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How Investors Perceive Mandatory Audit Firm Rotation in Korea

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Abstract: Credible audit quality is a precondition for a firm's sustainability. External auditors offer assurance with regard to the uncertain factors that can jeopardize a firm's sustainability and provide audit opinions that help investors assess risk. After the global crisis and accounting scandals, mandatory audit firm rotation has been implemented globally. However, few studies have investigated either the cost or the benefit of mandatory audit firm rotation. Prior studies provide only indirect evidence on the effects of audit firm tenure on audit quality/perceived audit quality. By discussing prior arguments, we examine how investors perceive the implementation of mandatory audit firm rotation in Korea. Using a unique and direct setting to examine our research question, we analyze the relationship between firms with mandatorily switched audit firms and the cost of equity capital from 2006 to 2008. We find that the mandatory change in the auditors has a negative association with the cost of equity capital. The results are robust to using the arithmetic mean of the cost of equity capital, lagged control variables, and the manufacturing industry effect. The results indicate that investors perceive that mandatory audit firm rotation provides an environment for qualified audits by enhancing auditor independence and skepticism, and thus decreases the cost of equity capital. This study helps to improve our understanding of the impact of mandatory audit firm rotation the information risk evaluations and provides political implications for policy makers by showing the benefit of mandatory audit firm rotation.

Keywords: mandatory auditor rotation; cost of equity capital; audit quality perception; information risk

1. Introduction

The separation of ownership and management induces information asymmetry between management and market participants and creates a conflict of interest among market participants [1]. Auditors' primary role is to reduce this information asymmetry by verifying and confirming managers' assertions [2]. Indeed, high audit quality is a precondition for reducing information asymmetry and enhancing the credibility of accounting information.

According to DeAngelo [3], audit quality is a joint probability of the auditor's expertise and independence. An audit with lower value relevance (due to an audit failure caused by lower auditor independence) hinders proper resource allocation in the capital market and would jeopardize a firm's sustainability. For example, the Enron scandal clearly shows how auditor independence affects a firm's sustainability. Enron was one of biggest energy companies in the U.S. and filed for bankruptcy in 2002. Arthur Andersen had provided both the external/internal auditing and non-audit

services to Enron since 1986. Enron's stakeholders expressed doubts about Arthur Andersen's independence when Enron restated its profits for 1997 through 2000, because Enron was one of his big clients. Moreover, their relationship of 16 years was too long [4]. The Enron scandal affected stakeholders including employees, shareholders, bank and government, as well as the U.S. economy. Therefore, most countries consider the systematic improvement of audit quality by enhancing audit firm/auditor independence. In addition to institutional movements, prior literature in accounting field has focused on the circumstances that jeopardize auditor independence, such as long auditor tenure, close relationships between auditor and management, and economic dependency.

After the enormous accounting scandals and global financial crisis, policy makers were concerned that close relationships between auditors and clients would lower auditor independence and thus ultimately harm audit quality [5,6]. The implementation of mandatory audit firm rotation is one solution to improve not only audit quality, but also perceived audit quality. However, empirical studies on the effect of mandatory audit firm rotation on audit quality or perceived audit quality have not shown consistent results so far.

Internationally, 28 of 69 countries have adopted or implemented mandatory audit firm rotation [5]. Even if countries do not implement mandatory audit firm rotation, most countries have grappled with whether to adopt the regime or not. For example, the European Commission [6] directly proposes mandatory audit firm rotation as a way to improve auditor independence. Although the U.S. House of Representatives prohibited the implementation of mandatory audit firm rotation in 2013, the Public Company Accounting Oversight Board of the U.S also raised the issue to prevent close relationships between audit firms and clients [7].

We chose Korea as our research, setting because Korea implemented mandatory audit firm rotation from 2006 to 2009. Despite the effort to reform the regulation, the Korean council passed a bill to rescind it in January 2009 due to side effects such as lower audit fees caused by intense competition among audit firms and lack of knowledge about clients. Recently, readopting mandatory audit firm rotation has been under fierce discussion in Korea [8]. In this context, we aim to provide direct evidence of how investors perceive mandatory audit firm rotation using Korean listed firms as our research sample.

Opponents to mandatory auditor rotation claim that the cost of implementing mandatory auditor rotation is hard to ignore [9–14]. For example, the client bears switching costs such as the time required for new auditor to deliberate over a firm's financial information and gain specific knowledge about the client. Moreover, new auditors have difficulties such as detecting material misstatements, omissions in financial reporting, or earnings manipulation [15]. Indeed, the possibility of an audit failure might be greater in the early period of audit engagement.

Proponents argue that mandatory audit rotation may enhance auditor independence [16–20]. Since reducing the economic dependency between the audit firm and client is one benefit of mandatory audit firm rotation, auditors retain their independence without any concern for the loss of quasi-rent or dismissal. In addition to enhanced auditor independence, mandatory audit firm rotation brings skepticism or a fresh look at the client. In this context, we argue that mandatory audit firm rotation affects not only audit quality, but also perceived audit quality [21]. Investors may express concerns about the outcomes of audit procedures if a long and close relationship between an incumbent auditor and managers reduces auditor independence. Moreover, investors may be concerned about auditing skill in the incumbent auditor when the auditor has a longer tenure. In this case, investors factor information risk into the cost of equity capital [22]. Nevertheless, mandatory audit firm rotation is one means to reduce the cost of equity capital if investors perceive that it enhances auditor independence and skepticism. In this context, we expect that the cost of equity capital lowers by reducing information risk through high audit quality.

We examine the relationship between mandatorily switched firms and the cost of equity capital from 2006 to 2008 using a sample of listed Korean firms. Using the Gode and Mohanram, Price-Earnings-Growth, and Modified Price-Earnings-Growth models, we find that the mandatorily

switched firms have a negative association with the cost of equity capital, with all three models showing consistent results. Moreover, we further use the arithmetic average of the three models to reduce measurement errors and find consistent results [23,24]. Overall, the results indicate that investors perceive that mandatory audit firm rotation enhances audit quality.

Our study makes several contributions to the literature. First, we provide direct evidence by investigating how investors perceive mandatory audit firm rotation, while prior studies examine either the relationship between audit firm tenure and audit quality/the perception of audit quality [9–19]. In contrast to Boone et al. [20], who find that the cost of equity capital decreases with audit firm tenure, we find clear evidence that mandatory audit firm rotation matters to investors and leads to a lower cost of equity capital. Since most countries do not have mandatory auditor rotation, previous studies could investigate the issue in only a roundabout way. Since Korea implemented and rescinded the policy, it provides a unique and direct setting to examine the effect of mandatory audit firm rotation on perceived audit quality.

