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#### Original Publication Information

Foster, Benjamin P., John M. Mueller, and Trimbak Shastri. "Impact of Assurance Level and Tax Status on the Tendency of Relatively Small Manufacturers to Manage Production and Earnings." 2016 *Journal of Accounting, Ethics and Public Policy*, 17(3): 625-643.

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**IMPACT OF ASSURANCE LEVEL AND TAX STATUS ON  
THE TENDENCY OF RELATIVELY SMALL  
MANUFACTURERS TO MANAGE PRODUCTION AND  
EARNINGS**

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Key Words: assurance level, independent accountants' reports, earnings management, manufacturers

JEL Classification(s): M11, M41, M42, M48

**Abstract**

The number and importance of private companies in the United States indicates that reliable quality of financial accounting reports (QFAR) of private companies that are useful for decision making is likely to be important for economic growth. Most previous research examining QFAR addressed earnings management among publicly-traded companies. This study extends prior literature by examining whether abnormal production of public and private companies is impacted by (i) assurance type (PCAOB-audit, GAAS-audit, and SSARS-Review), (ii) tax status (separately taxed versus pass-through entity) of private companies, and (iii) relative size. An audit of financial statements provides a high degree of assurance, whereas a review provides limited assurance. Due to data limitations with our private company sample, this study focuses on earnings management through abnormal production by

manufacturing companies. When examining companies that just met the benchmark of prior years' earnings or zero earnings we found positive abnormal production for publicly traded companies and privately held audited-taxable companies, but not for other privately held companies. Not identified in previous studies, we find that abnormal production of similarly sized public companies and private companies differ. Our findings provide evidence relevant to the Big GAAP/Little GAAP debate and that one set of accounting standards may not satisfy all public and private company financial statement users. Also, results of this study support the recommendations of the Financial Accounting Foundation's Blue Ribbon Panel's Report for establishing a separate private company standards board to help ensure appropriate modifications to GAAP.

**Acknowledgement:** We thank the University of Louisville, College of Business for a Summer Research Grant to support this project.

## I. INTRODUCTION

Privately-owned enterprises have traditionally been an important part of the U.S. economy. According to the U.S. Small Business Administration (2013a, 2013b), privately owned companies produced 46% of private nonfarm U.S. gross domestic product in 2008 and private sector businesses with less than 500 employees accounted for 56% of total employment in 2011. Consequently, reliable financial statements for small and medium sized businesses would provide many stakeholders with information with which to make decisions that collectively have a large impact on the U.S. economy.

The Financial Accounting Foundation's (2011) Blue Ribbon Panel (BRP) on Standard Setting for Private Companies reported that, in 2008, to promote investor protection the SEC only required financial reporting by about 14,000 public companies. In contrast,

about 28 million private companies in the U.S. operate without formal government guidance relating to the quality and types of information to be provided to protect investors. However, to assist preparers and users of financial information related to private companies, accounting regulators should recognize that the nature and extent of private company accounting information required and preferred could substantially differ from that required from public companies.

In fact, the AICPA's (2013) task force on its Financial Reporting Framework for Small-and-Medium Sized Entities (FRF-SME) noted differences in recognition and measurement of transactions between public and private companies. The task force on FRF-SME also pointed out differences including: (1) SMEs generally have more control over to whom they give their financial statements and key financial statement users have direct accesses to the entity's management, and (2) SME financial statement users may have greater interest in cash flows, liquidity, statement of financial position, and interest coverage. The FRF-SME is a non-GAAP framework, designed to provide financial information that would be relevant, efficient, simple, and optional for entities to use with no official or authoritative status (Durak 2013). The FRF-SME task force recognized that providing reliable, relevant and cost-effective financial accounting reports to users of information from small and medium sized private companies is important for the growth of private companies and the economy.

Most previous research examining the quality of financial accounting reports (QFAR) addressed earnings management among publicly-traded companies (e.g., Ching et al. 2006; Klein 2002; Badertscher 2011; Balsam et al. 2002; Jo and Kim 2007) and the audit-related issues arising from this behavior (Ashbaugh-Skaife et al. 2008; Cohen et al. 2008; Doyle et al. 2007; Francis and Krishnan 1999). A few recent studies have examined QFAR of privately owned companies including Givoly et al. (2010), Hope et al. (2013), and Kvaal et al. (2012).

Like Hope et al. (2013), we compare public and private company financial information to assess the quality of accounting reports of privately-held companies. We extend their study by investigating the impact of independent assurance services (audited versus reviewed) and tax status (separately taxed versus pass-through entity) on earnings management through production activities in the financial statements of privately-held manufacturing companies.

Gunny (2010) examined four types of real activities management (RAM) using public companies of all sizes from a variety of industries. Our private company database, Sageworks, contains much less consistent data for included observations than that available for public companies (in COMPUSTAT), except data relating to inventory. Consequently, we focus on one type of RAM examined by Gunny (2010), inventory and production decisions used in manufacturing industries.

Only manufacturers can substantially increase or decrease reported income by adjusting work in process and finished goods inventories to time the expensing of fixed manufacturing costs. Also, unlike public companies, most private companies (particularly those obtaining review services) are likely to be relatively small. Consequently, to compare public and private companies' production activities in a focused manner, we limit public companies included in our sample to manufacturers with sales in the same range as that of private companies included in the sample, from \$1 million to \$150 million.

Real earnings management behavior has been examined with respect to the demand and opportunistic behavior hypotheses (Givoly et al. 2010; Hope et al. 2013). The "demand" hypothesis predicts that public company shareholders and creditors will demand higher quality reporting than that demanded of private companies. The "opportunistic behavior" hypothesis expects public company managers to have more incentive to manage earnings than private company managers. These hypotheses could have a more complex relation to earnings management behavior in

private companies because, for example, private companies have the option to have their financial statements audited or reviewed to provide, respectively, a high degree or limited assurance. We did not examine private companies with compiled or self-prepared financial statements not covered by independent assurance services.

Companies engage independent accountants to provide their reports based on audit, review, or compilation of financial statements. Audit reports provide a high degree of assurance regarding the reliability of financial statements; review reports provide limited assurance; and compilation reports do not provide any assurance. In audits, whether under PCAOB auditing standards for the audits of public companies or Generally Accepted Auditing Standards (GAAS) for the audits of private companies, auditors are required to gather sufficient appropriate audit evidence in support of their audit report. Review engagement reports, according to the Statements on Standards for Accounting and Review Services (SSARS) provide limited assurance for which the scope of work undertaken by independent accountants is relatively narrower than the scope of work undertaken in audits. In compilation engagements, independent accountants merely compile financial statements based on data provided by management. In this paper we consider only audits and review services.

To obtain more reliable information for decision making, investors are more likely to demand that managers/owners engage independent accountants to audit rather than review their companies' financial statements. Also, the motivation for managing production activities to minimize overall income taxes differs between privately-owned taxable and pass-through companies. Thus, in private companies, opportunistic behavior could lead to either understating or overstating income due to varying owner objectives.

