Do credit ratings influence the demand/supply of audit effort?

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ABSTRACT

In this study, we determine whether the audit effort (hour) levels demanded by a client firm is significantly associated with credit ratings. Our results show that firms with higher credit ratings demand higher audit effort in hours compared to client firms with lower credit ratings. We interpret that firms with higher ratings (lower risk) demand higher levels of audit effort in hours to reduce information asymmetry and to demonstrate that financial reporting systems are robust based on audit effort signaling higher audit quality, consistent with legitimacy theory. We also interpret that firms with lower credit ratings do not have incentives to signal similar audit quality. We capture the 'Big4 auditor expertise' effect by demonstrating that client firms audited by NonBig4 auditors demand additional audit effort with increasing credit ratings compared to Big4 clients. Furthermore, we contribute to the audit effort literature by showing that audit hours may be considered a more plausible proxy for audit effort compared to audit fees. Given that audit effort in hours is only available in a handful of countries, our results can be informative to policymakers based on audit hour information providing insight to market participants about the incentives of firms to secure audit effort.

Keywords: credit ratings, legitimacy theory audit effort, audit demand theory, audit supply theory, Big4

I. Introduction

In this study, we question whether audit effort in hours is associated with credit ratings. A credit rating is designed to be an economically meaningful measurement to evaluate whether a firm can survive a business cycle, with higher (lower) credit ratings representing lower (higher) levels of default risk (Carey and Hrycay, 2001). Based on the established linkage between audit effort (input) and earnings quality (output), credit rating agencies are likely to reward (punish) firms with higher (lower) earnings/audit quality. Therefore, we question whether firms with higher credit ratings use audit effort as a legitimizing strategy to demonstrate earnings quality based on audit hours signaling that internal control systems and financial reporting quality is robust. To capture whether management utilize audit hours as a signaling mechanism, we use an unique South Korean sample because South Korea is one of the few countries that mandates that audit hours (and fees) be listed on annual reports as a rule. Thus, this study provides valuable insights to legislators and policymakers about the behavior of clients and audit firms as a result of audit hours being made publicly available.

We are motivated to establish a link between audit hours and credit ratings for several reasons. First, we posit that an association between credit ratings and audit hours is likely to exist. However, the relationship between audit hours and credit ratings has the potential to be bi-directional based on the underpinning logic of audit demand and audit supply theories. i) Audit demand theory suggests that audit effort is demanded by shareholders and management to enhance reporting quality based on audit effort being value

adding (DeFond and Zhang, 2014; Caramanis and Lennox, 2008; Lobo and Zhao, 2013; Bailey et al., 2012); suggesting a positive association between audit effort and credit ratings. On the other hand, audit supply theory suggests that audit effort is constrained by audit firms to reduce reputational damage and litigation risk (Simunic, 1980; Weber et al., 2008; Skinner and Srinivasan, 2012; Cahan et al., 2009); which suggests a negative association based on audit firms having higher incentives to conduct more (fewer) audit tests on riskier (less risky) clients. Therefore, establishing a directional relationship between audit hours/fees and credit ratings will provide insights whether audit effort is demanded by clients (demand theory) or imparted by audit firms (supply theory) in a situation where audit effort information is made publicly available. Second, Defond and Zhang (2014) surmise a limitation in the audit quality literature is that numerous audit effort studies use a single audit input when more than one input can enhance predictive validity. The audit effort literature generally refers to a positive association between audit effort (fees) and audit risk. However, because South Korea provides audit hour and fee information on a comparative basis, we are motivated to disentangle their relationships with credit ratings to report whether both inputs can be considered equivalent. Third, there is increasing demand in the audit profession to improve transparency and audit quality. There is evidence that auditors feel time pressure to complete audits (Guénin-Paracini, 2014; Lambert et al., 2017), whilst less time on audits is shown to reduce earnings quality (Ettredge, et al., 2014). Therefore, we are motivated to report on Korea's unique audit hour policy to provide suggestions to international policymakers.

We conduct a battery of OLS regressions, panel data regressions and various additional analyses to capture the relationship between audit hours and credit ratings using a sample of Korean listed firms from 2001-2015. Our results demonstrate that clients with lower credit ratings (e.g. B) demand lower levels of audit effort compared to clients with higher credit ratings (e.g. AA). Next, we question whether clients above the investment grade threshold demand higher/lower levels of audit effort. Our results suggest that there is a statically insignificant difference between the audit effort demanded for both the investment grade and non-investment grade samples using a dummy variable approach. The results suggest that our model is robust and includes relevant firm risk proxies. Next, we divide our sample into Big4 and NonBig4 auditors. Big4 auditors are shown to have higher levels of audit quality in the literature compared to NonBig4 auditors because they are less income dependent, have higher audit expertise and have higher incentives to minimize litigation and reputational damage (Behn et al., 2008; DeAngelo, 1981; Fang et al., 2016; Alzoubi, 2016). We find that the clients of Big4 firms secure lower levels of audit effort compared to Non-big4 firms. We interpret that because Big4 audit quality is higher compared to NonBig4 firms, NonBig4 clients secure additional audit effort to signal equivalent audit quality based on credit rating status. Next, we replace our audit hour dependent variable with audit fees. We find that the relationship between audit hours and credit ratings is more statistically significant compared to audit fees suggesting that audit hours can be considered a more robust proxy for audit effort.

Our study makes several important contributions to credit risk and accounting literatures. First, the audit effort literature suggests that the relationship between audit effort and firm/audit risk may be positive/negative based on Simunic's (1980) audit supply/demand theory. Based on DeAngelo's (1981) assertion that audit effort is required to detect breaches in a firm's financial reporting, the audit fee literature reports that audit firms have the power to secure additional fees as a premium based on their incentives to manage litigation and business threats (Lyon and Maher, 2005; Abbott et al., 2006; Gul et al., 2003; Hogan and Wilkins, 2008; Cahan et al., 2008; Simunic and Stein, 1996; Niemi 2002). Thus, the audit fee literature implies that audit firms have the power to control audit contracts.

However, audit hour information is rarely considered due to data unavailability. We find firms with higher credit ratings are shown to demand higher levels of audit hours, consistent with audit demand theory. We interpret that based on legitimacy theory, management have an incentive to signal enhanced financial reporting and audit quality, and to reduce information asymmetries compared to firms with lower credit ratings who have fewer incentives to demonstrate financial reporting accuracy. The results are consistent with previous studies that suggest that audit effort in hours associated with lower levels of firm/audit risk (Gul and Goodwin, 2010, Jallow et al., 2012; Jung, 2016). Thus, we contribute to the literature by demonstrating that audit hours are not necessarily imparted on to clients based on the power of audit firms to control audit contracts, but demanded by clients as a legitimacy strategy.

