beneficial in verifying historical transactions and assets-in-place, and less relevant for growth opportunities.

[29] An important caveat here—and a detail that future research should consider—is that we are unable to measure qualified audit opinions. We suspect that intangible assets are common causes of qualified opinions. Moreover, firms engaging in activities creating booked intangibles (e.g., acquisitions) are likely to benefit from audited GAAP statements for reasons other than their intangible assets. Our results simply find that booked intangibles are not negatively related to audited GAAP statements (in fact, they are positively related). We also caution against drawing causal inferences.

However, physical assets are more easily observable to interested parties (e.g., management and external capital providers). We speculate that growth opportunity firms benefit from audited GAAP statements in two ways: (1) they anticipate raising external capital, and audited GAAP statements facilitate this process; and (2) financial statement auditors serve as outsourced internal auditors, and external capital providers want to ensure that their investments are being allocated to projects (which may be intangible investments such as R&D) that were previously agreed upon with management. Audited GAAP statements—and the auditing function in particular—facilitate this process. We view that these empirical results, which stand in contrast to assertions made about the diminishing benefits of accounting in public firms (e.g., Lev and Gu 2016), can motivate further research.[30]

Collectively, the industry level results add to the firm-level inferences by identifying that industry asset tangibility (intangibility) is negatively (positively) related to audited GAAP financial statement production. In addition, audited GAAP production increases in the share of firms within the industry that is publicly traded, which suggests a potential role for spillovers from public firms (e.g., due to competition or access to capital) that may spur private firms to increase their audited GAAP statement production (e.g., Badertscher et al. 2013).

Population-level Financial Reporting Statistics

We conclude our analyses by providing a very high-level initial examination of audited GAAP financial statement production at the population level. While we only have three years of data, the exercise of estimating how many firms are using audited GAAP statements and how

[30] Note that our proxies identify both types of intangibles identified by Skinner (2011): (1) intellectual capital and lack of physical substance (proxied by R&D) and (2) identifiable and recognized (proxied by intangible line items on the balance sheet). While our finding that firms in industries with more intangibles (of either type) are more likely to have audited GAAP statements suggests that the current approach to accounting for intangibles is net cost-beneficial for these firms, we are cautious in making this inference. Nevertheless, our results suggest that the private firm U.S. setting—in which audited GAAP statements are only produced when cost-beneficial—could be a fruitful setting to investigate this set of issues. See, for example, Skinner (2011) and Lev (2011) for further discussion.

this choice may be changing provides an initial baseline result that has not been examined by either academics or practitioners. Understanding how the population of firms is changing—both from a filing perspective (we find that e-filers become an increasingly larger portion of the population each year) and from a firm characteristic perspective (characteristics of firms are changing over time)—is important to accurately measure the population dynamics of financial reporting choices. Thus, to examine financial statement production in the population of firms, we re-include paper filers into our sample (for *n*=216,898). We estimate paper filers' financial reporting choices based on propensity score matching of paper filers to e-filers. We describe this approach in detail in online appendix B. We note that there is significant common support between e-filers and paper filers to provide adequate matches for our estimation.

Table 8 reports the accounting choices along both GAAP and audit dimensions by year. Two key results emerge. First, we estimate that only 37% of the entire sample of firms produces audited GAAP financial statements (see upper left hand box of the "Total" column in Table 8). This is a result of 79% of firms reporting GAAP as the basis of accounting for their financial records over our sample period and only 38% of firms obtaining an audit. Second, GAAP and audit choices are quite stable over time. While assertions have been made that the use of GAAP has deteriorated for U.S. private firms (FAF 2011), the data reveal no evidence to support these assertions. In fact, we note that the proportion of firms with audited GAAP statements has *increased* slightly from 2008 (36%) to 2010 (38%). This trend seems to be the result of firms switching from unaudited GAAP to audited GAAP statements, as the lower left hand cell decreases from 43% in 2008 to 41% in 2010. In online appendix C, we estimate Markov transition matrices for both audit and GAAP decisions and confirm that most of the firm changes over time relate to the audit decision rather than the GAAP decision. However, we caution against strong

inferences from Table 8 given the short timeline and the lack of distinction between unqualified and qualified audit opinions. Nevertheless, these results suggest that a more detailed analysis of the claims regarding GAAP and audit use over time should be considered.

In all, the data reveal that while the level of audited GAAP statements remains relatively steady over the short window of time, the vast majority of private firms do *not* produce audited GAAP financial statements.

V. CONCLUSION AND DISCUSSION

This study contributes important new insights about private firms' production of audited GAAP financial statements, and how it relates to capital allocation. We focus on medium-to-large private U.S. firms, which are similar to small businesses in that they do not face a government mandate to determine their financial reporting practices, but also similar to public firms in terms of external capital, agency issues, organizational complexity, and economic size. Our results highlight that a variety of capital allocation factors drive accounting use. Firms with growth, intangible assets, a lack of reputation, losses, and extensive financing—not only from banks, but more importantly, from equity holders and vendors—have a higher likelihood of producing audited GAAP statements. These results extend prior empirical literature examining small U.S. and U.K. businesses (e.g., Allee and Yohn 2009; Dedman et al. 2013), but contrast with conclusions made from public firm data—namely that the debt market drives accounting outcomes. In our setting, which is void of financial speculators with incentives to acquire and trade on private information in liquid markets, we find evidence that a variety of parties shape a firm's accounting production perhaps more than debt markets do.

While we find strong evidence that audited GAAP statements facilitate capital allocation, we also find that the majority of medium-to-large U.S. private firms do *not* produce audited

GAAP financial statements, even after conditioning on at least some degree of external debt and ownership dispersion. Moreover, we find that tens of thousands of firms do not conform to expectations: many smaller, one-owner firms with no external debt prepare audited GAAP statements, while very large, highly dispersed ownership firms with millions of dollars of external debt do not. Although several attributes, such as firm size, asset intangibility and industry membership, have explanatory power, it is limited.

Our findings begin to address the shortage of evidence regarding the use of accounting in the private U.S. firm setting, but our paper does not conclusively provide causes or consequences of accounting. In fact, our analyses perhaps raise more questions than answers. What other factors explain the vast heterogeneity in accounting choices? One plausible explanation is that our variables are too coarse to have high explanatory power; for instance, we suggest that future studies look not only at the number of owners, but also the types of owners. As Zimmerman (2016) describes, professionally managed private equity is taking on a more substantial role in the economy. How do these equity investors differ from founder-managers or other equity investors in their demand for audited GAAP statements? Will the importance of audited GAAP statements increase as fewer knowledge-based firms seek financing through external equity and debt markets, and instead seek private investors?

Given the extensive research relating to debt contracting, perhaps one of the more surprising results from our study is that the relation between debt capital and accounting choices is relatively weak compared to other variables. We think more refined investigations can explore this result. While our findings confirm that debt financing is important to private firm financial reporting choices, the data show that audited GAAP statements are not a necessary condition for debt financing, even in larger firms with millions of dollars of external debt. Alternative financ-

ing sources (e.g., Business Development Companies and so-called 'shadow banks') are providing ever-increasing amounts of debt to private firms. Do these lenders rely differently on financial reporting relative to standard banking models? Research also suggests that incomplete contracting, wherein all future contingencies are not explicitly addressed in the loan contract ex ante, plays a fundamental role in lending in the entrepreneurial setting (Christensen et al. 2015). We find that many firms attract significant debt *without* audited GAAP statements, which is consistent with this perspective. As a result, what other mechanisms do larger private company lenders use to safeguard their loans (e.g., Cassar et al. 2015)?

Our study also highlights substantial variation across industries in the production of audited GAAP statements. Interestingly, the human capital and knowledge-intensive industries that Zingales (2000) and Zimmerman (2015, 2016) suggest are taking on a more dominant role in the economy are also those with the *highest* rates of audited GAAP statements. Does this shift indicate that audited GAAP statements will play a larger role in years to come, or will other factors from a general equilibrium perspective offset these changes? How do these findings, along with our short-window findings of a slight *increase* in the use of audited GAAP production, comport with the assertions that the use of audited GAAP statements has declined? Our data are insufficient for us to investigate each of these issues, but both the economic magnitude and vast heterogeneity of the larger private U.S. company setting warrant additional research.

REFERENCES

Abdel-khalik, R. 1983. Financial reporting by private companies: Analysis and diagnosis. Stamford, CT: FASB.

Allee, K. and T. Yohn. 2009. The demand for financial statements in an unregulated environment: An examination of the production and use of financial statements by privately held small businesses. *The Accounting Review* 84 (1): 1-25.

American Institute of Certified Public Accountants (AICPA). 1976. Report of the Committee on Generally Accepted Accounting Principles to Smaller and/or Closely Held Businesses. New York, NY: AICPA.

——. 1996. Report of the Private Companies Practice Section Special Task Force on Standards Overload. New York, NY: AICPA.

——. 2005. Private Company Financial Reporting Task Force report. New York, NY: AICPA.

——. 2010. AICPA Council Fall Meeting. November 2, 2010. Accessed from http://www.aicpa.org/News/AICPATV/Pages/Home.aspx?bctid=658105926001&Ca=Accounting%20and%20Auditing&Type=VideoCat on July 30, 2015.

——. 2013. Understanding the financial reporting framework for small- and medium-sized entities. New York, NY: AICPA.

Badertscher, B., N. Shroff, and H. White. 2013. Externalities of public firm presence: Evidence from private firms' investment decisions. *Journal of Financial Economics* 109 (3): 682-706.

Ball, R., A. Robin, and G. Sadka. 2008. Is financial reporting shaped by equity markets or by debt markets? An international study of timeliness and conservatism. *Review of Accounting Studies* 13 (2): 168-205.

Ball, R. and L. Shivakumar. 2005. Earnings quality in UK private firms: Comparative loss recognition timeliness. *Journal of Accounting and Economics* 39 (1): 83-128.

——. 2008. How much new information is there in earnings? *Journal of Accounting Research* 46 (5): 975-1016.

Barton, J. and G. Waymire. 2004. Investor protection under unregulated financial reporting. *Journal of Accounting and Economics* 38: 65-116.

Benston, G. 1969. The value of the SEC's accounting disclosure requirements. *The Accounting Review* 38: 147-154.

——. 1985. The market for public accounting services: Demand, supply and regulation. *Journal of Accounting and Public Policy* 4: 33-79.

Berger, A. and G. Udell. 2006. A more complete conceptual framework for SME finance. *Journal of Banking and Finance* 30 (11): 2945-2966.

Blackwell, D., T. Noland, and D. Winters. 1998. The value of auditor assurance: Evidence from loan pricing. *Journal of Accounting Research* 36 (1): 57-70.

Botosan, C., H. Ashbaugh-Skaife, A. Beatty, P. Davis-Friday, P. Hopkins, K. Nelson, K. Ramesh, R. Uhl, M. Venkatachalam, and G. Vrana. 2006. Financial accounting and reporting standards for private entities. *Accounting Horizons* 20 (2): 179-194.

Bradshaw, M., D. Bens, C.A. Frost, E. Gordon, S. McVay, G. Miller, R. Pfeiffer, M. Plumlee, C. Shakespeare, W. Thomas, F. Wong. 2014. Financial Reporting Policy Committee of the American Accounting Association's Financial Accounting and Reporting Section: Accounting standard setting for private companies. *Accounting Horizons* 28: 175-192.

Burgstahler, D., L. Hail, and C. Leuz. 2006. The importance of reporting incentives: Earnings management in European private and public firms. *The Accounting Review* 81 (5): 983-1016.

Cassar, G., C. Ittner, and K. Cavaluzzo. 2015. Alternative information sources and information asymmetry reduction: Evidence from small business debt. *Journal of Accounting and Economics* 59 (2-3): 242-263.

Chow, C. 1982. The demand for external auditing: Size, debt and ownership influences." *The Accounting Review* 57: 272-291.