Our study extends prior literature on earnings management by manufacturing companies by following the approach for measuring abnormal production used by Gunny (2010) to examine

whether (i) assurance type (PCAOB-audit, GAAS-audit, and Review) covering financial statements prepared according to GAAP affects the abnormal production of public and private companies, (ii) whether tax status (separately taxed versus pass-through entity) of private companies influences their abnormal production, and (iii) whether relative size affects the abnormal production of public and private companies. We find overall, that publicly traded companies tend to have significantly negative abnormal production, which would decrease reported income. Analysis of different groups of private companies revealed that audited and separately taxed companies exhibit a significantly positive abnormal production, which would increase reported income.

An interesting finding of our analysis that has not been identified in previous studies is that abnormal production of public companies and private companies differ based on their relative size. Within our sample of companies with sales between \$1 million and \$150 million, public companies in the lowest size quintile based on sales exhibit relatively higher abnormal production (increasing reported income) while those in the highest sales quintile exhibit relatively lower abnormal production (decreasing reported income). In contrast, all private companies except companies that are audited-taxed showed an opposite effect in that the companies in the lowest size quintile based on sales exhibit negative abnormal production while those in the highest sales quintile exhibit positive abnormal production. The results suggest that relatively larger public manufacturing companies report more conservatively than smaller ones, possibly because they are subjected to closer audit scrutiny due to higher litigation risk and the possibility of PCAOB inspection of larger audits.

For privately-owned companies, relative size does not appear to impact the abnormal production of audited-taxable companies. This could result from conflicting goals faced by private taxable companies of (1) showing good financial results for lenders and other external users, and (2) minimizing income tax

liability. Results for the private audited pass-through, reviewed taxable, and reviewed pass-through company groups suggest that the relatively larger of these companies likely have relatively larger abnormal production while the relatively smaller of these companies have relatively lower abnormal production. The desire to show good financial results for lenders and other external users could explain why relatively larger private companies exhibit positive abnormal production. Relatively smaller private companies are more likely to be owner managed and likely more highly motivated to reduce tax liability by reducing income reported for income tax purposes. (We could not verify this potential difference because Sageworks database does not contain ownership-and management-related data). These results appear to indicate that accounting information generated by both public and private companies of all sizes based on the one-GAAP framework might not satisfy small business user needs; thus supporting the need for an alternative non-GAAP framework as provided by the AICPA (2013) FRF-SME task force report.

To identify companies most likely to engage in earnings management, like (Gunny 2010), we included an indicator variable (BENCH) for companies that just met the benchmark of prior years' earnings or zero earnings in regression analyses. This variable was significantly positive for publicly traded companies and privately held audited-taxable companies. These results provide evidence that public and private audited-taxable manufacturing companies most likely to want to manage earnings upwards, appear to indeed manage production and inventory decisions. These companies may manage earnings through production and inventory decisions because auditors are more likely to identify manipulation of accruals than manipulation of production and inventory levels. In contrast, companies that are reviewed might find managing other accruals more convenient or easier than managing production activities to manage earnings.

We proceed in section II by discussing related literature which provides a context for our study and theoretical support for



our hypotheses. Section III provides a description of the data and the results of the empirical analysis in examining the hypotheses. Section IV discusses the limitations of the study, and offers suggestions for further research. We conclude in Section V with a summary of results and a discussion of the implications of the findings.

## II. LITERATURE REVIEW AND HYPOTHESES

Earnings management is defined as when managers use judgment in financial reporting and in structuring transactions to alter reported data to influence contractual outcomes that depend on reported accounting information (Healy and Wahlen 1999, 6). Prevalent earnings management has been found in publicly-traded companies (e.g. Fields et al. 2001; Healy and Wahlen 1999; Kothari et al. 2005; Roychowdhury 2006; Zhao et al. 2012). Earnings management can occur through accruals management or real activities management, such as managing production and inventory levels.

Roychowdhury (2006, 337) defines real activities (transactions) management as “actions that deviate from normal business practices, undertaken with the primary objective to mislead certain stakeholders into believing that earnings benchmarks have been met in the normal course of operations”. For example, management can deviate from normal operations by: reducing research and development expenditures, reducing selling, general, and administrative expenses (SG&A), deferring write-off of fixed costs, increasing or decreasing production and inventory levels to decrease or increase costs of goods sold, suspending business development activities to lower revenue, and offering unusual price discounts at the end of a period to increase sales.

All of these actions would impact reported earnings in the short term. Real activities management differs from accruals management because real activities have direct cash flow

consequences; real activities management negatively affects future operating performance (Gunny 2010; Zhao et al. 2012). Several studies have found activities management to be associated with earnings management in publicly-traded companies (e.g. Cohen et al. 2008; Cohen et al. 2010; Eldenburg et al. 2011; Gunny 2010; Roychowdhury 2006; Thomas and Zhang 2002; Zhao et al. 2012). Gunny (2010) found that real activities management is associated with companies just meeting their earnings benchmarks.

As mentioned previously, the Sageworks data was not complete for many observations. Consequently, constructing real earnings management variables to obtain a sufficient sample size of private companies was difficult. However, most Sageworks manufacturing observations did report production and inventory data. Due to data limitations, we focused on examining production and inventory levels of public and private manufacturing companies to determine the impact of assurance-type on real activities management. In our sample we included only manufacturing companies because only manufacturing companies could effectively manage earnings through their production and inventory decisions.

### **Regulations and Preferences in Managing Accruals and Activities**

As stated in the introduction, differences in real earnings management between private and public companies have been examined based on the demand and opportunistic behavior hypotheses (Givoly et al. 2010; Hope et al. 2013). Public company shareholders and creditors can "demand" higher quality reporting than that demanded of private companies. Public companies experience higher agency costs than private companies due to, for example, more greatly dispersed ownership of public companies and greater separation between managers and owners of public companies (Hope et al. 2013). Conversely, public company managers have more incentive to engage in "opportunistic

behavior" to manage earnings than private company managers. Lower relative ownership of the company by managers of public companies than private companies could lead public company managers to a short-term focus on executive compensation tied to reported earnings such as bonuses and stock options (Hope et al. 2013).

Regulation may also impact how much firms manage earnings, and what type of earnings management they use. Public trading of company shares on stock markets have been found to have a negative impact on accounting quality (Beatty et al. 2002). However, Ewert & Wagenhofer (2005) found that tightening accounting standards (regulations) makes the use of accrual management more difficult, resulting in an increase in real activities management. Consistent with this, Cohen et al. (2008) found that real activities management increased after implementation of the Sarbanes-Oxley Act (SOX) in 2004. SOX, by establishing the PCAOB to monitor the accounting industry, tightened accounting regulations to improve the quality of financial accounting reports. This additional regulation appears to have restricted the use of accrual management, forcing companies to use real activities management to manage earnings.

Earnings management might improve communication of private information by lessening the information asymmetry between the management and external investors (efficient earnings management) or could maximize benefits to management by increasing the price of the shares managers hold in the company (opportunistic earnings management) (Balsam et al. 2002; Bergstresser and Philippon 2006; Burgstahler and Dichev 1997; Cheng and Warfield 2005). Managers of public companies are frequently faced with ethical dilemmas between their obligation to provide reliable and fair QFAR to stakeholders, and their own short-term personal interest.

