

Article

Impact of Firm and CEO Characteristics and COVID-19 on SMEs' Earnings Management

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Abstract

This study investigated the effects of firm characteristics (external investment and co-CEO structures), managerial characteristics (CEO's experience and age), and COVID-19 on earnings management in small- and medium-sized enterprises (SMEs). Examining the data of 18,873 Korean SMEs between 2015 and 2020, this study determined the factors influencing discretionary accruals in SMEs. Discretionary accruals were estimated using firms' financial statements, and the effects of firm and CEO characteristics on the magnitude of the absolute value of discretionary accruals were estimated using random effects panel regression models. The results revealed that SMEs with co-CEO structures (vs. those with single-CEO structures), those led by more experienced CEOs (vs. those with less experienced CEOs), and those led by older CEOs (vs. those with younger CEOs) engage in less earnings management. Conversely, SMEs with external investors engage in greater earnings management than those without external investors. The results also showed that SMEs engaged in less earnings management during the COVID-19 period than during non-COVID-19 periods. Overall, this study is significant because it focuses on SMEs, a group often overlooked in earnings management research, and provides empirical evidence of how COVID-19, a global economic shock, influenced SMEs' earnings management practices.



Academic Editors: Rute Maria Gomes Abreu and Hualiang Lu

Received: 1 July 2025

Revised: 11 August 2025

Accepted: 27 August 2025

Published: 29 August 2025

Citation: Kim, K.S.; Oh, I. Impact of Firm and CEO Characteristics and COVID-19 on SMEs' Earnings Management. *Systems* **2025**, *13*, 747. <https://doi.org/10.3390/systems13090747>

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Keywords: earnings management; COVID-19; SMEs; Korea

1. Introduction

The accounting information provided by companies serves not only as a measure of corporate performance but also as essential data for predicting future growth. To effectively aid stakeholders in making informed decisions about a company, such information must be reliable and transparent. The transparency and reliability of accounting information are closely tied to earnings quality [1].

High earnings quality reflects accurate and consistent reporting of a company's financial position and signals a sustainable business model that can withstand economic shocks while maintaining stakeholder trust. Corporate sustainability, whether in the form of economic resilience, governance integrity, or ethical transparency, is closely linked to the credibility of reported earnings. Companies with strong governance and ethical standards are more likely to adopt accounting practices that limit earnings management and enhance the decision usefulness of financial statements [2]. Sustainable firms also tend to prioritize long-term value creation over short-term profit maximization, which supports higher earnings quality and fosters investor confidence [3]. Given its role in building trust and

enabling sustainable growth, earnings quality is equally critical for small- and medium-sized enterprises (SMEs), where resource constraints heighten the need for credible and transparent financial reporting. However, studies on earnings quality have predominantly focused on large listed firms, and relatively little attention has been paid to SMEs [4–6]. This is primarily because most SMEs are privately held, exempt from external audits, or not required to disclose corporate information, including accounting data. (In fact, according to the National Tax Service [7], nearly 730,000 out of approximately 760,000 SMEs in South Korea are not obligated to disclose their accounting information.)

To influence stakeholders' decision-making, companies sometimes use managerial discretion in reporting their financial performance. This process, known as earnings management, refers to the deliberate intervention by management to inflate or deflate current-year earnings in the financial information presented to external parties [8]. Earnings management may arise from various incentives, including the desire to meet earnings forecasts, avoid covenant violations, or secure performance-based compensation [9]. Managers may manipulate reported earnings to influence stakeholders' perceptions and maintain favorable evaluations in capital or labor markets. Such manipulation can occur through accrual-based accounting decisions, such as adjusting depreciation or provisions, or through real activities, including altering production volumes, offering aggressive sales discounts, or delaying discretionary expenditures [10].

Engaging in earnings management can be driven by various incentives, such as loss avoidance, income smoothing, and executive compensation. However, for earnings management to serve its purpose, it must be difficult for stakeholders to detect whether the company is engaging in such practices [11]. Notably, the likelihood of earnings management decreases when robust internal and external monitoring, surveillance, and control systems are in place. Thus, external stakeholders, such as investors, and internal stakeholders, such as co-CEOs, play critical roles in overseeing and potentially deterring earnings management.

