

PRIVATE EQUITY INVESTORS AND AUDIT QUALITY: EVIDENCE FROM SWEDEN

POSSAVEE CHEEWAKRIENGKRAI

JIAYI LI

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Abstract

Private Equity Investors plays a significant role in the Swedish economy, actively involved in the corporate governance of their portfolio companies to reduce risks. In this study, we investigate the impact of PE investors on the audit quality of their portfolio companies. We collected a comprehensive dataset of 366 PE transactions from 2013 to 2018 and analyzed audit fee and auditor information for 349 PE-owned companies over a 4-year period during the acquisition, comparing the results with a control group of 304 companies not acquired by PE. Our findings reveal an association between auditor changes and PE investors, with portfolio firms more likely to switch to a Big 4 audit firm when PE investor becomes involved. However, our results do not indicate higher audit fees for PE-backed companies after the acquisition. These findings suggest that PE investors may prioritize audit quality in their portfolio companies by changing auditors, often to a Big 4.

Keywords:

Private equity, Audit Quality, Audit Fee, Big 4, Auditing

Authors:

Possavee Cheewakriengkrai (42028)

Jiayi Li (42041)

Supervisor:

Ting Dong, Assistant Professor, Department of Accounting

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Possavee Cheewakriengkrai and Jiayi Li, 2023

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1. Introduction

1.1. Introduction and Motivation

Private equity entails high potential returns but carries a certain number of risks due to agency conflicts arising from information asymmetry between LPs (Limited Partners), managers, and shareholders (Maria et al., 2022; Beatty & Harris, 1999; Brander et al., 2002). To mitigate these conflicts, private equity investors actively engage in company operations (Gompers et al., 2016; Strömberg, 2009). Kaplan & Strömberg (2008) categorized three types of value-enhancing endeavors in their prior publication: i) financial, ii) governance, and iii) operational engineering.

Our focus in this paper was on the field of governance engineering. Prior research indicates that private equity ownership can positively impact corporate governance practices in portfolio companies (Strömberg, 2009; Wright et al., 2009; Latini et al., 2014). Moreover, it is widely acknowledged that an effective corporate governance framework correlates with improved audit quality (Imhoff, 2003). Private equity governance has a positive impact on the generation of accounting information both internally (Kaplan & Strömberg, 2008) and externally (Beuselinck et al., 2004; Katz, 2006).

However, previous papers did not study a relationship between private equity ownership and audit quality in the Swedish market. Existing research indicates that private equity and venture capital (PEVC) ownership is most influential in the early stages of a company's existence, resulting in a substantial improvement in management practices and corporate governance (Hellman & Puri, 2000). Despite this, empirical research on the specific characteristics and value relevance of financial reporting in Private Equity-backed firms is limited (Armstrong et al., 2006; Hand, 2005). In Belgium, Beuselinck et al. (2007) and Beuselinck et al. (2004) conducted research on private equity-backed companies in the field of corporate governance and disclosure quality. Bergstrom et al. (2007) were among the first researchers to analyze private equity (PE) on the Swedish market. However, their study did not focus on audit quality but on the effect of buyouts on operating performance and value creation in Swedish companies. Therefore, the purpose of this study is to contribute to and expand the existing research to increase our understanding of this topic.

This study aims to address this gap in previous research, where the purpose of the investigation is to examine the linkage between private equity investors and audit quality. We conduct empirical tests, using audit fees and the Big 4 as proxies for audit quality. Our analyses are based on a dataset of 349 Private Equity backed companies/transactions occurring from 2013 to 2018, and control firms of 304 non-PE backed companies over 4 years during the acquisition periods. In Sweden, both listed and private companies must

report yearly financial statements. Hence, we exploit a unique opportunity to study Swedish companies. Our study is based on Swedish data. Furthermore, we adopt the conventional definition of private equity, which includes investments in mainly private companies' equity shares, and encompasses venture capital, growth equity, other investment firms, and buyouts.

The significance of this research topic derives from Sweden's international orientation in the Private Equity sector. Sweden is the second largest nation in the European Union in terms of private equity capital raised as a percentage of GDP. According to the SVCA (2022) report, private equity and venture capital backed companies in Sweden have a significant impact on the country's workforce, employing 243,222 people by the end of 2020, or 5.1% of Sweden's total workforce of 4.8 million. Additionally, a wide range of stakeholders, including commercial banks, credit rating agencies, investors, employees, customers, and suppliers, rely in part on publicly accessible financial information during their decision-making process. Thus, private equity investors not only advance their own interests, but also provide valuable services to other parties.

This study contributes to the topic concerning the relationship between audit quality and Private Equity ownership by using audit fees and the Big 4 as proxies for audit quality. Our finding suggests that PE investors are likely to influence an auditor choice on their portfolio firms. We also discovered that the average audit fee changes for PE-backed companies were substantially higher than those for the control group in the two periods before PE investment. However, the effect of PE ownership on audit fees diminished over time. These results suggest that the impact of private equity ownership on audit fees may be greatest before transaction is closed. Further, our regression results suggest that private equity ownership may prompt changes in audit practices, such as switching auditors, often to Big 4 auditors. Although our result does not show that companies backed by PE always face higher audit fees after the acquisitions.

The structure of the paper is organized as follows. Section 2 outlines a review of the extant literature on the relationship between private equity and audit quality, culminating in the formulation of the study's main hypothesis. Section 3 shows the research design, providing a detailed description of the methodology and approach employed in the study. Section 4 presents the data selection process, encompassing the sources of data, data collection, and data descriptions to ensure transparency and comprehensibility. The results of the empirical analysis are explained in Section 5, followed by the conclusion in Section 6.

1.2. Corporate governance environment in Sweden

Sweden's corporate governance practices are renowned for their emphasis on transparency, accountability, and shareholder rights. In 2005, the Swedish Code of Corporate Governance (hereafter referred to as the Code) was implemented. The Code

applies to companies whose shares are traded on a regulated market in Sweden and aims to promote the positive development of corporate governance by inducting rules on the shareholders' meeting, the nomination committee, the tasks of the board of directors, etc. Initially, only companies listed on the large-cap and mid-cap platforms of the Stockholm Stock Exchange were included in the Code. In 2008, however, the Code became applicable to all Swedish corporations whose shares are traded on a regulated market (Tagesson & Collin, 2016).

According to Bolagsverket, small enterprises in Sweden are exempt from the requirement to hire an auditor. However, if a company has met at least two of the following criteria within the past two fiscal years, it is required to hire an auditor: i) an average of more than three employees, ii) a balance sheet total of more than SEK 2.5 million, and iii) a net sales volume of more than SEK 3 million. Moreover, if a parent company does not meet two of these criteria, but the group does, then the parent company must also have an auditor.

The Swedish government mandated the disclosure of audit fees earlier than the United States and other EU nations. In recent decades, Sweden's accession to the European Union in 1995 has been a significant event that has influenced the development of the auditing profession. Consequently, Swedish regulations had to be modified to conform to EU requirements. As per BFNAR 2008/2009: 135, starting July 1st, 2009, only large public limited companies or limited trading companies must report remuneration to auditors in their annual report. A limited trading company becomes large if it meets at least two of these criteria: i) over 50 employees, ii) assets over 25 million SEK, or iii) sales over 50 million SEK. Since Jan 1, 2014, a new 50-40-80 rule applies, requiring disclosure of audit fees only for large companies meeting two of the three conditions: i) over 50 employees, 2) over 40 million SEK in assets, or 3) over 80 million SEK in sales, according to BFNAR 2012:1.

2. Literature review

2.1. Private equity impact on corporate governance

Private equity investors often demand higher standards of corporate governance in their portfolio companies. Strömberg (2009) discovered that private equity ownership is positively correlated with stronger and more comprehensive corporate governance policies. According to Wright et al. (2009), private equity ownership can result in a "governance premium" that improves the general quality of corporate governance in portfolio companies. Private equity plays a crucial role in fostering best practices of corporate governance in invested firms, according to the research conducted by Latini et al. (2014) on small and medium-sized enterprises.