Christensen, H., V. Nikolaev, and R. Wittenberg-Moerman. 2015. Accounting information in financial contracting: An incomplete contract theory perspective. University of Chicago working paper.

Costello, A. 2014. Trade credit policy in long-term supply contracts. Working paper, SSRN: https://ssrn.com/abstract=2379118.

Dedman, E., A. Kausar, and C. Lennox. 2013. The demand for audit in private firms: Recent large-sample evidence from the UK. *European Accounting Review*: forthcoming.

Esplin, A., K. Jamal, and S. Sunder. 2015. Auditing and private capital formation: A field study. Yale University working paper.

Financial Accounting Foundation (FAF). 2011. Blue-Ribbon Panel on Standard Setting for Private Companies Report to the Board of Trustees of the Financial Accounting Foundation." Stamford, CT: FAF.

——. 2012. Financial Accounting Foundation establishes new council to improve standard setting for private companies. May 23.

http://www.accountingfoundation.org/cs/ContentServer?c=FAFContent_C&pagename=Foundation/FAFContent_C/FAFNewsPage&cid=1176160049265. Last accessed 7/30/2015.

Financial Accounting Standards Board (FASB). 1981. Financial reporting by private and small public companies. Stamford, CT: FASB.

Grossman, S. 1976. On the efficiency of competitive stock markets where trades have diverse information. *Journal of Finance* 31 (2): 573-585.

Herz, R. 2013. Accounting changes: Chronicles of convergence, crisis, and complexity in financial reporting. Durham, NC: AICPA.

Hope, O.K., W. Thomas, and D. Vyas. 2011. Financial credibility, ownership, and financing constraints in private firms. *Journal of International Business Studies* 42: 935-957.

——. 2013. Financial reporting quality of U.S. private and public firms. *The Accounting Review* 88 (5): 1715-1742.

Jensen, M. and W. Meckling. 1976. Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics* 3 (4): 305-360.

Kausar, A., N. Shroff, and H. White. 2016. Real effects of audit choice. *Journal of Accounting and Economics* 62 (1): 157-181.

Kothari, S.P., K. Ramanna, and D. Skinner. 2010. Implications for GAAP from an analysis of positive research in accounting. *Journal of Accounting and Economics* 50: 246-286.

Lennox, C., and J. Pittman. 2011. Voluntary audits versus mandatory audits. *The Accounting Review* 86 (5): 1655-1678.

Lev, B. 2011. A rejoinder to Douglas Skinner's 'Accounting for Intangibles – a critical review of policy recommendations.' *Accounting and Business Research* 38 (3): 209-213.

Lisowsky, P., M. Minnis, and A. Sutherland. 2016. Economic growth and financial statement verification. University of Chicago working paper.

Minnis, M. 2011. The value of financial statement verification in debt financing: Evidence from private U.S. firms. *Journal of Accounting Research* 49 (2): 457-506.

——, and A. Sutherland. 2016. Financial statements as monitoring mechanisms: Evidence from small U.S. commercial loans. *Journal of Accounting Research*: forthcoming.

Petersen, M. 2009. Estimating standard errors in finance panel data set approaches. *Review of Financial Studies* 22: 435-480.

Ramanna, K. 2008. The implications of unverifiable fair-value accounting: Evidence from the political economy of goodwill accounting. *Journal of Accounting and Economics* 45 (2): 253-281.

Risk Management Association (RMA). 2013. Letter from RMA to the AICPA, FASB, and NASBA.

Skinner, D. 2011. Accounting for intangibles – a critical review of policy recommendations. *Accounting and Business Research* 38 (3): 191-204.

Slee, R. 2011. Private Capital Markets, 2nd Edition. John Wiley and Sons, Inc. Hoboken, NJ.

Story, L. and S. Saul. 2015. Stream of foreign wealth flows to elite New York real estate. *The New York Times*, February 7.

Watts, R. 1977. Corporate financial statements, a product of the market and political processes. *Australian Journal of Management* 2 (1): 53-75.

——, and J. Zimmerman. 1978. Towards a positive theory of the determination of accounting standards. *The Accounting Review* 53 (1): 112-134.

——, and ——. 1983. Agency problems, auditing, and the theory of the firm: Some evidence. *Journal of Law and Economics* 26: 613-633.

Zimmerman, J. 2015. The role of accounting in the twenty-first century firm. *Accounting and Business Research* 45 (4): 485-509.

——. 2016. Private equity, the rise of unicorns, and the reincarnation of control-based accounting. *Journal of Applied Corporate Finance* 28 (3): 56-67.

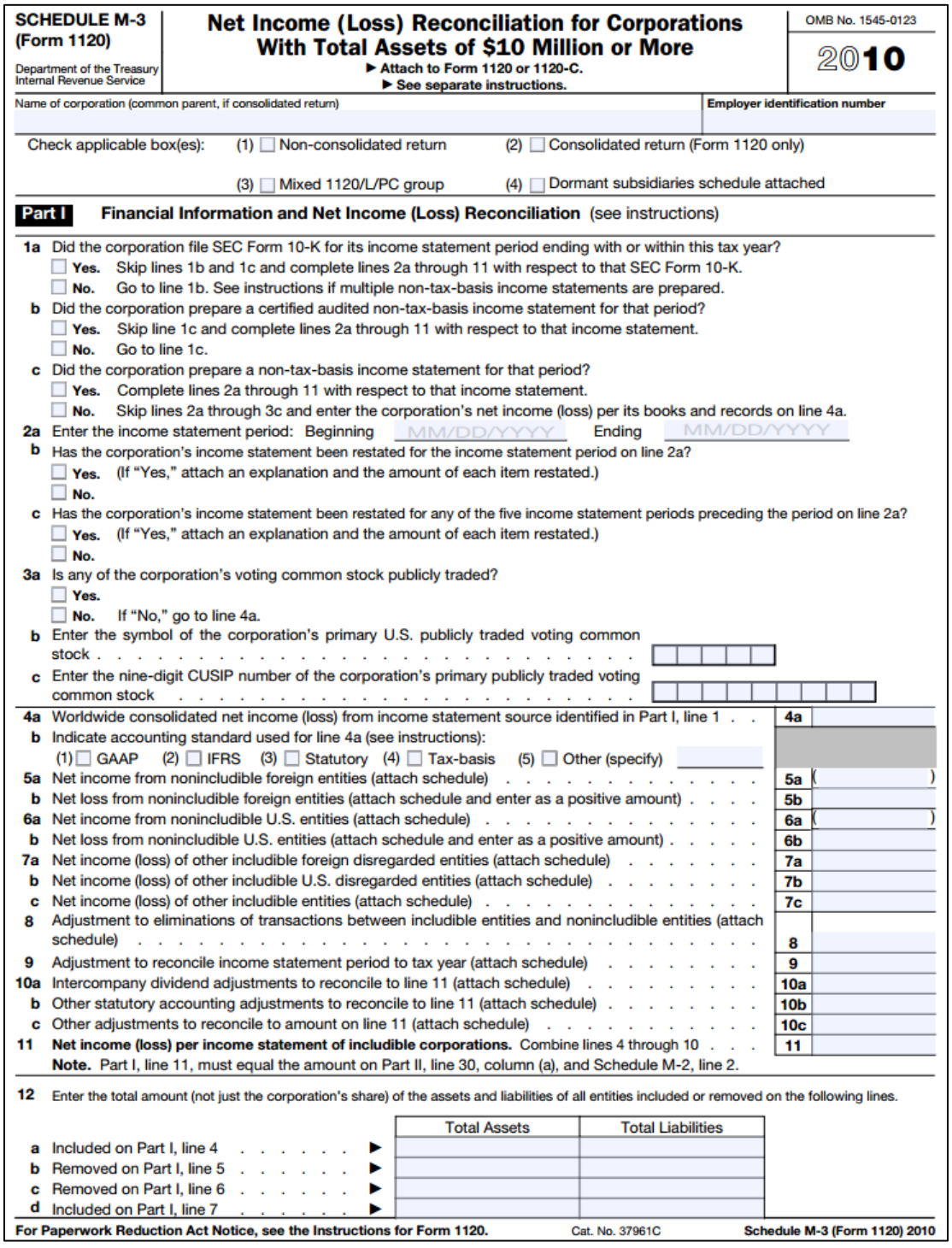
Appendix

Variable Definitions

		IRS Form Source:		
		1120	**1120S**	**1065**
Financial Reporting Choices				
GAAP	=	1 if Schedule M-3 Part I Line 4b accounting standard checkbox is checked "GAAP"; 0 otherwise.	1 if Schedule M-3 Part I Line 4b accounting standard checkbox is checked "GAAP"; 0 otherwise.	1 if Schedule M-3 Part I Line 4b accounting standard checkbox is checked "GAAP"; 0 otherwise.
AUDIT	=	1 if Schedule M-3 Part I Line 1b Audit use checkbox is checked “Yes”; 0 otherwise.	1 if Schedule M-3 Part I Line 1a Audit use checkbox is checked “Yes”; 0 otherwise.	1 if Schedule M-3 Part I Line 1b Audit use checkbox is checked “Yes”; 0 otherwise.
GAAP_AUDIT	=	1 if *GAAP* = 1 and *AUDIT* = 1; 0 otherwise.	1 if *GAAP* = 1 and *AUDIT* = 1; 0 otherwise.	1 if *GAAP* = 1 and *AUDIT* = 1; 0 otherwise.
Firm Characteristics				
LOG_REVENUE	=	log(1+Total Income) where Total Income is Total Income (Line 11) + COGS (Line 2) in $M from Page 1	log(1+Total Income) where Total Income is Total Income (Line 6) + COGS (Line 2) in $M from Page 1	log(1+Total Income) where Total Income is Total Income (Line 8) + COGS (Line 2) in $M from Page 1
LOG_NUM_OWNER	=	log(1+ # of shareholders from Schedule K Line 10; =101 if missing (it is missing if #shareholders is >100)	log(1+ # of shareholders from Page 1 Line I).	log(1+ # of partners from Page 1 Line I).
LOG_DEBT	=	log(1+ Mortgages, notes, bonds payable in less than 1 year [Schedule L Line 17 column d) + Mortgages, notes, bonds payable in 1 year or more [Schedule L Line 19 column d], in $M)	log(1+ Mortgages, notes, bonds payable in less than 1 year [Schedule L Line 17 column d) + Mortgages, notes, bonds payable in 1 year or more [Schedule L Line 20 column d], in $M)	log(1+ Mortgages, notes, bonds payable in less than 1 year [Schedule L Line 16 column d) + Mortgages, notes, bonds payable in 1 year or more [Schedule L Line 19 column d], in $M)
PROFIT_MGN	=	Taxable Income (Loss) before NOL from Page 1 Line 28, in $M / Total Income ($M); bounded to [-1, 1].	Ordinary Business Income (Loss) from Page 1 Line 21, in $M / Total Income ($M); bounded to [-1, 1].	Ordinary Business Income (Loss) from Page 1 Line 22, in $M / Total Income ($M); bounded to [-1, 1].
LOSS	=	1 if *PROFIT_MGN* < 0; 0 otherwise	1 if *PROFIT_MGN* < 0; 0 otherwise	1 if *PROFIT_MGN* < 0; 0 otherwise