Second, DeFond and Zhang (2014) suggest the audit quality literature can be extended by conducting analysis using various audit effort inputs. To disentangle the effect of credit ratings on audit effort, we compare the association between credit ratings and both audit fees and audit hours. We find the positive association between audit hours and credit ratings is more pronounced compared to audit fees after controlling for known audit risk determinants. The results suggest that firms with higher (lower) credit ratings (default risk) are more likely to demand higher levels of audit effort in hours for signaling purposes, but the level of audit hours provided do not linearly increase with audit fees. Thus, whilst we find firms with higher credit ratings can demand higher audit effort in hours, they are not expected to pay an audit fee premium. Third, we demonstrate that audit hours and audit fees can be considered different measures of audit effort based on their different associations with audit risk determinants. We provide evidence of a positive association between audit risk determinants and audit fees suggesting that audit fees may consistently be interpreted as audit risk. On the other hand, because audit hours are not associated with audit risk proxies associated with liquidity (but strongly associated with credit ratings), audit hours may be considered a proxy of audit effort, not audit risk.

Fourth, the literature consistently demonstrates that a Big4 audit (input) can enhances audit quality (output) relative to a NonBig4 audit (input) (DeAngelo, 1981; Becker et al., 1998; Khurana & Raman, 2004; Behn et al., 2008; Lisic et al., 2015). Therefore, we predict that NonBig4 clients with higher credit ratings would be required to demand higher levels of audit effort compared to Big4 clients to signal equivalent reporting quality. Our results show that based on credit rating status, clients that are audited by NonBig4 firms demand higher levels of audit effort relative to Big4 clients consistent with the Big4 expertise hypothesis. Therefore, our results contribute to the literature by demonstrating that audit characteristics influence audit demand. Fifth, we consider South Korea to be a unique setting to conduct our analysis. South Korea is an advanced economy. However, its legal infrastructure can be considered relatively weak compared to countries such as the USA and UK (Woods, 2013). South Korea has developed rapidly in recent decades and has experimented with various accounting policies such as the current mandatory audit firm rotation policy adopted in Europe. Previous studies show that the policy did not improve audit quality in South Korea (Mali and Lim, 2018; Choi et al., 2017). However, an audit policy that differentiates South Korea from other geographical locations is that audit effort in hours is listed on annual reports as a rule. It is not possible to link audit effort demanded based on a firm's credit risk status internationally because there are no rules in place to mandate that firms report audit effort in hours on annual reports. We would therefore encourage international regulators to consider adopting the audit hours policy to enhance the informativeness and transparency of annual reports.

The reminder of our paper proceeds as follows. In section II, we review relevant literature and develop our hypothesis. In section III, we include research design details. In section IV, we provide the results of our empirical tests. Additional analysis are conducted in section V. Section VI concludes by providing a discussion of our results and avenues for future research.

II. Literature review

2.1 Previous Literature

A credit rating is provided by a credit rating agency as an assessment of whether a client firm can survive a business cycle (Carey and Hrycay,2001). A credit rating is a comparative assessment of a firm's fundamentals which include an analysis of financial data including business complexity, financial performance, stability and size (Kraft, 2015; Hovakimian et al., 2001; Hovakimian and Hovakimian, 2009). A credit rating can be considered an economically meaningful representation of firm quality (Boot et al., 2006). Therefore, firms have an incentive to maintain or improve their credit rating status because there are numerous advantages associated with higher credit ratings including better terms from borrowers and suppliers, as well as reputational advantages. Previous international studies show that managerial strategies to employ opportunistic measures to improve credit ratings using earnings management (Ali and Zhang, 2008), earnings smoothing (Jung et al.,2013) and leverage management (Kisgen, 2009; Hovakimian and Hovakimian, 2009) are unsuccessful. Korean studies also report that firms are unlikely to secure higher credit ratings as a result of opportunistic earnings management (Mali and Lim, 2016). Moreover, there is evidence that firms that demonstrate robust accounting practices such as conditional conservatism have higher credit ratings (Lim and Mali, 2015). Credit ratings agencies utilize complicated AI technology and machine learning models to estimate credit ratings, (Galindo et al., 2000; Kwon et al., 1997; Shin et al., 2001; Jones et al., 2018) which may not be decipherable to humans (Huang et al., 2004). Therefore, because it may not possible for firms to artificially inflate credit ratings using opportunistic means, management may develop signaling strategies to legitimize firm quality.

In addition to financial statement data, credit rating agencies also use 'soft data' including management quality, corporate governance and business controls when issuing credit ratings (Moody's Investor Service, 2018). Thus, there is the potential that management utilize audit effort information to signal low levels of risk because audit effort (input) is accepted as a signal of audit/earnings quality (output). However, based on the interpretation of audit effort in previous literature, a bi-directional relationship between audit hours and credit ratings may exist. Simunic (1980) suggests that audit supply is constrained by the audit firm's incentive to reduce litigation risk and reputational damage (audit supply theory) and a client's demand for audit services (audit demand theory). Studies show that audit failures have significant negative effects on audit firms (Weber et al., 2008; Skinner and Srinivasan, 2012; Cahan et al., 2009). Thus, audit supply theory suggests that audit firms can dictate audit terms (fees) to clients based on their incentives to mitigate perceived risk. Based on client risk considerations including business practices (Lyon and Maher, 2005), earning management (Abbott et al., 2006; Gul et al., 2003), internal controls (Hogan and Wilkins, 2008), and business/industry specification (Cahan et al., 2008; Simunic and Stein, 1996), audit effort in fees are shown to be increasing with audit risk. Furthermore, using a sample of Chinese listed client firms, Cao et al. (2020) show that audit fees are associated with

subsequent restatements, irregularities and lawsuits suggesting that audit fees are increasing with potential fraud. Based on the extant audit fee literature, clients firms with higher credit ratings should therefore receive lower levels of audit effort in fees (hours) based on their intrinsically lower levels of firm risk.

However, the evidence that audit fees are consistently associated with audit/firm risk is not conclusive. There is evidence that audit fees are demanded by clients to reduce audit risk following credit ratings downgrades in an effort to improve audit quality (Gul and Goodwin, 2010). There is also evidence that investors demand additional audit effort in fees for monitoring purposes (Jallow et al., 2012). Thus, the audit fee (effort) literature is mixed. A potential limitation of the audit fee literature is that increasing audit fees can be interpreted as, i) the audit fee premium demanded by audit firms to reduce risk; ii) the demands of audit clients to improve audit quality. Furthermore, audit fees may not be a reliable measure of audit effort exerted, as per the example of Enron. Following the demise of Enron, it is established that Andersen received audit fees for consulting work, but are shown not to exert audit effort or perform audit tests (Alexander et al., 2002; Duska, 2003; Markelevich et al., 2005; Sridharan et al., 2002). Therefore, the limitations of the audit fee literature stems from the audit fee proxy capturing the incentive of audit firms, while ignoring the incentives of clients. We interpret that audit fees can therefore be considered an indirect driver of audit quality compared to audit effort in hours which captures the demand of management to improve audit quality.