In addition, research has identified various methods private equity firms use to improve corporate governance, such as increased board diversity, an increase in independent directors, consistent monitoring and performance evaluation, and enhanced executive compensation practices (Latini et al., 2014; Acharya et al., 2009). According to Latini et al. (2014), private equity plays a crucial role in fostering best practices of corporate governance in invested SMEs, contributing to the development of the institutional environment, and enhancing SMEs' access to external sources of financing. This supports Beasley's (1998) conclusion that external board members can enhance the board's ability to supervise management and prevent financial statement fraud.

Several factors contribute to the robust corporate governance observed in companies backed by private equity. First, the inherent nature of private equity investment, which is characterized by active ownership and close monitoring of portfolio companies, increases the importance of corporate governance as private equity firms seek to optimize their investments and create value (Achleitner et al., 2009; Dossani, 2012; Latini et al., 2014). Secondly, because of the agency cost problem, private equity firms' emphasis on accountability and transparency in portfolio companies may also result in increased demand for higher-quality accounting information to provide a more accurate representation of the financial performance of the companies (Beuselinck et al., 2008; Cornelli & Karakaş, 2008; Wright et al., 2009; Maria et al., 2022). In addition, Wilson et al. (2021) discovered that private equity investors prefer younger private firms with a fragmented ownership structure. However, these companies are more likely to manipulate their financial statements due to a variety of factors (Yang et al., 2022). Consequently, companies backed by private equity may be more likely to engage in third-party audits to assure robust financial reporting and corporate governance (Kaplan & Strömberg, 2008). This is consistent with the theory that private equity firms actively intervene in their portfolio companies to align their corporate governance with best practices to maximize their returns (Carvalho et al., 2014). Effective implementation of corporate governance can contribute to the enhancement and growth of internal audit functions (Sabbar et al.,

2018) and reduce the audit issues found and disclosed by external auditors (Fera et al., 2021).

2.2. Private equity impact on accounting and auditing

Previous research indicates that private equity governance has a positive impact on the generation of accounting information. Beuselinck et al. (2004) discovered evidence of opportunistic earnings management in PE-backed companies prior to their investment year, indicating a propensity for aggressive accounting practices. However, after the investment year, these same firms exhibited greater earnings conservatism compared to non-private equity acquired firms. This indicates that private equity investors could serve as external auditors and encourage companies to maintain higher standards of financial reporting quality. This is in line with findings by Goktan & Muslu (2015) that private equity-backed firms had a higher level of earnings quality and fewer instances of earnings management than their non-private equity-backed counterparts. Hand (2005) also demonstrated that the presence of private equity positively affects the value and relevance of the financial statements of private equity-backed companies. Katz (2006) obtained comparable results in relation to privately held companies sponsored by PE firms in the United States.

PE can contribute to a higher level of audit quality in their portfolio through different channels. First, they intervene actively in the Board of Directors, require regular interim reports, communicate frequently with management team members, and can install both an internal audit committee and external auditors to certify the accounting figures (Beuselinck et al., 2007). According to Carcello et al., (2000), independent and expert committees require a higher level of audit quality to protect their reputation and avoid legal issues. Moreover, Quick et al. (2008) argued that substantial changes in corporate governance are required for accounting and auditing improvements to be meaningful, and that truly independent boards, separate from corporate management and knowledgeable enough to act as effective shareholder advocates, are essential for driving change in these areas. However, Esplin et al. (2018) indicate that private equity (PE) firms, despite frequently holding a membership on the board of directors of portfolio companies, do not typically participate in auditor selection, although they may have some influence over auditor selection. Moreover, Beuselinck et al. (2008) discovered that firms with a significant equity stake held by private equity (PE) investors tend to have a positive relationship with increased disclosure, as PE investors may insist on full disclosure to signal the quality of their investments to external parties.

However, it is not always the case that the company owned by private equity firms undergo more thorough audits. Private equity firms may not always prioritize obtaining a higher level of audit quality and assurance. Private equity firms may strive to improve audit quality in their portfolio companies depending on a variety of factors, such as the

company's size and complexity, the industry in which it operates, and the level of regulatory scrutiny applicable to the company.

2.3. Measure of Audit Quality

Audit quality is broad and can be difficult to define and measure, especially from the perspective of different stakeholders. There is no concrete definition of audit quality, and there are many factors that could contribute to higher audit quality. According to the IAASB (2011), the extent of involvement of investors and audit committees in an audit, along with the standards used to assess audit quality, result in varying perceptions of audit quality. For instance, CFOs value an effective audit performed at a reasonable cost and view the audit as offering significant assurance and comfort to them (Esplin et al., 2018). Investors view audit quality as a measurable result, such as reputation and the auditor's report, whereas audit committee members view it as an ongoing process.

According to DeFond & Zhang (2014), audit quality is determined by both client demand and auditor supply, which depend on the incentives and competencies of the client and auditor. From practitioners' perspectives, error detection on financial statements suggests that high quality auditors will detect errors and enhance the reliability of the financial statements (Derek & Kit, 2001). Further, industry specialization plays an increasingly important role in audit quality. The positive association observed between auditor industry specialization and the earnings response coefficient indicates that specialist auditors increase the market's perception of the quality of these earnings (Balsam et al., 2003).

Many researchers have developed a framework to measure audit quality. Various proxies have been used in the audit literature, each with its own set of advantages and drawbacks. Knechel et al., (2012) view audit quality through a balanced scorecard and categorize four primary attributes, including inputs, process, outcomes, and context, to link the general attributes of audit quality: incentives, uncertainty, uniqueness, process, and judgement. DeFond & Zhang (2014) divide audit quality proxies into input and output proxies. This is also in line with the IAASB's framework on audit quality, which includes inputs, outputs, key interactions, and contextual factors. IAASB also noted that this framework is not enough to evaluate audit quality, other factors, including the nature and extent of audit evidence obtained in response to the risks of material misstatement in a particular entity, the appropriateness of the relevant audit judgements made, and compliance with relevant standards, also need to be considered. The study by Aobdia (2018) investigated auditor measures used by PCAOB inspection and the audit firm's internal inspection and found that the propensity to restate financial statements, the propensity to meet or beat the zero earnings threshold, and audit fees have significant associations with audit measures that are used by regulators and auditors.

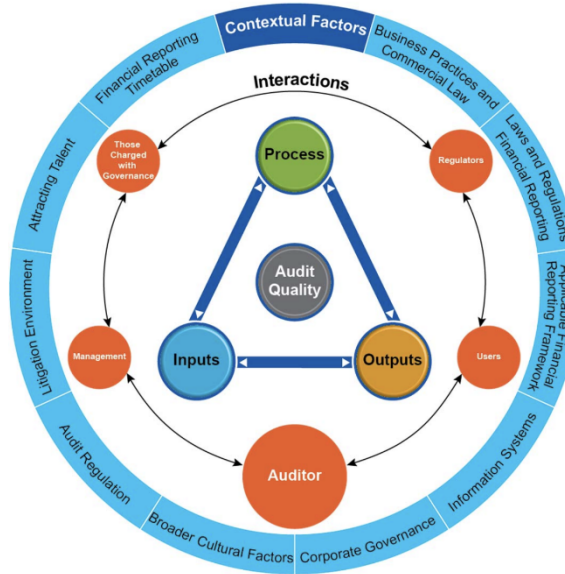


Figure 1. IAASB's framework on audit quality

2.3.1. Audit firms

The choice of auditor has a direct impact on the quality of an audit, and larger audit firms generally have the resources to provide a higher level of service and have more risk in case errors are not detected by them (DeAngelo, 1981). A shift in the demand for a higher level of quality can lead to a change in auditor (Haskins & Williams, 1990), as clients seeking to increase the level of audit quality will require a change in auditor (DeAngelo, 1981). Firms that utilize smaller audit firms tend to have a higher frequency of auditor changes, as smaller audit firms often have limited resources and are perceived as providing a lower level of audit quality compared to the Big Six (DeFond, 1992). Further, Noda (2018) found that the selection of an auditor is based on how much investors care about the earnings report and whether there are incentives for the management to manipulate the earnings. Previous research has identified audit opinion, auditor quality, management changes, income manipulation opportunities, leverage, complexity, and firm growth as significant factors that contribute to auditor changes (Woo & Koh, 2001).