Whether to engage in earnings management (implicit or explicit) ultimately stems from managerial decision-making. As CEOs operate on behalf of the company and are responsible for critical decisions, their personal characteristics significantly influence how they perceive the firm's circumstances and decide management strategies [12]. Consequently, managerial attributes also play a key role in reporting financial status and business performance.

The external environment also impacts the likelihood of earnings management. During exogenous shocks, such as economic crises, capital market uncertainty increases and information asymmetry between providers and users of accounting information worsens. These conditions make it easier for firms to engage in earnings management [13,14]. One such incidence was the COVID-19 pandemic. First reported in China in December 2019, the disease rapidly spread worldwide and significantly disrupted the global economy. These impacts were likely more pronounced for SMEs, as they typically have a lower capacity to adapt to environmental changes.

As SMEs tend to have fewer external stakeholders, they face less pressure to disclose their financial performance to external parties. They are often managed by their owners rather than professional managers, which increases the likelihood of discretionary interventions in accounting policy decisions [15]. Furthermore, their operating environment differs from that of large corporations because they receive government support in the form of protection policies and support measures. Differences in accounting systems and personnel management lead to distinct accounting practices and behaviors compared with those in large companies. These structural characteristics may lead to the neglect of accounting transparency in SMEs.

Therefore, this study analyzed the effects of firm characteristics (particularly the presence of external investors and a co-CEO structure), managerial characteristics (particularly the experience and age of the CEO), and external environment factors (specifically the COVID-19 pandemic) on the likelihood of earnings management in SMEs.

The contributions of this study can be summarized as follows. While numerous prior studies have examined the impact of firm and CEO characteristics on earnings management, their findings often differ depending on contextual factors such as country, industry, or firm size [2]. For example, Leuz et al. [16] investigated the influence of outside investors on earnings management across 31 countries and identified cross-country differences in the extent of such effects depending on national institutional frameworks. Regarding the co-CEO structure, prior research has examined its effect on earnings management in U.S. listed firms [17]. With respect to CEO characteristics, Chou and Chan [18] analyzed how CEO age and experience affect earnings management in the U.S. banking industry, while Le et al. [19] explored the same relationship in listed real estate firms in Vietnam. However, these studies have primarily relied on data from listed firms due to data availability constraints. This study contributes to the literature by providing empirical evidence from Korean SMEs, an area where research has been limited due to the lack of mandatory public disclosure of accounting information. It addresses this limitation by employing a reliable and comprehensive dataset from the corporate database of the Korea Credit Guarantee Fund, which contains both qualitative and quantitative data on a large number of Korean SMEs. In the context of COVID-19, existing research has examined its impact on earnings management in European countries and China [20,21], yet studies focusing on Korean SMEs remain scarce, thereby making this study a timely and unique contribution.

Figure 1 illustrates the research framework of this study.

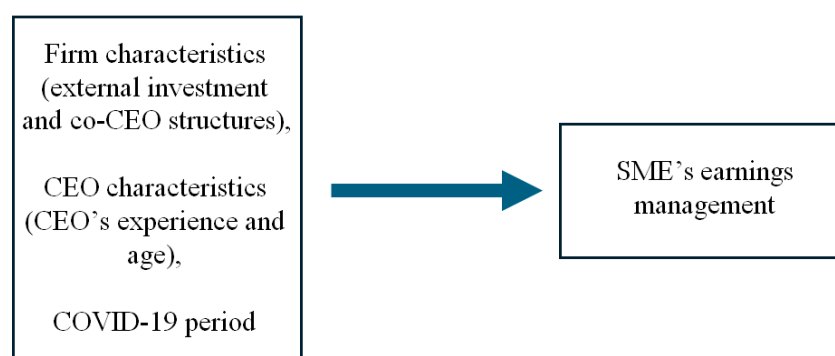


Figure 1. Research framework.

2. Literature Review and Hypothesis Development

2.1. SMEs and Earnings Management

Schipper [8] defined earnings management as management's intentional intervention in the financial reporting process to derive private benefits. Similarly, Healy and Wahlen [9] described it as the discretionary adjustment of financial reporting to mislead stakeholders about a firm's financial performance or influence contractual outcomes based on reported earnings. However, detecting the presence or magnitude of earnings management can be challenging. To address this, previous studies have evaluated discretionary accruals (DA) as a proxy for identifying earnings management [1,22]. Discretionary accruals arise when managers opportunistically adjust financial accounts, such as receivables, inventory assets, or payables, within the boundaries of accounting standards to suit their objectives [23].