Second, our study contributes to the literature on the economic consequences of mandatory audit firm rotation, which focuses primarily on the costs of implementing mandatory audit firm rotation [7,25–27]. Ewelt-Kauner et al. [5] state that only a few empirical studies document beneficial effects, whereas our study attempts to present the potential benefits of implementing mandatory audit firm rotation in terms of the cost of equity capital.

Lastly, our results have a political implication. Policy makers need to consider the costs and benefits of adopting mandatory audit firm rotation carefully. While most studies imply that the costs exceed the benefits, benefits clearly exist from the investors' perspective.

The reminder of the paper proceeds as follows. Section 2 summarizes the institutional background and prior literature, and sets forth our predictions regarding mandatory audit firm rotation. Section 3 describes our sample and research model, and explains the cost of equity capital. Section 4 presents our empirical results, and we offer our conclusions in Section 5.

2. Institutional Background, Prior Literature and Hypothesis Development

2.1. Institutional Background

According to Choi et al. [28], Austria, Bangladesh, Bolivia, Bosnia, Brazil, Costa Rica, Canada, China, Croatia, the Czech Republic, Ecuador, Hungary, India, Indonesia, Israel, Italy, Korea, Macedonia, Oman, Pakistan, Paraguay, Peru, the Philippines, Poland, Qatar, Saudi Arabia, Serbia, Singapore, Slovakia, Slovenia, Spain, Thailand, Tunisia, Turkey, Uganda, Ukraine, Uzbekistan, and Venezuela did or do adopt mandatory audit firm rotation. Of the 69 countries they list, 28, including Germany, the U.S., the U.K., Japan, and France, do not have mandatory audit firm rotation thus far.

However, adopting mandatory audit firm rotation is an on-going and controversial issue. For example, the EC [6] (p. 11) states, "*Situations where a company has appointed the same audit firm for decades seem incompatible with desirable standards of independence. Even when "key audit partners" are regularly rotated as currently mandated by the Directive, the threat of familiarity persists. In this context, the mandatory rotation of audit firms—not just of audit partners—should be considered.*" The EC [29] also proposes introducing mandatory auditor rotation after a maximum period of six years, except in certain circumstances. In 2011, the Chairman of the Public Company Accounting Oversight Board of the U.S., James Doty, proposed mandatory audit firm rotation to inspect and renew the auditing profession [7]. However, the U.S House of Representatives decided not to implement it in 2013 [7].

Korea implemented the policy from 2006 to 2009, and the translation rule lasted until 2010 [30]. After the foreign currency crisis in Korea, the government reformed *The Corporate External Audit Law* to enhance audit quality in 2003 [28] and the rule was effective from 2006. Among several amendments, this regime was one of rules adopted to strengthen auditor independence.

Specifically, mandatory audit firm rotation in Korea applied to all listed firms except firms listed in the foreign exchange stock market. The rule began in the fiscal year accounting period beginning

on January 1st in 2006, and the mandatory audit rotation for six consecutive years would include the fiscal year accounting periods prior to the initial application of the amendment [28]. The intention was to restrict the economic subordination/close relationship between the auditor and client and provide enhanced skepticism on the client's financial status [7]. Despite the effort to reform the regulation, the Korean council passed a bill to abolish it due to its side effects in January 2009, and only the translation rule lasted until 2010. Recently, the re-adoption of mandatory audit firm rotation has been under fierce discussion in Korea. Congressional representatives Jong-gul Lee and Gwang-ho Song proposed mandatory audit firm rotation to improve accounting transparency, and it is pending at the State Affairs Committee of Korea [8]. However, some members of the audit profession and accounting experts express concerns about its re-adoption [18].

2.2. Literature Review

While accounting experts and researchers try to provide the direct implications of mandatory audit firm rotation, previous studies have presented only indirect evidence, due to data accessibility. Therefore, instead of using direct data, several studies have examined the effect of auditor tenure on audit quality using proxies such as discretional accruals, audit opinion, and audit failures [9–19].

In an indirect research setting such as U.S., some evidence supports opponents of mandatory audit firm rotation [9–11]. For example, using U.S. listed firms, Johnson et al. [9] documents a negative relationship between auditor tenure and the level of absolute discretionary accruals (i.e., high accruals means low audit quality) due to the auditor's specific knowledge of the client. In a similar vein, Gul et al. [11] analyze the effect of audit firm tenure and industry specialized audit firm on audit quality. Their finding suggests that audit firms with specialized industry knowledge may overcome poor audit quality stemming from a short tenure. Bratten et al.'s [12] findings imply that a long relationship with the client reflects the underlying demand for expertise, which is critical for high audit quality. In addition, prior studies suggest that perceived audit quality is positively related to audit firm tenure because stakeholders perceive that the auditor enhances the credibility of financial reporting quality [13,14].

On the contrary, several studies indicate the usefulness of mandatory audit firm rotation [16–20]. For example, Chung [16] documents that discretionary accruals decease when clients are forced to change their auditor. Similarly, Carey and Simnett [17] suggest that the audit partner's tenure is negatively associated with audit quality. Lee et al. [18] show that audit firms with longer tenures are less likely to report a client's internal control deficiencies. Singer and Zhang [19], who emphasize the benefits of mandatory audit firm rotation, show that timely discovery and correction of misstatements decreases when the audit firm and client have a longer relationship. Dao et al. [20] demonstrate that shareholders are against renewing incumbent auditor when they have concerns about long audit firm tenure.

Only a few studies provide direct evidence on the effect of mandatory audit firm rotation on audit quality [7]. Prior research has used listed firms in Spain, Italy and Korea as an empirical setting to discuss the regime of mandatory audit firm rotation. First, Spain adopted the regime in 1994 and abolished it in 2000. According to Ruiz-Barbadillo et al. [25], the adoption of mandatory audit firm rotation is insignificantly associated with the probability of issuing going concern opinion. Their findings imply that mandatory audit firm rotation may induce poor audit quality. Second, Italy adopted the regime in 1975. The Italian rule requires that the client retain an audit firm for three consecutive years and enable firms to renew the contract for another three consecutive years, up to nine years. In 2006, the rule was revised to grant an option for the client to deny the incumbent auditor. Cameran et al. [26] provides direct evidence that earnings quality is positively associated with longer audit firm tenure under the revised regime. Third, Korea implemented the regime in 2006 and abolished it in 2009. Kwon et al. [7] document that audit quality did not change significantly, yet audit fees and audit hours increased significantly after adoption of the rule using a Korean sample. Those studies provide empirical evidence under direct setting supports the perspective of opponents.

However, Lu and Sivaramakrishinan [27] provide theoretical evidence that the benefits exceeds the costs when there are few clients in a very large in audit market, if the purpose of mandatory audit firm rotation is to bring a fresh look at clients.