There has been considerable research examining the relationship between Big N auditors and audit quality. The findings are mixed, with some studies indicating that switching to a Big N auditor leads to an improvement in audit quality (Jiang et al., 2017), while others suggest that there is no significant difference in audit quality between firms audited by Big N auditors and those audited by smaller firms (Lawrence et al., 2011). Further, several studies have explored the impact of Big N auditors on mergers and acquisitions activities. Xie et al. (2003) found that clients of Big N auditors are more likely to be targeted for successful acquisitions and having a well-known "brand-name" auditor can convey a

trustworthy signal about the accuracy of the financial information of the target firm. Additionally, Gal-Or et al. (2022) found that in industries with complex accounting, Big N auditors with expertise in M&A can help prevent misstatements during the acquisition period. According to Tagesson & Öhman (2015), their research on Swedish auditors and going concern warnings (GCWs) found that, on average, larger audit firms have a greater propensity to issue GCWs. Nevertheless, there are variations between individual firms, indicating that not all Big 4 audit firms may be better than other audit firms at predicting bankruptcies. However, the majority of these studies showed that Big N auditors produce higher efficient auditing than non-Big N auditors and lead to higher audit quality.

Further, the choice of auditor is particularly important for private firms that are being sold, as many potential buyers prioritize high-quality accounting systems and financial statements. According to a study by De Franco et al., (2009), the choice of a Big 4 auditor has a significant impact on the sale proceeds of private firms in the US, as not hiring such an auditor was found to result in a decrease in enterprise value. Several studies indicate that both the target and acquiring firms can benefit from a Big 4 auditor with a well-established brand name, as the auditor's reputation is perceived as providing credible assurance of the accuracy of financial information. On the other hand, Jiang et al., (2017) suggest that investors do not attach a premium to firm value based on the benefit of improved audit quality.

Moreover, studies have investigated instances where the target and the acquirer have the same auditor. Dhaliwal et al., (2014) discovered that in such scenarios, acquisitions are correlated with significantly lower acquisition premiums, lower target returns, and higher deal completion rates, while acquirer returns are higher. Studies by Cai et al., (2016) show that acquirers and targets with shared auditors have more aligned financial statements and less inaccuracies compared to those with different auditors.

2.3.2. Audit fee and non-audit fee

The concept of audit fees is important in auditing, as it refers to the compensation provided to auditors for their services. The remuneration of auditors is influenced by a number of variables, including the level of effort expended in conducting audits and the risk of prospective litigation (Choi, 2009). According to Simunic (1996), the appropriate level of audit fees is influenced by several factors, including audit risks, client size, and audit complexity. In practice, there are four common categories of audit contracts that are governed by legal regulations: fixed price, contingent fee, benefit in kind, and hourly billing rate (Diamant, 2000). Notably, Diamant (2000) notes that there is no overarching legal requirement regarding audit contract pricing in Sweden. Historically, auditors of all sizes in Sweden have used hourly billing rates as the premise for calculating audit fees, as there is no overarching legal requirement regarding the pricing of audit contracts in the country.

Previous research examined the relationship between audit fees and audit quality, with abnormal audit fees manifesting as excessively low or high fees. Blankley et al. (2012) conducted a study that revealed that abnormally low audit fees (i.e., discounts) may compromise audit quality. Moreover, Fitriany et al. (2016) examined the influence of abnormal audit fees on audit quality in Indonesia and discovered a negative correlation between abnormal audit fees and audit quality. This can be attributed to the client's negotiating strength during the bidding process (Barnes, 2004). When audit fees are below average, audit firms may reduce audit procedures, such as audit hours and staff experience (Gregory & Collier, 1996; Esleman & Guo, 2013). However, Choi et al. (2009) found no correlation between negative abnormal audit fees and audit quality, Francis & Yu (2009) acknowledged that auditors would be unlikely to confess to allowing clients to manipulate earnings to increase audit fees. Moreover, Krishnamurthy et al. (2002) demonstrated that the issue of audit fees and audit quality can lead to conflicts of interest between auditors and clients.

In addition to providing audit services, auditors are also allowed to offer non-audit services (NAS) to their clients. SEC regulations believe that an auditor's interest in establishing or preserving a non-audit services relationship raises two types of independence risks.

First, the more the audit has at stake in its dealings with the audit client, the greater the cost to the auditor should he or she displease the client, particularly when the non-audit services relationship has the potential to generate significant revenues on the audit relationship. Second, certain types of non-audit services, when provided by the auditor, create inherent conflicts that are incompatible with objectivity. (SEC, S7-13-00)

The influence of NAS fees on audit quality has gained significant attention in audit and accounting literature, particularly after well-known corporate scandals such as Enron and WorldCom, and the enactment of the Sarbanes-Oxley Act (SOX). However, the findings of these studies have been inconclusive and vary based on the metric used to measure audit quality. Some contend that it compromises auditor independence because the provision of NAS could create a conflict of interest for the auditor, which could result in a loss of objectivity during the auditing process. Defond et al. (2002) provided evidence that auditors' provision of non-audit services may compromise their independence when issuing continuing concern opinions. According to Ashbaugh-Skaife et al., (2002), NAS can create conflicts of interest that compromise the independence of auditors and increase the risk of financial statement manipulation. According to Craswell (1999), non-audit services can establish a financial relationship between the auditor and client, which may compromise the auditor's objectivity and independence. Simunic (1984) provides empirical evidence that non-audit fees are positively related to audit fees and negatively related to audit quality.

However, others contend that it does not compromise auditor independence and may even enhance audit quality by allowing auditors to acquire a deeper understanding of their clients' businesses. Firth (1997) examines a sample of British businesses and concludes that the provision of non-audit services is positively correlated with audit quality, contrary to the findings of earlier research that suggested a negative correlation. Positively correlated with the provision of non-audit services may be an increase in knowledge and proficiency. According to Lim & Tan (2007), companies that engage specialized auditors for non-audit services tend to experience an enhancement in audit quality as measured by a greater likelihood of issuing going-concern opinions, a decreased probability of missing analysts' forecasts, and higher earnings-response coefficients. Svanström (2016) utilized survey data from Sweden to explore the impact of auditors providing non-audit services to their clients, alongside the audit engagement, on auditor independence. The findings indicate a potential positive correlation between non-audit services and the quality of the audit, which may be attributed to a deeper understanding of the client company.

2.4. Hypothesis Development

Based on this, we anticipate that private equity firms are associated with audit quality on their invested firms. This is because of its function in protecting their investments, ensuring compliance with regulatory standards, monitoring performance, and preparing to sell their investment. Various research methods for assessing audit quality are described in the literature review. There is little evidence that private equity investors are directly related to audit quality. We intend to provide additional empirical evidence from the perspective of audit quality and investigate the mechanisms by which private equity investors influence the audit quality of their underlying portfolio companies. Consequently, the hypothesis is stated as follows:

H1: Private Equity Investors are associated with the audit quality of their portfolio companies.