Audit demand theory suggests that audit effort (hours) can be demanded by clients because it can be considered value adding. Audit hours can be interpreted by stakeholders as an audit effort input which directly influences audit quality (output) because whilst fees can be collected and audit services not provided, audit hours represent the duration of substantive and control tests completed by audit firms. Audit effort can be demanded by numerous stakeholders. Esplin et al. (2018) suggest shareholders have an incentive to demand additional effort to enhance audit quality and financial reporting quality. The literature suggests that shareholders demand audit effort in hours to reduce agency problems and the potential for management to act in their own self-interest (Caramanis and Lennox, 2008; Lobo and Zhao, 2013; Lee et al., 2014). There is also evidence that audit effort is demanded by management. Defond and Zhang (2014) suggest audit effort can be demanded by management so that accounting information is accurate for decision making. Bailey et al. (2012) also find that management demand additional audit services to provide robustness to internal business operations and to enhance management information systems. Overall, the literature suggests that audit effort can be demanded to reduce information asymmetry and enhance financial reporting quality. Therefore, based on the incentives of various stakeholders, audit effort in hour can be considered by stakeholders as an additional form of governance which enhances information quality.

Previous studies show that based on the incentives of specific firm ownership, shareholders have the potential to influence audit effort. Niemi (2005) demonstrates that additional audit hours can be demanded by firms with larger international ownership because higher levels of audit hours can be considered as an additional form of governance that reduces the potential for other stakeholders to act in their own self-interest. Khan et al., (2015) show that firms with higher levels of family ownership reduce audit effort levels. However, due to data unavailability and due to audit hours being listed on the annual reports of a handful of countries, the relationship between audit hours and firms risk is limited. Historical studies show that audit hours are increasing with firm risk characteristics. Deis and Giroux (1992) demonstrate that public accountants secure audit effort in both fees and hours to minimize audit risk. O'Keefe et al. (1994) capture specific firm level risk proxies that are

established in the literature including the size of clients, business complexity, and leverage to demonstrate that they have an incremental positive effect on audit hours. However, more recently, studies show that audit hours reduce firm risk. Caramanis and Lennox (2008) demonstrate that as audit hours increase, a client is less likely to engage in earnings management. Their result suggests that additional monitoring by external auditors reduces the potential for management to act opportunistically. Using a Korean firm sample, Jung (2016) shows that firms with higher levels of audit effort can enjoy lower levels of equity costs suggesting that market participants believe that firms with higher levels of audit effort are less risky.

We use a South Korean sample because South Korea provides a unique context to capture the effect of audit hours (effort) on credit ratings. Prior to 1982, South Korea implemented the 'Auditor Designation Rule'. During this period, the Financial Services Commission (FSC) appointed a client firm an auditor based on their perceived compatibility. To liberalize the economy in-line with international markets, the Free Auditor Engagement Rule provided client firms with the opportunity to select an auditor without the oversight of the FSC in 1982. However, in late 1997, following the 1997 Asian Financial Crisis, the FSC introduced a rule that required client firms to rotate their partner every three years, and retain an audit firm for five years because of evidence suggesting weak legislation was a contributing factor in the Asian Financial Crisis in 1997. In 2000, after the collapse of numerous Korean conglomerates, South Korean investigators demonstrated that window dressing was the cause of major bankruptcies including the collapse of Daewoo, a well-known conglomerate in the Korean market. Following additional concurrent collapses and a report by the Securities Supervisory Board that 3/10 Korean conglomerates were engaged in earnings management, two policies were introduced: i) the Mandatory Audit Firm Rotation rule was implemented in 2003 and was adopted on a mandatory basis until the rule was ceased in 2010. Overall, the rule was considered ineffective and expensive (Choi et al., 2017; Mali and Lim 2018). ii) In 2001 audit effort in hours and fees were mandated to be recorded on annual reports. The policy remains in place to this day.

The reason Korean legislators mandated that audit effort be reported on annual reports was to restore the tarnished image of the auditing profession. Mandating that audit effort be recorded on annual reports was also considered a strategy by the Korean government to influence market participants' confidence in the Korean economy. Therefore, there is a strong potential that client firms use audit effort as a singling strategy based on legitimacy theory. Lindblom (1993, p2) defines legitimacy theory as "a condition or status which exists when an entity's value system is congruent with the value system of the larger social system of which the entity is a part". Schuman (1995) states legitimacy theory reflects that the actions of management are socially constructed because legitimacy is ascertained when the behavior of management is congruent with society. Deegan (2009) reports that business performance is liked to firm legitimacy, suggesting that firms that are unable to align their business with the values of society will have lower levels of performance relative to firms with values that congruent to society. Furthermore, Henderson et al. (2004) suggest legitimate management actions convey the image that an organization is operating in alignment with the expectations of the society. Therefore, South Korea provides a unique opportunity to capture audit effort as a legitimacy strategy because historically the audit quality of South Korean firms has come under public scrutiny.

2.2. Hypothesis development

As illustrated in the literature and Figure 1, there may be a positive/negative relationship between audit effort and credit ratings based on i) audit demand theory and ii) audit supply theory (Simunic, 1980). Audit supply theory is underpinned by the reasoning that audit supply is controlled by audit firms, and that audit firms receive a fee premium based on audit risk (Weber et al., 2008; Skinner and Srinivasan, 2012; Cahan et al., 2009; Lyon and Maher, 2005; Abbott et al., 2006; Gul et al., 2003; Hogan and Wilkins, 2008; Cahan et al., 2008; Simunic and Stein, 1996; Cao et al., 2020). Thus, after controlling for known firm risk determinants, supply theory suggests a negative association between audit fees (effort) and credit ratings. However, Gul and Goodwin (2010) show that audit fees increase after a client suffers a credit rating downgrade to maintain or upgrade credit ratings, suggesting that audit services improve audit quality. Combined with evidence that audit fees can be collected by Andersen without conducting audit services (Enron), we consider that the association between audit effort and firm risk may be miss-specified using audit fees. We consider audit hours to be a more felicitous proxy for audit effort to capture the relationship between audit effort and credit ratings because it captures the incentives of management to conduct substantive and control test, excluding an audit risk premium demanded by auditors. Audit demand theory suggests that audit effort is value adding to stakeholders (DeFond and Zhang, 2014). Recent studies suggest audit effort reduces earnings management (Caramanis and Lennox, 2008). Furthermore, there is evidence that audit hours are demanded by clients to reduce financing costs (Jung, 2016). However, whether clients would select higher levels of audit effort based on a risk metric such as credit ratings is a question left unanswered. It is established in the literature that credit rating agencies use 'soft' data to estimate credit ratings (Moody's Investor Service, 2018). Therefore, we hypothesize that management have strong incentives to demand additional audit effort based on legitimacy theory.