Most of the prior literature provides indirect evidence on the effect of audit firm tenure on audit quality, while some studies investigate the effect of mandatory audit firm rotation in a direct setting. There is little evidence of either the benefits or costs of mandatory audit firm rotation. This study aims to fill this gap by examining the effect of mandatory audit firm rotation on the cost of equity capital.

2.3. Hypothesis Development

As we mentioned above, prior studies provide little evidence on either the costs or benefits of mandatory audit firm rotation. Opponents, who believe that the cost of mandatory audit firm rotation exceeds its benefits, argue that poor knowledge of the client is one cost that clients and stakeholders should bear under this regime. Some studies have found that audit quality decreases under short audit firm tenures [9–11]. Since new auditors have to learn specific, expert knowledge and skills, the audit risk around clients is higher during the early years of tenure [3,26]. For example, Bratten et al. [12] suggest that a long relationship between the auditor and client reflects an underlying demand for expertise, which is a precondition for high audit quality.

Mansi et al. [13] use the cost of debt as a proxy for perceived audit quality, and Ghosh and Moon [14] use earnings response coefficients from returns-earnings regressions as a proxy for perceived audit quality. These studies suggest a positive relationship between perceived audit quality and audit firm tenure, because investors perceive that the auditor's expertise enhances the credibility of financial reporting. This set of studies documents long audit firm tenure enhancing auditor-specific knowledge and core competence [15]. Only a few studies that provide direct evidence on mandatory audit firm rotation support the opponents' perspectives [7,25–27]. Ruiz-Barbadillo et al. [25] suggests that mandatory audit firm rotation may induce poor audit quality.

On the contrary, proponents argue that the benefits of mandatory audit firm rotation exceed its costs, because new auditors bring a new audit service and enhance auditor independence. Some empirical evidence also supports the proponents' arguments, even if most studies were performed in an indirect setting [16–18]. Those studies use the probability of reporting internal control deficiency, a going concern opinion, or the correction of misstatements as a proxy for audit quality to investigate the relation between audit firm tenure and audit quality. In addition, Johnson et al. [9] state that the economic dependence between audit firm and client is one factor that threatens auditor independence. If the audit firm tenure increases, audit firms may voluntarily reduce their independence in terms of retaining quasi-rent. Since every client should change audit firms periodically under the regime of mandatory audit firm rotation, auditors can retain their independence without any concern about the loss of quasi-rent or dismissal.

Dao et al. [20] use perceived audit quality as a proxy for the possibility that shareholders are against renewing an incumbent auditor. They document that shareholders are more likely to oppose renewing an incumbent auditor when the period of audit firm rotation is longer. In this context, investors expect that new auditors will provide rigorous auditing, leading to a higher perceived audit quality. If investors perceive that the benefits exceed the cost to implement mandatory audit firm rotation, the cost of equity, which is a proxy for perceived audit quality, decreases.

While there are costs to switching auditors, such as the time for the auditor to deliberate on the industry and acquire firm-specific knowledge in addition to the potential for audit failure, investors will bear the cost if the audit provides a better outcome [5]. For example, investors prefer audit services from BIG 4 audit firms, even under higher audit costs compared to non-BIG 4 audit firms, because investors perceive that they provide better audit quality [31]. We expect that the mandatory audit firm rotation will enhance auditor independence and skepticism, and reduce economic dependency, leading to an increase in perceived audit quality and thus, lower the cost of equity.

If investors perceive that mandatory audit firm rotation enhances audit quality and aids in allocating capital market resources efficiently, then the regime ultimately increases a firm's sustainability. Indeed, it lowers the cost of equity capital. Accordingly, given the prior arguments on the relationship between mandatory audit firm rotation and the cost of equity capital, we set the following hypothesis:

Hypothesis 1. *Firms under mandatory audit firm rotation lower the cost of equity capital compared with firms with incumbent auditors.*

3. Research Method

3.1. Sample Selection

Our study investigates the impact of the adoption of mandatory audit firm rotation on the cost of equity capital in Korea. We thus considered all firms listed in two Korean markets (Korea Composite Stock Price Index and Korea Securities Dealers Automated Quotation). We conducted our empirical analysis from 2006 to 2008 and used two databases: the Fn-Guide, which provides analysts' earnings forecast data; and the NEW KisValue database, which offers other financial and stock price data.

The Korean government implemented the mandatory rotation rule for Korean listed firms from 2006 to 2009, and retained only the translation rule until 2010. We set the sample period from 2006 to 2008 for two reasons. First, the Korean council passed the bill to rescind mandatory audit firm ration in January 2009. Hence, we note that the effect of the mandatory rotation rule on the capital market would not have been significant in 2009. Second, the accessibility of auditor designation data is limited to 2008.

The full sample is formed from the intersection of the merged Fn-Guide and the NEW KisValue, including the primary data. In addition, we imposed five criteria. First, we excluded companies subjected to the auditor designation law to avoid the compounding effect of two regulations [7,32]. Second, we deleted firms listed in the foreign stock exchange, because they were exempt from mandatory audit firm rotation law. Third, we excluded firms with non-December fiscal years and firms in the financial and insurance industries to increase the comparability of the sample. Financial or insurance firms follow regulations that differ from those in other industries, so we restricted our sample to firms in the non-financial industry [33]. Fourth, we excluded firms without analysts' earnings forecast information from Fn-Guide. As financial information disclosure occurs at the end of March, we extracted the analysts' earnings forecast and stock price data from the end of April [34,35]. We also excluded firms that reported a negative book value, because firms with capital impairment could have affected the bias of analysts' earnings forecasts [36]. Furthermore, we introduced the constraint eps2 > eps1 > 0, so that the estimates of R_{PEG} would have a positive root [15,23]. Last, we deleted firms that lacked financial data in NEW KisValue. Table 1 shows the selection criteria of the total sample. Our selection criteria produced 3-year samples of 43 companies that changed audit firms under mandatory audit firm rotation and 148 companies that maintained their incumbent auditor.

Table 1. Sample selection.

Category	2006	2007	2008	Total
Full samples	1608	1630	1593	4831
except:				
Firms with designated auditor	(118)	(96)	(66)	(280)
Foreign listed firms	(19)	(19)	(19)	(57)
Firms without December fiscal year, financial industry	(335)	(330)	(284)	(949)
Firms without cost of equity capital	(1049)	(1068)	(1109)	(3226)
Firms without financial data	(44)	(54)	(30)	(128)
Final Samples	43	63	85	191

Table 2 shows the composition of the firm-year observations. Panel A of Table 2 shows the year distribution. Among the sample of 191 firms, 148 retained their incumbent auditors, and 43 mandatorily changed their auditor. The number in our sample increases from 2006 to 2007, while it decreases from 2007 to 2008. The year distribution for our sample is similar to prior research [7].