In addition, it is important to understand that the need for audit quality may not be the same for all PE investors. The characteristics of a private equity (PE) investor and their level of ownership in a company can have a significant impact on audit decisions. For instance, if PE investors have minor equity stakes in their portfolio companies, information asymmetry issues may be more prevalent, resulting in a lack of control rights that impedes effective monitoring and consequently compromises accounting quality. Based on this, audit quality could be affected by the level of ownership.

H2: Private equity ownership level are associated with the audit quality of their portfolio companies.

3. Research Design

To ensure a comparable control group with similar characteristics to the PE-backed firms in the year of acquisition, we started by creating a control group based on industry, year, size (Total Asset), profitability (Return on Asset), and sales growth. We used the `ultimatch` command, which allows both exact matching (year and industry) and nearest matching for continuous variables, in a single command in Stata to find the appropriate control group. The descriptive statistics comparing the treatment group and the control group are in Table 3.

In this study, we utilize two input measures that are commonly used in audit-related research, namely the Big 4 dummy and audit fees. Audit quality can be approximated using audit fees since they are assumed to reflect the auditor's level of effort, which is a crucial factor in the audit process that is assumed to be correlated with audit quality. Also, a Big 4 dummy is used as a measure for audit quality, as it is believed that larger auditors have greater competencies and stronger motivations to deliver high quality audits. DeFond & Zhang's (2014) research supports both measures as reliable indicators of audit quality. Additionally, previous studies (Kausar et al., 2016; Lennox & Pittman, 2010) have utilized the Big 4 auditor proxy, while the audit fee has been used by Dong et al., (2022).

3.1 Testing H1: Private Equity Investors and Audit Quality

We have chosen to employ the difference-in-differences (DID) regression technique to analyze the impact of audit quality by private equity investors before and after their acquisition, compared to a control group of firms that were not acquired by private equity investors. This approach is a valuable methodology for several reasons. Firstly, analyzing the treatment group (PE-acquired firms) alone may not capture the true effects of the acquisition, as there may be pre-existing differences between the treated and control groups that could influence the results. By including a control group of non-PE-acquired firms, we can account for these pre-existing differences and isolate the true effects of private equity ownership on audit quality. Secondly, by using the DID regression technique, we can estimate the causal effect of the treatment by comparing the changes in audit quality over time between the treatment and control groups. This approach provides a more accurate estimate of the treatment effect as it accounts for factors that may influence the outcome variable over time, such as changes in market conditions or industry trends. The inclusion of a control group and the use of DID regression are important components of our study design as they allow us to estimate the true impact of private equity ownership on audit quality, while controlling for pre-existing differences between the treated and control groups.

Therefore, we run the following difference in difference model regressions:

$$\begin{aligned}
Y_{i,t} = & \beta_1 PEOWN_{i,t} + \beta_2 PE_{i,t} + \beta_3 OWN_{i,t} + \beta_4 ROA_{i,t} \\
& + \beta_5 \ln TotalAssets_{i,t} + \beta_6 Salesgrowth + \beta_7 Leverage_{i,t} + \beta_8 INV_{i,t} \\
& + \beta_9 REC_{i,t} + \gamma t \times \eta ind + \varepsilon
\end{aligned} \tag{1}$$

where $Y_{i,t}$ are the dependent variables of audit quality (ln Audit Fee, Big4 dummy), $PE_{i,t}$ is a dummy that equals one if the company is acquired by PE at any time (treatment firm). $OWN_{i,t}$ is equals 1 if a PE fund owns the portfolio company i at year t onwards, 0 if the company i is not owned by PE at time t (before the deal). $PEOWN$ is an interaction dummy variable between PE and OWN . To account for client company characteristics that may add complexity or risk to the audit and could influence the audit fee and outcome, a series of control variables have been incorporated into the regression models. We control for ROA , total assets, and sales growth, to account for a firm's profitability, size, and future growth opportunities, respectively. To address potential variables that may affect the results, we also include audit-related control variables, such as Leverage (LEV), Inventory scaled by total assets (INV), and Receivables scaled by total assets (REC). Essentially, the model used in this study is an extended version of Simunic's (1984) model and Carcello et al.'s (2000) audit fee model.

We employ fixed effects regression models to address the issue of the error term's correlation with the explanatory variables. By doing so, we enhance the accuracy of our estimates. Specifically, our two-way fixed effects regression model comprises fixed effects for both year (Year) and industry (Industry). This is because we take into account unobserved time-invariant characteristics of industries and years that are correlated with the observed independent variables. By using a fixed effects regression model for both industry and year, we can effectively control for this potential confounding factor. Firm-level clustering of standard errors is employed to address serial correlation.

We also examine whether PE firms change the auditor for their portfolio companies.

$$\begin{aligned}
AUDCHANGE_{i,t} = & \beta_1 PEOWN_{i,t} + \beta_2 PE_{i,t} + \beta_3 OWN_{i,t} + \beta_4 ROA_{i,t} + \\
& \beta_5 \ln TotalAssets_{i,t} + \beta_6 Salesgrowth + \beta_7 Leverage_{i,t} + \beta_8 INV_{i,t} + \\
& \beta_9 REC_{i,t} + \gamma t \times \eta ind + \varepsilon
\end{aligned} \tag{2}$$

$AUDCHANGE_{i,t}$ is defined as 1 if a firm's auditor is different from the previous year ($t-1$), and 0 otherwise. $OWN_{i,t}$ is defined as 1 if a firm is owned by a PE fund at time t , and 0 otherwise. If OWN has statistically significant positive coefficients, it would suggest that there is a relationship between PE ownership and changes in auditors. Additionally, the decision to switch auditors could serve as evidence that PE has an impact on the companies in its portfolio.

3.2 Testing H2: Private Equity Ownership Stake and Audit Quality

We also investigate diversity in audit quality demand across the range of ownership levels, given that discrepancies in ownership levels may lead to distinct demand for audit quality. We conducted a similar regression analysis to the main regressions, but this time applied it only to a sample of firms that are backed by private equity (PE). We coded majority acquisition as 1 and minority acquisition as 0. The interaction of this dummy variable with the variables of interest should be interpreted in a similar way to the comparisons between PE-backed and non-PE-backed firms.

$$\begin{aligned} Y_{i,t} = & \beta_1 OWN_Majority_{i,t} + \beta_2 Majority_{i,t} + \beta_3 OWN_{i,t} + \beta_4 ROA_{i,t} \\ & + \beta_5 \ln TotalAssets_{i,t} + \beta_6 Salesgrowth + \beta_7 Leverage_{i,t} + \beta_8 INV_{i,t} \\ & + \beta_9 REC_{i,t} + \gamma t \times \eta ind + \varepsilon \end{aligned} \quad (3)$$

A statistically significant positive coefficient for the interaction terms would suggest that PE majority ownership exerts a greater influence on the audit quality of its portfolio firms.

Our aim, through the research design outlined above, is to investigate whether PE investors are associated with an increase in audit fees, using Big 4 auditors or switching auditors for their portfolio firms. Additionally, we will explore whether level of ownership can affect the level of audit quality.

4. Data

4.1 Data source

This section describes the methodology used to collect private equity transactions from Capital IQ, financial data from the Swedish House of Finance's publicly available Serrano dataset, and audit fees and auditing firms from Retriever. To support our hypotheses, we analyze audit fees and changes in accounting firms over a four-year period consisting of data from two years prior to the transaction (T-2, T-1), the year of the transaction (T), and one year following the transaction (T+1).

4.1.1 Private equity transactions

Table 1. Transactions collection

Steps	#	Description
(1) Capital IQ PE Transactions	441	Screen Criteria: 1) Target is a Swedish Company 2) Buyer is private/public investment firm 3) M&A closed date 1/1/2013 - 12/31/2018
(2) Duplicates	(49)	Excluded transactions with the same targets
(3) Missing Company ID	(26)	Excluded transactions if the target company cannot match company ID
A. Transaction sample	366	Full samples
Minority investments	143	Transaction that buyer acquired <50% of the shares.
Majority investments	223	Transaction that buyer acquired >50% of the shares

The structure of our sample is elaborated in Table 1, providing a clear overview of the composition of our dataset.