LOG_ACCT_PAY	=	log(1 + Accounts Payable) where Accounts Payable from Schedule L Line 16 column d, in $M	log(1 + Accounts Payable) where Accounts Payable from Schedule L Line 16 column d, in $M	log(1 + Accounts Payable) where Accounts Payable from Schedule L Line 15 column d, in $M
PPE_TO_ASSETS	=	Net Depreciable Assets (Buildings and other depreciable assets on Schedule L Line 10b column d) divided by Total Assets (Page 1, Line D).	Net Depreciable Assets (Buildings and other depreciable assets on Schedule L Line 10b column d) divided by Total Assets (Page 1, Line F).	Net Depreciable Assets (Buildings and other depreciable assets on Schedule L Line 9b column d) divided by Total Assets (Page 1 Line F).
PPE_TO_WAGES	=	Net Depreciable Assets (Buildings and other depreciable assets on Schedule L Line 10b column d) divided by Salaries and wages (Page 1, Line 13).	Net Depreciable Assets (Buildings and other depreciable assets on Schedule L Line 10b column d) divided by Salaries and wages (Page 1, Line 8).	Net Depreciable Assets (Buildings and other depreciable assets on Schedule L Line 9b column d) divided by Salaries and wages other than to partners (Page 1, Line 9).
INTAN	=	1 if End of Year Gross Intangible Assets (Schedule L Line 13a column c) > 0; 0 otherwise.	1 if End of Year Gross Intangible Assets (Schedule L Line 13a column c) > 0; 0 otherwise.	1 if End of Year Gross Intangible Assets (Schedule L Line 12a column c) > 0; 0 otherwise.
GROWTH	=	Change in *LOG_REVENUE*	Change in *LOG_REVENUE*	Change in *LOG_REVENUE*
LOG_AGE	=	log(1 + Age), where Age is Fiscal Year minus Page 1 Box C "Year" in Date Incorporated field. Available only for 1120 and 1120S filers.	log(1 + Age), where Age is Fiscal Year minus Page 1 Box E "Year" in Date Incorporated field. Available only for 1120 and 1120S filers.	Not Available.
C_CORP	=	1 if entity filed Form 1120; 0 otherwise.	N/A	N/A
LOG_ASSETS	=	log(1 + Total Assets) where Total Assets from Page 1 Line D, in $M	log(1 + Total Assets) where Total Assets from Page 1 Line F, in $M	log(1 + Total Assets) where Total Assets from Page 1 Line F, in $M

Figure 1: 2010 Form 1120 Schedule M-3



SCHEDULE M-3 (Form 1120)
Department of the Treasury Internal Revenue Service

Net Income (Loss) Reconciliation for Corporations With Total Assets of $10 Million or More
► Attach to Form 1120 or 1120-C.
► See separate instructions.

OMB No. 1545-0123
2010

Name of corporation (common parent, if consolidated return) | Employer identification number

Check applicable box(es): (1) ☐ Non-consolidated return (2) ☐ Consolidated return (Form 1120 only)
(3) ☐ Mixed 1120/L/PC group (4) ☐ Dormant subsidiaries schedule attached

Part I **Financial Information and Net Income (Loss) Reconciliation** (see instructions)

1a Did the corporation file SEC Form 10-K for its income statement period ending with or within this tax year?
☐ Yes. Skip lines 1b and 1c and complete lines 2a through 11 with respect to that SEC Form 10-K.
☐ No. Go to line 1b. See instructions if multiple non-tax-basis income statements are prepared.
b Did the corporation prepare a certified audited non-tax-basis income statement for that period?
☐ Yes. Skip line 1c and complete lines 2a through 11 with respect to that income statement.
☐ No. Go to line 1c.
c Did the corporation prepare a non-tax-basis income statement for that period?
☐ Yes. Complete lines 2a through 11 with respect to that income statement.
☐ No. Skip lines 2a through 3c and enter the corporation's net income (loss) per its books and records on line 4a.
2a Enter the income statement period: Beginning MM/DD/YYYY Ending MM/DD/YYYY
b Has the corporation's income statement been restated for the income statement period on line 2a?
☐ Yes. (If "Yes," attach an explanation and the amount of each item restated.)
☐ No.
c Has the corporation's income statement been restated for any of the five income statement periods preceding the period on line 2a?
☐ Yes. (If "Yes," attach an explanation and the amount of each item restated.)
☐ No.
3a Is any of the corporation's voting common stock publicly traded?
☐ Yes.
☐ No. If "No," go to line 4a.
b Enter the symbol of the corporation's primary U.S. publicly traded voting common stock
c Enter the nine-digit CUSIP number of the corporation's primary publicly traded voting common stock

4a	Worldwide consolidated net income (loss) from income statement source identified in Part I, line 1	4a	
b	Indicate accounting standard used for line 4a (see instructions): (1) ☐ GAAP (2) ☐ IFRS (3) ☐ Statutory (4) ☐ Tax-basis (5) ☐ Other (specify)		
5a	Net income from nonincludible foreign entities (attach schedule)	5a	( )
b	Net loss from nonincludible foreign entities (attach schedule and enter as a positive amount)	5b	
6a	Net income from nonincludible U.S. entities (attach schedule)	6a	( )
b	Net loss from nonincludible U.S. entities (attach schedule and enter as a positive amount)	6b	
7a	Net income (loss) of other includible foreign disregarded entities (attach schedule)	7a	
b	Net income (loss) of other includible U.S. disregarded entities (attach schedule)	7b	
c	Net income (loss) of other includible entities (attach schedule)	7c	
8	Adjustment to eliminations of transactions between includible entities and nonincludible entities (attach schedule)	8	
9	Adjustment to reconcile income statement period to tax year (attach schedule)	9	
10a	Intercompany dividend adjustments to reconcile to line 11 (attach schedule)	10a	
b	Other statutory accounting adjustments to reconcile to line 11 (attach schedule)	10b	
c	Other adjustments to reconcile to amount on line 11 (attach schedule)	10c	
11	**Net income (loss) per income statement of includible corporations.** Combine lines 4 through 10	11	

Note. Part I, line 11, must equal the amount on Part II, line 30, column (a), and Schedule M-2, line 2.

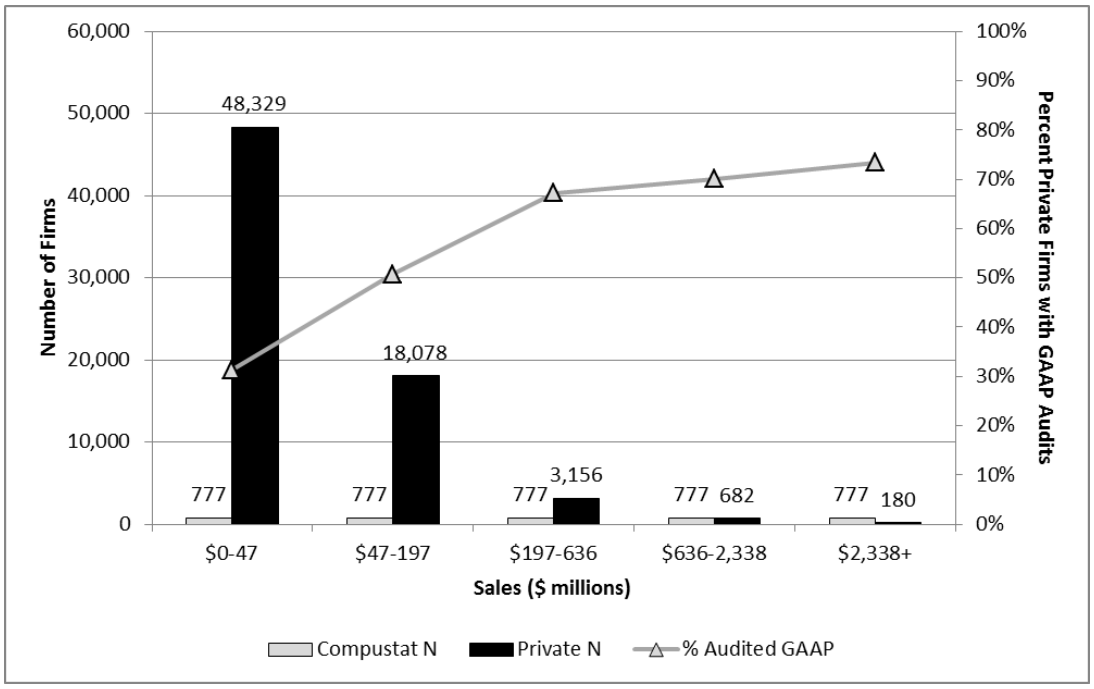
12 Enter the total amount (not just the corporation's share) of the assets and liabilities of all entities included or removed on the following lines.

		Total Assets	Total Liabilities
a	Included on Part I, line 4 ►		
b	Removed on Part I, line 5 ►		
c	Removed on Part I, line 6 ►		
d	Included on Part I, line 7 ►		

For Paperwork Reduction Act Notice, see the Instructions for Form 1120. Cat. No. 37961C Schedule M-3 (Form 1120) 2010

This figure shows the first page of the Schedule M-3 for Form 1120 tax filers (i.e., C Corporations). We use the responses to questions 1 through 4 to identify firms without public reporting requirements and to identify those firms' financial reporting choices.

Figure 2: Number of Private and Public Firms and Percent of Private Firms with Audited GAAP Financial Statements by Compustat Sales Size Quintile for the Year 2010.



This chart reports the distribution of private firms (paper and e-file) partitioned by Compustat sales revenue quintiles for the year 2010. The bar charts report the number of firms in each size quintile and the line chart reports the percentage of privately held firms in that quintile that produce audited GAAP financial statements. The quintiles are based on the Compustat variable "sale" for all nonfinancial U.S. firms in Compustat. The sizes of the private firms are based on the variable *Revenue* as defined in the Appendix. The financial reporting data (i.e., % Audited GAAP) for the e-filing firms is as reported on Schedule M-3; estimates are used for the paper filing firms as described in online appendix B. In comparing tax return data to Compustat data, we note two important caveats. First, "Revenues" per the tax return are not an exact comparison to the "sale" variable in Compustat. Various differences in definitions, consolidation rules, foreign versus domestic revenues all need to be considered. Second, Compustat does not cover all firms that have SEC registration requirements—i.e., it is not a comprehensive sample of publicly traded firms. This chart is meant to demonstrate broad relative magnitudes of the two settings rather than precise estimates.

TABLE 1

Sample Selection

	IRS Form Source:			
	1120	**1120S**	**1065**	**Total**
All Parent-Level Consolidated Tax Returns Fiscal Years 2008-2010 With Total Assets >= $10M[1]	131,831	115,445	397,150	644,426
Less: Publicly Traded (Total):	(13,108)	-	(1,242)	(14,350)
Non-Financial Publicly Traded	(8,126)	-	(378)	(8,504)
Financial Publicly Traded	(4,982)	-	(864)	(5,846)
	118,723	115,445	395,908	630,076
Less: Financial and Real Estate Firms[2]	(45,340)	(30,246)	(317,792)	(393,378)
Less: Foreign-Owned Firms[3]	(19,324)	-	(476)	(19,800)
Population Estimate Test Sample	54,059	85,199	77,640	**216,898**
Less: Tax Return Paper Filers	(28,152)	(42,359)	(54,977)	(125,488)
Firm-Level Test Sample (E-Filers Only)	*25,907*	*42,840*	*22,663*	**91,410**

This panel reports the sample selection process. We begin with all tax returns that also file Schedule M-3.

[1] $10M or more in assets is the filing requirement for Schedule M-3, which is the only IRS form that contains both accounting method and audit frequency data required for this study.

[2] We remove firms in NAICS Codes 52, 53, and 55.

[3] We remove firms with $\geq$25% foreign ownership.

Sources: For 1120: Schedule K Line 7. For 1065: Schedule B Line 1e. 1120S firms cannot be foreign.

