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The impact of client information technology capability on audit pricing☆

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ABSTRACT

This paper explores the question: "How does a client's information technology (IT) capability influence audit pricing?" Company data for the years 2004 through 2012 are employed. Firms appearing on the *InformationWeek 500* (*IW500*) annual list of U.S. organizations with superior IT functions serve as a proxy for companies with superior IT capability. Our findings suggest that companies with superior IT capabilities incur higher levels of audit fees. In addition, as client size increases, the audit fees of firms with advanced IT capabilities increase at a greater rate than firms without such capabilities. These findings contrast with prior research by Chen et al. (2014) that found in the immediate post-Sarbanes-Oxley Act (SOX) period for the years 2004 through 2007, client IT capability reduced audit fee increases. In addition, we replicate the Chen et al. (2014) results and find that IT capability did not influence audit fee increases during the subsequent recession and recovery periods. Further, superior capability clients see smaller audit fee increases when exogenous shocks such as SOX regulations occur. These results suggest a revised interpretation of Chen et al. (2014) may be warranted. This study contributes to the literature by providing a more complete picture of how a client's IT capability affects audit fees.

1. Introduction

Accounting and information technology (IT) have become inexorably intertwined. Clients and auditors alike seek to leverage "big data" and advanced analytics throughout their operations (PWC, 2015). Accounting information systems are embedded within complex enterprise resource planning (ERP) software. Also, the Securities and Exchange Commission (SEC) requires listed companies to file their financial statements via eXtensible Business Reporting Language (XBRL) (U.S. SEC, 2017). Big 4 audit firms are responding by expanding their IT auditing and consulting practices (Hermanson, 2009).

These changes create technological complexities and risk while simultaneously enabling enhanced analytics and controls. As a construct, IT capability reflects a company's capacity to marshal investments in people, processes and technologies in order to improve business performance (Dehning et al., 2003). Companies with advanced IT capabilities select the investments that best support their strategy from a myriad of potential IT expenditures. Having selected these IT priorities, they can successfully execute related projects and deploy new technologies within their organizations. There is, therefore, reason to believe that increased IT capability may allow for either a more cost-effective audit – stronger controls and internal information systems that support the auditor – or a more expensive audit – increased difficulties involved with auditing more advanced and complex IT systems.

☆ Data availability: Data used in this study are available from public sources noted in the article.

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Prior research has studied the effect of IT capability on the external audit. This work focused exclusively on the immediate post-Sarbanes-Oxley Act of 2002 (SOX) period. Masli et al. (2010) suggest that specific IT investments in internal control-monitoring technology reduce the rate of audit fee increase. Also, during the immediate post-SOX period, for the years 2004 through 2007, companies with strong IT capabilities had slightly lower (9.1%) rates of audit fee increase than those without strong IT resources (Chen et al., 2014). We argue, however, that these findings may not extend beyond the immediate post-SOX era when public audit failures (for example, Enron Corporation, WorldCom, Tyco International, Adelphia Communications Corporation) generated severe market and regulatory responses, leading companies to deploy IT resources specifically targeted to addressing audit and internal control risks. Additionally, we are unaware of any research that explores how the client's IT capability impacts the actual level of audit fees incurred. This paper addresses the gap in prior research by exploring the broader question: *How does a client's IT capability impact audit pricing*?

The COBIT 5 (Control Objectives for Information and Related Technology) framework recommends that firms align, plan and organize IT investments in support of their chosen business strategy (ISACA, 2017). Firms may gain sustainable advantage by utilizing IT to develop business capabilities that are difficult for competitors to imitate or acquire (Mata et al., 1995). In particular, firms generate value by aligning their internal capabilities with their IT strategy, creating synergistic resources to respond to market, industry and supply chain forces (Nevo and Wade, 2010; Melville et al., 2004). For example, Mithas et al. (2012) find that "… firms have had greater success in achieving higher profitability through IT-enabled revenue growth than through IT-enabled cost reduction (pg. 205)." Absent the exogenous effect of SOX, whether firms with advanced IT capabilities choose to emphasize enhancing internal controls and audit efficiency among their many competing IT priorities remains an empirical question. In other words, when deciding where to invest in and implement IT resources, internal control is just one of the many options upon which a company can focus their efforts.