<Insert Figure 1 roughly here>

Legitimacy theory implies that the goals of management and society are congruent (Lindblom, 1993; Schuman, 1995) suggesting that successful businesses align their behavior with society (Deegan, 2009; Henderson et al., 2004). As explained in the literature review, South Korean legislators mandated that audit effort in hours be recorded on annual reports as a rule to improve financial reporting transparency following infamous high profile financial collapses. Because audit hour information is made publicly available in South Korea on comparative basis, we hypothesize that: 1) based on legitimacy theory, management have strong incentives to demonstrate that a firm's reporting controls are robust and financial reporting is accurate. Therefore, based on increasing credit ratings, management have incentives to secure the highest level of audit hours as a signaling strategy to signal the highest level of audit quality. 2) The shareholders of firms with higher credit ratings can expect their firms to have inherently lower levels of risk and potentially higher levels of financial performance. Therefore, shareholders of AAA firms can expect the highest levels of assurances that a firm's internal controls are robust. We posit that if AAA firms do not secure sufficient audit effort, it may be perceived as an agency problem by shareholders. Because audit effort is show to reduce agency problems (Caramanis and Lennox, 2008; Lobo and Zhao, 2013), management are likely to accommodate shareholders in such a situation. 3) External stakeholders such as creditors, supplier and capital providers depend on annual reports to evaluate firm fundamentals, and are likely to offer better terms to firms with higher credit ratings. External stakeholders would therefore prefer higher audit effort compared to lower audit effort to legitimize a firm's financial position. 4) Holding all other firm risk variables constant, additional audit effort may demanded because it is likely perceived positively by

market participants, especially if credit rating (risk) levels are high (low). However, risker firms with lower credit ratings do not have the same incentives for signaling purposes. Taken together, because audit effort is known to market participants as a policy to improve audit quality and financial reporting transparency following instances of financial mismanagement in South Korea, it is very likely that management use audit effort in hours as a legitimacy strategy. Based on the above, we develop the following hypothesis:

H1. Client firms with higher ratings have incentives to demand additional audit effort

III. Research design

Our sample selection process is listed in Table 1. Financial statement data and audit data are downloaded from two Korean databases called TS-2000 and KISVALUE, then merged. The sample period of our study is 2001 to 2015. We select the year 2001 for the initial sample period because it is recognized in the Korean literature as a period not influenced by the 1997 Asian Financial Crisis effect, and the first year audit hours were recorded on a mandatory basis. We initially download a total of 14,736 firm year observations for all firms listed on the Korean KRX stock exchange (excluding financial firms). We then exclude a combination of 3,724 observations if insufficient financial or audit data is available to conduct our analysis. Our final sample is a total of 11,012 firm year observations.

<Insert Table 1 roughly here>

A firm's credit rating is collected from KISVALUE. Since a rating score of 1 is originally the highest credit rating score using raw data, we subtract each credit rating score from 11 to ease interpretation of our empirical results. For instance, firms with a credit rating of 1 have a rating of C by Moody's and D by S&P, as illustrated in Table 2. Thus, firms with higher (lower) ordinal values are considered as having lower (higher) levels of default risk by credit rating agencies. We borrow the 1-10 ordinal ranking based on the South Korean risk metric suggested by South Korea's largest credit rating agency, NICE. As explained in our hypothesis, we conjecture a positive relationship is likely to exist between audit hours and credit ratings based on legitimacy theory and the assumption that market participants including management and credit rating agencies are aware that audit hours are made available publicly. Thus, additional audit hours (input) can be perceived as enhancing transparency, monitoring, and financial reporting accuracy to enhance audit quality (output). Our dependent variable, audit effort in hours is estimated as the natural logarithm of audit hours.

<Insert Table 3 roughly here>

$$Audit\ effort_{i,t} = \beta_0 + \beta_1 Credit\ rating_{i,t} + \beta_2 Size_{i,t} + \beta_3 Lev_{i,t} + \beta_4 Earning_{i,t} + \beta_5 Loss_{i,t} + \beta_6 Age_{i,t} + \beta_7 Big4_{i,t} + \beta_8 BigOwn_{i,t} + \beta_9 Fore_{i,t} + YD + ID + \varepsilon_{i,t} \quad (1)$$

<Insert Table 2 roughly here>

In equation (1), we illustrate our OLS regression model. All our variable definitions and how they are estimated are listed in Table 3. We borrow from the limited audit hour

literature to explain the potential relationships between audit effort and other risk control proxies. Based on Xiao, et al. (2020), Simunic (1980) and O'Keefe et al. (1994), we would expect audit effort in hours to be increasing with firm size, age and business complexity because larger and more complex firms require additional audit testing. We would expect firms with higher leverage to be supplied with high levels of audit effort to demonstrate that their reporting systems are robust. Previous literature suggests that Big4 auditors provide higher levels of audit effort compared to NonBig4 firms (DeAngelo, 1981; Fang et al., 2016; Alzoubi, 2016); therefore, we would expect a positive relationship between Big4 status and audit effort. Next, we control for corporate ownership structure using both large foreign owner and large domestic owners. Both Nimei (2005) and Khan et al. (2015) suggest that a large shareholder is likely to be involved with daily operations of firms; and may therefore play an active role in monitoring and governance. In this situation, they may perceive that audit effort is unnecessary because they have a deep understanding of the firm's reporting systems and are involved in decision making. A negative result would suggest that large owners play an active role in a firm's business activities, reducing the demand for external monitoring and audit effort. We expect a positive relationship between audit effort and foreign ownership control based on Korean studies that suggest that foreign owners demand higher levels of governance (Mali and Lim, 2016). Based on audit supply theory (Simunic, 1980), we would expect a positive/negative relationship between *audit effort* and *Loss/Earnings.* The relationship between abnormal performance may be positive/negative based on audit demand/supply for profitable firms. Because audit firms have an incentive to minimize litigation risk and reputational damage, loss making firms would be provided additional audit scrutiny. To control for year and industry effects, we add year and industry dummy variables. In our initial model, we only include variables that are consistently statistically significantly related with audit hours based on Woodside's (2016) suggestion that adding unnecessary variables reduces the predictive validity of regressions. However, we extend our model in section 5 to include variables that influence audit fees.