Most SMEs are privately held, with corporate governance typically concentrated in the hands of a few major owners. Directly or indirectly, these shareholders are often involved in the firm's management. This gives them privileged access to internal company information

and an active role in decision-making [24]. Consequently, financial reporting in privately held SMEs is often influenced more by internal considerations, such as tax reporting and dividend policies, than by the informational needs of external capital providers [25,26]. Given this structure, SMEs face lower demand for high-quality financial reporting. To shareholders, the financial information provided by SMEs may hold less significance than that provided by large corporations. This disparity may increase the likelihood of earnings management in SMEs [11].

2.2. Firm Characteristics and Earnings Management

2.2.1. External Investment and Earnings Management

The impact of external investment on earnings management has shown mixed results in prior research. Some studies suggest that external investors in SMEs may seek to recover their investments through IPOs or M&As and therefore have incentives to inflate firm value through earnings management [27,28]. On the other hand, there is also evidence pointing in the opposite direction. External investors, such as venture capitalists, are adept at identifying firms with high growth potential and contribute to their development through various activities, such as providing management consultation and technical guidance and overseeing operations [29–31]. Schipper [8] and Chung et al. [32] argued that the presence of institutional investors, such as venture capitalists, can mitigate earnings management. Empirical evidence from Korea aligns with these findings. For example, Choi and Seo [33] found that higher institutional ownership is associated with decreased earnings management. Similarly, Lee and Lee [34] found that, in publicly listed firms, higher institutional ownership increases the incentive and capacity for monitoring and oversight, which reduces earnings management.

Based on this discussion, we posit that SMEs with external investors (vs. those without external investors) may exhibit different levels of earnings management, resulting in different magnitudes of discretionary accruals.

It should be noted that in our analysis, we used the absolute value of discretionary accruals to measure earnings quality. This value reflects the extent to which reported earnings have been adjusted, either upward or downward. A higher absolute value indicates greater adjustments and, consequently, lower earnings quality. Numerous studies have employed the absolute value of discretionary accruals as a proxy for assessing earnings quality [35–37]. Accordingly, we formulated the following hypothesis:

Hypothesis 1. *The absolute value of discretionary accruals differs between SMEs with external investors and those without external investors.*

2.2.2. Co-CEO Structure and Earnings Management

A co-CEO structure is a management system in which a company has two or more CEOs. Alvarez and Svejnova [38] analyzed the prevalence and formation processes of co-CEO structures across approximately 70 companies worldwide. They found that the co-CEO structure serves as a desirable alternative to traditional management systems. Similarly, Kandel and Lazear [39] argued that the mutual checks and balances inherent in a co-CEO structure can mitigate the unilateral behavior of an individual agent. In companies with a co-CEO structure, responsibilities are often shared or divided among co-CEOs, and decisions are made collaboratively. This fosters the exchange of diverse perspectives and information, which complements unilateral decision-making and enhances oversight through mutual checks and balances. Choi et al. [40] found that companies with co-CEO structures exhibit greater financial reporting quality, as observed by external auditors. Additionally, Lee et al.'s [41] study involving publicly traded firms in South Korea found that companies with co-CEO structures have lower levels of earnings management than those with single-CEO

structures. On the other hand, there is also research suggesting the opposite effect. For example, some studies find that when co-CEOs have aligned incentives (for example, in the context of family ownership), their cooperation may strengthen internal control but also increase earnings management, ultimately lowering earnings quality [42,43].

Similarly, in the context of SMEs, co-CEO structures may promote rational decision-making by enabling information sharing, mutual consultation, and oversight. However, when strong incentive alignment exists between co-CEOs, it may also increase the likelihood of opportunistic behavior, including earnings management. This duality suggests that the relationship between co-CEO structures and earnings management is not necessarily straightforward.