TABLE 2

Descriptive Statistics

	E-filers						*GAAP_AUD* = 1	*GAAP_AUD* =0	
	n =91,410						*n* =40,623	*n* =50,787	Difference in
	n	Mean	P25	Median	P75	Std Dev	Mean	Mean	Means
Financial Reporting Choices									
GAAP_AUDIT	91,410	0.44	0	0	1	0.50	1	0	
GAAP	91,410	0.84	1	1	1	0.37	1	0.71	0.29 ***
AUDIT	91,410	0.45	0	0	1	0.50	1	0.02	0.98 ***
Firm Characteristics									
LOG_REVENUE	91,410	3.39	2.68	3.59	4.36	1.53	3.93	2.96	0.96 ***
Revenue ($M)	91,410	72.50	13.58	35.40	77.17	110.72	101.83	49.05	52.78 ***
LOG_NUM_OWNER	91,410	1.91	1.10	1.61	2.40	1.20	2.14	1.72	0.42 ***
Number of Owners	91,410	16.58	2.00	4.00	10.00	32.12	21.04	13.01	8.03 ***
Number of Owners (if <101)	83,498	7.73	2.00	3.00	7.00	13.27	9.87	6.11	3.76 ***
OWNER_EQ_1	91,410	0.18	0	0	0	0.38	0.17	0.19	-0.02 ***
OWNER_EQ_2	91,410	0.20	0	0	0	0.40	0.15	0.24	-0.09 ***
OWNER_EQ_3to5	91,410	0.25	0	0	1	0.44	0.22	0.28	-0.06 ***
OWNER_EQ_6to10	91,410	0.12	0	0	0	0.33	0.14	0.11	0.02 ***
OWNER_EQ_11to100	91,410	0.15	0	0	0	0.36	0.21	0.11	0.10 ***
OWNER_EQ_101orMore	91,410	0.09	0	0	0	0.28	0.12	0.06	0.05 ***
LOG_DEBT	91,410	1.59	0.00	1.62	2.56	1.41	1.82	1.41	0.40 ***
Debt ($M)	91,410	13.96	0.00	4.08	11.99	33.49	19.52	9.50	10.02 ***
PROFIT_MGN	91,410	-1.1%	-1.6%	1.3%	6.3%	28.4%	-0.007	-0.014	0.01 ***
LOSS	91,410	0.33	0	0	1	0.47	0.33	0.33	0.00
LOG_ACCT_PAY	91,410	1.10	0.29	0.87	1.65	1.00	1.44	0.82	0.62 ***
Accounts Payable ($M)	91,410	4.79	0.34	1.38	4.22	10.96	7.12	2.93	4.19 ***
PPE_TO_ASSETS	91,410	0.21	0.03	0.12	0.33	0.24	0.22	0.21	0.01 ***
PPE_TO_WAGES	91,410	4.83	0.10	0.58	2.67	15.23	4.88	4.79	0.09
INTAN	91,410	0.53	0	1	1	0.50	0.57	0.50	0.07 ***
GROWTH	46,388	-1.1%	-13.5%	0.2%	13.0%	50.3%	-0.01	-0.01	0.00
LOG_AGE	68,580	3.03	2.48	3.22	3.71	0.93	3.01	3.05	-0.04 ***
Age (years)	91,410	28.00	11.00	24.00	40.00	21.33	28.57	27.46	1.11 **
LOG_ASSETS	91,410	3.39	2.70	3.10	3.79	0.95	3.69	3.15	0.54 ***
Total Assets ($M)	91,410	61.78	13.81	21.14	43.44	165.89	86.70	41.85	44.85 ***
C_CORP	91,410	0.28	0	0	1	0.45	0.38	0.21	0.17 ***

This table reports the descriptive statistics for the variables used in the primary analysis. The sample size for *Number of Owners if <101* is 35,886 (if *GAAP_AUD* =1) and 47,612 (if *GAAP_AUD* =0); for *GROWTH* is 21,828 (if *GAAP_AUD* =1) and 24,560 (if *GAAP_AUD* =0); and for *LOG_AGE* and *Age (years)* is 33,308 (if *GAAP_AUD* =1) and 35,272 (if *GAAP_AUD* =0). See the Appendix for variable definitions.

TABLE 3

Two Way Sorts by Size, Ownership Dispersion, and Debt

Panel A: Size and Ownership Dispersion Partitions

Total Revenue ($ millions)	Number of Owners: 1	2-5	6-10	11-15	16-20	21-25	26-30	31-35	36-40	41-45	46-50	51-100	> 100	Total
< 20	4,538	14,675	3,452	1,265	669	439	362	296	211	183	177	725	2,724	29,716
	25%	19%	27%	34%	36%	40%	46%	38%	45%	46%	43%	51%	50%	27%
20-50	5,469	12,742	3,370	1,191	589	385	272	209	135	124	128	470	1,697	26,781
	42%	37%	48%	53%	57%	56%	55%	59%	59%	57%	61%	69%	64%	44%
50-100	3,405	8,275	2,218	792	409	296	235	179	126	72	78	419	1,205	17,709
	46%	46%	59%	67%	68%	73%	66%	73%	67%	54%	64%	60%	67%	52%
100-500	2,466	5,711	1,972	842	559	278	217	186	167	128	110	463	1,666	14,765
	61%	61%	71%	81%	77%	82%	85%	83%	84%	80%	87%	77%	66%	67%
> 500	337	584	263	124	124	59	61	46	38	33	31	119	620	2,439
	69%	70%	84%	84%	85%	93%	85%	96%	89%	91%	81%	86%	60%	73%
Total	16,215	41,987	11,275	4,214	2,350	1,457	1,147	916	677	540	524	2,196	7,912	91,410
	42%	36%	49%	56%	59%	61%	62%	62%	64%	61%	62%	64%	60%	44%

Panel B: Size and Debt Partitions

Total Revenue ($ millions)	Total Debt ($ millions): 0	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-100	> 100	Total
< 20	10,493	7,206	4,849	3,014	1,503	786	486	322	214	155	128	361	199	29,716
	25%	32%	27%	21%	23%	25%	28%	25%	29%	34%	38%	34%	39%	27%
20-50	6,047	10,094	5,591	2,253	907	480	316	206	166	120	76	356	169	26,781
	41%	43%	39%	46%	59%	58%	68%	69%	66%	68%	74%	71%	49%	44%
50-100	3,678	4,959	3,290	2,258	1,112	611	407	242	170	143	114	451	274	17,709
	49%	53%	47%	44%	52%	63%	64%	71%	71%	75%	82%	78%	67%	52%
100-500	3,122	2,714	1,513	1,192	1,038	815	630	450	385	290	262	1,168	1,186	14,765
	58%	63%	64%	67%	66%	67%	71%	70%	74%	77%	79%	80%	79%	67%
> 500	505	204	105	75	78	66	50	53	40	46	39	281	897	2,439
	55%	77%	79%	79%	67%	83%	80%	68%	83%	67%	72%	81%	79%	73%
Total	23,845	25,177	15,348	8,792	4,638	2,758	1,889	1,273	975	754	619	2,617	2,725	91,410
	38%	44%	40%	40%	48%	53%	58%	59%	63%	66%	70%	72%	73%	44%

This table partitions the full sample of e-filing firms (2008-2010) by the number of owners and sale revenues (Panel A) and amount of debt and sales revenue (Panel B). Each cell reports the number of firms in each portfolio and the percentage of those firms that produce audited GAAP financial statements.

TABLE 4

Firm-Level Regressions

Dependent Variable: *GAAP_AUDIT = 1*

	(1)		(2)		(3)	
	Coefficients	Shapley Value	Coefficients	Shapley Value	Coefficients	Shapley Value
LOG_REVENUE	0.099 ***	8.51%	0.080 ***	5.67%	0.096 ***	5.32%
	(8.13)		*(7.44)*		*(10.01)*	
LOG_NUM_OWNER	0.044 ***	1.98%	0.031 ***	1.43%	0.044 ***	1.74%
	(6.72)		*(3.49)*		*(12.53)*	
LOG_DEBT	0.037 ***	1.55%	0.028 ***	1.04%	0.031 ***	1.06%
	(4.39)		*(3.56)*		*(3.64)*	
PROFIT_MGN			-0.060 **	0.09%	-0.061 **	0.08%
			(-2.32)		*(-2.42)*	
LOSS			-0.006	0.03%	0.006	0.03%
			(-0.72)		*(0.70)*	
LOG_ACCT_PAY			0.051 ***	4.39%	0.045 ***	4.20%
			(3.59)		*(3.97)*	
PPE_TO_ASSETS			0.023	0.05%	0.055	0.10%
			(0.62)		*(1.51)*	
PPE_TO_WAGES			-0.0003	0.01%	-0.0003	0.01%
			(-1.57)		*(-1.22)*	
INTAN			0.016	0.16%	0.003	0.04%
			(1.27)		*(0.24)*	
GROWTH					0.050 ***	0.77%
					(8.25)	
LOG_AGE					-0.013 ***	0.27%
					(-2.57)	
C_CORP			0.093 ***	1.67%	0.076 ***	1.56%
			(3.54)		*(6.73)*	
Industry FE?	YES	6.43%	YES	5.35%	YES	5.73%
Year FE?	YES	0.02%	YES	0.01%	YES	0.02%
Adj.R^2	18.5%	18.5%	19.9%	19.9%	20.9%	20.9%
Observations	91,410		91,410		36,058	
Where *GAAP_AUDIT*=1	40,623		40,623		18,437	

This table reports firm-level linear probability model coefficient estimates and Shapley values in which the dependent variable is *GAAP_AUDIT*. The Shapley value represents each variable's contribution to the overall R^2 of each model (see Shapley 1953). All models use robust standard errors clustered by 3-digit NAICS industry code. Continuous variables are winsorized at the 1 and 99 percentile levels. Please see the Appendix for all variable definitions. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively (all two-tailed).

TABLE 5

Within Firm Analyses of Beginning or Ending a GAAP Audit

	Dependent Variable:			
	BEGIN_AUDIT		*END_AUDIT*	
	(1)	(2)	(3)	(4)
LOG_REVENUE	0.009**	0.008*	-0.008*	-0.007*
	(2.39)	*(1.76)*	*(-1.91)*	*(-1.71)*
LOG_NUM_OWNER	0.014***	0.021***	-0.001	0.000
	(3.22)	*(4.87)*	*(-0.25)*	*(0.09)*
LOG_DEBT	0.013***	0.011**	-0.003	-0.001
	(2.74)	*(2.35)*	*(-1.30)*	*(-0.62)*
PROFIT_MGN	-0.000	0.006	-0.032**	-0.041**
	(-0.04)	*(0.48)*	*(-2.28)*	*(-2.30)*
LOSS	0.022***	0.022**	0.018***	0.013*
	(2.72)	*(2.60)*	*(2.71)*	*(1.87)*
LOG_ACCT_PAY	0.017**	0.023***	-0.004	-0.007
	(2.46)	*(3.34)*	*(-1.06)*	*(-1.61)*
PPE_TO_ASSETS	-0.035	-0.016	-0.001	-0.005
	(-1.49)	*(-0.63)*	*(-0.06)*	*(-0.26)*
PPE_TO_WAGES	0.000	0.000	0.000	0.000
	(0.14)	*(0.59)*	*(0.82)*	*(0.80)*
INTAN	0.019**	0.016**	-0.002	-0.001
	(2.57)	*(2.21)*	*(-0.44)*	*(-0.24)*
GROWTH	0.044***	0.043***	-0.035***	-0.035***
	(3.93)	*(3.68)*	*(-3.24)*	*(-3.07)*
OWNER_INCREASE	0.039***	0.182***	-0.004	-0.026
	(2.76)	*(2.80)*	*(-0.57)*	*(-1.23)*
OWNER_DECREASE	-0.006	0.002	0.008	0.025
	(-0.42)	*(0.03)*	*(1.16)*	*(0.83)*
ΔLOG_DEBT	0.010	0.007	-0.009**	-0.005
	(1.16)	*(0.72)*	*(-2.61)*	*(-1.30)*
ΔPROFIT_MGN	-0.036	-0.024	-0.037	-0.065
	(-1.37)	*(-0.80)*	*(-1.02)*	*(-1.43)*
ΔLOG_ACCT_PAY	-0.005	-0.005	0.005	0.006
	(-0.46)	*(-0.39)*	*(0.71)*	*(0.76)*
ΔPPE_TO_ASSETS	0.129**	0.088	-0.018	-0.059
	(1.99)	*(1.21)*	*(-0.35)*	*(-1.22)*
ΔPPE_TO_WAGES	-0.003***	-0.003**	-0.000	-0.000
	(-2.88)	*(-2.51)*	*(-0.42)*	*(-0.22)*
C_CORP	0.033***	0.029***	-0.009	-0.010
	(3.17)	*(3.09)*	*(-1.56)*	*(-1.49)*
LOG_AGE		-0.024***		-0.003
		(-3.71)		*(-0.82)*
*LOG_AGE * OWNER_INCREASE*		-0.051***		0.007
		(-2.89)		*(1.03)*
*LOG_AGE * OWNER_DECREASE*		-0.002		-0.007
		(-0.13)		*(-0.75)*
Industry FE?	YES	YES	YES	YES
Adj.R^2	4.3%	6.3%	1.8%	2.0%
Observations	4,858	3,916	6,062	5,196
Where *Dep. Var.* = 1	255	205	202	163

This table reports linear probability model regression estimates in which the dependent variable =1 if the firm switches audit regime and =0 otherwise. The samples in all columns require the firm to exist in all three years and report using GAAP. Columns (1) and (2) compare firms which are not audited in 2008 but are audited in 2009 and 2010 to firms that never receive an audit 2008 to 2010. Columns (3) and (4) compare firms which are audited in 2008 but are not audited in 2009 and 2010 to firms that always receive an audit 2008 to 2010. All models use robust standard errors clustered by 3-digit NAICS industry code. Non-indicator variables are winsorized at the 1 and 99 percentile levels. Please see the Appendix for all variable definitions. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively (all two-tailed). The model specifications exclude firms with number of owners >100.