Panel B of Table 2 shows the industry distribution and its proportions following KSIC codes. We use the KSIC as an industry standard to classify the sample [37]. The Korean government provides the KSIC to describe the domestic industry structure. The classification includes 21 industry codes from A to U. Our initial sample consisted of industry codes from A to U and the final sample after the selection process consisted of industry codes C, E, F, G, H, J, M, N, P, and R. Our sample includes 114 industry C firms, with the remaining 77 observations belonging to other industries. Of the total sample, 59.69% belong to the manufacturing industry; those conducting professional, scientific, and technical activities and publication and information activities account for 17 and 16, respectively, and the sample in business facility and support is 0.52%.

The sample composition is similar to the industry proportion of prior studies investigating the relationship between the characteristics of the audit and market perceptions in Korea [16,37]. The Korean economy developed under a government-initiated industrial policy. Thus, the manufacturing industry has a significantly high proportion compared to other developed countries.

Table 2. Sample distribution.

Panel A: Sample size by year				
Category	**2006**	**2007**	**2008**	**Total**
Firms with mandatorily changed auditors	2	23	18	43
Firms with incumbent auditors	55	60	33	148
Total samples	57	83	51	191

Panel B: Sample size by industry		
Industry Name (Industry Code)	**Observations**	**Proportion (%)**
Manufacturing (C)	114	59.69
Electricity, gas, and tap water (E)	3	1.57
Construction (F)	12	6.28
Wholesale and retail (G)	11	5.76
Transportation industry (H)	8	4.19
Publication and information (J)	16	8.38
Professional, scientific and technical activities (M)	17	8.90
Business facility and support (N)	1	0.52
Education services (P)	6	3.14
Art, sports, and leisure industry (R)	3	1.57
Total samples	191	100

Note: Proportion: measured by dividing the number of observation by total sample.

3.2. *Variable Definitions*

3.2.1. Cost of Equity Capital

We use three measures of the cost of equity capital as a proxy for perceived audit quality. The cost of equity capital is the required rate of return that sets the current stock price to the discounted expected future dividends [23,24]. Although prior studies use ex-post returns rather than ex-ante returns to value a firm, several studies point out that ex-post returns are not a proper proxy to estimate market participants' expectations [38,39]. Specifically, Fama and French [40] point out several weaknesses in using ex-post realized returns. First, they mention the difficulty in finding a proper asset pricing model. Second, the factor loading estimate is imprecise, as is the estimate of the factor risk premia. Most of all, ex-post realized returns do not contain all available information at the time of estimation, while the (ex-ante) cost of equity capital considers publicly available information when stakeholders

such as analysts and researchers estimate it. Similarly, Elton [41] shows that the correlation between the cost of equity and ex-post realized return is weak, stating that ex-post realized return could be a poor proxy for the cost of equity capital. Ahn et al. [34] also note that using analyst earnings forecasts rather than ex-post realized returns improves the reliability of the cost of equity capital in the Korean research setting.

Our first model for estimating the cost of equity capital is the Price-Earnings-Growth model (PEG) [23]. The second model is the Modified Price-Earnings-Growth model (MPEG), which assumes that γ-1 is not equal to zero [23]. The last model is from Gode and Mohanram [24], the GM model. All three specifications were developed from the abnormal earnings growth model [42] (the OJ model), because it provides the theoretical background for the price earnings (PE) ratio, which is widely used by analysts and investors. Even if the PE ratio is convenient, it only represents abnormal earnings growth in the short-term. Thus, Easton [23] suggests both the PEG and MPEG models to capture long-term abnormal growth.

$$P_t = \frac{eps_{t+2} - eps_{t+1}}{r^2_{peg\ t}} \tag{1}$$

where γ-1 is the perpetual growth rate of the capitalized abnormal earnings growth after two years and dpst+1 is the dividend per share at time t+1. The OJ model assumes that the abnormal earnings growth is the changes in earnings that exceed the return on net reinvestment. Equation (1) suggests that earnings growth and the implied discount rate explain the current stock price. More specifically, there are no changes in abnormal earnings growth beyond the forecast horizon and dividend payments. Then, rearranging the terms, we have,

$$r_{peg_t} = \sqrt{\frac{eps_{t+2} - eps_{t+1}}{P_t}}, \tag{2}$$

where P_t is the stock price per share at time t, $\mathrm{eps_t}$ is the analyst earnings forecast per share at time t, and r_{pegt} is the cost of equity capital at time t. P_t, $r^2_{peg\ t}$, $\mathrm{r^2_{mpeg_t}}$ are different from zero. Furthermore, we work with the constraint that $\mathrm{eps_{t+2}} > \mathrm{eps_{t+1}} > 0$, so that the estimates of $\mathrm{R_{PEG}}$ have a positive root [15,23].

For the second model, MPEG, we release the assumption that dps_{t+1} is equal to zero. Thus, MPEG includes the assumption of dividend payments. Furthermore, we make several assumptions regarding the dividend payout ratio in the MPEG models. We estimate future dividends by scaling the dividends in the most recent year with the earnings over the same year. If the firm reports negative earnings, we divide the dividends in the most recent year by the one-year-ahead or two-years-ahead (or three-year-ahead) analyst earnings forecasts to estimate the payout ratio. If the earnings forecasts are still negative, we assume that the future dividend payout ratio is zero. If the estimated dividend payout ratio is higher than 0.5, then we assume a payout ratio of 0.5 [34,42].

$$P_t = \frac{eps_{t+2} + r_t \times dps_{t+1} - eps_{t+1}}{\mathrm{r^2_{mpeg_t}}} \tag{3}$$

After rearranging the terms, we have

$$r_{mpeg_t} = \frac{dps_{t+1} + \sqrt{dps_t^2 + 4 \times P_t \times (eps_{t+2} - eps_{t+1})}}{2 \times P_t} \tag{4}$$

where P_t is the stock price per share at time t, dps_t is the dividends per share at time t, eps_t is the analyst earnings forecast per share at time t, and r_{mpegt} is the cost of equity capital at time t.