Accordingly, we propose the following hypothesis:

Hypothesis 2. *SMEs with co-CEO structures exhibit a different level of discretionary accruals compared to those with single-CEO structures.*

2.3. Managerial Characteristics and Earnings Management

CEO characteristics may influence a firm's financial reporting behavior, including the propensity to engage in earnings management. Agency theory assumes a conflict of interest between owners and managers due to the separation of ownership and control, suggesting that managers may use earnings management to pursue personal benefits such as compensation or job security [44]. In contrast, stakeholder theory emphasizes the importance of addressing the needs of a broader set of stakeholders, leading managers to consider long-term outcomes and organizational legitimacy [45]. The influence of CEO characteristics on earnings management can vary depending on which theoretical lens is applied. Factors such as CEO age and experience may affect how managerial discretion is exercised in this context.

2.3.1. CEO Experience and Earnings Management

Friedman and Krackhardt [46] suggested that managers with more experience possess greater problem-solving skills because of their accumulated knowledge and expertise. Additionally, their ability to communicate effectively contributes to better performance outcomes. Studies on CEO tenure, which is often used as a proxy for managerial experience, have shown that long-tenured CEOs adopt more conservative accounting practices and engage in less aggressive discretionary accruals than short-tenured CEOs [47]. Ali and Zhang [48] elaborated that short-tenured CEOs are more likely to inflate reported earnings than their long-tenured counterparts.

Park [49] investigated CEO tenure and forecasting behavior in publicly listed Korean firms and found that short-tenured CEOs are more inclined to disclose forecast information to signal their capabilities. This behavior was interpreted as an attempt to build a reputation, which may also incentivize upward earnings management. Similarly, in SMEs, more experienced CEOs (vs. those with less experience) are expected to exhibit less overconfidence and adopt more conservative accounting practices. From an agency theory perspective, greater experience may mitigate opportunistic incentives by enabling CEOs to better align their actions with shareholder interests. From a stakeholder theory perspective, experienced CEOs may place greater emphasis on sustaining trust and long-term relationships with various stakeholders. Based on this rationale, the following hypothesis was proposed:

Hypothesis 3. *The absolute value of discretionary accruals is lower in SMEs with more experienced CEOs than those with less experienced CEOs.*

2.3.2. CEO Age and Earnings Management

CEO age is a proxy variable encompassing the CEO's experience, career, and accumulated intellectual capacity, all of which significantly influence decision-making [50–52].

Older CEOs tend to exhibit more conservative management behaviors, such as avoiding excessive capital expenditure, maintaining low debt levels, and holding higher cash reserves [53]. Similarly, studies on managerial characteristics and disclosure behavior have shown that older managers adopt more conservative disclosure practices, including less frequent disclosures [50].

Huang et al. [51] argued that managers' age is a crucial factor affecting earnings quality alongside firm-specific characteristics, such as size, growth, and corporate governance. Their empirical analysis demonstrated that older CEOs are more conservative and ethical, making them less likely to engage in earnings management. Similarly, studies on Korean listed companies have revealed that older CEOs are associated with lower absolute values of discretionary accruals (i.e., higher earnings quality) [54].

Given these tendencies, older CEOs are expected to exhibit greater stability and risk aversion, which would also influence their accounting decisions. From an agency theory perspective, increased age may reduce opportunistic incentives by aligning managerial behavior more closely with shareholder interests. From a stakeholder theory perspective, older CEOs may prioritize maintaining trust and fulfilling the expectations of a broader set of stakeholders, which can encourage more conservative reporting. Based on this reasoning, we hypothesized that SMEs led by older CEOs engage in less earnings management, resulting in lower absolute values of discretionary accruals. Accordingly, the following hypothesis was developed:

Hypothesis 4. *The absolute value of discretionary accruals is lower in SMEs with older CEOs than in SMEs with younger CEOs.*

2.4. COVID-19 and Earnings Management

COVID-19 caused widespread disruptions worldwide. From early 2020, many countries implemented nationwide lockdowns, which restricted the movement of people and goods and caused a worldwide decline in production and economic activity. In South Korea, strict social distancing measures and heightened uncertainty significantly worsened the business environment and reduced production, consumption, and employment. Studies have shown that economic crises and increased uncertainty in capital markets exacerbate the information asymmetry between financial information providers and users, creating conditions conducive to opportunistic financial reporting [13,14]. Choi and Cho [55] argued that for certain industries in Korea, COVID-19 was not only a critical event threatening corporate survival but also a factor that increased the prevalence of discretionary accounting practices due to the rise in external shocks and non-accounting information. Additionally, heightened market volatility and deteriorating corporate performance likely motivated managers to engage in earnings management.