To maximize share price, management in publicly-traded companies prefer to report steadily increasing earnings and avoid reporting losses (Roychowdhury 2006). Managers of publicly-

traded companies have an incentive to manage earnings to meet certain milestones and forecasts to secure their jobs (DeFond and Park 1997) and satisfy shareholders, creditors, and analysts (Daniel et al. 2008; Graham et al. 2005; Trueman and Titman 1988; Tucker and Zarowin 2006). Public company managers may also desire to manipulate/manage earnings to earn/increase bonuses and/or increase the value of stock/options they own.

Cohen & Zarowin (2010), focusing their analysis around seasoned equity offerings, found that companies use both accrual and real activities-based earnings management to manipulate earnings. When examining the tradeoffs between accrual and real activities management, Zang's (2012) study suggests that managers treat the two strategies as substitutes to manage earnings; managers first consider management of real activities before considering accruals management. Likewise, managers exhibit a greater preference to manage earnings through real activities management than through accrual management (Bruns and Merchant 1990; Graham et al. 2005) because: (1) accrual management is more likely to draw the attention of auditors while increasing or decreasing inventory levels through adjusting production is a management decision and is not likely to be subjected to the same level of audit scrutiny as those for accruals management (Roychowdhury 2006), (2) managers perceive earnings management through real activities management as more ethical than accruals management (Bruns and Merchant 1990), and (3) a recent study indicates that investors perceive accruals-based earnings management a more serious violation of their trust in managers than real earnings management (Hewitt et al. 2013).

### **Public vs. Private Companies and Inventory Management (Abnormal Production)**

A significant number of studies address earnings management through production and inventory levels using data sets consisting of publicly-traded companies (Badertscher 2011;

Chien et al. 2011; Gunny 2010; Cohen and Zarowin 2010; Bartov and Cohen 2009; Cohen et al. 2008; Roychowdhury 2006; Thomas and Zhang 2002). However, only recently has real activities management research focused on privately-held companies (Asker et al. 2011; Bharat et al. 2010; Brav 2009; Edgerton 2012; Gao et al. 2010; Michaely and Roberts 2012; Minnis 2011; Saunders and Steffen 2011; Sheen 2009).

For publicly-traded companies, earnings management has been found to be related to: corporate governance, valuation issues, disclosure frequency, and stock ownership characteristics. However, compared to publicly-traded companies, private companies do not have: the same reporting requirements, the same level of regulations, same type of ownership structure or the same level of external scrutiny. Consequently, corporate governance, valuation issues, disclosure frequency, and stock ownership characteristics may impact earnings management by private companies differently or not at all.

Also, other factors might motivate private companies to manage their earnings, such as to minimize overall income taxes (e.g. Beatty and Harris 1999). Likewise, the transparency of information and goals of investors/owners could influence whether a firm manages earnings. Further, the use of GAAP as proscribed by the FASB and PCAOB is likely to be complex and costly to private companies leading some private companies to prepare statements that depart from standards not considered useful.

Recent research has addressed several issues with private companies. Some of this research has empirically tested differences between private and publicly-traded companies. For example, in examining public and private banks, Beatty & Harris (1999) argued that private companies manage earnings less aggressively because they have less information asymmetry with owners and have a greater proportion of long-run investors. Some studies comparing publicly and privately owned companies used limited samples of U.S. companies. Givoly et al. (2010), analyzed a sample of 531 private equity firms with 2519 firm-year

observations and found that private equity firms have higher quality accruals and a lower propensity to manage income than public equity firms. Gao et al. (2010) used public and private companies in the CapitalIQ database to compare CEO compensation. They found that public-company CEO pay was sensitive to measures such as stock prices and profitability while CEO pay in private companies was not.

Asker et al. (2011) obtained the Sagedata base that provided a large sample of private companies to compare to publicly-traded companies. All data in their sample covered from 2002 to 2007. They matched companies from Sagedata and COMPUSTAT on size and industry and developed a sample to contain 4,975 observations from each data set, coming from 1,666 and 620 separate publicly-traded and private companies, respectively. They found that publicly-traded companies invested considerably less and were less responsive to changes in investment opportunities than were private companies. These results were especially pronounced in industries where earnings announcements impacted stock prices the most. Asker et al. (2011) concluded that an agency problem might explain the differences in investment behavior between publicly-traded and private companies; public company managers' investment decisions reflect a focus on short-term results.

Hope et al. (2013) using a sample of 73,596 observations of public and private firms, found that, on average, public firms have higher accrual quality and report more conservatively, which is consistent with the "demand" (for higher quality information) effect dominating the "opportunistic behavior" effect. Their study did not examine the effects of different tax statuses (taxable and pass-through) and/or the impact of different assurance levels (audits and review) on QFAR. Further, their sample included numerous industries. Since our study focuses on the effects of production and inventory activities on QFAR under different assurance types and tax statuses, our analyses include manufacturing companies only.

Results from the studies cited, and the Blue Ribbon Panel's report (2011) would suggest private and publicly-traded companies differ in many ways. One set of accounting standards may not allow users to adequately evaluate the differences between public and private companies. Consequently, examining whether privately-held companies exhibit similar abnormal production patterns as those found in publicly-traded companies becomes important.

### **Level of Assurance**

The type of assurance (e.g., PCAOB-audit, GAAS-audit or SSARS-review) is likely to affect the quality of financial statements of the company. Under the "opportunistic behavior" hypothesis, public company managers generally have more incentive to manage earnings than privately-held company managers (e.g., Givoly 2010). However, as Hope et al. (2013) found, the demand for higher quality information, including stricter regulations governing public companies, likely restricts public company practices that manage earnings more so than private company managers. For example, auditors of publicly-traded companies are subject to more regulatory oversight than auditors of private companies.

Audits of public companies are subject to periodic PCAOB inspection. The PCAOB can impose sanctions for violations of auditing standards (such as by suspending audit firm and/or associated auditors from auditing public companies, and/or by imposing monetary penalty which in some cases could exceed \$2,000,000).<sup>1</sup> Further, auditors of public companies are likely exposed to higher levels of litigation and adverse publicity risk than auditors of private companies in the event of an audit failure.

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<sup>1</sup> See PCAOB's *Settled Disciplinary Orders*, <http://pcaobus.org/Enforcement/Decisions/Pages/default.aspx>

Consequently, regulatory and audit scrutiny may not allow management of public companies the same level of opportunity to manage earnings as private company managers.

Only privately owned companies can choose among different levels of assurance associated with their financial statements. We limited our analysis to private companies whose financial statements were either audited or reviewed by certified public accountants; private companies with compiled or self-prepared financial statements not covered by independent assurance services were not included in our sample. Independent accountants engaged to review financial statements only offer a limited negative assurance by stating that they are not aware of any material modifications that should be made to the financial statements for the statements to be in accordance with GAAP (AICPA 2009). In contrast, when issuing a clean audit opinion, auditors are required to provide a high degree of assurance that financial statements are free of material misstatements (including those that may result from production management) and are presented in accordance with GAAP. In addition to complying with GAAS, independent auditors face a greater level of litigation risk than the risk-level faced by independent accountants engaged to review financial statements.

Consequently, managers of companies using review services may likely find it easier to manage production activities compared to those using audit services. However, this does not necessarily mean that reviewed financial statements will be unreliable. The reliability of reviewed financial statements depends on the *tone at the top* and is likely to be comparable to those of audited financial statements when management insists on tightly controlled financial reporting.