We base the last model on Gode and Mohanram [24], who apply a model from Ohlson and Juettner-Nauroth [42] empirically. We calculate this model without considering the book value of the cost of equity capital, but estimate it through the relationship between the stock price and analyst earnings forecasts. Additionally, we set γ-1 as equal to the risk-free interest rate minus the long-term

inflation rate to estimate the moving averages of the annual inflation rates for the previous 10 years. The equation from the GM model is:

$$P_t = \frac{eps_{t+1}}{r_{gm_t}} + \frac{E_t\left(eps_{t+2} + r_{gm_t} \times dps_{t+1} - \left(1 + r_{gm_t}\right) \times eps_{t+1}\right)}{r_{gm_t}\left(r_{gm_t} - \gamma + 1\right)} \tag{5}$$

After rearranging the terms, we have

$$r_{gm_t} = A + \sqrt{A^2 + \frac{eps_{t+1}}{P_t}}\left[\frac{(eps_{t+2} - eps_{t+1})}{eps_{t+1}} - (\gamma - 1)\right] \tag{6}$$

where P_t is the stock price per share at time t, $\mathrm{dps_t}$ is the dividends per share at time t, eps_t is the analyst earnings forecast per share at time t, stg_t is the short-term earnings growth rate, and r_{gmt} is the cost of equity capital at time t. Equation (6) is valid only if $\mathrm{A} \equiv \frac{1}{2}\left(\gamma - 1 + \frac{dps_{t+1}}{P_t}\right)$ and $stg_t = \frac{(eps_{t+2} - eps_{t+1})}{eps_{t+1}}$. To reduce the measurement errors in the cost of equity capital estimates in the three models, we present the results calculated from the arithmetic average (r_{avg}) from the three cost of equity capital (r_{peg}, r_{mpeg}, r_{gm}) calculations in the main results section [36].

3.2.2. Research Model

To test the hypothesis, we examine whether mandatory audit firm rotation affects the cost of equity capital. In our empirical regression model, we control for other determinants of the cost of equity capital to exclude the potential risk effect. Since several factors may affect the cost of equity capital, we add six variables from the prior research as controls [24,34,43–45]. Equation (7) presents our OLS regression model.

$$\begin{aligned} COE_{i,t} &= \beta_0 + \beta_1 ManCh_{i,t} + \beta_2 SIZE_{i,t} + \beta_3 BM_{i,t} + \beta_4 LEV_{i,t} + \beta_5 BETA_{i,t} \\ &+ \beta_6 OIVOL_{i,t} + \beta_7 GRW_{i,t} + \sum ID + \sum YD + \epsilon \end{aligned} \tag{7}$$

The dependent variable of our model is the cost of equity capital (COE) calculated using the PEG, MPEG, and GM models. Section 3.2.1 gives a detailed description of these models.

Our main independent variable (ManCh) equals 1 if firm i mandatorily changed audit firms from 2006 to 2008, and 0 otherwise. Investors might perceive that mandatory audit firm rotation enhances auditor independence and skepticism. The cost of equity capital might decrease due to improved audit quality, leading to lower information risk. Based on our hypothesis, we posit that the relationship under mandatory audit firm rotation with the cost of equity capital is negative, and thus the predicted sign of β_1 is (-).

We include several control variables in our model [15,34,43–45]. First, we calculate firm size (SIZE) by the natural logarithm of the market value of common equity at time t. Prior studies show that if a firm is relatively large, the accessibility of its information will increase due to stakeholder interest [34,35]. Thus, as larger firms disclose a great deal of information, their information asymmetry decreases. Therefore, we expect a negative relationship between firm size and the cost of equity capital. Second, we include the book-to-market ratio (BM) at time t because they can capture other types of risk [35,38]. Consistent with prior research, we expect to find a positive relationship between the cost of equity capital and the book-to-market ratio. Third, we include leverage (LEV) as the ratio of total liabilities to total assets. Prior studies argue that firms with higher leverage ratios have a higher default risk. We control for this risk by including the leverage ratio, and expect a positive relationship between the leverage ratio and the cost of equity capital.

Fourth, we include the market beta (BETA) estimated from the capital asset pricing model to control for firms' systematic risk [15,38]. We expect that the market beta will have a positive relationship with the cost of equity capital. Fifth, we include the volatility of operating income measured using the standard deviations of the operating income (OIVOL) for the past five years divided by the mean of total assets. According to Gode and Mohanram [24], firms with highly volatile operating activities tend to have a higher risk. Thus, we posit a positive relationship between the volatility of operating income and the cost of equity capital. Sixth, we include firm growth (GRW), because prior studies argue that risk may increase for rapidly growing firms [15,39]. We deduct analysts' earnings forecasts after two years from their earnings forecasts after three years and then divide the numbers by analysts' earnings forecasts after two years. We expect that firm growth will have a positive sign. Finally, we include industry (∑ID) and year dummies (∑YD) to control the cross-sectional differences in each year and industry [34,39].

4. Empirical Results

4.1. Descriptive Statistics

Table 3 presents the summary of the statistics. Panel A of Table 3 provides the descriptive statistics for the variables included in Equation (7) for the firms with an incumbent auditor, which has 148 observations. The dependent variables, which measure the cost of equity capital, include the PEG, MPEG, GM, and MR. The mean values of cost of equity capital ranges from 0.133 to 0.150, and are consistent with results from previous studies [36]. The median values of R_{PEG}, R_{MPEG}, and R_{GM} are 0.115, 0.129, and 0.132, respectively. Furthermore, the mean and median of MR are 0.143 and 0.127, respectively. Among the four measures of the cost of equity capital, the standard deviation of RMPEG is the highest, at 0.072. Since MPEG requires further assumptions regarding the future dividend payout, it induces the highest standard deviation among the measures of cost of equity capital.

The descriptive statistics of the control variables in Panel A of Table 3 are as follows. First, firm size ranges from 24.726 to 30.520, with a mean of 27.726. Second, the BM and LEV are proxies for a firm's financial condition. The mean (median) BM and LEV are 0.017 (0.026) and 0.575 (0.389), respectively. This indicates that most of the sample firms in Panel A are financially healthy. Third, BETA and OIVOL are proxies of firm risk, with means (standard deviations) of 0.982 (0.365) and 0.043 (0.046), respectively. Finally, the median (standard deviation) of the growth rate for 1 year is 0.132 (0.194).

Panel B of Table 3 provides the descriptive statistics for the variables included in Equation (7) for the sample of the firms that mandatorily changed their auditor. The mean values of R_{PEG}, R_{MPEG}, and R_{GM} are 0.121, 0.134, and 0.137, respectively. These are relatively less than those in Panel A of Table 3. The median value of the cost of equity capital ranges from 0.116 to 0.130. The mean and median values of MR are 0.131 and 0.124, respectively. Likewise, the results in Panel A of Table 3 for MPEG show the highest standard deviations.

The descriptive statistics of the control variables in Panel B of Table 3 are as follows. First, the averages of SIZE, LEV, and BM are 27.766, 0.065, and 0.526, respectively, with median values of 27.749, 0.066, and 0.384, respectively. The observations of firms with mandatorily changed auditors do not seem to differ from the sample in Panel A of Table 3. Second, the means (standard deviations) of BETA and OIVOL are 0.993 (0.394) and 0.029 (0.027), respectively. Finally, the mean (median) of the growth rate for 1 year is 0.106 (0.090).