On the other hand, COVID-19 may have had effects in the opposite direction. In response to the unprecedented decline in corporate investment and surge in unemployment caused by the pandemic, governments around the world implemented expansive monetary policies along with large-scale fiscal support for businesses [56–58]. In Korea, the government provided substantial financial assistance to SMEs to prevent mass bankruptcies and rising unemployment [59], which may have reduced incentives for earnings management among these firms. Another explanation is the “cookie jar” hypothesis, which suggests that since the pandemic was widely perceived as an exogenous shock unrelated to managerial decisions, managers were able to attribute poor firm performance to external factors [60].

This situation provided an opportunity to either refrain from engaging in earnings management during the pandemic or conduct downward earnings management to create reserves for future income smoothing.

Based on the context of the COVID-19 pandemic, we consider the possibility that SMEs may have exhibited different earnings management behavior compared to non-COVID-19 periods. Specifically, we examine whether the absolute value of discretionary accruals differed between the two periods.

Hypothesis 5. *The absolute value of discretionary accruals in SMEs differs between the COVID-19 period and non-COVID-19 periods.*

3. Methods

3.1. Data Source and Sample

This study used data from the corporate database of the Korea Credit Guarantee Fund. The Korea Credit Guarantee Fund (KCGF), established in 1976 in South Korea, is a public institution that provides credit guarantees to SMEs when they borrow funds from banks. Although most SMEs lack authoritative accounting information, the KCGF regularly updates its corporate database by evaluating the creditworthiness of SMEs during each transaction with banks. Consequently, it is recognized as the largest and most reliable source of qualitative and quantitative data on SMEs in South Korea.

We sourced the data of Korean SMEs whose financial statements were available for at least three consecutive years between 2013 and 2020. Firms meeting the following conditions were excluded to enhance comparability and ensure data reliability. First, companies in the financial and insurance industries were excluded due to significant differences in their financial statements and accounting practices compared to non-financial industries. Second, since most SMEs close their accounts in December, firms with fiscal year-ends other than December were excluded to minimize the impact of differences in fiscal periods. Third, firms with total assets below KRW 5 billion—equivalent to approximately USD 3.66 million based on the 2024 average exchange rate of 1365.2 KRW per USD—were excluded, as they tend to have incomplete data. Additionally, firms with missing values for key variables (e.g., total liabilities and paid-in capital) were removed. All monetary values were adjusted to 2015 levels using a GDP deflator. To control for outliers, firms in the top and bottom 1% of discretionary accrual estimates across the database were excluded.

The final sample comprised 18,873 SMEs with a total of 37,301 firm-year observations, and the analysis period was from 2015 to 2020 (We extracted data pertaining to the period from 2013 to 2020. However, the analysis period was from 2015 to 2020 because some variables required t-2 data). Table 1 presents the industry composition of the sample, categorized using 2-digit standard industrial classification codes.

3.2. Measurement of Discretionary Accruals

3.2.1. Modified Jones Model

Dechow et al. [61] improved upon the traditional Jones Model [62] and developed the Modified Jones Model. Whereas the original model considers only the change in sales, the Modified Jones Model subtracts the change in receivables from the change in sales to account for credit sales that may not be realized as cash. Under the Modified Jones Model, discretionary accruals for company i and year t are calculated using the residuals derived from Equation (1), where parameters (β_1 and β_2) are estimated using linear regression for

each year and for each industry. These residuals are then used to compute discretionary accruals, as shown in Equation (2).

$$TA_{i,t}/A_{i,t-1} = \beta_1[(\Delta REV_{i,t} - \Delta REC_{i,t})/A_{i,t-1}] + \beta_2(PPE_{i,t}/A_{i,t-1}) + \varepsilon_{i,t} \quad (1)$$

where

$TA_{i,t}$: Total Accruals for year t {Net Income $_t$ – Operating Cash Flow $_t$ },
 $\Delta REV_{i,t}$: Change in Sales in year t (Sales $_t$ – Sales $_{t-1}$),
 $\Delta REC_{i,t}$: Change in Receivables in year t (Receivables $_t$ – Receivables $_{t-1}$),
 $PPE_{i,t}$: Property, Plant, and Equipment subject to depreciation in year t ,
 $A_{i,t-1}$: Total Assets in year $t - 1$,
 $\varepsilon_{i,t}$: Residual term for year $t - 1$.

$$DA_{i,t}^{MJ} = TA_{i,t}/A_{i,t-1} - [\hat{\beta}_1\{(\Delta REV_{i,t} - \Delta REC_{i,t})/A_{i,t-1}\} + \hat{\beta}_2(PPE_{i,t}/A_{i,t-1})] \quad (2)$$

where

$DA_{i,t}^{MJ}$: Discretionary Accruals estimated using modified Jones model.

