# "Impact of internal control system managers' education on financial reporting: Focusing on manager-auditor disagreement"


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# IMPACT OF INTERNAL CONTROL SYSTEM MANAGERS' EDUCATION ON FINANCIAL REPORTING: FOCUSING ON MANAGER-AUDITOR DISAGREEMENT

## Abstract

The purpose of this study is to explore the correlation between internal control system (ICS) managers and the quality of financial reporting, assessed through the disagreements observed between managers and auditors. Using the regression model, an analysis of 5,007 firms from 2018 to 2021 shows a negative relationship. This suggests that as the education level of ICS managers increases, their proficiency in preparing initial financial statements improves, resulting in fewer errors and more accurate application of accounting policies. Consequently, a higher level of alignment between managers and auditors is anticipated, contributing to an overall enhancement in the quality of financial reporting. Additionally, this study thoroughly examines the correlation within firms operating in environments characterized by increased complexity and a heightened susceptibility to financial statement vulnerabilities. This evaluation is predicated upon the engagement in research and development (R&D) investments. The result suggests that higher education levels of ICS managers mitigate the disagreement between managers and auditors, even within intricate business environments.

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**Keywords** internal control system manager, education hours, reporting quality, research and development expenditure

**JEL Classification** M40, M41, M42

## INTRODUCTION

This study focuses on the critical role of ICS managers in enhancing operational efficiency and fostering financial reporting transparency in companies. Following the comprehensive revision of South Korea's ICS in 2018, emphasizing an elevated assurance level, companies have responded by investing in highly educated ICS personnel aligned with elevated audit standards. Therefore, it is plausible to verify the effectiveness in preventing accounting fraud and enhancing the reliability of financial reporting. To achieve this objective, it is imperative to maintain the operation and management of ICS at a higher standard. Considering that operational procedure of ICS is conducted by the personnel responsible for its oversight, it is important to ensure capability of personnel dedicated to operating the system for its effective functionality. Companies characterized by robust ICS are expected to encounter a decrease in managerial discretion and enhanced transparency in financial reporting, consequently resulting in reduced information asymmetry. South Korea is the only country that publicly discloses data of ICS managers' educational background, while other studies depend on the survey or proprietary data. Thus, it will provide generally available evidence that the supporting role of ICS managers is critical in the financial statement preparation process.



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As the auditing process starts with external auditors examining pre-audited financial statements, they ensure whether there is any disagreement with management assertion expressed by financial statements. The study further examines the nuanced impacts of ICS managers' education, especially in companies involved in research and development (R&D) activities. R&D investments in companies are essential expenditures for the firms' growth. However, R&D investments involve uncertainty and no guarantee of success. As a result, the heightened inherent risk contributes to an increased level of audit risk. Given that R&D investments inherently bring about uncertainties, the study suggests that highly educated ICS managers may play a pivotal role in mitigating these risks. Their in-depth knowledge of accounting rules and heightened awareness of biases could contribute to maintaining the accuracy of financial reporting.

# 1. LITERATURE REVIEW AND HYPOTHESES

Commencing in 2002, the obligatory disclosure of ICS operational reports in South Korea has furnished the accounting academic researcher with reliable data for analyzing ICS operations. A pivotal moment arrived in 2018 with the amendment to Korea's New External Audit Law, emphasizing the necessity of robust ICS operation for enhanced accounting transparency. Specifically, as the level of audit assurance escalates, a comprehensive standard framework is applied to regulate auditing processes. The scope of mandatory disclosure expanded to encompass detailed records of accounting personnel's professional hours and education, which should be included as attachments in business reports. All these changes collectively endeavor to enhance the transparency of the ICS, aiming to reduce or prevent errors and irregularities in preparing financial statements. Thus, it is reasonable to anticipate that companies will make efforts to improve their competencies by selecting ICS managers with appropriate experience and knowledge, as well as by managing their expertise via training and education. ICS managers consist of internal accounting managers and accounting executives.