Table 3. Summary of statistics.

Panel A: Firms with incumbent auditors								
Variables	**N**	**Mean**	**Min**	**Q1**	**Q2**	**Q3**	**Max**	**Std**
R_{PEG}	148	0.133	0.026	0.099	0.115	0.158	0.619	0.063
R_{MPEG}	148	0.148	0.026	0.109	0.129	0.170	0.707	0.072
R_{GM}	148	0.150	0.022	0.112	0.132	0.175	0.695	0.071
MR	148	0.143	0.025	0.106	0.127	0.168	0.674	0.068
SIZE	148	27.726	24.726	26.593	27.825	28.847	30.520	1.381
BM	148	0.017	−0.559	−0.019	0.026	0.075	0.526	0.124
LEV	148	0.575	0.020	0.171	0.389	0.719	3.676	0.619
BETA	148	0.982	0.162	0.726	0.955	1.240	1.809	0.365
OIVOL	148	0.043	0.004	0.016	0.027	0.053	0.335	0.046
GRW	148	0.147	−0.332	0.029	0.132	0.246	1.060	0.194
Panel B: Firms with mandatorily changed auditor								
Variables	**N**	**Mean**	**Min**	**Q1**	**Q2**	**Q3**	**Max**	**Std**
R_{PEG}	43	0.121	0.058	0.092	0.116	0.141	0.210	0.034
R_{MPEG}	43	0.134	0.061	0.100	0.125	0.152	0.299	0.044
R_{GM}	43	0.137	0.067	0.106	0.130	0.155	0.271	0.042
MR	43	0.131	0.062	0.100	0.124	0.148	0.250	0.039
SIZE	43	27.766	24.983	27.147	27.749	28.590	29.662	1.062
BM	43	0.065	−0.238	0.008	0.066	0.116	0.511	0.138
LEV	43	0.526	0.021	0.279	0.384	0.654	1.909	0.442
BETA	43	0.993	0.176	0.698	0.959	1.343	1.697	0.394
OIVOL	43	0.029	0.005	0.011	0.018	0.036	0.127	0.027
GRW	43	0.106	−0.645	−0.003	0.090	0.239	0.531	0.204

Note: i denotes firm, t denotes year; COE: Cost of equity capital in the PEG, MPEG, and GM models; MR: arithmetic mean of the three COE measures; ManCh: indicator variable equal to 1 if the firm changes auditors mandatorily, and 0 otherwise; SIZE: the natural logarithm of the market value of common equity; BM: the ratio of the book value of equity to the market value of equity; LEV: leverage measured by dividing the beginning total liabilities by total assets; BETA: a firm's market model beta calculated over the previous 60 months; OIVOL: standard deviation of the operating income for the past 5 years divided by the mean of total assets; GRW: residuals of analysts' earnings forecasts after two years deducted from analysts' earnings forecasts after three years divided by the number by analysts' earnings forecasts after two years.

Table 4 presents present the Pearson correlation matrix for the variables. First, all cost of equity capital measures (R_{PEG}, R_{MPEG}, and R_{GM}) are insignificantly negative with dependent variable (ManCh). These results are from the univariate analysis; thus, we present the multivariate analysis in Section 4.2. In addition, we find the preliminary relationships between dependent variables (R_{PEG}, R_{MPEG}, and R_{GM}) and control variables (SIZE, BM, LEV, BETA, OIVOL, GRW) are all in the expected directions suggested by prior studies [15,34].

The correlations between the control variables and the cost of equity capital are as follows. First, the relationship between firm size and the cost of equity capital is negative and significant at the 1% level, which is closely in line with the literature [38,45]. Second, BM and LEV have significantly positive relationships with all cost of equity capital measures. Finally, the relationship between BETA, OIVOL, and GRW and the cost of equity capital are insignificant, but positive. As mentioned above, the results of the correlation statistics are based on the univariate analysis. We present the multivariate analysis in Section 4.2.

Table 4. Correlation statistics.

Var.	R_{PEG}	R_{MPEG}	R_{GM}	MR	SIZE	BM	LEV	BETA	OIVOL	GRW
ManCh	−0.085	−0.086	−0.084	−0.085	0.013	0.157	−0.035	0.012	−0.135	−0.087
	(0.244)	(0.239)	(0.248)	(0.242)	(0.859)	(0.030)	(0.632)	(0.869)	(0.062)	(0.231)
R_{PEG}		0.980	0.987	0.993	−0.230	0.261	0.323	0.057	0.008	0.010
		(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.433)	(0.908)	(0.886)
R_{MPEG}			0.996	0.997	−0.263	0.253	0.311	0.021	0.017	−0.004
			(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.769)	(0.818)	(0.960)
R_{GM}				0.999	−0.244	0.253	0.308	0.027	0.007	0.008
				(0.000)	(0.001)	(0.000)	(0.000)	(0.706)	(0.928)	(0.913)
MR					−0.247	0.257	0.315	0.034	0.011	0.005
					(0.001)	(0.000)	(0.000)	(0.636)	(0.883)	(0.949)
SIZE						−0.133	0.020	0.219	−0.332	−0.031
						(0.066)	(0.782)	(0.002)	(0.000)	(0.672)
BM							0.226	0.023	0.007	0.086
							(0.002)	(0.747)	(0.925)	(0.237)
LEV								0.295	−0.279	0.006
								(0.000)	(0.000)	(0.937)
BETA									0.010	0.041
									(0.895)	(0.575)
OIVOL										0.078
										(0.284)

Note: i denotes firm, t denotes year; COE: Cost of equity capital in the PEG, MPEG, and GM models; MR: arithmetic mean of the three COE measures; ManCh: indicator variable equal to 1 if the firm changes auditors mandatorily, and 0 otherwise; SIZE: the natural logarithm of the market value of common equity; BM: the ratio of the book value of equity to the market value of equity; LEV: leverage measured by dividing the beginning total liabilities by total assets; BETA: a firm's market model beta calculated over the previous 60 months; OIVOL: standard deviation of the operating income for the past 5 years divided by the mean of total assets; GRW: residuals of analysts' earnings forecasts after two years deducted from analysts' earnings forecasts after three years divided by the number by analysts' earnings forecasts after two years.

4.2. Effect of Mandatory Audit Firm Rotation on Cost of Equity Capital

We report the regression results for Equation (7) in Table 5. Columns 2, 3, 4, and 5 present the implied costs of equity capital. First, across all three specifications of the dependent variables, we find a negative association with the cost of equity capital at the 5% significance level, supporting our hypothesis. The results indicate that investors expect a lower ex-ante risk from mandatorily switched firms than from others. The results show that mandatory audit firm rotation reduces the cost of equity capital, because investors perceive that it enhances auditor independence and skepticism [5,28]. The results also indicate that the arithmetic mean of the cost of equity capital is significantly and negatively associated for firms with mandatory auditor changes. The results are robust and suggest that this policy increases perceived auditor independence and skepticism. Prior studies of the cost of equity capital present adjusted R^2 values ranging from 10% to 30% in Korea [34,46]. Considering the small size of our sample, the adjusted R^2 values from the regression model seem to be reasonable.