- 1) Capital IQ PE transactions: Our database includes private equity transactions that occurred in Sweden between 2013 and 2018 and involved private or public investment firms as buyers.
- 2) Duplicates: We have taken into consideration cases where a target company has been acquired by different buyers within our selected periods. In such instances, we have included only the earlier transaction in our analysis. A total of 49 transactions were identified and subsequently removed from our dataset.
- 3) Missing company ID: Some of the transactions disclosed in Capital IQ could not be matched with a Company ID, which is necessary for obtaining audit fee and financial information. As a result, we were unable to include 26 transactions in our dataset where the Company ID was unavailable.

Our final sample consisted of 366 transactions involving unique companies. Notably, 143 of these transactions were classified as minority share acquisitions.

It is important to acknowledge that our dataset may have limitations due to the absence of mandatory reporting for private equity transactions. Private equity transactions are not always publicly disclosed or reported, so it is possible that some transactions that occurred during the study period may not be included in our dataset. Despite this potential limitation, we have utilized available data sources to create a sample for our analysis.

4.1.2 Audit fee and changes in Audit firms

The Retriever database is used to capture audit fees and audit firms. The compiled audit fee data includes revisionsuppdrag, which refers to audit fees, and revisionsverksamhet utöver revisionsuppdraget, skatt, and other, which represent non-audit fees. These additional fees are typically associated with services provided by accounting firms outside the scope of the audit, such as tax consulting or other advisory services. Further details on the number of data collected can be found in Table 2.

Table 2. Treatment group and control group Audit fee and changes in auditing collection

	Treatment group		Control group	
	#	%	#	%
(1) Full sample	366		304	
(2) Remove missing audit report	(17)		(0)	
A. Total	349		304	
Completed audit fee	187	54%	183	60%
Completed accounting firms	309	89%	300	99%

- 1) Remove missing audit report: we removed 17 companies from our sample that did not have an audit report available within the selected period.

Table 2 compares the audit fees and changes in auditing collection between the treatment group and control group in our study. When missing audit reports are removed from the sample, the treatment group consists of 349 firms and the control group remains at 304 firms. The table shows that in the full sample, 54% of the treatment group and 60% of the control group had completed audit fees across the four years period. Additionally, 89% of the treatment group and 99% of the control group had completed accounting firms across the four years period of our study.

Table 3 provides detailed summary statistics on the basic characteristics of the treatment and control groups. Here, we used size (ln Total assets), profitability (ROA) and sales growth as the key variables to generate control firms. There are 349 PE and 304 non-PE individual firm observations for the year of PE acquisition. The number of companies in the control group is 304 due to the lack of data on sales growth, as matching is not

available for some companies. We do regression on 349 firms for regression without a control group and on 304 firms when we do difference in difference regression.

Table 3. Descriptive Statistics of Treatment & Control Firms in Matching Year

	N	Mean	Median	p5	p25	p75	p95
Treatment Group							
ROA	304	.055	0.074	-.463	.002	.184	.382
LEV	304	2.946	1.232	.115	.558	2.486	6.44
LN TA	304	19.209	19.068	15.995	17.765	20.443	23.187
Sales growth	304	.217	0.086	-.919	-.038	.244	1.212
Control Group							
ROA	304	.059	0.064	-.222	0	.144	.383
LEV	304	6.777	1.735	.17	.762	4.249	25.728
LN TA	304	19.192	19.071	15.994	17.771	20.441	23.255
Sales growth	304	.166	0.075	-.29	-.024	.219	.75

4.2 Data description

4.2.1 Transaction summary

Figure 1 offers a comprehensive overview of the annual trends in Private Equity transactions over a six-year period, spanning from 2013 to 2018. The data reveals that in 2013, there were a total of 45 private equity transactions, which saw a slight increase to 47 in 2014. However, a notable surge in activity occurred in 2015, with a substantial jump to 86 transactions, indicating a significant uptick in private equity investment. Subsequently, in 2018, the number decreased again to 54 transactions. The fluctuations in private equity transaction activity over the years highlight the dynamic nature of the market.

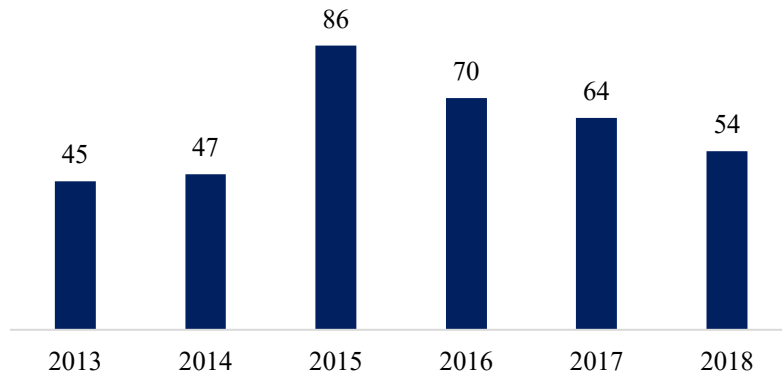


Figure 1. Number of transactions by years

4.2.2 Types of Buyers

We observe that Capital IQ does not clearly differentiate between private equity, venture capital, and other types of investment firms, including asset management (AM) and pension funds. Therefore, we have categorized the different kinds of buyers based on the definitions provided by the companies themselves, as found on their respective websites. In instances where the company's website did not provide a definition, we looked at other sources, such as Bloomberg or the LinkedIn introduction page, to determine the correct classification.

Table 4. Transactions collection breakdown by buyers and level of ownership

	PE	VC	AM	Pension	Total
Majority	198	7	11	6	222
Minority	76	8	41	19	144
Total	274	15	52	25	366

4.2.2 Audit fee and non-audit fee

Table 5. Audit fee descriptive statistics

SEK('000)	T-2		T-1		T		T+1	
	PE=1	PE=0	PE=1	PE=0	PE=1	PE=0	PE=1	PE=0
N	189	194	217	203	226	201	220	197
Minimum	7.2	12.0	10.0	15.0	18.0	18.0	10.0	18.0
Average	1,519.7	1,665.0	1,632.8	1,668.0	1,824.4	1,661.6	1,846.0	1,960.9
Maximum	44,000.0	63,000.0	38,000.0	116,000.0	42,000.0	89,000.0	40,000.0	104,000.0
10th percentile	100.0	74.1	110.3	64.4	100.0	60.6	120.0	82.8
25th percentile	181.0	130.0	187.9	133.0	214.6	141.0	241.3	144.5
Median	374.0	313.0	404.0	312.4	434.4	323.0	513.0	352.1
75th percentile	1,198.0	731.0	1,289.1	657.8	1,230.3	794.8	1,402.0	841.5
90th percentile	4,000.0	2,167.0	4,020.0	2,004.0	4,932.9	2,181.9	4,990.0	2,458.2

Table 5 presents the descriptive statistics for audit fees, measured in SEK, across four years (T-2, T-1, T, and T+1). One finding is that the average audit fees for both PE-backed and non-PE-backed levels increase over the four years, with the highest average fees observed in T+1.