Ge and McVay (2005) initially highlighted the importance of investing in skilled human resources and offering comprehensive education for the efficient functioning of Internal Control Systems (ICS), with a specific focus on pertinent experiences. Following in the footsteps of Ge and McVay (2005), Park et al. (2012) conducted a study on enhancements in ICS, underscoring the essential role of education in both the effective operation and maintenance of ICS. These studies indicate that an adequate workforce is vital for the effective implementation of ICS. Furthermore, companies led by ICS managers with prior expertise in accounting demonstrate improved capabilities in addressing weaknesses in internal controls (Gramling & Schneider, 2018).

If a company's ICS managers are well-educated, they are likely to comprehend and implement accounting principles. Therefore, as the presence of an adequate number of human resources in ICS is linked to lower discretionary accruals, reduced likelihood of accounting errors (Ryu et al., 2012), higher education among ICS managers can help prevent accounting errors and irregularities, thereby enhancing the reliability of financial reporting. Accordingly, companies known for their strong IC are likely to have less managerial discretion and greater transparency in financial reporting. In other words, if ICS managers are adequately educated, this can lead to effective implementation of ICS when preparing financial statements to be audited.

Measuring manager-auditor disagreement means the extent to which the initial financial statements, as prepared by the company, correspond with the conclusions found by the auditor throughout the audit process. In other words, manager-auditor disagreement refers to the difference between pre and post-audited earnings and implies the degree of adjustment made by external auditors to the pre-audited earnings. Specifically, it refers to a measurement that captures the difference between net income before the audit and the net income of the financial statement after the audit (Sohn & Lee, 2008). Sohn et al. (2008) used audit hours on the business report and analyzed the relationship between audit hours and manager-auditor disagree-


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ment. The analysis results revealed that as abnormal audit hours increase, the extent of adjustment made by external auditors to pre-audit earnings is higher. This suggests higher audit efforts suppress the financial statement errors, implying enhancing the reliability of financial reporting. Also, Sohn et al. (2010) reported that the higher independence of the audit committee decreases the extent of pre-audit earnings adjustment. The authors concluded that this result can be attributed to independent outside directors' monitoring effect on managers' financial reporting. Kim (2013) confirmed a significant increase in the extent of manager-auditor disagreement after the Korean International Financial Reporting Standards (K-IFRS) implementation. This suggests that challenges in preparing financial statements may lead to differences in opinions between managers and auditors. Cho and Chung (2022) investigated the relationship between auditor characteristics and manager-auditor disagreement. This finding suggests that as the ratio of engagement partners and experienced CPA increases, the disagreement between auditors and managers also increases. This implies a higher proportion of engagement partners with extensive CPA experience is associated with a greater likelihood of disagreement in the audit. However, an interesting observation in this result is that a significant decrease in manager-auditor disagreements is observed as the number of client firms assigned to the engagement partner and the audit fee per engagement partner increase. This suggests that allocating more resources or providing increased attention and understanding to client firms may contribute to a decrease in disagreements.

For the companies to ensure sustainability, investment in R&D is essential for future growth. However, R&D result occurs over an extended period of time, it entails uncertainty, which will lead to higher business and audit risk (Cho & Chung, 2022). At the same time, this uncertainty creates information asymmetry between companies and external information users (Barron et al., 2002). Also, R&D expenditures are sometimes utilized by managers' tool for earnings management, by adjusting the level of R&D expenditures to achieve their goal (Perry & Grinaker, 1994). These uncertainties associated with R&D expenditures, coupled with business risk and information asymmetry, are the factors that can elevate inherent risk, such as errors in initial financial statements prepared by managers.

The investment in R&D is likely to elevate the inherent risk of a firm, thereby amplifying the potential manager-auditor disagreement. However, as expertise education contributes to a transparent accounting environment (Kwon, 2019), educated ICS managers are expected to play a pivotal role in enhancing the reliability of financial statements in the presence of an uncertain environment. Similarly, enhanced education among ICS managers is expected to alleviate the complexities that result from R&D investments. In this nuance, it is worth testing the potential impact of educated ICS managers in navigating uncertainties, thereby reducing the likelihood of manager-auditor disagreement.