The relationships between the control variables and the cost of equity capital are as follows. First, firm size is significantly negatively related with the cost of equity capital, as prior research suggests [34,35]. This indicates that larger companies offer greater information accessibility, thus reducing information asymmetry. Second, although several risk proxies such as the book-to-market ratio and leverage are positively associated with the cost of equity capital [24,43–45], the statistical significances vary across the specifications of the dependent variables. Finally, the relationship between growth and the cost of equity capital is insignificant.

Table 5. Mandatory audit firm rotation and cost of equity capital.

Variables	R_{PEG}		R_{MPEG}		R_{GM}		MR	
	Coefficient	t-stat.	Coefficient	t-stat.	Coefficient	t-stat.	Coefficient	t-stat.
Intercept	0.323 ***	3.65	0.420 ***	4.42	0.399 ***	4.09	0.380 ***	4.09
ManCh	−0.018 **	−2.24	−0.021 **	−2.13	−0.020 **	−2.14	−0.020 **	−2.18
SIZE	−0.009 ***	−2.96	−0.011 ***	−3.62	−0.010 ***	−3.28	−0.010 ***	−3.31
BM	0.092 ***	2.91	0.102 ***	2.7	0.102 ***	2.74	0.099 ***	2.79
LEV	0.027 **	1.99	0.032 **	2.07	0.029 *	1.94	0.029 **	2
BETA	0.000	0.02	−0.005	−0.24	−0.003	−0.17	−0.003	−0.13
OIVOL	−0.053	−0.64	−0.073	−0.71	−0.084	−0.85	−0.070	−0.75
GRW	−0.005	−0.21	−0.011	−0.45	−0.006	−0.26	−0.007	−0.31
∑ID	Included		Included		Included		Included	
∑YD	Included		Included		Included		Included	
F-value	3.32 ***		3.68 ***		3.41 ***		3.49 ***	
Adj. R^2	16.35%		18.41%		16.87%		17.32%	

Note: ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively; *i* denotes a firm, *t* denotes the year; COE: Cost of equity capital in the PEG, MPEG, and GM models; MR: arithmetic mean of the three COE measures; ManCh: indicator variable equal to 1 if the firm changes auditors mandatorily, and 0 otherwise; SIZE: the natural logarithm of the market value of common equity; BM: the ratio of the book value of equity to the market value of equity; LEV: leverage measured by dividing the beginning total liabilities by total assets; BETA: a firm's market model beta calculated over the previous 60 months; OIVOL: standard deviation of the operating income for the past 5 years divided by the mean of total assets; GRW: residuals of analysts' earnings forecasts after two years deducted from analysts' earnings forecasts after three years divided by the number by analysts' earnings forecasts after two years; ∑ID: industry indicator variable based on KSIC codes; ∑YD: year indicator variable.

4.3. Robustness Checks

In this section, we report the results of the robustness checks. First, we consider the industry effect by running an additional analysis using only the manufacturing firms in the sample. As mentioned above, the manufacturing industry is significant in the Korean economy. Prior studies report that 74.2% of their observations are from the manufacturing industry [37]. Similarly, approximately 60% of our sample is from the manufacturing industry. Since the firm-year observations in other industries are not sufficient to perform a multivariate regression, we use the manufacturing observations and retest the effect of mandatory audit firm rotation on the cost of equity capital. Table 6 presents the results.

Table 6. Manufacturing industry effect.

Variables	R_{PEG}		R_{MPEG}		R_{GM}		MR	
	Coefficient	t-stat.	Coefficient	t-stat.	Coefficient	t-stat.	Coefficient	t-stat.
Intercept	0.361 ***	3.39	0.417 ***	3.68	0.396 ***	3.42	0.391 ***	3.51
ManCh	−0.023 *	−1.79	−0.031 **	−2.06	−0.030 **	−2.02	−0.028 **	−1.97
SIZE	−0.009 **	−2.45	−0.010 ***	−2.72	−0.009 **	−2.42	−0.009 ***	−2.54
BM	0.072	1.36	0.091	1.43	0.086	1.4	0.083	1.41
LEV	0.035	1.39	0.042	1.48	0.038	1.35	0.038	1.41
BETA	−0.001	−0.04	−0.007	−0.24	−0.004	−0.15	−0.004	−0.15
OIVOL	0.001	0.01	0.036	0.36	0.008	0.08	0.015	0.16
GRW	0.031	0.97	0.032	0.88	0.037	1.02	0.033	0.96
∑YD	Included		Included		Included		Included	
F-value	3.32 ***		3.68 ***		3.41 ***		3.49 ***	
Adj. R^2	16.35%		18.41%		16.87%		17.32%	

Note: ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively; *i* denotes a firm, *t* denotes the year; COE: Cost of equity capital in the PEG, MPEG, and GM models; MR: arithmetic mean of the three COE measures; ManCh: indicator variable equal to 1 if the firm changes auditors mandatorily, and 0 otherwise; SIZE: the natural logarithm of the market value of common equity; BM: the ratio of the book value of equity to the market value of equity; LEV: leverage measured by dividing the beginning total liabilities by total assets; BETA: a firm's market model beta calculated over the previous 60 months; OIVOL: standard deviation of the operating income for the past 5 years divided by the mean of total assets; GRW: residuals of analysts' earnings forecasts after two years deducted from analysts' earnings forecasts after three years divided by the number by analysts' earnings forecasts after two years; ∑ID: industry indicator variable based on KSIC codes; ∑YD: year indicator variable.

Table 6 shows significant effects of mandatory audit firm rotation on the cost of equity capital of −0.023, −0.031, −0.030, and −0.028. These test results are consistent with our main results and suggest that many manufacturing firms that mandatorily change their auditor receive a more profound effect of lower ex-ante returns. Finally, the F-values are 3.32, 3.68, 3.41, and 3.49 and significant. The adjusted R^2 values are 16.35, 18.41, 16.87, and 17.32.

Second, we mitigate endogeneity issues by running an additional analysis using lagged control variables. Since all listed Korean firms must change their audit firm every 6 years, our main independent variable, ManCh, is supposed to be an exogenous variable. However, we cannot rule out the possibility that the endogeneity problem still distorts our main results. Thus, we perform the tests using lagged control variables (i.e., LSIZE, LBM, LLEV, LBETA, LOIVOL, and LGRW). Table 7 reports the results.