IV. Empirical Results

We list the results of descriptive statistics and Pearson correlations in Table 4. Descriptive statistics show that mean and median levels are consistent and that our sample can be considered normally distributed. Our Pearson correlation results show that higher credit ratings have a positive relationship with audit effort (par 0.02) at the 1% significance level, suggesting that audit hours increase with credit ratings. All correlation results show the predicted sign and are consistent with our expectations.

<Insert Table 4 roughly here>

In Table 5, we provide the results of our main analysis using OLS regression. Our results show a positive relation between audit hours and credit ratings (coeff 0.02, t value 2.80). We interpret the results as follows. First, the management of firms with higher credit ratings have an incentive to signal that financial statements reflect business operations using audit hours to signal audit quality. Second, shareholders are likely to demand additional external monitoring to reduce information asymmetry. Third, our results are consistent with the information legitimacy requirements of external stakeholders such as creditors, capital providers and suppliers because firms with higher credit ratings will enjoy better terms from external stakeholders (Alissa et al., 2013). Firms with lower credit ratings do not have an

incentive to signal high levels of financial reporting quality and do necessarily have the same incentives to reduce information asymmetries compared to competing firms with higher credit ratings. The results are consistent with previous studies that suggest that the audit function is perceived as reinforcing confidence in annual reports (Mangena et al., 2014). Our independent variables show the expected sign and are consistent with univariate and bivariate tests.

V. Additional Analysis

4.1 Investment Grade/Non-Investment Grade Analysis

In Table 6, we perform a comparative test to determine whether firms above/below the investment grade (IG) threshold demand higher audit hours. Numerous studies show that investment grade (IG) and non-investment grade (NIG) firms are considered differently by market participants, banks, investors and suppliers (Becker and Milbourn, 2011; Bolton et al., 2012; Opp et al., 2013; Kraft, 2015; Mali and Lim, 2019). However, whether NIG/IG groups demand statistically significantly different levels of audit hours is a question left unanswered. Alissa et al. (2013) suggest that firms below the investment grade threshold have numerous incentives to straddle the investment grade threshold because IG firms can enjoy numerous economic benefits including better terms from supplier and better access to investment amongst others. Therefore, there is the potential that NIG firms may acquire higher audit effort to signal that internal financial reporting quality is robust through demonstrating robust audit quality. In Panel A, we perform 3 regressions for our full, IG and NIG samples. In our independent IG (coeff 0.03, t value 1.75) and NIG (coeff 0.03, t value 2.28) sample regressions, we find a positive relation between audit hours and credit ratings, consistent with our main analysis. In the first column, we add an interaction term to estimate whether the relation between credit ratings and audit effort is different for IG and NIG firms. We find the *Credit rating*IG* interaction term is insignificant. Our results suggest that whilst both samples have incentives to demand different audit effort, after controlling for variables that influence audit risk, IG/NIG status does not influence audit hours. The results also suggest that our initial model is robust because we show that regardless of IG/NIG partitioning, there is no difference between audit effort demanded/supplied after controlling for firm risk effects.

<Insert Table 4 roughly here>

4.2 Big4/NonBig4 Analysis

In Table 6, Panel B, we examine whether the demand for audit hours is different for Big4 and NonBig4 auditors. The 'Big4 auditor expertise hypothesis' suggests that the audit quality of Big4 firms is higher compared to NonBig4 firms based on three assumptions. First, Big4 auditors demonstrate higher levels of audit quality because Big4 firms have incentives to minimize litigation risk and reputational damage relative to NonBig4 firms (Behn et al., 2008). Second, as a result of years of experience, Big4 audit firms have developed higher levels of audit knowledge and systems compared to NonBig4 firms (DeAngelo, 1981). Finally, NonBig4 auditors are likely to be income dependent on a handful of customers, and therefore more likely to impair their judgement compared to less income dependent Big4 audit firms.

In column 2 and 3, we provide the results of two individual regressions for Big4 and NonBig4 audit firm samples. We find a positive relation between credit ratings and audit hours for both Big4 (coeff 0.03, t value 2.30) and NonBig4 (coeff 0.03, t value 2.15) samples,

consistent with our main analysis. Our variable of interest is the $Credit\,rating * Big4_{i,t}$, interaction term to compare Big4 and NonBig4 group. In column 1, we provide results comparing the audit effort demanded by Big4 firms and NonBig4 firms. Our results suggest that a different relationship exists between the demand for audit hours based on Big4 and NonBig4 audit firm selection. We find that as firms' credit ratings increase, Big4 clients supply/demand lower levels of audit hours compared to NonBig4 client firms (coeff -0.02, t value -2.11). We interpret that because of the perceived audit expertise of Big4 firms, client firms audited by NonBig4 clients with high credit ratings secure additional audit effort for signaling purposes to demonstrate that their audit systems are equivalent to clients audited by Big4 auditors.

4.3 Extended model and fee interpretation

As an additional analysis, we test whether the relationship between audit fees and credit ratings are equivalent to our main findings. Because short term liquidity ratios have been shown to influence audit fees (risk) in countless academic studies, we expand our initial model by including two risk variables, 1) cash ratio and 2) current ratio. Table 7, Model 1 provides the results of our initial analysis using audit hours (which is identical to Table 5). In Model 2, we add the two liquidity variables explained above. We continue to find that the relationship between audit hours and credit ratings is significant. In Models 3 and 4, we replace our dependent variable audit hour with audit fee and re-run the regression. When we repeat our analysis with audit fee as the dependent variable, we find that audit fee has a positive relationship with credit ratings, but with lower significance (coeff 0.00, t value 2.02). In our extended model, we continue to find a consistent relationship between audit fees and credit ratings, but again with a relatively weaker significance level (coeff 0.01, t value 2.22). Overall, we find consistent results regardless of audit quality proxy, but the relationship between audit hours and credit ratings is relatively more pronounced. We find that there is no association between cash risk variable and audit hours/fees. However, current ratio is found to have significantly negative relationship with audit hours/fees at a level of 10%/1% respectively. The results suggest that audit fees are more strongly related to audit risk determinants, whilst audit hours can be considered a more plausible proxy for audit effort.

4.4 Panel data analysis and GMM regression

Finally, to further add robustness to our main findings, we conduct two more analyses. First, although our sample is not a strongly balanced panel, our sample firms tend to appear again in subsequent years. Thus, panel data analysis may shed more light on our research purpose. Hence, we conduct panel data analyses using random GLS regression models to account for both cross-sectional as well as time dependency. Our panel is made up of 908 firms and the average observations (years) per group (firm) is 12.1 (years). For brevity, we report untabulated results. Despite not having a perfect panel, our results remain qualitatively the same as our main analysis (Credit rating Coeffi 0.02, z statistics 2.88).