TABLE 6

Across Industry Use of GAAP and Audit

		(1)	(2)	(3)	(4)	(5)	(6)
NAICS	**Industry Name**	**Total Number**	**Total Percentage**	**GAAP Audit**	**GAAP No Audit**	**No GAAP Audit**	**No GAAP No Audit**
51	Information	3,607	4%	62%	32%	0%	6%
22	Utilities	862	1%	57%	32%	1%	9%
31-33	Manufacturing	19,907	22%	56%	38%	0%	6%
54, 56	Prof., Scientific, Tech., Admin, Waste Mgt. Services	10,180	11%	50%	32%	3%	15%
61-62	Education and Healthcare	3,770	4%	48%	39%	1%	11%
42	Wholesale Trade	11,606	13%	47%	43%	0%	10%
48-49	Transportation and Warehousing	2,931	3%	46%	43%	0%	11%
81	Other and unclassified	1,265	1%	44%	38%	1%	17%
23	Construction	12,745	14%	44%	37%	1%	19%
21	Mining	3,040	3%	32%	32%	1%	34%
71-72	Arts, Entertainment, Recreation, Accommodation, and Food Service	6,311	7%	30%	38%	1%	31%
44-45	Retail Trade	11,907	13%	29%	52%	1%	19%
11	Agriculture, Forestry, Fishing and Hunting	3,279	4%	25%	40%	0%	34%
	Total	91,410	100%	40,623	36,013	814	13,960
				44%	39%	1%	15%

This table presents a summary of the use of GAAP and auditing between and within industry for our sample of e-filer firms for all years 2008 - 2010. Column 1 reports the number of firm years; Column 2 reports the percentage of firm years in the given industry; Columns 3 through 6 report the percentage of firms within the industry based on whether they follow GAAP and whether the financial statements are audited by an independent accountant. Columns 3 - 6 are mutually exclusive and collectively exhaustive and thus sum to 100% within industry. Column 2 foots to 100% across all industries.

TABLE 7

Analysis of Industry Fixed Effects

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
ROA	-0.036									-0.021
	(-0.83)									(-0.48)
ROA_DISP		0.074*								0.029
		(1.91)								-0.57
%PUBLIC			0.120***							0.101**
			(2.90)							-2.47
LEV				-0.038						0.008
				(-0.80)						-0.14
PPE_TO_ASSETS					-0.089**					-0.016
					(-2.54)					(-0.31)
INTAN_TO_ASSETS						0.119***				0.068
						(3.35)				-1.59
GROWTH							0.089**			0.039
							(2.14)			-1.03
R&D_TO_SALES								0.141***		0.085**
								(4.51)		-2.29
MTB									0.062	-0.021
									(1.37)	(-0.46)
INTERCEPT	0.014	-0.040*	-0.063**	0.016	0.040*	-0.062**	-0.047*	-0.069***	-0.034	-0.136**
	(0.60)	(-1.90)	(-2.63)	(0.60)	(1.96)	(-2.60)	(-1.78)	(-3.36)	(-1.36)	(-2.47)
Adj.R^2	-0.3%	4.0%	13.3%	-0.1%	6.5%	12.9%	6.5%	22.5%	2.3%	31.2%
Observations	64	64	64	64	64	64	64	64	64	64

This table reports industry level linear probability model regression estimates for the 64 nonfinancial 3-digit NAICS industries with at least three firms with sufficient data to calculate all variables. The dependent variable is the estimated fixed effect coefficient for each industry from the firm-level regression results in Table 4, column 2. All independent variables are industry-based measures for publicly held firms from Compustat. *ROA* is net income scaled by total assets for the average firm in the industry. *ROA_DISP* is the within-industry interquartile range of *ROA*. *%PUBLIC* is the number of firms in CRSP divided by the number of firms in CRSP plus the number of private firms with at least $10 million in assets in the U.S. *LEV* is the sum of total short and long term debt scaled by total assets for the average firm in the industry. *PPE_TO_ASSETS* is the percentage of total assets composed of net property, plant, and equipment for the average firm in the industry. *INTAN_TO_ASSETS* is intangible assets divided by total assets for the average firm in the industry. *GROWTH* is the percentage revenue growth for the average firm in the industry. *R&D_TO_SALES* is research & development scaled by total sales for the average firm in the industry. *MTB* is the market value of assets (market value of equity plus book value of total debt) divided by the book value of total assets for the average firm in the industry. To facilitate comparability across the coefficients, all variables are placed into deciles and scaled between [0,1]. Heteroscedasticity robust t-statistics reported below the coefficient estimates. Continuous variables are winsorized at the 1 and 99 percentile levels. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively (all two-tailed).

TABLE 8

Summary Population Estimates by GAAP/Audit State

	2008		***2009***		***2010***		***Total***	
	GAAP	**No GAAP**	**GAAP**	**No GAAP**	**GAAP**	**No GAAP**	**GAAP**	**No GAAP**
Audit	27,477	694	26,590	535	27,019	694	81,086	1,923
	36.1%	*0.9%*	*37.8%*	*0.8%*	*38.4%*	*1.0%*	*37.4%*	*0.9%*
No Audit	32,695	15,320	28,820	14,342	28,566	14,146	90,081	43,808
	42.9%	*20.1%*	*41.0%*	*20.4%*	*40.6%*	*20.1%*	*41.5%*	*20.2%*
	76,186		70,287		70,425		216,898	
	100.0%		*100.0%*		*100.0%*		***100.0%***	

This table reports the distribution of financial reports based on whether the firm follows GAAP and whether the firm has their financial statements audited by an independent accountant. The data includes the population of firms. For e-filing firms, we use the financial reporting characteristics as reported on the tax return. For paper filing firms, we estimate their financial reporting characteristics using propensity score matching based on the e-filing firms. See the online appendix for specific details and estimation results.

Online Appendix for:

Accounting Choices and Capital Allocation: Evidence from Large Private U.S. Firms

December 2016

Table of Contents

Appendix A: Response Validity

We rely on the responses of e-filer firms in their Schedule M-3 tax forms for the main variable *GAAP_AUDIT* used in this study.[1] One potential concern is the validity of these responses. In this appendix, we describe this concern and provide both internal and external validity checks of the tax return data.

We first consider the nature of the tax form question and discuss the potential for errant or biased responses. Figure A1 shows the section of Form 1120 Schedule M-3 for the year 2010 that contains the relevant questions (other years' forms are very similar). In particular, question 1b is the source of whether or not the firm received an audit (independent of whether or not the firm uses GAAP). Note several aspects about this question. First, it specifically uses the word "audited," minimizing the risk of respondents mistaking this question for reviewed or compiled financial statements. Second, the question explicitly requires the firm to affirmatively answer either "Yes" or "No" as to whether their income statement is audited. This design differs from a single "check-the-box" question, where the lack of a "Yes" response might not necessarily mean a true "No" response, e.g., the firm simply skipped the question.

Moreover, the answer to the question causes the respondent firm to move to another portion of the Schedule M-3 conditional on the response, thus creating an opportunity to assess the internal validity of the firm's response. For example, we can examine if a firm erroneously responded to question 1c after providing a "Yes" response to question 1b. We found only 71 total instances (29 in 2008, 23 in 2009, and 19 in 2010) out of 91,410 tax returns in which answers between 1b and 1c were potentially internally inconsistent, i.e., "Yes" in 1b and "Yes"

[1] Recall that Schedule M-3 data on GAAP and audit use are only available for our e-filer firms.

in 1c.[2] A separate, yet more general internal validity check is to examine whether the firm's total assets, reported in two separate locations on the tax return (on page 1 and Schedule L), yield the same answer in both locations. We find that only 18 firms report different answers (6 in 2008, 5 in 2009, and 7 in 2010). In sum, we find very little evidence of inconsistent responses within the tax forms.

We also consider the possibility of errors and incentives for providing incorrect responses. First, we note that 90% of our e-file firms hire paid preparers to complete their tax forms. In fact, 25% (10%) of the prepared returns in 2010 are completed by the top 25 preparers by volume (Big Four accounting firms) out of over 8,000 unique paid preparers that year, providing evidence that many of the returns are completed by competent firms familiar with the forms. While paid preparers are certainly not exempt from making mistakes, the fact that a significant number of the forms is prepared by a concentrated number of professional firms each year should mitigate concerns regarding tax return reporting quality.

Separate from the quantitative validity checks above, there are few (if any) incentives from a qualitative aspect for explicitly misreporting responses on the Schedule M-3 regarding GAAP use or audits. In particular, it would be doubtful that firms systematically report that they do not receive a financial statement audit when in fact they do, especially on their tax forms. This observation suggests, if anything, that the reported audit rates may be biased upward. Also, if an audit is associated with the diligence with which the firm considers completing the form, then those that are audited are more likely to complete the form correctly relative to firms that are not audited. This logic again suggests a possibility of more false positives (firms that do not

[2] Note that the firm does not have to answer 1c at all if the response in question 1b is "Yes." However, a "Yes" to question 1c does not invalidate the answer in question 1b because a firm that prepares an *audited* financial statement ("Yes" in 1b) does prepare a financial statement generally ("Yes" in 1c). In fact, these firms might be over-complying by answering "Yes" in 1c when the firm answers "Yes" to 1b.

receive an audit reporting they do) than false negatives. In sum, considering that the substantial majority of responses are prepared by professional firms and that there are seemingly low incentives to systematically answer incorrectly, we find little reason to suspect significant bias in the reported audit rates.

Finally, we demonstrate external validity using two unrelated datasets of private firm financial statements. The first dataset is compiled by Sageworks, Inc., and contains financial data from privately held firms collected primarily by accounting firms (see Minnis 2011 for a description of this dataset). While this dataset does not provide unbiased statistics regarding the overall use of accounting because the data are collected from accounting firms, it provides a useful benchmark of the level of auditing conditional on the firm using an accountant.[3] To make the comparison as consistent as possible, we place a few conditions on both the IRS and Sageworks samples. From the IRS dataset, we condition on the firm using GAAP and calculate the percentage of firms that receive an audit by gross income size. From the Sageworks dataset, we condition on the firm reporting that they use accrual accounting and receive either a compilation, review, or audit. We further require the Sageworks firms to have $10 million in assets, to be consistent with the M-3 filers. Panel A of Table A1 shows that the overall rate of auditing is very similar in both of these samples across the revenue size categories.