Further, the increase in costs to provide potentially irrelevant information from limited accounting resources has led some private companies to prepare financial statements containing departures from GAAP, which users are willing to accept. The Blue Ribbon Panel (BRP) questioned whether the aspects of U.S.



GAAP, which might not be relevant to many users, are truly "generally accepted" (Hilmi et al. 2012). Further, in many situations, preparing overly complex GAAP financial statements (and obtaining audit, review, or compilation services) forces small and medium sized private entities (SMEs) to incur unnecessary costs. In this regard, the AICPA's FRF-SMEs purports to formally provide an alternative framework for preparing reliable non-GAAP financial statements that are efficient with qualitative attributes of *objectivity, measurability, completeness* and *relevance*.

Whether all companies should comply with the same GAAP has been debated for years as users and preparers of financial statements have frequently called for a separate set of standards for relatively small companies. Frequently in this debate, the two sets of standards option has been referred to as Big GAAP/Little GAAP (Burton et al. 1979; Burnie et al. 1987/1988; Grusd 2006; Thrower 2010; Wright et al. 2012). Thus, we cannot predict whether the demand for higher quality financial information by users and auditors as users' agents will outweigh opportunistic behavior and other incentives for private companies.

### **Tax Status of Companies**

In addition to ownership structure, the tax status of a company could influence the way management of a private company is motivated to manage earnings. Private companies have more options when establishing their form of business entity than publicly-traded firms. Almost all publicly-traded companies are formed in a C corporation status. In contrast, only 5.7% of the companies that filed tax returns in 2008 with the Internal Revenue Service were C corporations (IRS 2011), indicating that a large proportion of non-public companies are not formed as C corporations. Regular corporations (C corporations) pay separate income taxes at the corporate level; then dividends are taxed to owners when distributed.

Private companies also have the following options: individual ownership, incorporating as an S corporation or limited liability corporation (LLC), and forming as a limited liability partnership (LLP) or other form of partnership. (The Sagemworks database identifies the legal/organizational form of their observations.) Partnerships, LLPs, LLCs, and S Corps are usually pass-through entities that generally are not taxed at the entity level. The earnings of these entities are typically reported to owners, and included on their individual income tax returns to determine owners' taxable income.

Asker et al. (2011) found that different organizational/ownership structures of private companies did not appear to impact their investment behavior. However, legal forms other than in the form of 'C corporation' can provide a tax benefit with respect to the combined tax liability of the business and its owners. Consequently, private companies may have different incentives to try to increase or decrease income (by adjusting inventory levels) depending upon their tax status. Privately-held audited, separately taxed companies are somewhat comparable to publicly-held companies.

Because of potential effects of tax status on earnings management, we also examine privately-held taxable companies separate from privately-held pass-through companies. Taxable companies are subjected to double taxation because their income is taxed at both the company level and at owners' level (via dividends). Thus, managements of these companies could be motivated to underreport taxable income through managing production levels (e.g., overstating cost of goods sold and understating inventory). However, the more formally structured taxable private companies may have incentives to report higher incomes to make financial statements appealing to suppliers and lenders.

While incomes of taxable companies are subjected to double taxation, incomes of pass-through companies are included in owners' tax returns for determining taxes. As a result, owners'

motivation to adjust production may vary depending on the circumstance dictated by owners' overall tax burden based on taxable income consisting of owners' income from the business and from other sources. Accordingly, managers can (i) manage production accrual to adjust reported income in the financial statements, or (ii) make adjustment in their tax return (based on income and/or losses from other activities) for determining taxable income without adjusting financial statements, or (iii) adjust both financial statements and tax returns.

Further, companies (audited or reviewed) that are separately taxed are subjected to more scrutiny of tax auditors. (See IRS 2013.) Therefore, it could be argued that financial statements of private companies that are separately taxed are likely to be more reliable than those of pass-through companies. However, tax authorities are likely to be more concerned with companies exhibiting negative abnormal production (reducing reported income and income taxes due) than those exhibiting positive abnormal production. Consequently, we present the following hypotheses (in the null form):

*H<sub>1</sub>: Public and private companies that are audited and taxable exhibit similar abnormal production.*

*H<sub>2a</sub>: Private company financial statements that are audited-taxable and those reviewed-taxable exhibit similar abnormal production.*

*H<sub>2b</sub>: Private company financial statements that are audited pass-through and those reviewed pass-through exhibit similar abnormal production.*

*H<sub>3a</sub>: Private companies that are audited-taxable and those audited pass-through exhibit similar abnormal production.*

*H<sub>3b</sub>: Private companies that are reviewed-taxable and those reviewed pass-through exhibit similar abnormal production.*

### **Size of the Company**

Size of a company could influence behavior of public and private company management, which could affect QFAR. We address this possibility by limiting our sample overall to companies with sales between \$1 million and \$150 million. However, even within this group of relatively small manufacturers (compared to most publicly traded manufacturers), a wide variation in size exists which could impact abnormal production levels. For example, in a small owner-managed private company with relatively weak control over financial reporting, the owner-manager might be able to easily adjust production and inventory to achieve a desired level of taxable income. In contrast, a larger company with more effective internal control over financial reporting and subject to closer scrutiny by internal, external, and tax auditors might find it difficult to manipulate earnings. Also, relatively different sized companies could have different incentives to increase or decrease income. As a result, we examine the following hypothesis (in the null form):

*H<sub>4</sub>: The size of public and private companies does not impact the level of abnormal production reported.*

## **III. EMPIRICAL ANALYSES**

### **Data**

This study examines the data from Sageworks Incorporated's database, a proprietary source of private company information, and public information from the COMPUSTAT database. The Sageworks Inc. private company database contains collected and assembled private company information to help accounting firms and banks compare data for individual companies

to a set of peer company data (Minnis 2011). The information comes from the clients of Sageworks' customers/users who enter their clients' financial statement information into the system. Information gathered from all of Sageworks customers' clients constitutes their private company data set. Sageworks offers customers/users access to summary statistics from this data set by subscription.

The Sageworks data set includes income statement and balance sheet items, calculated ratios, some cash flow information, the level of assurance of the information (e.g., review, or audit), the private companies' industry (NAICS code), legal form, fiscal year-end, and state. However, the data set does not indicate: whether a company prepares statements in accordance with GAAP or another comprehensive basis of accounting (OCBOA), auditor name, opinion in the audit or review report issued, and whether GAAP departures, if any, are disclosed. Sageworks has accounting and programming specialists who work to maintain the integrity of information in the data set. Sageworks briefly allowed researchers access to company-level data, with companies only identified by an ID number, but no longer makes its firm-level information available publicly.

Table 1 summarizes the sample selection approach used, beginning with 423,631 observations for 2001 through 2008 in the Sageworks database.<sup>2</sup> To examine our research questions in a focused context required production and inventory-related data of manufacturing companies. Accordingly, from this large data set we identified companies reporting sales in the manufacturing NAICS codes (311822 to 339999), which yielded 31,835 observations. Years before 2005, contained substantially fewer observations with the necessary three years data for analysis than the later years. Earlier years therefore might be subject to selection bias because Sageworks had fewer subscribers during the data set start-up phase

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<sup>2</sup> The latest year used was 2008 because at the time the data set was obtained, complete data for 2009 was not available.