Second, our results may be affected by endogeneity issues. Thus we conduct an instrumental variables (GMM) regression as a robustness test to check whether the findings of our study are affected by possible endogeneity problems. We use the two step estimator and a weight matrix that assumes robust standard errors are independent but not identically distributed. For brevity, we report untabulated results. In the first stage, we use credit ratings (endogenous variable) as a dependent variable, and include the previous year's credit rating as an instrument that is highly likely to influence the current year's credit rating and the

variables that are included in the main analysis. Using the first stage regression, we compute the predicted value of credit ratings after controlling for the influence of the instrumental variable. Next, we repeat our main analysis after substituting credit rating with the newly computed predicted credit rating vale and other control variables being held constant. Our untabulated results suggest that our main results remain qualitatively unchanged (Predicted value of credit rating Coeffi 0.03, z value 2.64). After the analysis, we conduct an endogeneity test (orthogonality conditions) where the null hypothesis implies that the predicted value of credit rating is exogenous. The GMM C statistic doesn't reject the null hypothesis that credit ratings in the 2nd stage is exogenous at a conventional significance level (GMM C statistic chi2 = 1.45, p = 0.2280) suggesting that our main results (the positive relationship between the two main dimensions) are not affected by an endogeneity problem.

VI. Conclusions

We discover that firms with higher credit ratings demand higher levels of audit effort in hours compared to firms with lower credit ratings. We find NonBig4 clients demand higher levels of audit effort compared to Big4 clients based on credit rating levels. We also find the relationship between credit ratings and audit hours is consistently highly statistically significant, but not consistently associated with audit risk characteristics. However the association between credit ratings and audit fees is not highly significantly associated with credit ratings, but associated with audit risk determinants.

The results of this study are important for several reasons. First, because audit effort literature is divided into audit fee and audit hour studies, there are conflicting views on how audit effort is perceived. Numerous studies based on audit supply theory suggest audit fees are demanded by audit firms as a premium for bearing threats to their business and reputation (Lyon and Maher, 2005; Abbott et al., 2006; Gul et al., 2003; Hogan and Wilkins, 2008; Cahan et al., 2008; Simunic and Stein, 1996; Yao and Percy, 2018). However, conflicting evidence suggest that audit fees can be demanded in periods following credit ratings decreases to limit the possibility of further reductions (Gul and Goodwin, 2010). There is also evidence that investors demand audit effort to enhance audit quality (Jallow et al., 2012). Therefore, the link between audit fee and credit risk is not well established, especially considering the Enron situation in which Andersen received audit fees without exerting audit effort. Thus, we utilize audit effort in hours to develop the extant literature. We demonstrate a positive relationship between audit effort and credit ratings. The results show that firms with AAA credit ratings demand higher levels of audit effort compared to firms with BBB status. Based on previous literature, firms have been shown to be unsuccessfully in influencing credit ratings using opportunistic means (Ali and Zhang, 2008; Jung et al.,2013; Kisgen, 2009; Hovakimian and Hovakimian, 2009 Mali and Lim, 2015). Therefore consistent with legitimacy theory, clients are more likely to secure sufficient audit effort to maintain credit ratings as a result of audit quality signaling. We interpret that management with increasing credit rating status demand higher audit effort in hours i) because audit hour (input) can be seen to enhance financial reporting/audit quality (output) through substantive and control tests; (ii) to reduce information asymmetries and agency problems; (iii) to allow clients to benefit from better terms from borrowers and suppliers, and (iv) holding all other risk variables constant, market participants will perceive higher audit effort levels more favorably. We would encourage future studies in countries where audit hours are available to determine whether

audit hour information can be associated with other forms of risk including Tobin Q and stock price volatility amongst others.

Second, DeFond and Zhang (2014) assert that audit quality studies are limited if only a single audit effort input is considered. Therefore, we provide an interpretation of the relationship between both i) audit fees and credit ratings and ii) audit hours and credit ratings. We find the relationship between audit fee and credit ratings is less statistically significant compared to audit hours and credit ratings. The results suggest that audit effort is demanded as a signal of audit quality, but audit fees are a byproduct of the demand for audit services, not an audit fee premium as reported in previous studies. We encourage future studies to test whether audit effort and audit fees can be disentangled by capturing the relationship between audit hours and firm performance. Third, the auditor expertise hypothesis suggests that Big4 auditors offer superior quality to NonBig4 auditors (Behn et al., 2008; DeAngelo, 1981; Fang et al., 2016; Alzoubi, 2016). Our results suggest that client firms that select Big4 audit firms demonstrate audit quality to market participants through audit selection type. However, as credit ratings increase for NonBig4 clients, we find evidence that NonBig4 clients demand relatively higher levels of audit hours to mimic the audit quality of Big4 audit firms.

Fourth, we consider South Korea to be an unique setting to conduct our analysis. A report by the FTSE suggests that whilst South Korea fits the criteria of a developed country using financial metrics, South Korea's legal infrastructure can be considered weak (Woods, 2013). South Korea has experimented with numerous accounting policies to enhance audit quality such as the mandatory audit firm rotation policy currently implemented in Europe. However, the policy did not have the desired effect on audit quality (Mali and Lim, 2018; Choi et al., 2017). South Korea can provide important lessons to international policymakers because it is one of few countries that has implemented the 'audit hour' policy on a consistent basis. Internationally, disclosures are associated with audit quality (Chen et al., 2019; Knechel et al., 2015; Lee et al., 2003; Schultz and Reckers, 1981). However, accounting disclosures are criticized by the IFRS because i) there is not enough relevant information; ii) there is too much irrelevant information, and iii) information is not communicated effectively in audit disclosures (IFRS, 2017). We would therefore advise international policymakers and legislators to mandate that audit hours be listed on annual reports as a rule to improve the transparency and comparability of management's incentives to report audit quality.

Finally, we list limitations. We do no report that audit effort can lead to credit ratings upgrades. Our (untabulated) tests in which credit rating was listed as the dependent variable and audit hours was the main independent variable did not show that credit rating agencies reward firms with higher credit ratings based on audit hours secured. Our results show the incentives of management in a unique environment in which audit effort is publicly available and interpreted by market participants. We encourage future studies to collect qualitative data in the form of questionnaires and interviews to determine the importance of audit hour information for stakeholders to further establish why firms with different risk status would secure incrementally different audit effort levels. We also exclude the 'auditing busy season' from our study because our results are based on annual data. Future studies may test whether firms at specific credit rating levels would demand higher/lower levels of audit effort based on audit season. Furthermore, we do not control for specific auditor characteristics such as audit tenure and switch because the Mandatory Audit Firm Rotation rule in Korea mandated the removal of incumbent auditors from 2003-2010. Thus, the inclusion of switch and tenure can lead to bias. Moreover, we control for ownership structures using the percentage holding of the largest foreign and domestic shareholders because the largest foreign/domestic shareholders have the power and incentives to demand

different levels of audit effort. However, we do not control for board characteristics because 1) the influence of board characteristics on audit effort is the outside scope of our paper, 2) the data is not widely available, thus we exclude board characteristics so that our sample is more representative of the population. We encourage future studies to consider the influence of board characteristics such as board size; CEO duality; board diversity and board composition on audit effort.