Table 6 Non-audit fee descriptive statistics

SEK (000)	T-2		T-1		T		T+1	
	PE=1	PE=0	PE=1	PE=0	PE=1	PE=0	PE=1	PE=0
N	187	193	214	204	224	201	217	197
Minimum	0	0	0	0	0	0	0	0
Average	609.1	456.6	743.9	437.7	808.7	671.3	1,066.2	869.7
Maximum	16,000.0	15,000.0	33,000.0	16,000.0	26,000.0	26,000.0	90,000.0	38,000.0
10th percentile	0	0	0	0	0	0	0	0
25th percentile	0	0	0	0	0	0	0	0
Median	65.0	50.0	90.5	35.0	65.0	46.0	61.0	45.5
75th percentile	394.0	183.3	400.0	172.5	315.8	275.3	469.0	283.0
90th percentile	1,196.8	1,000.0	1,502.0	1,187.8	2,000.0	1,770.0	1,600.0	2,000.0

Table 6 presents the descriptive statistics of non-audit fees for the years T-2, T-1, T, and T+1. Please note that some companies did not report any non-audit fees during these years. The average non-audit fee increased from T-2 to T, but then decreased from T to T+1. However, the maximum non-audit fee increased substantially from T to T+1. The median non-audit fee remained relatively consistent across the four years, with some slight fluctuations. The lack of a clear trend in the data suggests that non-audit fees are more variable and less predictable than audit fees.

Table 7. Audit fee changes for Treatment group and Control group

	Audit fee change (T-2 to T-1)		Audit fee change (T-1 to T)		Audit fee change (T to T+1)	
	PE=1	PE=0	PE=1	PE=0	PE=1	PE=0
Average	35.4%	5.5%	47.6%	13.5%	24.9%	18.9%
10th percentile	-20.7%	-27.3%	-40.5%	-27.5%	-34.0%	-23.7%
25th percentile	-5.1%	-9.9%	-11.8%	-5.5%	-11.0%	-5.5%
Median	7.4%	0.0%	7.6%	4.1%	7.8%	2.4%
75th percentile	43.0%	11.4%	36.9%	26.3%	29.9%	24.1%
90th percentile	114.6%	36.6%	84.6%	66.0%	80.4%	76.0%

In Table 7, the Treatment group has much higher percentage changes in average audit fees compared to the Control group for all time periods. The largest difference is in the T-1 to T time period, where the Treatment group had an average increase of 47.6% in audit fees, while the Control group only had an average increase of 13.5%. This suggests that the Treatment group had much larger fee increases compared to the Control group, especially in the period before the transaction was closed.

Table 8. Non-audit fee changes for Treatment group and Control group

	Non-audit fee change (T-2 to T-1)		Non-audit fee change (T-1 to T)		Non-audit fee change (T to T+1)	
	PE=1	PE=0	PE=1	PE=0	PE=1	PE=0
Average	89.0%	35.1%	339.4%	194.5%	260.6%	58.3%
10th percentile	-80.7%	-100.0%	-100.0%	-100.0%	-100.0%	-99.2%
25th percentile	-47.1%	-74.7%	-84.2%	-53.2%	-84.2%	-55.1%
Median	0.0%	-3.1%	-31.2%	0.0%	-18.5%	-0.3%
75th percentile	96.2%	52.8%	81.8%	94.6%	96.2%	90.2%
90th percentile	343.5%	148.5%	456.5%	376.6%	737.7%	217.9%

In Table 8, the Treatment group also has much higher percentage changes in non-audit fees compared to the Control group for all time periods. The largest difference is in the T-1 to T period, where the Treatment group had an average increase of 339.4% in non-audit fees, while the Control group only had an average increase of 194.5%.

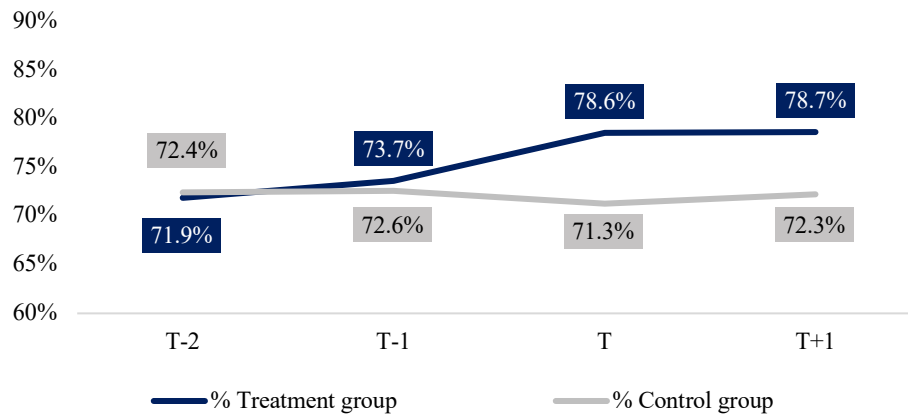
4.2.3 Changes on auditing firms

Table 9. Auditing firms' changes

	Auditor Change (T-2 to T-1)		Auditor Change (T-1 to T)		Auditor Change (T to T+1)	
	PE=1	PE=0	PE=1	PE=0	PE=1	PE=0
Non-Big 4 to Big 4	12	5	26	2	7	5
Big 4 to Non-Big 4	6	3	11	7	6	2
Big 4 to another Big 4	14	9	40	11	9	12
Non-Big 4 to Non-Big 4	9	5	7	2	2	4
Total number of changes	41	22	84	22	24	23
% of Changes to Total Sample	12%	8%	24%	7%	7%	8%

Table 9 provides insights into the changes in auditing firms among treatment groups and control groups. The results show that a higher proportion of PE-owned companies changed to Big 4 auditing firms in all three time periods. Changes from Big 4 to non-Big 4 or other Big 4 auditing firms were less frequent, and changes from non-Big 4 to non-Big 4 auditing firms were relatively low for both TG and CG.

Figure 3. Big4 auditors throughout PE investment horizon



This chart shows the percentage of companies in the treatment and control groups that use a Big 4 auditor for audit services. In the treatment group, the percentage of companies using a Big 4 auditor was 71.9% in T-2, increasing to 73.7% in T-1, further increasing to 78.6% in T, and remaining relatively stable at 78.7% in T+1. In the control group, the percentage of companies using a Big 4 auditor was 72.4% in T-2, decreasing slightly to 72.6% in T-1, decreasing further to 71.3% in T, and increasing slightly to 72.3% in T+1. Overall, both the treatment and control groups had a high percentage of companies using a Big 4 auditor, with the treatment group having higher percentages each year.

5. Result

Table 10 provides detailed summary statistics on firm characteristics in pooled post-PE financing observation years where the top and bottom 1% outliers in Total Assets, ROA, Leverage and Sales growth are winsorized. There are 1202 PE and 1207 non- PE individual firm-year observations for total assets, ROA, sales growth, and leverage. Due to data unavailability, sales growth yields slightly less firm-year observations.

Table 10. Summary statistics: Pooled Observation Years

	N	Mean	Median	p5	p25	p75	p95
Treatment Group							
ROA	1202	.066	0.072	-.306	0	.187	.432
LEV	1199	3.857	1.271	.143	.61	2.866	10.308
LN TA	1202	19.124	18.988	15.834	17.562	20.431	23.066
Sales growth	1162	.298	0.091	-.362	-.016	.254	1.307
Control Group							
ROA	1207	.061	0.064	-.236	.001	.145	.382
LEV	1206	7.756	1.850	.163	.834	4.515	36.236
LN TA	1208	19.114	19.003	15.901	17.677	20.374	23.271
Sales growth	1178	.196	0.063	-.328	-.032	.19	.811

We further examine whether audit quality is affected once PE invests in a company. Table 12 presents initial univariate results with regards to the trends of the portfolio firms' audit quality proxies before and after PE investment. For the Big 4, we observe increasing trends for treatment firms once PE takes ownership. The percentage of firms using Big4 exhibits a significant increase, from 0.71 at year T-2 to 0.79 at year T+1. The Big4 percentage tends to stay relatively constant for control firms. The level of increase seems to be a significant increase for treatment firms compared to control firms. PE-owned firms show an increasing pattern, contrary to control groups' relatively similar patterns.