Table 1. Industry composition of the sample.

Industry Classification	Number of Observations	Proportion (%)
01. Agriculture, Forestry, Fishing, and Mining	133	0.4
Manufacturing	19,636	52.6
02. Food, Beverages, Tobacco	1270	3.4
03. Textiles, Apparel, Leather, Bags, Shoes	1447	3.9
04. Wood, Timber, Furniture	563	1.5
05. Paper, Printing, Media Duplication	696	1.9
06. Petroleum, Chemicals, Rubber, Non-metal Minerals	3689	9.9
07. Primary Metals, Metal Processing	3673	9.8
08. Electronics, Electrical, Communication, Medical Equipment	3000	8.0
09. Automotive, Machinery, Transportation Equipment	5298	14.2
10. Electricity, Gas, Water, Recycling, etc.	514	1.4
11. Construction	3422	9.2
12. Wholesale	8781	23.5
13. Retail	1121	3.0
14. Transportation and Other Services	2470	6.6
15. Knowledge-based and Manufacturing-related Services	1224	3.3
Total	37,301	100.0

3.2.2. Performance-Matched Modified Jones Model

To account for the influence of firm performance on accruals measurements, Kothari et al. [63] extended the Modified Jones Model by introducing a variable for return on assets (ROA) and adding an intercept. This performance-matched model provides a more nuanced approach to estimating discretionary accruals.

Under this model, discretionary accruals are estimated using the residuals derived from Equation (3), which includes the previous year's ROA and a constant term (α_0). The discretionary accruals are then calculated using Equation (4).

$$TA_{i,t}/A_{i,t-1} = \alpha_0(1/A_{t-1}) + \beta_1\{(\Delta REV_{i,t} - \Delta REC_{i,t})/A_{i,t-1}\} + \beta_2(PPE_{i,t}/A_{i,t-1}) + \beta_3ROA_{i,t-1} + \varepsilon_{i,t} \quad (3)$$

where $ROA_{i,t-1}$: $\text{Net Income}_{t-1} / \text{Total Assets}_{t-2}$.

$$DA_{i,t}^{PM} = TA_{i,t} / A_{i,t-1} - [\hat{\alpha}_0(1/A_{t-1}) + \hat{\beta}_1\{(\Delta REV_{i,t} - \Delta REC_{i,t}) / A_{i,t-1}\} + \hat{\beta}_2(PPE_{i,t} / A_{i,t-1}) + \hat{\beta}_3 POA_{i,t-1}] \quad (4)$$

where

$DA_{i,t}^{PM}$: Discretionary Accruals estimated using performance matched modified Jones model.

The two models have complementary strengths and weaknesses. Consequently, many previous studies have utilized both models to ensure robust and reliable results [1,22,35,64]. Similarly, in this study, we employed both models to strengthen the robustness of our findings and enhance the credibility of the analysis. Discretionary accruals were calculated annually for each industry.

3.3. Explanatory and Control Variables and Their Measurement

Table 2 presents the definition and measurements of the explanatory and control variables.

Table 2. Definitions and measurement of variables.

Type of Variable	Name of Variable	Definition	Measurement
Explanatory variables	INVEST	Whether the firm had external investors	1 if the firm had a share premium in the statement of financial position; 0 otherwise
	COCEO	Whether the firm had co-CEOs	1 if the firm had more than one CEO; 0 otherwise
	CEOEXP	Experience of the CEO	1 if the CEO's tenure (measured using database records as the total period the individual has served as a CEO, including at the current firm and other firms) was in the top 30% among the analyzed firms; 0 otherwise
	CEOAGE	Age of the CEO	1 if the CEO's age was in the top 30% among the analyzed firms; 0 otherwise
Control variables	AUDIT	Whether the firm was externally audited	1 if the firm was externally audited; 0 otherwise
	LSIZE	Size of the firm	Natural logarithm of total assets
	LEV	Debt ratio	Total debt/total assets
	CFO	Operating cash flow	Operating cash flow/total assets
	GRW	Sales growth ratio	Year-over-year change in sales
	LAGTA	Lagged total accruals	$(\text{Net Income } t - 1 - \text{Operating Cash Flow } t - 1) / \text{Total Assets } t - 2$
	LOSS	Whether the firm incurred a loss	1 if the firm incurred a loss; 0 otherwise