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Table 1 Sample selection

Initial sample	14,736
Excluding firms with no audit hour/financial data available	(3,724)
Final sample	11,012

Table 2 Credit ratings coding

CR	IG/NIG	Grade	Definition	Moody's	S&P
10	IG	Best grade	Extremely strong	Aaa	AAA
9		High grade	Very strong	Aa1 & Aa2	AA+ & AA
8			Strong	Aa3	AA-
7		Middle grade	Good	A1 & A2	A+ & A
6			Medium	A3	A-
5			Less vulnerable	Baa1 & Baa2	BBB+ & BBB
4	NIG	Low grade	More vulnerable	Baa3	BBB-
3		Poor grade	Currently vulnerable	Ba & B &Caa	B & C & CCC
2			Highly vulnerable	Ca	C
1			Extremely vulnerable	C	D

Table 3 Variable Definitions

Variable Definitions

Variable	Sign	Category	Definition	Variable	Sign	Category	Definition
Audit effort		Dependent variable	Natural logarithm of audit hour	*Age*	+	Firm experience	Firm age
Credit rating	+	Variable of interest	Credit ratings, ordinal rank 1 to 10	*Big 4*	+	Auditor size	A dummy variable that takes 1 if an auditing firm is Big4 auditor, 0 otherwise
Size	+	Firm size	Natural logarithm of total assets	*Big Own*	+ / -	Governance structure	Biggest shareholder's share holdings(%)
Lev	+	Business risk	Debt ratio (=Total liabilities/Total assets)	*Foreign*	+	Governance structure	Foreign investors' share holdings(%)
Earning	-	Firm performance	Firm Return on asset (ROA) divided by industry median ROA	*YD*		Fixed effect	Year fixed effect
Loss	+	Business risk	A dummy variable that takes 1 if a firm's net income is negative, 0 otherwise.	*ID*		Fixed effect	Industry fixed effect

Table 4 Descriptive Statistics and Pearson Correlations

	Mean(Med)	*Max(Min)*	*S.D.*	*1.*	*2.*	*3.*	*4.*	*5.*	*6.*	*7.*	*8.*	*9.*
1. Audit Effort	6.41(6.51)	8.96(1.79)	1.21	1								
2. Credit rating	5.14(5)	10(1)	1.90	0.02***	1							
3. Size	18.70(18.47)	25.85(12.48)	1.47	0.51***	-0.01	1						

4. Lev	0.43(0.43)	26.47(0.00)	0.35	0.06***	-0.46***	0.05***	1					
5. Earning	0.01(0.01)	26.18(-13.39)	0.31	-0.01*	0.22***	0.08***	-0.24***	1				
6. Loss	0.23(0)	1(0)	0.42	0.01*	-0.53***	-0.12***	0.15***	-0.29***	1			
7. Age	30.17(28.93)	117.90(0)	15.79	0.26***	0.01	0.47***	0.01	0.03***	-0.05***	1		
8. Big4	0.51(1)	1(0)	0.22	0.32***	0.03***	0.36***	0.01*	0.02***	-0.06***	0.09***	1	
9. Bigown	0.36(0.37)	1(0.00)	0.21	-0.08***	0.11***	0.07***	-0.07***	0.04***	-0.12***	0.05***	0.09***	1
10. Foreign	0.06(0.01)	0.9297(0)	0.11	0.23***	0.22***	0.42***	-0.09***	0.06***+	-0.12***	0.13***	0.24***	0.03***

*Note 1: *, **, *** indicate significance level at 10%, 5%, 1% respectively

Table 5 Credit ratings and audit effort

Model:

$$Audit\ effort_{i,t} = \beta_0 + \beta_1 Credit\ rating_{i,t} + \beta_2 Size_{i,t} + \beta_3 Lev_{i,t} + \beta_4 Earning_{i,t} + \beta_5 Loss_{i,t} + \beta_6 Age_{i,t} + \beta_7 Big4_{i,t} + \beta_8 BigOwn_{i,t} + \beta_9 Fore_{i,t} + YD + ID + \varepsilon_{i,t}$$

	Pred. sign	Parameter estimate	t-statistic
Intercept	+/-	-0.70***	-4.41
Credit rating	+/-	0.02***	2.80
Size	+	0.36***	39.92
Lev	+	0.27***	4.04
Earning	-	-0.08***	-2.72
Loss	+	0.15***	5.16
Age	+	0.00***	5.91
Big4	+	0.37***	17.59
BigOwn	+/-	-0.48***	-8.15
Foreign	+	0.70***	4.41
YD		*Included*	
ID		*Included*	
F value		507.79***	
Adj. R2		0.2935	
Obs.		11012	

*Note 1: *, **, *** indicate significance level at 10%, 5%, 1% respectively.

Table 6 Comparative Analysis

Panel A: Investment grade vs Non-investment grade group

Model

$$Audit\ effort_{i,t} = \beta_0 + \beta_1 Credit\ rating_{i,t} + \beta_2 IG/Big4_{i,t} + \beta_3 Credit\ rating * IG/Big4_{i,t} + \beta_4 Size_{i,t} + \beta_5 Lev_{i,t} + \beta_6 Earning_{i,t} + \beta_7 Loss_{i,t} + \beta_8 Age_{i,t} + \beta_9 Big4_{i,t} + \beta_{10} BigOwn_{i,t} + \beta_{11} Fore_{i,t} + YD + ID + \varepsilon_{i,t}$$

$$Audit\ effort_{i,t} = \beta_0 + \beta_1 Credit\ rating_{i,t} + \beta_2 Size_{i,t} + \beta_3 Lev_{i,t} + \beta_4 Earning_{i,t} + \beta_5 Loss_{i,t} + \beta_6 Age_{i,t} + \beta_7 Big4_{i,t} + \beta_8 BigOwn_{i,t} + \beta_9 Fore_{i,t} + YD + ID + \varepsilon_{i,t}$$