The purpose of this study is to empirically examine whether the education level of ICS managers affects the quality of financial reporting. Additionally, the investigation seeks to validate the existence of this correlation within intricate business environments. Considering these objectives, the following hypotheses are established:

*H1: The education level of ICS managers is negatively associated with manager-auditor disagreement.*

*H2: The education level of ICS managers in companies engaged in R&D investments is negatively associated with manager-auditor disagreement.*

## 2. METHODS

To test, the data of the companies listed on the Korean stock market are collected that satisfy the following criteria:

1. December-year-end companies, excluding the financial industry y from 2018 to 2021.
2. Companies that disclose their pre-audit profits.
3. Companies that can obtain information related to ICS from the Financial Supervisory Service's electronic disclosure system.

4. Companies with unqualified audit opinion.

5. Companies with financial data available from Fn-Guide.

To ensure homogeneity among the sample, companies operating in the financial industry and companies with a fiscal year-end other than December were excluded. To measure manager-auditor disagreement, the sample was restricted to companies that reported pre-audit profits. Within the category of ICS managers, there are internal accounting managers and accounting executives. Therefore, the data on the education hours of internal accounting managers and accounting executives were collected manually from the annual report of each company. Companies with qualified audit opinion were excluded from the sample since such companies may have potential issues or errors in the financial statements. Through this process, the possibility of presence of distorted financial information is minimized and the reliability and accuracy of the data used in this study are ensured. The final sample consists of 5,009 company-years for which the financial information was obtained through Fn-Guide.

The first hypothesis of this study is to examine the relationship between the ICS managers and manager-auditor disagreement. To assess the first hypothesis, equation (1) is set up as follows:

$$\begin{aligned} Diff_t = {} & \alpha_1 + \beta_1 Edu1(2)_t + \beta_2 Size_t \\ & + \beta_3 Lev_t + \beta_4 Roa_t + \beta_5 Growth_t + \beta_6 Ocf_t \\ & + \beta_7 Loss_t + \beta_8 Big_t + \beta_9 First_t + \beta_{10} Ah_t \\ & + \beta_{11} Af_t + \beta_{12} Mkt_t + \sum Ind + \sum Yr + \varepsilon. \end{aligned} \tag{1}$$

Variable definition: *Diff* = Absolute value of the difference between pre- and post-audited net income divided by post-audited net income; *Edu1* = the education hours of internal accounting manager; *Edu2* = the education hours of accounting executives; *Size* = natural logarithm of total assets; *Lev* = total liabilities divided by total assets; *Roa* = net income divided by total assets; *Growth* = (total assets in the current year – total assets in the previous year) / total assets in the current year; *Ocf* = cash flow from operation/total asset; *Loss* = 1 if the firm-year reports net loss, and 0 otherwise; *Big* = 1 if the firm-year is audited by one of the Big4 audit firms; *First* = 1 if the firm changed the audit firm; *Ah* = natural logarithm of total audit hours; *Af* = natural logarithm of total audit fees; *Mkt* = 1 if the firm is included in KOSPI market, 0 otherwise; *Ind* = industry dummy variables; and *Yrd* = year dummy variables.

Specifically, the absolute value of the difference between pre-audit and post-audit net income (*Diff*) is utilized as a measure of the difference between manager and auditor (Cho et al., 2016). The independent variables consist of the natural logarithm of education hours for both internal accounting managers and accounting executives. To account for potential confounding factors that could influence the manager-auditor disagreement, the following control variables are included in the model. Firm size (*Size*) is included in the model to address the influence of firm size on the disagreement between manager and auditor. It is often considered that larger-sized companies have more robust accounting information system and external monitoring methods (Lee & Park, 2016). To control for the possible effect on the financial condition of managerial incentives to earnings management, the debt ratio (*Lev*) is included (Lee & Park, 2016). Profitablity of the company is a factor that influences managerial incentive for earnings management (Dechow et al., 2010). Thus, Loss, Growth, and RoA are included in the model. To address the possible influence of auditor characteristics on disagreements between managers and auditors, the factors linked to the quality of external auditors have been taken into consideration. If bigger audit firms are related to higher audit quality, then such firms are more likely to detect errors and make efforts to make corrections. At the same time, it is likely to detect errors in the initial year of auditors. Furthermore, when auditors devote a great number of times to audit process, they are expected to detect errors. By considering these factors in the analysis, the variables, *Big*, *First*, *Ah*, and *Af* are included.