(Minnis 2011). Consequently, observations prior to 2005 were omitted, leaving 24,307 observations. We discovered that several of these observations were duplicate annual observations or quarterly data; these we dropped, reducing the observations to 20,542.

**Table 1**  
Derivation of Usable Manufacturing Observations in Sample

	Sageworks Total <u>Observations</u>	Sageworks <u>Observations</u> <u>with sales</u>	COMPUSTA T <u>Observations</u> <u>with sales</u>	<u>Total</u>
2001-2004	87,655	7,528		
2005	73,914	5,671	3,156	
2006	89,674	6,548	3,022	
2007	92,410	6,534	2,849	
2008	<u>79,978</u>	<u>5,554</u>	<u>2,651</u>	
	423,631	31,835		
Less: 2001-2004 observations		<u>7,528</u>		
Total 2005-2008 observations		24,307		
Less duplicates and quarterly		<u>3,765</u>		
Observations from 2005-2008		20,542	11,678	32,220
Less: Observations with < \$1 million in sales <sup>1</sup> , or > \$150 million in sales, or missing variables.		13,089	7,416	20,505
Less: Sageworks observations whose data source was compiled, company prepared, annualized, tax return, blank, or other.		<u>2,604</u>	—	<u>2,604</u>
Usable Observations with all variables		4,849	4,262	9,111
Less: observations with < 15 observations in a year in 3-dig NAICS Code		<u>38</u>	<u>72</u>	<u>110</u>
Sample for main analyses <sup>2</sup>		<u>4,811</u>	<u>4,190</u>	<u>9,001</u>

<sup>1</sup> Only 155 observations from the Sageworks data with sales from \$100,000-\$1,000,000 had all necessary data for variables. Most of these smaller companies did not have the required three years consecutively reported data.

<sup>2</sup>The sample included 2,451 separate Sageworks companies and 1,163 COMPUSTAT companies.

Estimating abnormal production for an observation required companies to have data for three consecutive years. We also restricted the sample to companies with sales of \$1 million or greater because a small manipulation in inventory and production might have a magnified effect on income, and smaller companies may not have the same know-how or systems to manage earnings as larger companies. Further, there were only 155 Sageworks companies with sales less than \$1 million that had sufficient data to be included in the analysis. These restrictions eliminated another 13,089 observations, most due to incomplete data. Also, to restrict our analysis to observations in which accountants offered a reasonable degree of assurance (audit) or limited (review) assurance, we deleted 2,604 observations (related to compiled, company prepared, tax return, other or left blank) leaving 4,849 Sageworks observations for analyses.

The COMPUSTAT sample also was collected from manufacturing companies (NAICS codes 311822 to 339999) for 2005 through 2008 that reported sales for three consecutive years (11,678 observations). To construct a sample comparable to Sageworks companies, those observations with sales more than the largest sales reported by a Sageworks observation (\$150 million) or less than \$1 million in sales were deleted. This step eliminated 7,416 COMPUSTAT observations, leaving 4,262.

The abnormal production calculation required at least 14 other observations from the same three-digit NAICS code for a year. Consequently, companies from three-digit NAICS codes with few observations were deleted. This led to the deletion of 38 Sageworks observations and 72 COMPUSTAT observations. Thus, the full sample for the main analysis included 9,001 observations (4,811 Sageworks + 4,190 COMPUSTAT) from 3,614 separate companies (2,451 Sageworks + 1,163 COMPUSTAT).

Observations from COMPUSTAT remained somewhat steady over the years examined, with slight declines from 2005 to 2008. In contrast, the number of Sageworks observations increased substantially from 2005 to 2006 and from 2006 to 2007; total observations were essentially the same for 2007 and 2008. The mix of Sageworks observations by level of assurance (audit and review) and tax status (pass-through and taxable) remained relatively stable from 2005 to 2008.

Companies included in the sample came from a broad range of manufacturing industries, but were concentrated in a few industries. For example, over 40% of the COMPUSTAT observations came from computer and electronic product manufacturing companies and over 22% were companies in chemical manufacturing. In contrast, for the private companies, only fabricated metal products and machinery manufacturing represented high percentages of total observations at 19% and 15%, respectively. The percentages of observations by three-digit NAICS codes were similar for the private company sample broken down by level of assurance and tax status.

### Statistical Models

Within each three-digit NAICS code for each year, we use Roychowdhury (2006, 345) equation 4, and Cohen et al. (2008, 766) equation 7, to estimate abnormal production. Production is defined as the companies' cost of goods sold plus change in inventory for the year. To estimate abnormal production, the following regression equation was run:

$$(1) \quad \text{PROD}_{t,f}/A_{t-1,f} = \alpha_0 + \alpha_1(1/A_{t-1,f}) + \alpha_2(\text{Sales}_{t,f}/A_{t-1,f}) + \alpha_3(\text{Salechg}_{t,f}/A_{t,f}) + \alpha_3(\text{Salechg}_{t-1,f}/A_{t-1,f}) + \varepsilon_{t,f}$$

where:  $\text{PROD}_{t,f}$  = (cost of goods sold<sub>t,f</sub> + change in inventory<sub>t,f</sub>)

$A_{t-1}$  = total assets at the beginning of the year,

$\text{Sales}_t$  = current year net sales,



$\text{Salechg}_t$  = change in sales during current year,  
 $\text{Salechg}_{t-1}$  = change in sales during previous year, and  
 $\varepsilon_t$  = the error term from the regression is abnormal production,  $\text{Ab\_Prod}_t$ ; a positive  $\text{Ab\_Prod}_t$  would indicate the company increased reported income, whereas a negative  $\text{Ab\_Prod}_t$  indicates the company decreased reported income.

Like Gunny (2010), we constructed variables to indicate companies that would most likely want to manage their incomes (for example, to avoid reporting a loss or avoiding reporting lower net income than that of the previous year): (1)  $\text{MEET}_0 = 1$  if net income scaled by total assets at the beginning of the year was greater than or equal to zero, but less than 0.01, (2)  $\text{MEET}_{\text{last}} = 1$  if net income of the current year scaled by net income of the previous year was greater than or equal to zero, but less than 0.01, and (3) any observations falling within these categories are considered to have the greatest incentive/likelihood of engaging in earnings management to increase income and consequently were coded as  $\text{BENCH} = 1$ .

We constructed a formula similar to that used by Gunny (2010) to test whether those companies most likely to manage income exhibited different  $\text{Ab\_Prod}_t$  than others:

$$(2) \quad \text{Ab\_Prod}_t = \alpha_0 + \alpha_1(\text{BENCH}_t) + \alpha_2(\text{Size\_lnA}_{t-1}) + \alpha_3(\text{ROA}_t) + \alpha_6(\text{Industry}_f) + \alpha_7(\text{Year}_g) + \varepsilon_t$$

where:  $\text{Ab\_Prod}_t$  was defined as the residual from Equation 1 above,

$\text{BENCH}_t$  was defined in the previous paragraph,

$\text{Size\_lnA}_{t-1}$  = the natural log of total assets at the beginning of the year,

$\text{ROA}_t$  = income before extraordinary items divided by total assets at the beginning of the year,

$\text{Industry}_f = 1$  if company is in industry  $f$  (based on 3-digit NAICS codes), 0 otherwise, and

$Year_g = 1$  if the observation is from year  $g$ , 0 otherwise.