	IG vs NIG	IG	NIG
Intercept	-0.79***(-4.21)	-0.57**(-2.28)	-0.94***(-4.27)
Credit rating	0.04***(2.30)	0.03*(1.75)	0.03**(2.28)
IG	0.11(1.00)		
*Credit rating*IG*	-0.02(-1.01)		
Size	0.47***(39.93)	0.35***(26.03)	0.38***(30.28)
Lev	0.28***(4.12)	0.19**(2.20)	0.45***(4.16)
Earning	-0.08***(-2.67)	-0.08***(-2.69)	0.31**(2.09)
Loss	0.15***(4.87)	0.14***(3.93)	0.18***(3.34)
Age	0.01***(5.87)	0.01***(4.70)	0.00***(3.61)
Big4	0.37***(17.60)	0.34***(10.27)	0.40***(14.38)
BigOwn	-0.48***(-8.17)	-0.52***(-5.73)	-0.45***(-5.62)
Foreign	0.27***(2.87)	0.61***(3.01)	0.12(1.13)
YD	*Included*	*Included*	*Included*
ID	*Included*	*Included*	*Included*
F value	415.52***	189.77***	320.44***
Adj. R2	0.2935	0.2740	0.3084
Obs.	11012	4536	6476

Panel B: Big4 vs Non-big4 auditors

	Big4 vs Non-big4	Big4	Non-Big4
Intercept	-0.77***(-4.76)	-0.98***(-5.26)	0.84***(2.71)
Credit rating	0.04***(3.48)	0.03**(2.30)	0.03**(2.15)
Big4	0.49***(8.49)		
*Credit rating*Big4*	-0.02**(-2.11)		
Size	0.36***(39.98)	0.40***(38.38)	0.28***(15.57)
Lev	0.27***(4.02)	0.39***(3.97)	0.20**(2.13)
Earning	-0.08***(-2.68)	-0.02(-0.33)	-0.08***(-2.34)
Loss	0.15***(5.14)	0.14***(3.59)	0.13***(3.05)
Age	0.00(5.89)***	0.00***(3.04)	0.01***(5.85)
BigOwn	-0.47***(-7.99)	-0.36***(-4.72)	-0.60***(-6.47)
Foreign	0.26***(2.67)	0.26**(2.45)	0.05(0.23)
YD	*Included*	*Included*	*Included*
ID	*Included*	*Included*	*Included*
F value	457.60***	339.40***	65.56***
Adj. R2	0.2938	0.3188	0.0917
Obs.	11012	5810	5202

*Note 1: *, **, *** indicate significance level at 10%, 5%, 1% respectively.

*Note 2: IG is a dummy variable that takes 1 if a firm is investment grade firm, 0 otherwise.

Table 7 Extended Fee/Hour Analysis

Model 1: $Audit\ hour_{i,t} = \beta_0 + \beta_1 Credit\ rating_{i,t} + \beta_2 Size_{i,t} + \beta_3 Lev_{i,t} + \beta_4 Earning_{i,t} + \beta_5 Loss_{i,t} + \beta_6 Age_{i,t} + \beta_7 Big4_{i,t} + \beta_8 BigOwn_{i,t} + \beta_9 Fore_{i,t} + YD + ID + \varepsilon_{i,t}$

Model 2: $Audit\ hour_{i,t} = \beta_0 + \beta_1 Credit\ rating_{i,t} + \beta_2 Size_{i,t} + \beta_3 Lev_{i,t} + \beta_4 Earning_{i,t} + \beta_5 Loss_{i,t} + \beta_6 Age_{i,t} + \beta_7 Big4_{i,t} + \beta_8 BigOwn_{i,t} + \beta_9 Fore_{i,t} + \beta_{10} CashR_{i,t} + \beta_{11} CurrentR_{i,t} + YD + ID + \varepsilon_{i,t}$

Model 3: $Audit\ Fee_{i,t} = \beta_0 + \beta_1 Credit\ rating_{i,t} + \beta_2 Size_{i,t} + \beta_3 Lev_{i,t} + \beta_4 Earning_{i,t} + \beta_5 Loss_{i,t} + \beta_6 Age_{i,t} + \beta_7 Big4_{i,t} + \beta_8 BigOwn_{i,t} + \beta_9 Fore_{i,t} + YD + ID + \varepsilon_{i,t}$

Model 4: $Audit\ Fee_{i,t} = \beta_0 + \beta_1 Credit\ rating_{i,t} + \beta_2 Size_{i,t} + \beta_3 Lev_{i,t} + \beta_4 Earning_{i,t} + \beta_5 Loss_{i,t} + \beta_6 Age_{i,t} + \beta_7 Big4_{i,t} + \beta_8 BigOwn_{i,t} + \beta_9 Fore_{i,t} + \beta_{10} CashR_{i,t} + \beta_{11} CurrentR_{i,t} + YD + ID + \varepsilon_{i,t}$

		DV: Audit Hour		*DV: Audit Fee*	
	Sign	Model 1	Model 2	Model 3	Model 4
Intercept	+/-	-0.70***	-0.68***	4.18**	4.20***
		(-4.41)	(-4.28)	(65.29)	(65.67)
Credit Rating	+/-	0.02***	0.03***	0.00**	0.01**
		(2.80)	(2.85)	(2.02)	(2.22)
Size	+	0.36***	0.36***	0.37***	0.37***
		(39.92)	(39.93)	(99.59)	(99.87)
Lev	+	0.27***	-0.31***	0.10***	0.06**
		(4.04)	(-4.49)	(3.32)	(2.02)
Earning	-	-0.08***	-0.08***	-0.03**	-0.03***
		(-2.72)	(-2.87)	(-2.45)	(-2.83)
Loss	+	0.15***	0.15***	0.10***	0.10***
		(5.16)	(5.19)	(8.37)	(8.46)
Age	+	0.00***	0.00***	-0.01***	-0.00***
		(5.91)	(5.90)	(-6.73)	(-6.78)
Big4	+	0.37***	0.37***	0.13***	0.12***
		(17.90)	(17.56)	(14.64)	(14.64)
BigOwn	+/-	-0.48***	-0.48***	-0.48***	--0.46***
		(-8.15)	(-8.06)	(-19.68)	(19.47)
Foreign	+	0.70***	0.28***	0.40***	0.41***
		(4.41)	(2.99)	(10.42)	(10.57)
CashR	-		0.00		-0.00
			(0.27)		(-1.11)
Current R	-		-0.00*		-0.00***
			(-1.96)		(-3.46)
YD		*Included*	*Included*	*Included*	*Included*
ID		*Included*	*Included*	*Included*	*Included*
F value		507.79***	416.73***	2358.89***	1936.90***
Adj. R2		0.2935	0.2941	0.6559	0.6579
Obs.		11012	11012	11012	11012

*Note 1: *, **, *** indicate significance level at 10%, 5%, 1% respectively. Numbers in parenthesis indicate t values.

*Note 2: See the Table 1 for the variable definitions

*Note 3: Variable definitions: *Audit fee* = Natural logarithm of audit fee, *CashR* = Cash and cash equivalents divided by short term assets, *CurrentR* = Short term assets divided by short term debt