The second hypothesis of this study is to verify the effect of R&D investment on the relationship between the education hours of ICS managers and manager-auditor disagreement. Thus, the variable to identify whether the companies make R&D investments or not is included in equation (2).


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$$Diff_t = \alpha_1 + \beta_1 Edu1(2)_t + \beta_2 R\&D + \beta_3 Edu1(2) * R\&D + \beta_4 Size_t + \beta_5 Lev_t + \beta_6 Roa_t + \beta_7 Growth_t + \beta_8 Ocf_t + \beta_9 Loss_t + \beta_{10} First_t + \beta_{11} Ah_t + \beta_{12} Af_t + \beta_{13} Mkt_t + \sum Ind + \sum Yr + \varepsilon. \quad (2)$$

Variable definition: *R&D* = 1 if the firm makes R&D investments, 0 otherwise. See equation (2) for variable definitions of other variables.

Hypothesis 1 predicts a negative relationship between *Edu1(2)* and *Diff*. Also, if the second hypothesis suggests that the relationship between these two variables is still effective in the companies with R&D investments is supported, it is expected that the coefficient of Edu1(2) * R&D in the regression analysis will have significant negative value.

## 3. RESULTS AND DISCUSSION

Table 1 shows the descriptive statistics of the main variables used in the study. The mean value of *Diff* is 0.051, indicating that there is a 5.1% adjustment in pre-audit net income compared to post-audit net income. The hours spend on education of internal accounting managers (*Edu1*) show 0.826, which shows actual average hours of 2.285. The average of accounting executives' education hours (*Edu2*) is reported as 0.996, indicating an actual average of 2.705 hours. This indicates that accounting executives have, on average, acquired around 2.705 hours of education in the relevant field. Additionally, 59.1% of the companies with R&D expenditures constituted the data.

**Table 1.** Descriptive statistics

| Variables | Mean | STD | Q1 | Median | Q3 |
|---|---|---|---|---|---|
| Diff | 0.051 | 0.138 | 0.006 | 0.019 | 0.053 |
| Edu1 | 0.826 | 1.368 | 0.000 | 0.000 | 1.609 |
| Edu2 | 0.996 | 1.423 | 0.000 | 0.000 | 1.946 |
| R&D | 0.591 | 0.492 | 0.000 | 1.000 | 1.000 |

*Note*: *Diff* = Absolute value of the difference between pre- and post- audited net income divided by post-audited net income; *Edu1* = the education hours of internal accounting managers; *Edu2* = the education hours of accounting executives; *R&D* = 1 if a firm makes R&D investments, 0 otherwise;

Table 2 presents a Pearson correlation among variables. The correlation between *Diff* and *Education 1(2)* is negative. The correlation between the variable *Diff* and *Edu1(2)* is negative. However, no statistically significant correlation is observed between the variable *Diff* and *Edu1*. Given the fact that no control variables are considered, it is necessary to conduct multiple regression analysis. This will allow us to investigate the association while also controlling for the effect that other variables may have.

**Table 2.** Pearson correlation

| Variables | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| (1) Diff | 1.000 | –0.018 | –0.024 | 0.017 |
| | | 0.203 | 0.092 | 0.159 |
| (2) Edu1 | | 1.000 | 0.685 | –0.065 |
| | | | <.0001 | <.0001 |
| (3) Edu2 | | | 1.000 | –0.068 |
| | | | | <.0001 |
| (4) R&D | | | | 1.000 |
| | | | | |

*Note*: *Diff* = Absolute value of the difference between pre- and post-audited net income divided by post-audited net income; *Edu1* = the education hours of internal accounting managers; *Edu2* = the education hours of accounting executives; *R&D* = 1 if a firm makes R&D investments, 0 otherwise.

The analysis results for the first hypothesis are presented in Table 3. Panel A and B display the regression result of education hours of ICS and accounting managers on manager-auditor difference. In panel A and B, the education hours of internal accounting managers (*Edu1*) and accounting executives (*Edu2*) show the statistically significant negative value of 0.003 and 0.002, respectively.