### **Descriptive Statistics and Preliminary Analyses to Address Hypotheses 1, 2a, 2b, 3a, and 3b**

Table 2 provides the means for public (COMPUSTAT) companies and Sageworks companies (by level of assurance and organization tax status) for variables from Equations 1 and 2 and the residual from Equation 1, the abnormal production measure. Some differences between the groups are evident based on means shown in Table 2. The means of  $PROD_t$ ,  $one\_A_{t-1}$ ,  $Sales_t$ ,  $salechg_t$ ,  $salechg_{t-1}$ ,  $BENCH_t$ ,  $ROA_t$ , and  $Ab\_Prod_t$  appear quite a bit lower for public companies than for private companies. In contrast,  $Size\_lnAT_t$  appears much higher for public companies than for private companies. Also, means for  $Ab\_Prod_t$  of private companies appear to vary somewhat by tax status.

To help examine Hypotheses 1, 2a, 2b, 3a, and 3b we calculated Z-test statistics for  $Ab\_Prod_t = 0$  for the various sample groups. For the subsamples, only the publicly traded companies, with a negative  $Ab\_Prod_t$  (mean = -0.012), and the private audited-taxed group, with a positive  $Ab\_Prod_t$  (mean = 0.026), exhibited significant Z-test scores. The opposite signs on the means of the groups and the significant Z-tests provide evidence to support rejection of null Hypothesis 1 (relating to abnormal production of comparable public versus private audited-taxable companies), indicating that abnormal production exhibited by public companies differs from that exhibited by private companies that are audited and taxable.

While  $Ab\_Prod_t$  of privately-owned audited-taxable companies is significant, the means for the other private company subgroups generate nonsignificant Z-test statistics. This indicates differences between  $Ab\_Prod_t$  of privately-owned audited-taxable companies and the other groups. These differences provide some evidence to reject Hypotheses 2a and 3a, in that  $Ab\_Prod_t$  of

privately-owned audited-taxable companies differ from both the  
privately-owned reviewed-taxable and audited pass-through

**Table 2**  
Descriptive Statistics of Variables for the Full  
Sample and Various Subsamples

Panel A: Full, COMPUSTAT, and All Private companies  
samples

Variable	N=	<u>All</u> 9001	<u>COMPUSTAT</u> 4190	<u>All Private</u> 4811
PROD_A_t_1		1.275	0.710	1.767
		1.029	0.712	1.010
one_A_t_1		0.228	0.101	0.339
		0.350	0.250	0.386
Sale_A_t_1		1.773	1.038	2.413
		1.268	0.899	1.193
salechg_A_t_1		0.156	0.106	0.199
		0.501	0.419	0.559
salechg_1_A_t_1		0.129	0.072	0.180
		0.404	0.335	0.450
BENCH <sub>t</sub>		0.089	0.060	0.113
		0.284	0.238	0.317
Size <sub>ln</sub> _TA		2.448	3.405	1.615
		1.495	1.327	1.076
ROAt		-0.067	-0.243	0.086
		0.433	0.534	0.230
AB_PROD		-0.003 <sup>1</sup>	-0.012	0.006
		0.318	0.313	0.322

Means and (standard deviations)

<sup>1</sup>Windsorizing results in AB\_PROD mean slightly different from zero.

AB\_PROD = 0

(2-tailed Z test)      -0.756      -2.489\*\*      1.237

**Table 2**  
(continued)

Panel B: Private company subsamples

Variable	N=	<u>Private-</u>	<u>Private-</u>	<u>Private-</u>	<u>Private-</u>
		<u>Audited-</u>	<u>Audited-</u>	<u>Reviewed</u>	<u>Reviewed-</u>
		<u>Taxable</u>	<u>Pass</u>	<u>-Taxable</u>	<u>Pass</u>
		<u>837</u>	<u>Through</u>	<u>1393</u>	<u>Through</u>
		<u>1780</u>			
PROD_A_t_1		1.492	1.732	1.743	1.931
		0.854	1.025	1.001	1.047
one_A_t_1		0.193	0.180	0.458	0.387
		0.284	0.231	0.444	0.389
Sale_A_t_1		2.026	2.352	2.394	2.636
		0.984	1.174	1.164	1.263
salechg_A_t_1		0.206	0.217	0.161	0.217
		0.482	0.555	0.545	0.602
salechg_1_A_t_1		0.164	0.201	0.144	0.205
		0.402	0.450	0.461	0.462
BENCH <sub>i</sub>		0.134	0.081	0.150	0.089
		0.341	0.273	0.357	0.285
Size <sub>ln</sub> _TA		2.230	2.223	1.187	1.388
		1.063	0.995	0.925	0.971
ROAt		0.025	0.114	0.047	0.132
		0.269	0.279	0.129	0.236
AB_PROD		0.026	-0.016	0.012	0.001
		0.301	0.345	0.311	0.328

Means and (standard deviations)

AB\_PROD = 0  
(two-tailed Z  
test)

2.499\*\*    -1.313    1.440    0.129

**Table 2**  
**(continued)**

\*\*,\*\*\*--Significant at .05 and .01, respectively.

Variable Definitions:

$PROD\_A\_t\_1 = (\text{cost of goods sold}_{t,f} + \text{change in inventory}_{t,f}) / \text{total assets at the beginning of the year.}$

$one\_A\_t\_1 = 1 / \text{total assets at the beginning of the year.}$

$Sale\_A\_t\_1 = \text{current year net sales} / \text{total assets at the beginning of the year.}$

$salechg\_A\_t\_1 = \text{change in sales during current year} / \text{total assets at the beginning of the year.}$

$salechg\_1\_A\_t\_1 = \text{change in sales during previous year} / \text{total assets at the beginning of the year.}$

$BENCH_t = 1$  if net income scaled by total assets at the beginning of the year was greater than or equal to zero, but less than 0.01, or MEET if net income of the current year scaled by net income of the previous year was greater than or equal to zero, but less than 0.01, else 0.

$Size\_ln\_TA = \text{the natural log of total assets at the beginning of the year.}$

$ROAt = \text{income before extraordinary items} / \text{total assets at the beginning of the year.}$

$AB\_PROD = \text{the error term from the regression of } PROD\_A\_t\_1 \text{ is abnormal production.}$

company groups. Nonsignificant Z tests on  $Ab\_Prod_t$  for the audited pass-through, reviewed-taxable, and reviewed pass-through companies provide no support to reject Hypotheses 2b and 3b.

### **Analyses of Abnormal Production for Companies Most Likely to Manage Earnings and the Impact of Size on Abnormal Production**

Our abnormal production measure, constructed by the error term from a regression model (1) of expected production, could result from factors other than intentional manipulation. Abnormal production could be caused by an omitted variable or capture an

efficient management decision (Gunny 2010). Accordingly, we also analyzed the data and tested the hypotheses for a context where a strong likelihood of earnings management exists. As described above, following Gunny (2010), we constructed an indicator variable (BENCH) for companies that meet the benchmarks of just meeting or barely exceeding zero net income, or their previous years' income. Like Gunny (2010, 871), we also included the log of total assets to control for size effects, and ROA because real earnings management may be correlated with performance. Our Equation 2 differs from Gunny in that we do not include a market to book value variable to control for growth opportunities because our sample includes privately owned companies for which market value is unknown. (Gunny also multiplied her abnormal production measure by -1, leading to reversing the signs on their reported parameter estimates.)