We also compare the IRS data's statistics to those generated by the Risk Management Association's (RMA) Annual Statement Studies (See Lisowsky, Minnis, and Sutherland 2016 for a description of this dataset). Each year, RMA collects approximately 200,000 financial statements from member banks, which in turn have collected these financial statements from commercial borrowers. The advantage of the RMA dataset is its overall size and that it is not

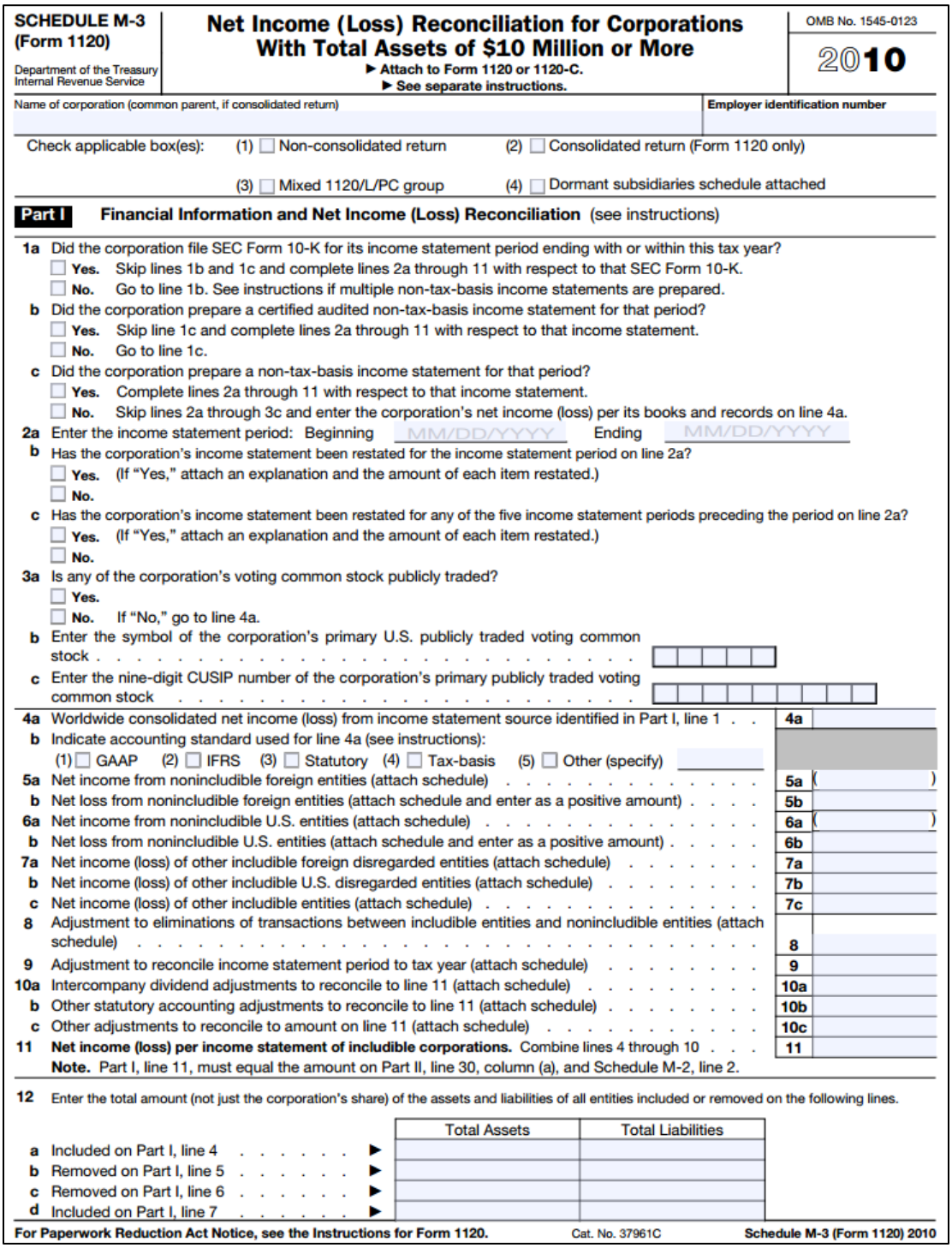
[3] Likewise, the time trends are biased because firms that stop using an accountant are truncated from the sample. This truncation does not occur with the tax return data.

biased by collection from accounting firms. Moreover, it reports the distribution of the financial statements into five categories: unqualified audits, reviews, compilations, tax returns, and other. Therefore, the database is not restricted to financial statements *per se*, but also reports when banks only collect tax returns. The reporting of "unqualified" audit opinions is advantageous to discern this particular aspect of auditing, but it creates a comparison issue because "qualified" audit opinions are reported in "other" (along with other types of statements collected by banks) in the RMA data. However, on the tax return, firms do not distinguish between unqualified and qualified audit opinions when answering the tax return question about audit use. A particular disadvantage of the RMA dataset is that the figures are reported at an aggregate level by industry and firm size, and the firm size partitions are coarse. Panel B of Table A1 shows the distribution of income statement types by three sales revenue categories and compares it to the IRS figures. Column (a) of the RMA sample reports the percent of unqualified audits while column (b) combines unqualified audit rates with the "other" financial statement category. Thus, column (a), which includes only unqualified audits, should track below the rates in the IRS data because the IRS data includes unqualified *and* qualified audits. However, column (b) should track above the rates in the IRS data because column (b) not only includes unqualified and qualified audits, but also financial reports generated internally by the company (which is a high proportion of the "other" category). Indeed, our analysis finds that the IRS audit rates comfortably track between columns (a) and (b) of the RMA rates, despite the different samples.[4]

[4] Note two additional differences between the IRS and RMA data which lead to point estimates that are higher for the IRS data relative to the RMA data: (1) The IRS data conditions on firms have at least $10 million in assets, which makes the smaller revenue size groups less comparable between the IRS and RMA data sets. (2) The IRS data in Table A1 omits paper filers, which have lower audit rates than e-filers. See online appendix B for a detailed discussion of our use of paper filers.

Collectively, the data suggest that firms are reasonably diligent in completing the tax forms used in our study, and the comparison to external datasets suggests that the statistics compiled from the IRS dataset (and vice versa, by Sageworks and RMA), are quite reasonable.

Figure A1: 2010 Form 1120 Schedule M-3



SCHEDULE M-3 (Form 1120)
Department of the Treasury
Internal Revenue Service

Net Income (Loss) Reconciliation for Corporations With Total Assets of $10 Million or More

► Attach to Form 1120 or 1120-C.
► See separate instructions.

OMB No. 1545-0123

2010

Name of corporation (common parent, if consolidated return) | Employer identification number

Check applicable box(es): (1) ☐ Non-consolidated return (2) ☐ Consolidated return (Form 1120 only)
(3) ☐ Mixed 1120/L/PC group (4) ☐ Dormant subsidiaries schedule attached

Part I **Financial Information and Net Income (Loss) Reconciliation** (see instructions)

1a Did the corporation file SEC Form 10-K for its income statement period ending with or within this tax year?
☐ **Yes.** Skip lines 1b and 1c and complete lines 2a through 11 with respect to that SEC Form 10-K.
☐ **No.** Go to line 1b. See instructions if multiple non-tax-basis income statements are prepared.

b Did the corporation prepare a certified audited non-tax-basis income statement for that period?
☐ **Yes.** Skip line 1c and complete lines 2a through 11 with respect to that income statement.
☐ **No.** Go to line 1c.

c Did the corporation prepare a non-tax-basis income statement for that period?
☐ **Yes.** Complete lines 2a through 11 with respect to that income statement.
☐ **No.** Skip lines 2a through 3c and enter the corporation's net income (loss) per its books and records on line 4a.

2a Enter the income statement period: Beginning MM/DD/YYYY Ending MM/DD/YYYY

b Has the corporation's income statement been restated for the income statement period on line 2a?
☐ **Yes.** (If "Yes," attach an explanation and the amount of each item restated.)
☐ **No.**

c Has the corporation's income statement been restated for any of the five income statement periods preceding the period on line 2a?
☐ **Yes.** (If "Yes," attach an explanation and the amount of each item restated.)
☐ **No.**

3a Is any of the corporation's voting common stock publicly traded?
☐ **Yes.**
☐ **No.** If "No," go to line 4a.

b Enter the symbol of the corporation's primary U.S. publicly traded voting common stock . . . . . ☐☐☐☐☐

c Enter the nine-digit CUSIP number of the corporation's primary publicly traded voting common stock . . . . . ☐☐☐☐☐☐☐☐☐

4a	Worldwide consolidated net income (loss) from income statement source identified in Part I, line 1	**4a**	
b	Indicate accounting standard used for line 4a (see instructions): (1) ☐ GAAP (2) ☐ IFRS (3) ☐ Statutory (4) ☐ Tax-basis (5) ☐ Other (specify)		
5a	Net income from nonincludible foreign entities (attach schedule)	**5a**	( )
b	Net loss from nonincludible foreign entities (attach schedule and enter as a positive amount)	**5b**	
6a	Net income from nonincludible U.S. entities (attach schedule)	**6a**	( )
b	Net loss from nonincludible U.S. entities (attach schedule and enter as a positive amount)	**6b**	
7a	Net income (loss) of other includible foreign disregarded entities (attach schedule)	**7a**	
b	Net income (loss) of other includible U.S. disregarded entities (attach schedule)	**7b**	
c	Net income (loss) of other includible entities (attach schedule)	**7c**	
8	Adjustment to eliminations of transactions between includible entities and nonincludible entities (attach schedule)	**8**	
9	Adjustment to reconcile income statement period to tax year (attach schedule)	**9**	
10a	Intercompany dividend adjustments to reconcile to line 11 (attach schedule)	**10a**	
b	Other statutory accounting adjustments to reconcile to line 11 (attach schedule)	**10b**	
c	Other adjustments to reconcile to amount on line 11 (attach schedule)	**10c**	
11	**Net income (loss) per income statement of includible corporations.** Combine lines 4 through 10	**11**	

Note. Part I, line 11, must equal the amount on Part II, line 30, column (a), and Schedule M-2, line 2.

12 Enter the total amount (not just the corporation's share) of the assets and liabilities of all entities included or removed on the following lines.

		Total Assets	Total Liabilities
a	Included on Part I, line 4 ►		
b	Removed on Part I, line 5 ►		
c	Removed on Part I, line 6 ►		
d	Included on Part I, line 7 ►		

For Paperwork Reduction Act Notice, see the Instructions for Form 1120. Cat. No. 37961C **Schedule M-3 (Form 1120) 2010**

TABLE A1

Comparison of the Percentage of Firms Audited between IRS Tax Returns and Alternative Data Sources

Panel A: Comparison of IRS and Sageworks

Sales size	**IRS**	**Sageworks**
<$20 MM	37%	44%
$20 to $50 million	47%	41%
$50 to $100 million	57%	53%
$100 to $500 million	72%	68%
>$500 million	79%	75%

Panel B: Comparison of IRS and RMA

Sales size	**IRS**	**RMA**	
		(a)	**(b)**
$5 to $10 million	38%	13%	47%
$10 to $25 million	45%	20%	55%
>$25 million	59%	42%	82%

This table compares the audit rate from the IRS dataset to the audit rate of the Sageworks and RMA datasets for the year 2008. The IRS sample is the percent of firms who have a financial statement audit conditional on using GAAP. The Sageworks sample is the percentage of firms receiving an audit conditional on following accrual accounting and receiving either an audit, review, or compilation. The RMA sample is the percentage of firms receiving unqualified audit opinions in column a and the sum of unqualified and "other" types of financial statements (which include qualified audit opinions) in column b.

Appendix B: Estimating Financial Reporting Choices of Paper Filers

One of the objectives of our empirical analysis is to understand the population-level accounting choices of large private firms in the U.S. and describe the dynamics of these choices. While our sample includes the population of tax filing firms with assets of $10 million or more, one empirical challenge relates to data availability on the financial reporting choices from Schedule M-3. Firms file their tax returns in either paper or electronic formats and, unfortunately, the M-3 data for the paper filers about GAAP and audit use are not available to us. Moreover, untabulated descriptive statistics reveal that e-filers and paper filers differ significantly along many dimensions. For example, e-filers are larger, more frequently Subchapter C corporations, with intangibles, and they have more owners (and fatter tails in the distribution of owners), debt, and trade payables. Because each of these characteristics likely varies with the financial reporting choices of firms, making the assumption that the choice to e-file is random would likely lead to biased estimates of the population parameters. Therefore, we use the e-filing firms to estimate the choices of the paper filing firms and derive population estimates of audited GAAP production. To ensure robustness, we use two different propensity models to make these estimates.