Table 13 displays the regression results for both the full sample with control variables and the sample without a control group. We have presented the results of regression analyses related to audit quality in Regressions (1) to (4). Regression (1) and (2) focus on the relationship between PE ownership and the natural log of audit fees. In both regressions, with and without control groups, the coefficients for OWN and PEOWN variables are negative, and not statistically significant. On the other hand, Regressions (3) and (4) demonstrate logistic regressions that set Big4 as the dependent variable. In both regressions, with and without a control group, OWN and PEOWN variables show positive coefficients of 0.425 and 0.36 at 5% statistically significant respectively. The findings indicate that PE ownership may be linked with a shift towards Big 4 auditors, but there is

no evidence to suggest that it results in increased audit fees when the portfolio firm comes under PE control.

Regression (1) in Table 14 demonstrates PE firms' tendency to switch auditors, and this captures the tendency of private equity firms to change auditors once they take ownership of the firm. The variables OWN and PEOWN have positive coefficients of 0.924 and 0.823 and are statistically significant at the 1% and 10% levels, for the regression conducted without a control group and with a control group, respectively. This suggests that PE ownership is positively associated with auditor changes. This reveals the tendency of PE investors to change the portfolio companies' auditors to other auditors once PE firms invested in their portfolio company. The evidence witnessed seems to support the notion that PE firms are associated with changing audit firms and are likely to switch to the Big 4.

Table 15 displays the relationship between audit quality and PE ownership stake. The results of the regression (3) indicate that a high level of PE ownership is significantly associated with auditor change, with a coefficient of 0.129 and statistical significance at the 5% level. Nevertheless, the findings do not find a significant relationship between high PE ownership and the probability of utilizing the Big 4 or experiencing an increase in audit fee. We can infer from these results that auditor change decisions are influenced by PE ownership and ownership stakes.

Additional Test:

(i) Non-Audit Fees and Total Fees Paid to Auditors

We performed a regression analysis on non-audit fees using the same model as previously employed, and the results are presented in Table 16. We found that the coefficients were negative in both the control and non-control groups, and they were not statistically significant. We also conducted a regression analysis on total fees and found that the coefficients were negative, and not statistically significant. These findings indicate that PE acquisitions do not necessarily lead to higher non-audit fees.

(ii) Types of Buyers

In our analysis, we have distinguished several categories of investors, including private equity (PE), venture capital (VC), pension funds, and asset management firms, among others, as outlined in the relevant section of the Data section. To examine the effects of these investor types on our regression model, we have excluded VC, asset management, and pension funds from our analysis.

To isolate the specific impact of private equity, we have conducted a regression analysis on a subset of our data, which only includes private equity investors. This additional regression analysis was performed on the same model as our main regression, with the

exclusion of all other types of investors. The results of this analysis are presented in Table 17. In regressions for Big4 and Auditor Change, the coefficients for OWN variables are positive at 0.463 and 0.492, and statistically significant at 5% and 10%, respectively. This supports our findings from the main regression analysis in Table 13.

6. Conclusion / Discussion

The primary objective of our research is to examine the linkage between audit quality and private equity investors. To achieve this, we utilized a comprehensive database from S&P Capital IQ, as well as Serrano and Retriever financial data sources to gather financial statements of Swedish private firms. Two proxies that are used to measure audit quality are audit fee and Big 4. We found that Private Equity firms are associated with the audit quality of their portfolio firms. Notably, we observe that portfolio firms are likely to undergo audit changes and, in many instances, switch to a Big 4 audit firm once a PE investor becomes involved. It is worth noting that our findings do not suggest that PE-backed companies necessarily have higher audit fees. Moreover, PE-backed firms with a high level of PE ownership are more likely to change auditors compared to firms with a low level of PE ownership.

It is essential to discuss potential reasons why the audit fee does not increase and, in some cases, even decreases, under PE ownership. Several possible reasons could explain this outcome. First, due to concentrated ownership and diverse channels of information, PE funds may not consider financial statement disclosures as critical as they did before the investment. As a result, there is no need for additional work that would require an auditor to put more effort into the audit process.

Furthermore, it's worth noting that we observed an average increase in audit fees of 47.6% during the period of T-1 to T, which is relatively higher than the control group's increase of 13.5%. However, this trend did not persist after the transaction was closed. This finding could suggest that auditors were required to put in extra effort to audit the portfolio companies prior to the deal's closure, potentially resulting in higher audit quality. Our regression model did not reveal any evidence of increasing audit fees after the PE acquisition, and we cannot conclusively state that PE has an effect on audit quality as measured by audit fees after the acquisition.

Alternatively, as our results indicate, PE firms may require their portfolio companies to switch auditors. It's possible that these firms have preferred auditors with whom they have a strong relationship, enabling them to negotiate favorable audit fees. However, we cannot make any causal statements about the motivation behind PE-backed firms' decreased audit fees because we don't have information about their auditor's preferences and negotiations. Another reason for using a Big 4 auditor could be that such a change can significantly impact a firm's enterprise value, resulting in higher sales proceeds. Additionally, the reputation of a Big 4 auditor is perceived to provide credible assurance of the accuracy of financial information, as discussed by De Franco et al. (2009).

Our research provides new insights regarding the impact of PE investment on corporate governance in the Swedish market. We found evidence that suggests PE investors actively

participate in the selection of auditors, which serves as one of the channels through which they exert their influence on portfolio companies. Our findings lend support to the argument that PE investors can contribute positively to the improvement of corporate governance practices, highlighting the potential benefits of their involvement in the decision-making processes of portfolio companies. Moreover, the fact that PE-owned firms frequently switch to Big 4 auditors underscores the significance of audit quality, particularly in the context of prospective equity investments.

In conclusion, our study found a relation between audit quality and PE-backed firms. Furthermore, our findings suggest that private equity ownership can trigger changes in audit practices, including the need to change auditors, in many cases, to Big 4 auditors. While our study does not indicate that PE-backed companies necessarily face higher audit fees, further research is warranted to better understand the drivers of audit fee changes in the context of private equity ownership.

Limitations

The data utilized in our study is specific to Sweden, and as such, caution must be taken when generalizing the results to other institutional contexts. The auditing profession is regulated, with a licensing system for individual auditors and specific regulations for audit firms. Additionally, cultural factors may also influence auditing practices. Consequently, the institutional context in which auditors operate may impact audit quality and reduce the generalizability of our findings to other institutional settings.

The definition of audit quality is not concrete, making it difficult to observe in an objective manner. As a result, researchers often rely on proxies to estimate audit quality in their studies. Our research is not immune to this challenge, and as such, we utilize two proxies of audit quality, namely Audit Fee and Big 4, which are both input measures. The limited time period of our study may impact the validity and generalizability of our results, particularly in relation to the use of limited proxies.

Furthermore, the nature of data collection, particularly the time-consuming nature of the process, coupled with the constraints of time, has resulted in a sample size that is limited in scope. Consequently, the sample size used in our study may have impacted the reliability and statistical power of our analysis, which needs to be taken into account when interpreting our findings.

It is important to note that our study is limited to a specific period from 2013 to 2018, and as such, it may not be generalizable to the current capital market. However, given the growing significance of Private Equity to the global economy and the increased emphasis on corporate governance efforts by investors in recent years, we anticipate that PE investors will continue to play a critical role in shaping the corporate governance landscape.