Motivations to manage earnings may differ between different sized companies even within these relatively small manufacturing companies -- particularly when considering private companies (with differing tax statuses) compared to public companies. Because the overall size restriction for inclusion in our sample was based on sales from \$1 to \$150 million, we add indicator variables for size based on sales. For manufacturing companies, differences in sales may be better indications of size differences than differences in total assets; differing depreciation methods and differing ages of assets could lead to wider variation in a measure of total assets than a measure of variation in sales. We add two variables for size to Equation 2 to construct Equation 2a which is used to test our hypotheses:

$$(2a) \quad Ab\_Prod_t = \alpha_0 + \alpha_1(BENCH_t) + \alpha_2(Size\_lnA_{t-1}) + \alpha_3(ROA_t) + \alpha_4(Sales\_quint\_low_t) + \alpha_5(Sales\_quint\_high_t) + \varepsilon_t$$

where:  $Ab\_Prod_t$ ,  $BENCH_t$ ,  $Size\_lnA_{t-1}$ , and  $ROA_t$  were defined above,

$Sales\_quint\_low_t = 1$ , if the observation falls in the lowest quintile of sales for the full sample, 0 otherwise, and

Sales\_quint\_high<sub>t</sub> = 1, if the observation falls in the highest quintile of sales for the full sample, 0 otherwise.

Table 3 shows the results from regression analyses based on Equation 2a.

**Table 3**  
 Cross-sectional Regressions Relating Abnormal Production to Companies Just Meeting Zero or Previous Year's Earnings

Panel A: Full, COMPUSTAT, and All Private companies samples

<u>Variable</u>	<u>N=</u>	<u>All</u> <u>9001</u>	<u>COMPUSTAT</u> <u>4190</u>	<u>All Private</u> <u>4811</u>
Intercept		-0.005	-0.149	0.042
		-0.50	-6.43***	2.61***
BENCH <sub>t</sub>		0.031	0.030	0.003
		2.94***	1.84*	0.21
Size <sub>ln</sub> _TA		-0.003	0.034	-0.004
		-0.70	5.34***	-0.68
ROA <sub>t</sub>		-0.157	-0.145	-0.388
		-11.01***	-8.42***	-8.86***
Sales_quint_low		-0.011	0.045	-0.027
		-0.97	2.57***	-1.78*
Sales_quint_high		-0.012	-0.068	0.128



	-1.14	-5.58***	6.86***
Adjusted R <sup>2</sup>	0.045	0.076	0.083

**Table 3**  
(continued)

Panel B: Private company subsamples

Variable	N=	<u>Private- Audited- Taxable</u>	<u>Private- Audited- Pass Through</u>	<u>Private- Reviewed -Taxable</u>	<u>Private- Reviewed – Pass Through</u>
Intercept		837	801	1393	1780
		-0.038	-0.013	0.095	0.067
BENCH <sub>t</sub>		-0.94	-0.27	3.80***	2.55**
		0.043	0.031	-0.019	-0.009
Size <sub>ln</sub> TA		1.74*	0.90	-0.84	-0.34
		0.025	0.013	-0.035	-0.001
ROA <sub>t</sub>		1.65*	0.70	-2.90***	-0.11
		-0.220	-0.429	-0.565	-0.455
Sales <sub>quint</sub> low		-2.32**	-4.52***	-6.41***	-7.27***
		0.029	-0.161	-0.041	-0.041
Sales <sub>quint</sub> high		0.63	-2.79***	-1.70*	-1.77*
		0.026	0.150	0.157	0.174
Adjusted R <sup>2</sup>		0.80	3.99***	2.71***	4.47***
		0.041	0.158	0.053	0.115

\*\*,\*\*\*--Significant at .05 and .01, respectively.

Parameter estimates and t-statistics for independent variables from Gunny (2010), less market to book value, plus variables for highest and lowest sales quintiles.

Gunny (2010) found an insignificant impact for ROA on  $Ab\_Prod_t$ , while we found a negative and significant coefficient for ROA overall and in all subgroups. The impact of ROA may be more pronounced for our relatively small manufacturing company sample compared to the public company sample from all industries included in Gunny's analysis. For our overall sample, the coefficient for BENCH was positive and significant, like Gunny's (2010, 872), indicating that companies just meeting earnings benchmarks were more likely to have increased production.

BENCH was significant for the public (COMPUSTAT) subsample, suggesting that public companies are likely to engage in managing production activities to manage earnings. Within privately-held companies, while BENCH for audited-taxable companies was positive and significant, BENCH was insignificant for all other privately-held groups, indicating that privately-held audited-taxable companies are also likely to engage in production management to manage earnings. Further, BENCH for the privately-held audited pass-through group is positive (0.031) though not significant, whereas BENCH for reviewed taxable and pass-through subsamples are negative and insignificant.

These results suggest that audited public and audited private-taxable companies (with positive BENCH) might manage earnings by managing production activities to satisfy financial statement users. In contrast, we find no evidence of earnings management related to BENCH for reviewed-companies. The significance on BENCH for audited public and private-taxable companies may result from closer auditor scrutiny which might prevent audited companies from managing other accruals. Consequently, audited-taxable companies may be more likely to engage in earnings management through production and inventory decisions. Possibly, reviewed companies could manage earnings through other accruals. Also, users of reviewed financial

statements may have access to all desired information about the company, whereas users of audited companies might be more dispersed, requiring the services of an external auditor as their agent.

The coefficients on  $Size\_lnA_{t-1}$ ,  $Sales\_quint\_low_t$  and  $Sales\_quint\_high_t$  reported in Table 3 show the impact of size on abnormal production for the overall sample and various subsamples. In line with Gunny's (2010) results, the coefficient for  $Size\_lnA_{t-1}$  is positive and significant for public companies. Within privately-held companies,  $Size\_lnA_{t-1}$  is: (1) positive and significant for the audited-taxable group, and positive but insignificant for audited pass-through, (2) negative and significant for the reviewed-taxable subsample, and negative but insignificant for reviewed pass-through subsample. These results indicate that asset-size does impact  $Ab\_Prod_t$  of privately-held companies differently in various subgroups. Further, BENCH and asset size appear to impact  $Ab\_Prod_t$  in similar directions.