The findings of this study highlight the significance of providing regular training to enhance the competency and qualification of ICS personnel. This is consistent with the result of Kim and Jung (2020) that the experience and education of accounting managers are negatively related to audit hours. Consequently, companies that have ICS and accounting managers with higher education hours who effectively oversee the ICS procedures can enhance the efficiency and effectiveness of the ICS mechanism. In line with the first hypothesis, the findings show that higher education hours for both internal accounting managers and accounting executives are positively associated with improved financial statements, thereby reducing audit adjustments.

**Table 3.** Regression analysis on the relationship between education hours of ICS managers and auditor-manager disagreement

| Variables | Panel A | | Panel B | |
|---|---|---|---|---|
| | Coeff. | t-stat. | Coeff. | t-stat. |
| Intercept | 0.077 | 1.48 | 0.063 | 1.22 |
| Edu1(2) | –0.003 | –2.54*** | –0.002 | –2.61*** |
| Size | –0.001 | –0.29 | –0.001 | –0.35 |
| Lev | 0.019 | 1.76* | 0.018 | 1.65* |
| Roa | –0.010 | –0.88 | –0.012 | –1.03 |
| Growth | 0.027 | 5.76*** | 0.028 | 5.91*** |
| Ocf | –0.151 | –7.27* | –0.153 | –7.36*** |
| Loss | 0.009 | 1.86 | 0.009 | 1.89 |
| Big | –0.002 | –0.31 | –0.001 | –0.19 |
| First | 0.010 | 2.20** | 0.010 | 2.28** |
| Ah | –0.014 | –2.01** | –0.014 | –1.93** |
| Af | 0.011 | 1.76* | 0.011 | 1.83 |
| Mkt | –0.007 | –1.42 | –0.008 | –1.59 |
| Ind | Included | | Included | |
| Yrd | Included | | Included | |
| F-value | 8.87*** | | 8.88*** | |
| Adj. $R^2$ | 0.036 | | 0.034 | |
| Observations | 5,007 | | 5,007 | |

*Note*: 1) ** and *** indicate significance at the 5% and 1% levels. 2) Variable definition: *Edu1* = the education hours of internal accounting managers; *Edu2* = the education hours of accounting executives; *Size* = natural logarithm of total assets; *Lev* = total liabilities divided by total assets; *Roa* = net income divided by total assets; *Growth* = (total assets in the current year – total assets in the previous year) / total assets in the current year; *Ocf* = cash flow from operation/total asset; *Loss* = 1 if the firm-year reports net loss, and 0 otherwise; *Big* = 1 if the firm-year is audited by one of the Big4 audit firms; *First* = 1 if the firm changed the audit firm; *Ah* = natural logarithm of total audit hours; *Af* = natural logarithm of total audit fees; *Mkt* = 1 if the firm is included in the KOSPI market, 0 otherwise; *Ind* = industry dummy variables; *Yrd* = year dummy variables.

Table 4 shows the result of regression analysis on examining the effect of R&D investment on the relationship between education hours of both internal accounting managers and accounting executives and manager-audit disagreement. Panel A of Table 6 displays the result of internal accounting managers' education hours, while panel B provides the result of accounting executives' education hours. In panel A, the coefficient of R&D investment is 0.025, indicating statistically significant at the 5% level. The interaction variable of Education1 and R&D investment shows a negative coefficient of –0.005, which is also statistically significant at 5%. In panel B, the coefficient of R&D shows a positive value of 0.012, which is statistically significant. The interaction variable of education hours of accounting executives and R&D investment shows a negative value of –0.003, statistically significant at 5%.

Companies that engage in R&D investments often face uncertainty in their business operations. Managers may use R&D investments to manage earnings (Barber et al., 1991; Perry & Grinaker, 1994), yielding a greater degree of disagreement between managers and auditors. However, the presence of highly educated ICS managers can mitigate the potential for managerial manipulation. If ICS managers gain the necessary knowledge and skills to monitor and control financial reporting processes effectively, companies are likely to experience lower levels of conflict between managers and auditors.