Even if strong IT capability has positive effects on a firm's value-generating capabilities and its internal controls, this does not automatically translate into increased audit affordability. For example, auditors may need to use more specialized and expensive resources with clients that routinely deploy new and advanced technology. Auditors also have more difficulty assessing risk in complex accounting systems (Abernathy et al., 2013).

Building upon prior work modeling factors influencing audit pricing (for example, Francis and Wang, 2005; Raghunandan and Rama, 2006; Hogan and Wilkins, 2008; Masli et al., 2010; Chen et al., 2014), we analyze data on audit fees in relation to the company's IT capability. The data employed by this study comprises the population of SEC-registered U.S. companies audited for the years 2004 through 2012 with audit fees data compiled by *Audit Analytics*. Following prior research, SEC-registered companies cited in the annual *InformationWeek 500* report (*IW500*) identifying U.S. companies with superior IT capabilities, are utilized as a proxy for firms with superior IT capabilities. These firms are compared to a propensity score matched sample of control firms. We find that superior client IT capability is associated with higher levels of audit fees, ceteris paribus.

Additional analysis suggests a reinterpretation may be warranted of the findings of Chen et al. (2014). Consistent with their study, we found that clients with advanced IT capabilities had a smaller increase in audit fees post-SOX for the time period 2004 through 2007. The recession (years 2008 through 2009) and recovery (years 2010 through 2012) periods, however, reveal no statistically significant difference in audit fee changes when comparing clients with or without advanced IT capabilities. Additionally, we find that, while companies with advanced IT capabilities incurred higher levels of audit fees during the post-SOX period examined by Chen et al. (2014), they experienced smaller audit fee increases. These higher levels of audit fees remain consistent during the recession and recovery periods as well.

Finally, exploring various interaction effects between advanced IT capability and major audit fee determinants (Hay et al., 2006; Simunic, 1980), we find that superior IT capability positively moderates the impact of client size on audit fees. Specifically, as firm size in terms of total assets increases, the audit fees of firms with advanced IT capabilities increase at a greater rate than the audit fees of firms without advanced IT capabilities. At the same time, we find no evidence that IT capability moderates the impact of client complexity or risk on audit fees.

This paper contributes to the accounting literature in two areas: First, while a stream of research examining the use of IT by auditors in their work exists (for example, Fischer, 1996; Behn et al., 2006; Janvrin et al., 2008; Dowling, 2009; Chang et al., 2011; Alles, 2015; Cao et al., 2015; Axelsen et al., 2017), there is little scholarly work that examines the impact of a client's IT capability on audit pricing. Given the prevalence of IT as a foundation of most modern accounting information systems (AIS), understanding the role of the client's IT capability on the cost of external assurance is highly relevant. Prior studies (Masli et al., 2010; Chen et al., 2014) focus on year-to-year audit fee increases, while we focus on audit fee magnitude in a given year. We also extend the Chen et al. (2014) results beyond the immediate post-SOX period and observe that their finding of smaller audit fee increases for advanced IT-capability companies does not persist beyond 2007. This suggests that clients with strong IT capabilities adapted more quickly to SOX compliance, exhibited by these smaller audit fee increases. This also may imply that these companies adapt better to exogenous events such as new regulations.

This paper's second area of contribution to the accounting literature concerns the impact of IT on the audit profession. The link between client IT capability and audit cost suggests that audit firms can extract higher fees from firms with greater IT complexity, and that firm size amplifies this effect. Given the continuing investment in advanced IT by most major companies, this particular finding raises cost concerns for both clients and auditors. This finding should be of interest to practitioners as they increase the use of IT auditors during financial statement audits (Axelsen et al., 2017). This finding should also be of interest to client managers as they seek to understand the relationship between IT complexity and audit fees.

The remainder of the paper is organized as follows: The second section presents the literature review, which leads to the paper's hypotheses. The third section summarizes the sample used and methodology employed. The fourth section presents the results of our