We find significant effects of mandatory audit firm rotation on the cost of equity capital of −0.014, −0.014, −0.015, and −0.015. These results are consistent with our main results. The relationship between R_{PEG}, MR, and ManCh are significant at the 5% level, while the relationship between R_{MPEG}, R_{GM}, and ManCh are significant at the 10% level. These results imply that the endogeneity issue is less likely to affect the relationship between mandatory audit firm rotation and the cost of equity capital. Finally, the F-values are 3.32, 3.68, 3.41, and 3.49 and significant. The adjusted R^2 values are 16.35, 18.41, 16.87, and 17.32.

Furthermore, we consider the year effect by running an additional analysis for each year. Despite the fact that the directions of this test are consistent with our main analysis, both internal and external validities of our results seem to be weakened due to the smaller sample size. Thus, we present the main results, including year dummy, instead.

Table 7. Endogeneity.

Variables	R_{PEG}		R_{MPEG}		R_{GM}		MR	
	Coefficient	**t-stat.**	**Coefficient**	**t-stat.**	**Coefficient**	**t-stat.**	**Coefficient**	**t-stat.**
Intercept	0.342 ***	3.12	0.408 ***	3.56	0.402 ***	3.39	0.384 ***	3.37
ManCh	−0.014 **	−2.19	−0.014 *	−1.93	−0.015 *	−1.97	−0.015 **	−2.04
LSIZE	−0.010 ***	−2.92	−0.012 ***	−3.22	−0.012 ***	−3.07	−0.011 ***	−3.09
LBM	0.004	0.09	−0.002	−0.05	−0.005	−0.12	−0.001	−0.03
LLEV	0.008	1.09	0.009	1.2	0.008	0.96	0.008	1.09
LBETA	0.033 ***	2.9	0.034 ***	2.78	0.034 ***	2.73	0.034 ***	2.82
LOIVOL	0.039	0.75	0.040	0.45	0.027	0.34	0.035	0.51
LGRW	0.029 *	1.8	0.027	1.56	0.032 *	1.82	0.029 *	1.73
∑ID	Included		Included		Included		Included	
∑YD	Included		Included		Included		Included	
F-value	2.43 ***		2.55 ***		2.48 ***		2.50 ***	
Adj. R^2	17.31%		18.47%		17.79%		17.99%	

Note: ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively; *i* denotes a firm, *t* denotes the year; COE: Cost of equity capital in the PEG, MPEG, and GM models; MR: arithmetic mean of the three COE measures; ManCh: indicator variable equal to 1 if the firm changes auditors mandatorily, and 0 otherwise; LSIZE: the lagged natural logarithm of the market value of common equity; LBM: the lagged ratio of the book value of equity divided by the market value of equity; LLEV: lagged leverage measured by dividing the beginning total liabilities by total assets; LBETA: a lagged variable in which the firm's market model beta is calculated over the previous 60 months; LOIVOL: lagged variable of the standard deviation of the operating income for the past 5 years divided by the mean of total assets; LGRW: the lagged residuals of analysts' earnings forecasts after two years deducted from analysts' earnings forecasts after three years divided by the number by analysts' earnings forecasts after two years; ∑ID: industry indicator variable; ∑YD: year indicator variable.

5. Conclusions

This study proposes that mandatory audit firm rotation, which is one method to increase the value relevance of an audit, has a positive effect. As mentioned above, if increasing the value relevance of an audit due to improved auditor independence helps the capital market allocate resources efficiently, then it eventually contributes to a firm's sustainability. If stakeholders observe the outcome of a low-quality

audit to be due to damaged auditor independence, as in the Enron scandal, they may misallocate their resources. To improve auditor independence, several countries have attempted various policies, such as auditor designation, mandatory audit firm rotation, restriction of non-audit services, and so on. Introducing an audit policy is important, because it can lead to sustainable firm growth as an outcome of efficient resource allocation in the capital market. Indeed, implementing mandatory audit firm rotation affects resource allocation decisions by influencing the cost of equity capital.

This study investigates the relationship between mandatory auditor rotation and the cost of equity capital in the Korean audit market. Under mandatory auditor rotation, the firms that have been using the same auditors for the last 6 years must switch to a new auditing firm. The rule aimed to avoid close relationships between the client and incumbent auditors, in order to prevent auditors from losing independence and quality [7]. There is a global discussion as to the adoption of mandatory audit firm rotation, yet only 26 counties did or do adopt this policy. Thus, the direct evidence on the consequences of mandatory audit firm rotation is currently insufficient.

We explore whether mandatory auditor rotation affects the cost of equity capital from 2006 to 2008 using 191 firm-year observations from the Korean stock market. We use the cost of equity capital as a proxy for perceived audit quality and calculate four measures (PEG, MPEG, GM, and the arithmetic mean of these variables) [23,24]. We find the following results. First, the cost of equity capital decreases if the client firm must change audit firms, indicating that investors reflect this rotation in their resource allocate decisions. That is, the perceived audit quality and independence increases under a mandatory audit firm rotation regime because investors expect that new auditors offer a fresh look at a client. Second, the relationship between mandatory audit firm rotation and the cost of equity capital is still negative when we consider the manufacturing industry effect. Third, the robustness tests using one-year lagged control variables are consistent with our main results.

We argue that the mandatory audit firm rotation regime clearly provides benefits, though we cannot rule out the potential auditor switching costs. This study may provide useful insights to management because mandatory audit firm rotation acts as a bonding mechanism to mitigate agency problems [47]. For example, if management is planning for external finance, they signal the credibility of the accounting information through enhanced auditor independence. This study also has implications for policy makers. While Korea rescinded mandatory audit firm rotation in 2009, Korean policy makers pondered its implementation for three years. Since the regime may have side effects, it is necessary to improve our understanding and to provide sufficient time to prepare before implementing mandatory audit firm rotation.

Simultaneously, we acknowledge that we use only a small amount of data on mandatory audit firm rotation for this study. Our dataset is neither long enough to examine long-term effect nor big enough to test a year-by-year analysis. Furthermore, we cannot rule out the possibility that the results may be inconsistent with those in markets besides Korea, because the quality of analysts' earnings forecasts differs across countries, and investors outside of Korea are likely to use different equity valuation methods that yield different estimations, even for the same firm [34].

We suggest several approaches for future research into the effect of mandatory audit firm rotation and the cost of equity capital. Researchers can examine the effect of mandatory audit firm rotation on stock market reactions, such as returns or trading volume. Likewise, we can investigate the effect of mandatory audit firm rotation on perceived audit quality using the earnings response coefficient. In addition, future empirical research from the perspective of the client would also be interesting, to compare the difference between experienced audit firms who provided audit service before the regime and audit firms who did not provide audit service before the regime.

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