In our primary approach, we match each paper filer with an e-filer within the same industry-year using the following probit specification (subscripts for firm *i*, industry *j*, and year *t* are suppressed for brevity):

$$\begin{aligned} PAPER = \; & \beta_0 + \beta_1 LOG\_REVENUE + \beta_2 LOG\_NUM\_OWNER + \beta_3 LOG\_DEBT + \\ & \beta_4 PROFIT\_MGN + \beta_5 LOSS + \beta_6 LOG\_ACCT\_PAY + \\ & \beta_7 PPE\_TO\_ASSETS + \beta_8 PPE\_TO\_WAGES + \beta_9 INTAN + \\ & \beta_{10} GROWTH + \beta_{11} LOG\_AGE + \beta_{12} C\_CORP + \varepsilon \end{aligned} \quad \text{(A)}$$

Each paper filing firm is then assigned the financial reporting characteristics (i.e., the values of *GAAP* and *AUDIT*) of the propensity score matched e-filing firm. Note that while e-filing and

paper filing firms are significantly different on average, there is common support across all variables for e-filing and paper filing firms (i.e., there is an abundant number of e-filing firms that are sufficiently similar to paper filing firms) to ensure very close matches.

There are two important items to note about this matching approach. First, it likely results in noisy estimates of financial reporting choices at the firm level; however, as long as these estimates are not biased, then the noise will be eliminated in aggregate and the population estimates of the financial reporting choices will be unbiased. Second, because there is noise at the firm level as a result of the approximation process, the transition rates (i.e., the rate at which firms switch between states, e.g., Audit to No Audit) are biased upwards. In other words, for each firm-year, there is a significant random component to the assignment, which means that firms for which estimates are made will randomly move from one state to another for no reason other than estimation error. So while the estimation error tends toward zero when averaging across all firms to derive a population estimate of the *level* of the financial reporting choices, the estimated number of *changes* in financial reporting choices will be inflated relative to the true number of changes. As a result, we use paper filers to estimate population parameters of the levels, but not changes, of financial reporting choices each year, and the transition rates we estimate only apply to the e-filers. Table A2 reports our detailed estimates of GAAP and audit use used to derive our population estimates from Table 8 in the paper.

To ensure robustness, we also use an alternative propensity matching approach. We estimate the percentage of the paper filers who follow GAAP and receive audits by estimating the same specification as equation (A) above, except we use separate indicator variables for *AUDIT* and *GAAP* as the dependent variables. We then derive the estimated parameters of these equations using only the e-filers and then apply these parameters to calculate estimated

propensity scores for the paper filing firms. The calculated average propensity score across all paper firms is the estimated average audit and GAAP rate for this portion of the sample. In untabulated results, we find that the estimates of GAAP and audit use following this approach are nearly identical to our main approach discussed above.

Table A2

Detailed Population Estimates of GAAP/Audit Use

	GAAP		Audit		GAAP and Audit		Total	
	2008	**2010**	**2008**	**2010**	**2008**	**2010**	**2008**	**2010**
Firms that exist in both 2008 and 2010								
Firms that E-File in both years	13,837	13,651	7,903	7,870	7,726	7,682	16,129	16,129
	85.8%	84.6%	49.0%	48.8%	47.9%	47.6%		
Firms that only E-File in one of the years	12,523	12,762	5,949	6,815	5,785	6,698	15,532	15,532
	80.6%	82.2%	38.3%	43.9%	37.2%	43.1%		
Firms that Paper file in both years	17,770	17,551	7,625	7,970	7,429	7,721	23,384	23,384
	76.0%	75.1%	32.6%	34.1%	31.8%	33.0%		
Subtotal before considering entry or exit	44,130	43,964	21,477	22,655	20,940	22,101	55,045	55,045
	80.2%	79.9%	39.0%	41.2%	38.0%	40.2%		
Firms that exist in only one year								
Firms that E-File in either 2008 or 2010	4,520	5,886	2,032	2,672	2,000	2,618	5,500	7,379
	82.2%	79.8%	36.9%	36.2%	36.4%	35.5%		
Firm that Paper file in either 2008 or 2010	11,522	5,735	4,662	2,386	4,537	2,300	15,641	8,001
	73.7%	71.7%	29.8%	29.8%	29.0%	28.7%		
Subtotal for entry/exit firms	16,042	11,621	6,694	5,058	6,537	4,918	21,141	15,380
	75.9%	75.6%	31.7%	32.9%	30.9%	32.0%		
Total sample	**60,172**	**55,585**	**28,171**	**27,713**	**27,477**	**27,019**	**76,186**	**70,425**
(Using propensity matching approach)	**79.0%**	**78.9%**	**37.0%**	**39.4%**	**36.1%**	**38.4%**		

Appendix C: Additional Analyses

TABLE A3

Rates of Accounting Standards and Auditing

All Years

	GAAP	No GAAP				Totals
		Tax	IFRS	Statutory	Other	
Audit	40,623	343	68	17	386	41,437
	44.4%	*0.4%*	*0.1%*	*0.0%*	*0.4%*	*45.3%*
No Audit	36,013	11,124	86	513	2,237	49,973
	39.4%	*12.2%*	*0.1%*	*0.6%*	*2.4%*	*54.7%*
Total	76,636	11,467	154	530	2,623	**91,410**
	83.8%	*12.5%*	*0.2%*	*0.6%*	*2.9%*	***100.0%***

This table reports the number of proportion of e-filing firms over the years 2008-2010 by the set of accounting standards followed by the firm (across the columns) and whether the firm had its financial statements audited (down the rows). The category "Other" includes cash-basis, hybrid, completed contract method, and percentage of completion method.

Table A4

Robustness Tests of Firm-Level Analysis

	From the paper Table 4, Col. 2	Use Log Assets as size control and Scale by Assets	Same as (1) but eliminate firms <$5 million in revenue	Same as (2) but eliminate firms <$5 million in revenue	Same as (1) but use interest deductions instead of Debt
	(1)	(2)	(3)	(4)	(5)
LOG_REVENUE	0.080***		0.087***		0.077***
	[7.44]		[4.18]		[7.39]
LOG_ASSETS		0.128***		0.122***	
		[10.99]		[10.35]	
LOG_NUM_OWNER	0.031***	0.029***	0.028***	0.028***	0.031***
	[3.49]	[4.08]	[2.94]	[3.02]	[3.41]
LOG_DEBT	0.028***		0.033***		
	[3.56]		[4.46]		
LEVERAGE		0.018		0.057*	
		[0.53]		[1.92]	
PROFIT_MGN	-0.060**	0.025	-0.064	-0.068	-0.060**
	[-2.32]	[0.77]	[-1.47]	[-1.32]	[-2.30]
LOSS	-0.006	-0.003	0.000	-0.025***	-0.007
	[-0.72]	[-0.51]	[-0.01]	[-2.69]	[-0.81]
LOG_ACCT_PAY	0.051***		0.043**		0.052***
	[3.59]		[2.50]		[3.88]
ACCT_PAY_TO_ASSETS		0.331***		0.186*	
		[2.86]		[1.85]	
PPE_TO_ASSETS	0.023	0.112***	0.031	0.073	0.048
	[0.62]	[2.77]	[0.64]	[1.48]	[1.45]
PPE_TO_WAGES	0.000	-0.001***	0.000	-0.001**	0.000
	[-1.57]	[-3.61]	[-0.67]	[-2.56]	[-1.43]
INTAN	0.016	0.032**	0.027**	0.029**	0.021
	[1.27]	[2.42]	[2.09]	[2.19]	[1.56]
LOG_INT_DEDUCTIONS					0.056***
					[4.31]
C_CORP	0.093***	0.110***	0.085***	0.081***	0.091***
	[3.54]	[3.98]	[3.79]	[3.41]	[3.40]
Industry FE?	Y	Y	Y	Y	Y
Year FE?	Y	Y	Y	Y	Y
Adj.R^2	0.199	0.161	0.163	0.143	0.197
N	91,410	91,410	77,531	77,531	91,410
N where *GAAP_AUD*=1	40,623	40,623	38,114	38,114	40,623

This table reports firm level linear probability estimates in which the dependent variable is *GAAP_AUDIT*. The results from Table 4, Column 2 from the paper are reproduced in Column 1 above. The results in Column 2 substitute the log of total assets from total revenues as the size control and also scale *DEBT* and *ACCOUNTS_PAYABLE* by total assets. Column 3 (4) reports the same results as Column 1 (2) but firms with less than $5 million in revenues have been removed. Column 5 reports the same results as Column 1 but the log of interest deductions have been used rather than the log of debt. All models use robust standard errors clustered by 3-digit NAICS industry code. Continuous variables are winsorized at the 1 and 99 percentile levels. Please see the Appendix in the main paper for variable definitions. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

Table A5

Firm-Level Results Estimated by Industry

	Agriculture NAICS11	Mining NAICS21	Utilities NAICS22	Construction NAICS23	Manufact. NAICS31-33	Wholesale NAICS42	Retail NAICS44,45	Transport/ Warehouse NAICS48,49	Information NAICS51	Prof/ Admin Services NAICS54,56	Educ/ Healthcare Services NAICS 61,62	Entert/ Accom./Food Services NAICS 71,72	Other Services NAICS81
	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
LOG_REVENUE	0.044***	0.043***	0.065***	0.113***	0.112***	0.091***	0.040***	0.080***	0.075***	0.052***	0.065***	0.100***	0.082***
	[5.24]	[4.97]	[3.80]	[25.63]	[18.97]	[12.91]	[5.58]	[7.53]	[7.17]	[11.20]	[6.61]	[13.42]	[6.32]
LOG_NUM_OWNER	0.045***	0.027***	0.055***	0.029***	0.044***	0.043***	0.041***	0.058***	0.055***	-0.010**	0.011	0.034***	0.051***
	[3.91]	[3.13]	[2.82]	[4.53]	[10.89]	[6.36]	[5.68]	[4.85]	[6.84]	[-2.08]	[1.32]	[4.45]	[3.67]
LOG_DEBT	0.034***	0.062***	0.015	-0.014***	0.046***	0.074***	0.009	0.054***	0.028***	0.028***	0.035***	0.013**	0.032**
	[4.27]	[7.00]	[1.03]	[-3.25]	[11.61]	[14.19]	[1.59]	[6.08]	[3.97]	[5.72]	[4.20]	[2.12]	[2.39]
PROFIT_MGN	-0.063***	-0.097***	0.06	-0.031*	-0.138***	0.037	0.065	0.047	-0.02	-0.142***	-0.121***	0.021	-0.022
	[-2.82]	[-3.25]	[0.94]	[-1.84]	[-5.78]	[1.08]	[1.56]	[1.15]	[-0.54]	[-7.16]	[-3.20]	[0.91]	[-0.49]
LOSS	0.014	-0.037	-0.005	-0.047***	-0.016	0.050***	0.021**	-0.015	-0.040*	-0.030**	-0.038	-0.005	0.034
	[0.58]	[-1.26]	[-0.09]	[-3.84]	[-1.59]	[3.64]	[1.97]	[-0.65]	[-1.74]	[-2.04]	[-1.61]	[-0.28]	[0.87]
LOG_ACCT_PAY	0.119***	0.038***	-0.027	0.082***	-0.018**	0.012	0.127***	0.036**	-0.054***	0.048***	0.092***	0.058***	0.033
	[7.23]	[2.89]	[-1.00]	[10.94]	[-2.52]	[1.52]	[16.92]	[2.14]	[-3.42]	[5.79]	[5.36]	[3.85]	[1.39]
PPE_TO_ASSETS	-0.102**	0.117**	0.208***	0.279***	0.04	-0.014	0.238***	-0.087*	0.273***	-0.158***	-0.165***	0.029	0.071
	[-2.55]	[2.16]	[2.82]	[9.78]	[1.45]	[-0.28]	[6.13]	[-1.96]	[5.99]	[-4.13]	[-3.64]	[1.06]	[1.04]
PPE_TO_WAGES	0	0	-0.001	0	0	-0.002**	0	0	0.001**	-0.001*	0	0	0.001
	[0.55]	[-0.41]	[-1.18]	[-0.75]	[-1.58]	[-2.05]	[0.39]	[0.33]	[1.99]	[-1.77]	[0.26]	[-0.78]	[0.54]
INTAN	-0.067***	-0.047**	0.019	-0.051***	0.043***	0.035***	0.027**	0.032	0.058**	0.076***	-0.002	-0.084***	-0.01
	[-3.40]	[-2.13]	[0.40]	[-4.27]	[4.38]	[2.77]	[2.44]	[1.28]	[2.34]	[5.66]	[-0.08]	[-4.34]	[-0.27]
C_CORP	-0.025	0.069**	0.038	0.030*	0.083***	0.030**	0.053***	0.039	0.068***	0.247***	0.057**	0.139***	0.206***
	[-0.80]	[2.33]	[0.67]	[1.84]	[7.71]	[2.01]	[3.54]	[1.39]	[2.63]	[16.17]	[2.09]	[5.15]	[4.97]
Industry FE?	N	N	N	N	N	N	N	N	N	N	N	N	N
Year FE?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Adj.R2	0.213	0.145	0.118	0.306	0.134	0.145	0.165	0.201	0.138	0.161	0.156	0.22	0.262
N	3,279	3,040	862	12,745	19,907	11,606	11,907	2,931	3,607	10,180	3,770	6,311	1,265
N where *GAAP_AUD*=1	817	977	493	5,565	11,082	5,398	3,396	1,334	2,229	5,050	1,826	1,899	557