7. Appendix

Table 11. Variable Definitions

PE	Equals one if a company received PE investment some point in time within the sample period, zero otherwise.
OWN	Equals one if the relative year of PE investment is greater than or equal to zero. Also applies to matching control firms.
PEOWN	Interaction term between PE and OWN. $PE * OWN$.
LN_AF	Natural log of a firm's audit fees in a given fiscal year.
LN_NAF	Natural log of a firm's non-audit fees in a given fiscal year.
LN_TF	Natural log of a firm's total fees paid to auditors in a given fiscal year.
Big4	Equals one if a firm is audited by one of the big 4 auditors (PricewaterhouseCoopers, KPMG, Ernst & Young and Deloitte), and zero otherwise.
AUDCHANGE	Equals one if an audit firm is different from previous year's auditors, and zero otherwise.
ROA	Measures profitability of a firm, calculated by net income / total assets.
LN_TA	Natural log of a firm's total assets in a given fiscal year.
Sales Growth	Annual revenue growth rate
LEV	Measures the firm's financial structure, calculated as total liabilities / total shareholders' equity.
INV	Calculated by inventory/total assets
REC	Calculated by accounts receivable/total assets

Table 12. Changes in audit quality before/after PE ownership

This table displays the yearly means and medians of audit quality proxies. The year column indicates the year relative to the year of private equity investment, with year T referring to the year in which the company received private equity investment. PE=1 denotes treatment firms that received private equity investment at some point during the panel period, while PE=0 denotes control firms.

		% Big4		ln (Audit fee)	
		PE=1	PE=0	PE=1	PE=0
T-2	Mean	71.88%	72.43%	13.126	12.756
	Median			12.832	12.653
T-1	Mean	73.65%	72.61%	13.190	12.717
	Median			12.909	12.650
T	Mean	78.55%	71.29%	13.251	12.810
	Median			12.981	12.685
T+1	Mean	78.65%	72.28%	13.318	12.917
	Median			13.147	12.771

Table 13.

This table presents the results from multiple regressions conducted to examine the impact of private equity ownership on audit quality. Regressions (1) and (2) have an Audit fee as the dependent variable, while regressions (3) and (4) have BIG 4 as the dependent variable. Statistical significance is denoted by *, **, and *** at the 10%, 5%, and 1% levels, respectively. All control variables are winsorized at 1% and 99%.

	(1)	(2)	(3)	(4)
	No Control	Control	No Control	Control
VARIABLES	LN_AF		BIG 4	
OWN	-.033 (.071)	.016 (.076)	.425** (.212)	.09 (.149)
PE		.538*** (.087)		.061 (.218)
OWN*PE		-.046 (.072)		.36** (.178)
ROA	-.875*** (.212)	-.661*** (.156)	-.385 (.431)	-.513* (.309)
LEV	-.019*** (.005)	-.008** (.003)	.004 (.009)	.004 (.007)
LN_TA	.622*** (.032)	.593*** (.028)	.685*** (.088)	.619*** (.063)
Sales Growth	.048 (.031)	.013 (.027)	.032 (.068)	-.031 (.051)
INV	.458 (.38)	.141 (.285)	.728 (1.032)	-.574 (.663)
REC	.103 (.226)	.056 (.174)	.015 (.527)	.668* (.382)
Constant	.883 (.682)	.94 (.586)	-11.221*** (2.014)	-10.556*** (1.286)
Observations	699	1371	1018	1998
R ²	.704	.623	.234	.192
Industry FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES

Table 14.

This table presents the results from multiple regressions conducted to examine the impact of private equity ownership and auditor change on both the control group and the without control group. Statistical significance is denoted by *, **, and *** at the 10%, 5%, and 1% levels, respectively. All control variables are winsorized at 1% and 99%.

	(1)	(2)
	No Control	Control
VARIABLES	AUDCHANGE	
OWN	.924*** (.269)	.054 (.353)
PE		.674** (.315)
OWN*PE		.823* (.43)
ROA	.426 (.415)	.333 (.363)
LEV	.015 (.011)	-.001 (.006)
LN_TA	-.326*** (.061)	-.236*** (.054)
Sales Growth	-.315 (.262)	-.254 (.177)
INV	-.102 (.909)	.146 (.676)
REC	.071 (.508)	-.211 (.419)
Constant	4.016** (1.654)	1.298 (1.493)
Observations	554	1107
R ²	.133	.111
Industry FE	YES	YES
Year FE	YES	YES

Table 15.

This table presents the results from multiple regressions conducted to examine the impact of level of ownership and audit quality for treatment groups. Statistical significance is denoted by *, **, and *** at the 10%, 5%, and 1% level, respectively. All control variables are winsorized at 1% and 99%

VARIABLES	(1) LN_AF	(2) BIG 4	(3) AUDCHANGE
OWN	0.0182 (0.0902)	0.0292 (0.0395)	-0.0234 (0.0421)
Majority	-0.436*** (0.0925)	-0.0130 (0.0383)	-0.0202 (0.0467)
OWN*Majority	-0.0706 (0.117)	0.0763 (0.0495)	0.129** (0.0541)
ROA	-0.739*** (0.154)	-0.0459 (0.0512)	0.0271 (0.0514)
LEV	-0.0150*** (0.00441)	0.000408 (0.00133)	0.000564 (0.00132)
LN_TA	0.576*** (0.0191)	0.0854*** (0.00644)	-0.0264*** (0.00666)
Sales Growth	0.0348 (0.0242)	-0.000322 (0.00984)	-0.0167* (0.00963)
INV	0.342 (0.249)	0.232** (0.0991)	-0.0206 (0.101)
REC	0.218 (0.148)	0.0187 (0.0553)	0.0127 (0.0564)
Constant	1.966*** (0.418)	-0.946*** (0.137)	0.637*** (0.143)
Observations	699	1,037	819
R-squared	0.724	0.217	0.082
Industry FE	YES	YES	YES
Year FE	YES	YES	YES

Table 16.

This table presents the results from multiple regressions conducted to examine the impact of private equity and non-audit fee and total fee paid to auditors. Statistical significance is denoted by *, **, and *** at the 10%, 5%, and 1% level, respectively. All control variables are winsorized at 1% and 99%

VARIABLES	No Control	Control	No Control	Control
	LN_NAF		LN_TF	
OWN	-.064 (.143)	.239* (.133)	-.077 (.073)	.035 (.074)
PE		.464*** (.128)		.575*** (.073)
OWN*PE		-.237 (.173)		-.086 (.098)
ROA	-.746** (.361)	-.427* (.257)	-.9*** (.167)	-.596*** (.136)
LEV	-.017 (.016)	.001 (.005)	-.022*** (.005)	-.009*** (.002)
LN_TA	.595*** (.039)	.655*** (.027)	.632*** (.02)	.626*** (.015)
Sales Growth	-.025 (.049)	-.048 (.039)	.052* (.026)	.015 (.023)
INV	-.571 (.598)	-.362 (.38)	.03 (.275)	-.071 (.21)
REC	.574* (.338)	.494** (.212)	.026 (.16)	.011 (.112)
Constant	.268 (.849)	-1.514*** (.582)	1.065** (.424)	.564* (.328)
Observations	476	906	699	1371
R ²	.447	.481	.693	.625
Industry FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES

Table 17.

This table presents the results from multiple regressions conducted to examine the impact of private equity and audit quality by excluding other types of buyers including Venture Capital, Asset Management and Pension Funds. Statistical significance is denoted by *, **, and *** at the 10%, 5%, and 1% level, respectively. All control variables are winsorized at 1% and 99%

	(1)	(2)	(3)
	LN_AF	BIG 4	AUDCHANGE
OWN	.002 (.081)	.463** (.233)	.492* (.264)
ROA	-.818*** (.266)	-.31 (.477)	.612 (.378)
LEV	-.013*** (.005)	-.003 (.016)	.018 (.014)
LN_TA	.589*** (.045)	.628*** (.105)	-.272*** (.064)
Sales Growth	.038 (.039)	.034 (.076)	-.481** (.22)
INV	.339 (.388)	1.129 (.997)	.055 (.672)
REC	-.005 (.255)	.285 (.601)	.233 (.496)
Constant	1.441 (.909)	-11.002*** (2.014)	3.828*** (1.486)
Observations	472	735	589
R ²	.593	.181	.083
Industry FE	YES	YES	YES
Year FE	YES	YES	YES

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