**Table 4.** Regression analysis of the impact of R&D investment on the relationship between education hours of ICS managers and manager-auditor disagreement

| Variables | Panel A | | Panel B | |
|---|---|---|---|---|
| | Coeff. | t-stat. | Coeff. | t-stat. |
| Intercept | 0.069 | 1.31 | 0.054 | 1.04 |
| Edu1(2) | –0.001 | –0.88 | –0.001 | –0.90 |
| R&D | 0.025 | 2.07** | 0.012 | 1.73* |
| Edu1(2) * R&D | –0.005 | –2.12** | –0.003 | –1.99** |
| Size | –0.001 | –0.36 | –0.001 | –0.27 |
| Lev | 0.017 | 1.60* | 0.018 | 1.67* |
| Roa | –0.010 | –0.88 | –0.012 | –1.01 |
| Growth | 0.028 | 5.82*** | 0.028 | 5.90*** |
| Ocf | –0.149 | –7.20*** | –0.154 | –7.40*** |
| Loss | 0.009 | 1.90** | 0.009 | 1.87* |
| Big | –0.001 | –0.18 | –0.001 | –0.16 |
| First | 0.010 | 2.21** | 0.010 | 2.29** |
| Ah | –0.014 | –1.96** | –0.014 | –1.97** |
| Af | 0.010 | 1.76* | 0.011 | 1.85** |
| Mkt | –0.008 | –1.58 | 0.054 | 1.04* |
| Ind | Included | | Included | |
| Yrd | Included | | Included | |
| F-value | 8.37*** | | 8.36*** | |
| Adj. $R^2$ | 0.037 | | 0.037 | |
| Observations | 5,007 | | 5,007 | |

*Note*: 1) *** indicates significance at the 1% level. 2) See equations (1) and (2) for variable definitions.

Table 5 presents the results of additional tests examining the impact of Big4 and non-Big4 accounting firms. The companies in the sample are divided into two groups based on the auditor: the companies audited by Big4 accounting firms and other companies audited by non-Big4 accounting firms. In panel A of Table 5, the coefficient of *Edu1* shows a negative value of 0.007, which is statistically significant at the 1% level. However, among the companies audited by


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Big4 accounting firms, the variable *Edu1* shows a positive value with no statistical significance. In Panel B, under the non-Big4 category, the coefficient of *Edu2* exhibits a statistically significant negative value of 0.003 at the 1% level. However, for the Big4 category, the coefficient of *Edu2* is positive and not statistically significant. Companies audited by Big 4 accounting firms exhibit characteristics such as larger size, higher market value of equity, lower bankruptcy risk, and greater stock volatility and complexity. Conversely, companies audited by non-Big 4 accounting firms tend to have smaller market value and total assets but show higher profitability, leverage, and lower levels of discretionary accruals and current assets (Lawrence et al., 2011). The research findings indicate that in companies audited by non-Big 4 firms, where accounting systems may be less developed, the education hours of both ICS and accounting managers play a critical role. This emphasizes the significance of having experienced accounting personnel in non-Big 4 accounting firms.

**Table 5.** The result of additional tests

| Panel A. Internal accounting managers | | | | |
|---|---|---|---|---|
| **Variables** | **Big4** | | **Non-Big4** | |
| | **Coeff.** | **t-stat.** | **Coeff.** | **t-stat.** |
| Intercept | 0.032 | 0.630 | 0.197 | 2.010*** |
| Edu1 | 0.002 | 1.620 | –0.007 | –3.420*** |
| Control variables | Included | | Included | |
| Ind | Included | | Included | |
| Yrd | Included | | Included | |
| F-value | 4.39*** | | 7.47*** | |
| Adj. $R^2$ | 0.039 | | 0.047 | |
| Observations | 2,360 | | 2,647 | |

| Panel B. Accounting executives | | | | |
|---|---|---|---|---|
| **Variables** | **Big4** | | **Non–Big4** | |
| | **Coeff.** | **t-stat.** | **Coeff.** | **t-stat.** |
| Intercept | 0.040 | 0.810 | 0.175 | 1.800* |
| Edu2 | 0.001 | –0.350 | –0.003 | –2.710*** |
| Control variables | Included | | Included | |
| Ind | Included | | Included | |
| Yrd | Included | | Included | |
| F-value | 4.29*** | | 7.27*** | |
| Adj. $R^2$ | 0.037 | | 0.045 | |
| Observations | 2,360 | | 2,647 | |