As indicated above, Table 3 also includes the effect of size (based on sales) on  $Ab\_Prod_t$ .  $Sales\_quint\_low_t$  and  $Sales\_quint\_high_t$  for the subgroups reveal an interesting size effect. Public companies in the lowest sales quintile exhibit significantly higher/positive  $Ab\_Prod_t$ , while public companies in the highest sales quintile exhibit significantly lower  $Ab\_Prod_t$ . In contrast, private companies collectively ( $n=4811$ ) exhibit the opposite size effect: the full private sample and all private company subsamples except the audited-taxable subsample, exhibit significantly lower abnormal production in  $Sales\_quint\_low_t$ , and significantly higher abnormal production in  $Sales\_quint\_high_t$ . These results provide support for rejecting Hypothesis 4, because size (based on both assets and sales revenue) does influence abnormal production.<sup>3</sup>

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<sup>3</sup>We extended our analyses on the effects of size on  $Ab\_Prod_t$  because  $Size\_lnA_{t-1}$ ,  $Sales\_quint\_low_t$ , and  $Sales\_quint\_high_t$  are correlated. Accordingly, we adjusted Equation 2 by excluding the variable  $Size\_lnA_t$ .

Results reported in Table 3 reveal that the impact on  $Ab\_Prod_t$  of  $Sales\_quint\_high_t$  and  $Sales\_quint\_low_t$  differs between public companies and all ( $n=4811$ ) privately-held companies. These differences hold in almost all cases for private company subgroups. The differences in the signs on  $Sales\_quint\_high_t$  and  $Sales\_quint\_low_t$  within the samples provide strong evidence to reject Hypothesis 4, that size does not impact abnormal production. These results should warrant caution by researchers when comparing real earnings management of private companies and public companies, or when using a combined sample of private and public companies to draw inferences.

#### **IV. LIMITATIONS AND AREAS FOR FUTURE RESEARCH**

Kvaal et al. (2012) found that the real earnings management behavior of family-owned private firms tend to be different from nonfamily-owned private firms. We could not address this issue due to lack of ownership information in the Sageworks database. Prior studies have also indicated that the quality of financial reporting may vary depending upon auditor size. We did not have information regarding either which public accounting firm performed the audit or the type of independent accountant opinion related to private company financial statements.

Due to data limitations in our Sageworks private company sample we restricted our sample to manufacturing companies and focused on inventory and production activities management. Differences in earnings management between public and private companies in industries other than manufacturing, through measures other than production and inventory decisions could be

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<sup>1</sup> and rerunning the analyses. In this additional analysis, results for BENCH conform closely with those in Table 3 and results for the sales size variables differ only slightly from those reported in Table 3.

even wider and more unpredictable due to complexity of accounting regulations (such as accounting for fair values). However, as recognized by the FRF-SME task force and BRP Panel, some of these reporting requirements could be irrelevant to most users of most private company financial statements.

Limitations suggest future avenues for research. Samples with more detailed ownership information related to private firms could allow examination of differences between family-owned versus nonfamily-owned private companies as found by Kvaal (2012). A sample with more detailed auditor and audit opinion information for private companies would allow examination of whether auditor size and auditor opinion affect the quality of financial reporting by private companies. Also, a larger sample would allow an investigation of the effects of other potential earnings management methods.

## **V. SUMMARY OF RESULTS AND DISCUSSION OF IMPLICATIONS**

For our sample of relatively small public manufacturing companies (with sales ranging between \$1 & \$150 million) the demand for high-quality information apparently leads to significant negative abnormal production overall (Table 2); particularly, public companies in the largest sales quintile of our sample tend to manage production to decrease reported earnings (Table 3). This could be due to closer auditor scrutiny to comply with PCAOB standards and possible PCAOB inspection of larger audits. However, the potential for opportunistic behavior by managers of public companies may also explain some results: public companies are likely to manage production to increase reported earnings to just meet certain benchmarks (Table 3).

Results from our privately-owned company sample indicate a more complex relationship between abnormal production and company characteristics than that for publicly traded companies. Overall, audited-taxable companies exhibit significant positive abnormal production (Table 2), suggesting audited taxable

companies are more likely to use production and inventory decisions to increase earnings, and less likely to understate income (e.g., to minimize tax liability) than companies in other subgroups. Further, audited-taxable companies in the highest and lowest quintiles do not exhibit significantly different abnormal production, suggesting that size differences among the audited-taxable companies do not impact production and inventory decisions (Table 3).

In contrast, while private companies in other groups (audited pass-through, reviewed-taxable and pass-through) do not exhibit overall significant abnormal production (Table 2), they exhibit significantly higher (lower) abnormal production in the highest (lowest) quintiles (Table 3). These outcomes may arise from conflicting incentives for these companies, influenced by size. Reviewed-taxable, and audited and reviewed pass-through companies may experience lower demand for high-quality information, (perhaps due to less complex ownership structures). Opportunistic behavior by managers (to obtain personal compensation or external financing for the company) in these three groups of private companies (audited pass-through, reviewed-taxable and reviewed pass-through) could explain the significant positive abnormal production in the largest quintile.

However, the potential for opportunistic behavior for tax avoidance by managers of private companies in the smallest quintile may also explain the significantly negative abnormal production exhibited by these three groups of private companies. Collectively these results suggest that, in some accounting contexts, financial information from private companies that are audited-taxable should be analyzed separately from other private companies. Also, taxing authorities might want to more carefully examine reported inventories from private companies (particularly small ones) that could be motivated to manage earnings downward to minimize tax burden.

Results reported in Table 3, provide strong evidence that abnormal production of private and publicly owned manufacturing

companies differs depending upon their relative size. Further, public and private-taxable audited companies might rely more on managing production activities to meet certain earnings benchmarks, rather than managing other accruals, because of audit scrutiny. These results suggest caution when research findings and recommendations from studies examining only publicly traded companies are extrapolated to private companies.

Our results reveal significant differences in management of production activities between public and private manufacturing companies, and between audited-taxable private manufacturing companies and other private manufacturing company groups. Differences between public and private companies' accounting methods, ownership structure, and/or incentives to manage earnings lend credence to Big GAAP/Little GAAP advocates. Current accounting regulations are mainly based on a one-GAAP philosophy focusing on public company user needs. These regulations may not satisfy the needs of private company financial statement users.

The FRF-SME task force observed that, compared to publicly traded companies, small owner-managed businesses have different financial statement users with varying informational needs and that many key users of SMEs' financial statements have direct access to the entity's management. Consequently, information asymmetry/gap between preparers and users of financial information is likely to be smaller for private companies compared to those of public companies.

According to the Blue Ribbon Panel (BRP) Report (2011), private companies, under current practice in the United States, may report under U.S. GAAP or some Other Comprehensive Basis of Accounting (OCBOA). Consequently, an increasing number of private company financial statements are prepared in accordance with OCBOA (usually cash or tax basis) or sometimes depart from U.S. GAAP with such departures disclosed in the accountant's or auditor's report (Hilmi et al. 2012). The BRP Report points out that the current accounting standards setting process has not

evaluated and addressed the information needs of users of private companies and how their information needs differ from those of users of public company financial statements.

Our results support the BRP conclusion that urgent and growing systemic issues need to be addressed in the current system of U.S. accounting standard setting. Any new accounting standard-setting system should seek to maintain a high degree of financial reporting comparability for business entities, regardless of their ownership structure. The BRP recommended establishing, under the oversight of Financial Accounting Foundation, a separate private company standards board to help ensure appropriate and sufficient exceptions and modifications are made for both new and existing standards. The AICPA (2013) FRF-SME task force report provides a non-GAAP framework as an alternative to GAAP for small and medium sized entities. This non-GAAP framework might, to some extent, address the BRP's concerns about the burden placed on SMEs by the one-GAAP framework.

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