This table reports firm level linear probability estimates in which the dependent variable is *GAAP_AUDIT*. These results are the same specification as Table 4, Column 2 from the paper except the coefficients are allowed to vary by industry. All models use robust standard errors clustered at the firm level. Continuous variables are winsorized at the 1 and 99 percentile levels. Please see the Appendix in the main paper for variable definitions. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

Table A6

Robustness Tests of Ownership Variable Specification

	Exclude firms with > 100 Owners	**Exclude firms with > 100 Owners and use indicators for #Owners**
	(1)	(2)
LOG_REVENUE	0.088***	0.087***
	[12.38]	[12.47]
LOG_NUM_OWNER	0.053***	
	[10.76]	
OWNER_EQ_1		-0.122***
		[-10.97]
OWNER_EQ_2		-0.138***
		[-12.19]
OWNER_EQ_3_5		-0.120***
		[-11.15]
OWNER_EQ_6_10		-0.055***
		[-4.90]
LOG_DEBT	0.031***	0.031***
	[3.74]	[3.70]
PROFIT_MGN	-0.049**	-0.050**
	[-2.19]	[-2.21]
LOSS	-0.004	-0.005
	[-0.46]	[-0.50]
LOG_ACCT_PAY	0.050***	0.051***
	[4.03]	[4.09]
PPE_TO_ASSETS	0.029	0.032
	[0.88]	[0.98]
PPE_TO_WAGES	-0.000**	-0.000**
	[-2.36]	[-2.41]
INTAN	0.011	0.011
	[1.10]	[1.11]
C_CORP	0.086***	0.083***
	[5.70]	[5.40]
Industry FE?	Y	Y
Year FE?	Y	Y
Adj.R2	0.205	0.206
N	83,498	83,498
N where GAAP_Aud=1	35,886	35,886

This table reports firm level linear probability estimates in which the dependent variable is *GAAP_AUDIT*. The specification in Column 1 is the same specification as Table 4, Column 2 from the paper except firms with more than 100 owners have been eliminated. The specification in Column 2 is the same as Column 1 except indicator variables have been included to semi-parametrically examine ownership. Firms with 11 to 100 owners are the holdout. All models use robust standard errors clustered at the firm level. Continuous variables are winsorized at the 1 and 99 percentile levels. Please see the Appendix in the main paper for variable definitions. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

TABLE A7

Firm-Level Regressions: Year-by-Year (2008-2010)

Dependent Variable: *GAAP_AUDIT = 1*

	Table 4 Col. (2) Results (2008-2010)	2008 Only	2009 Only	2010 Only
LOG_REVENUE	0.080 ***	0.078 ***	0.084 ***	0.079 ***
	(7.44)	*(6.96)*	*(7.14)*	*(7.77)*
LOG_NUM_OWNER	0.031 ***	0.029 ***	0.029 ***	0.034 ***
	(3.49)	*(3.34)*	*(3.14)*	*(3.74)*
LOG_DEBT	0.028 ***	0.028 ***	0.027 ***	0.029 ***
	(3.56)	*(3.24)*	*(3.43)*	*(3.85)*
PROFIT_MGN	-0.060 **	-0.079 **	-0.055 *	-0.054 **
	(-2.32)	*(-2.64)*	*(-1.92)*	*(-2.30)*
LOSS	-0.006	-0.019 **	-0.003	-0.003
	(-0.72)	*(-2.16)*	*(-0.23)*	*(-0.28)*
LOG_ACCT_PAY	0.051 ***	0.048 ***	0.053 ***	0.052 ***
	(3.59)	*(3.65)*	*(3.48)*	*(3.54)*
PPE_TO_ASSETS	0.023	0.037	0.011	0.025
	(0.62)	*(0.91)*	*(0.32)*	*(0.68)*
PPE_TO_WAGES	-0.0003	-0.0004 *	0.0003	0.0002
	(-1.57)	*(-1.99)*	*(-1.12)*	*(-1.06)*
INTAN	0.016	0.014	0.015	0.018
	(1.27)	*(1.36)*	*(1.13)*	*(1.26)*
C_CORP	0.093 ***	0.105 ***	0.096 ***	0.084 ***
	(3.54)	*(4.13)*	*(3.28)*	*(3.33)*
Industry FE?	YES	YES	YES	YES
Year FE?	YES	NO	NO	NO
Adj.R^2	19.9%	20.1%	20.2%	19.3%
Observations	91,410	22,655	30,741	38,014
Where *GAAP_AUDIT*=1	40,623	10,155	13,902	16,566

This table reports firm-level linear probability model estimates in which the dependent variable is *GAAP_AUDIT*. All models use robust standard errors clustered by 3-digit NAICS industry code. Continuous variables are winsorized at the 1 and 99 percentile levels. Please see the Appendix for all variable definitions. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively (all two-tailed).

Table A8

Logit and Ordered Logit Specifications

	Logit		Ordered Logit
	(1)	(2)	(3)
LOG_REVENUE	0.496***	0.416***	0.431***
	[6.45]	[6.63]	[7.56]
LOG_NUM_OWNER	0.214***	0.153***	0.140***
	[5.65]	[3.14]	[3.72]
LOG_DEBT	0.187***	0.148***	0.120***
	[4.80]	[3.95]	[2.84]
PROFIT_MGN		-0.360**	-0.265**
		[-2.46]	[-1.96]
LOSS		-0.02	0.043
		[-0.50]	[1.43]
LOG_ACCT_PAY		0.246***	0.278***
		[3.48]	[4.20]
PPE_TO_ASSETS		0.11	0.224
		[0.58]	[1.38]
PPE_TO_WAGES		-0.001	-0.001
		[-1.34]	[-0.81]
INTAN		0.083	0.003
		[1.38]	[0.05]
C_CORP		0.454***	0.486***
		[3.80]	[4.37]
Industry FE?	Y	Y	Y
Year FE?	Y	Y	Y
Pseudo R2	0.1490	0.1615	0.1382
Area under ROC Curve	0.7577	0.7661	n/a
N	91,410	91,410	90,596
N where *GAAP_AUD* =1	40,623	40,623	40,623

This table reports firm level logit and ordered logit specifications. The specifications in Columns 1 and 2 are the same specifications as in Table 4, Columns 1 and 2, respectively, from the paper, except logit estimation is used instead of a linear probability model. Column 3 reports the results of an ordered logit model in which the dependent variable takes on the value of 0 for unaudited non-GAAP firms; 1 for unaudited GAAP firms; and 2 for audited GAAP firms. The 814 firm years with audited non-GAAP statements have been removed for this specification. All models use robust standard errors clustered at the firm level. Continuous variables are winsorized at the 1 and 99 percentile levels. Please see the Appendix in the main paper for variable definitions. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

Table A9

2 x 2 Contingency Tables Conditional on Age, Ownership, and Debt

Panel A: Partitioning by firm age and change in ownership

		Ownership		
		No change/ decrease	Increase	
Age	Old	4.2%	6.3%	2.1%
	Young	15.0%	40.0%	25.0%**
		10.8%***	33.7%***	22.9%***

Panel B: Partitioning by firm age and change in debt

		Debt		
		No change/ decrease	Increase	Diff
Age	Old	4.1%	5.5%	1.4%**
	Young	17.2%	19.1%	1.9%
	Diff	13.1%***	13.6%***	0.5%

This table reports contingency tables after partitioning the sample based on firm age and change in ownership (Panel A) or change in debt (Panel B). The sample is restricted to firms that exist in all three years (2008-2010), do not have their financial statements audited in 2008, and report choosing GAAP as their set of accounting standards. The sample size is 3,916 (identical to Table 5, column 2 in the paper). Each cell reports the percentage of firms which begin to have their financial statements audited in the year 2009. A firm is classified as young if it is three years old or younger; otherwise it is classified as old. The outer rows and columns report differences in means and the lower right number in each panel reports the difference-in-difference. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively, using robust standard errors clustered at the 3-digit NAICS industry level.

Table A10

Transition Matrix for Main Firm-Level Test Sample (n=91,410)

Panel A. Considering the GAAP and Audit Decisions Separately, Conditional on Existing 2 Consecutive Years

		t+1	
		GAAP	No GAAP
t	GAAP	**99%**	1%
	No GAAP	4%	**96%**

		t+1	
		Audit	No Audit
t	Audit	**95%**	5%
	No Audit	5%	**95%**

Panel B. By Year and Disaggregating the GAAP/Audit Decision, Conditional on Existing 2 Consecutive Years

		t+1			
		GAAP Audit	GAAP No Audit	No GAAP Audit	No GAAP No Audit
t	GAAP/Audit	**95%**	5%	0%	0%
	GAAP/No Audit	6%	**92%**	0%	2%
	No GAAP/Audit	5%	0%	**86%**	9%
	No GAAP/No Audit	1%	3%	0%	**96%**

Panel C. Allowing for Entrance and Exit States (i.e., not conditional on existing 2 consecutive years)

		t+1					
		GAAP Audit	GAAP No Audit	No GAAP Audit	No GAAP No Audit	Exit	Percent of t
t	GAAP/Audit	**81%**	4%	0%	0%	15%	45%
	GAAP/No Audit	4%	**71%**	0%	2%	23%	40%
	No GAAP/Audit	4%	0%	**76%**	8%	12%	1%
	No GAAP/No Audit	1%	2%	0%	**72%**	24%	15%
	Entry	39%	42%	1%	18%		
	Percent of t+1	44%	39%	1%	16%		

This table reports state transition matrices. Each state is characterized by two choices: whether the firm follows GAAP and whether the firm receives an audit, creating four mutually exclusive, collectively exhaustive states. Panel A combines both transition years and examines each choice separately. Panel B examines all four states and reports the estimates of each transition year separately. Panel C further includes the "Entry" and "Exit" states, thus eliminating the requirement that a firm be present in two consecutive years. By definition, the rows sum to 100%.