*Note*: 1) *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

The result of this study shows that companies' investments in the education of ICS managers contribute to an increased accuracy in financial statement preparation, ultimately leading to a decrease in disagreements between manager and auditor. This suggests that the presence of ICS managers with higher levels of education equips companies with the capability to produce reliable initial financial statements. To assess whether the impact of ICS managers' education within the companies is influenced in companies with greater complexity, the analysis considers the companies' R&D investment. The results imply investment in human resources contributes to a more transparent and accurate financial reporting process to address uncertainties related to R&D activities.

Previous research has focused on the outcomes of ICS and the existence of ICS-related material weaknesses in companies. The challenge with the current research relative to ICS weaknesses is that it is underpinned by the dichotomous assumption that all organizations with reported ICS difficulties are functioning at the same level. In other words, even if a company admits that it has significant weaknesses in its ICS, it does not indicate that its degree of functioning ICS will be the same as the operating level of ICS at other companies. As a result, it is essential to analyze the operational degree of ICS across different companies. Additionally, prior research on ICS has primarily centered around human resource investments, specifically in terms of dedicated personnel, Certified Public Accountants (CPA), and domain experts. In contrast, studies investigating education hours in the context of ICS are scarce (Jung et al., 2021). As such, this study stands out by shedding light on previously unexplored aspects of ICS, specifically delving into the effects of dedicated department and educational investments, which have received limited attention in the current body of literature. This research investigated how the educational attainment of ICS managers positively influences the quality of financial reporting, particularly in complex business environments like those involving R&D. The findings of this study corroborate Koo (2020), indicating that skilled IC personnel can enhance effective control and operations within companies.

## CONCLUSION

This study's purpose is to examine the influence of educational investment in ICS managers and its consequential effects on financial reporting, with a particular emphasis on firms engaged in R&D. In other words, the results imply that in companies with adequate and skilled ICS managers, errors in financial information and fraudulent activities by management are effectively suppressed. As a result, the quality of financial statements improved before audit, leading to reduced disagreement between managers and auditors. The results underscore the effectiveness of the qualitative characteristics of ICS in achieving the objectives of IC mechanisms, specifically in facilitating transparent and reliable financial reporting disclosures. Furthermore, the observed improvement in the quality of financial statements in companies that enhance the qualitative aspects of their internal accounting personnel supports the validity of the amendment to the External Audit Act, which emphasizes accountability for audited companies. Additionally, this relationship is verified in companies with a strategic focus on R&D investments, characterized by inherent uncertainty and information asymmetry. This study has several contributions to the industry, market, and investor decision-making. First, the findings suggest that companies can strengthen their ICS by investing in the education of ICS personnel. This, in turn, can contribute to minimizing manager-auditor disagreements, ensuring more accurate financial statement preparation. Industries, especially those engaged in research and development, can benefit from implementing robust education programs for ICS managers, fostering a culture of transparency and reliability in financial reporting. Second, for the market, investors rely heavily on the accuracy and reliability of financial statements when making investment decisions. Companies that invest in the education of ICS personnel may experience reduced manager-auditor disagreements, signaling a commitment to transparent financial reporting. This enhanced credibility can positively influence market confidence, attracting investors and potentially improving stock performance. Third, as shown in this study, ICS managers can act as a mitigating factor in offsetting risks associated with uncertainties in financial reporting, particularly in industries with R&D investments. Investors can use this insight to assess a company's risk management strategies, considering the education level of ICS managers.

## AUTHOR CONTRIBUTIONS

Conceptualization: Suyon Kim.
Data curation: Suyon Kim.
Formal analysis: Suyon Kim.
Funding acquisition: Suyon Kim.
Investigation: Suyon Kim.
Methodology: Suyon Kim.
Project administration: Suyon Kim.
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