INVEST was a dummy variable indicating whether the SME had a share premium (the amount above the par value when the company issues shares at a premium) in its financial position statement. The presence of a share premium was used as a proxy for the presence of external investors. This is because outside investors, such as venture capitalists, typically assess the enterprise's growth potential and calculate the enterprise value. Then, they invest in the enterprise at a price per share above the par value. COCEO was a dummy variable that represented whether the SME had a co-CEO structure. CEOEXP and CEOAGE were dummy variables indicating the CEO's experience and age, respectively. CEOEXP was assigned the value of 1 if the CEO's tenure fell within the top 30% among the analyzed firms, and 0 otherwise. CEOAGE was assigned a value of 1 if the CEO's age fell within the top 30%, and 0 otherwise. It should be noted that, in this study, we used dummy variables rather than continuous measures for both CEOEXP and CEOAGE. This decision was made for analytical convenience, as the continuous specifications did not yield statistically significant results, whereas the dummy variables demonstrated clearer

associations with the outcome. This may indicate the existence of threshold effects in the influence of these variables (as suggested in [65,66]).

Selected based on previous studies, the control variables were the presence of external auditors (AUDIT), firm size (LSIZE), debt ratio (LEV), operating cash flow (CFO), sales growth rate (GRW), lagged total accruals (LAGTA), and loss occurrence (LOSS). AUDIT reflected whether the SME underwent external auditing. This variable was included as a control variable because external audits enhance the reliability of a firm's financial information [1,22,67]. LSIZE was included as a proxy for omitted variables that may be correlated with earnings management [1,22]. LEV was included as a control variable because debt covenants can influence a firm's earnings management practices [22,68]. CFO was included as a control variable to account for potential systematic bias in the estimation of discretionary accruals. Extremely high or low levels of cash flow can cause over- or under-estimation of discretionary accruals [22,61,69,70]. GRW was included because firms with higher sales growth opportunities may have stronger incentives to manage their earnings; they may intend to meet market expectations or secure financing by engaging in earnings management [1,71,72]. LAGTA was included to control for the reversal effect of prior-period earnings management, which is inherent in the discretionary nature of accruals [1,71]. Finally, LOSS indicated whether the SME had incurred a financial loss. It was included as a control variable to control for the impact of financial distress on earnings quality [22,73].

3.4. Data Analysis

This study analyzed panel data from 18,873 SMEs, comprising a total of 37,301 firm-year observations over a five-year period. In panel regression analysis, we do not employ a fixed effects specification for two main reasons. First, our panel dataset exhibits a short-panel structure with a very large number of cross-sectional units and a very small number of time periods. In such settings, estimating a separate intercept for each unit in the fixed effects model can lead to the incidental parameters problem, which induces bias and inefficiency [74]. Second, by construction, fixed effects models remove all time-invariant explanatory variables, making it impossible to estimate the effects of key variables of interest in our analysis, such as CEO characteristics [74]. For these reasons, we did not use the fixed effects specification in our analysis. To choose between the pooled regression and random effects models, we conducted the Breusch–Pagan Lagrange Multiplier (LM) test. In all model specifications, the LM statistics were significant at the 1% level, indicating that the random effects model was preferred. Therefore, our main analysis is based on the random effects specification. Additionally, we performed a robustness check by estimating a pooled regression with clustered standard errors at the firm–year level.

4. Results and Discussion

4.1. Descriptive Statistics

Table 3 presents the descriptive statistics for the main variables. The absolute value of discretionary accruals calculated using the Modified Jones Model ($|DA^{MJ}|$) had a mean of 0.093. Similarly, the absolute value of discretionary accruals calculated using the Performance-Matched Modified Jones Model ($|DA^{PM}|$) had a mean of 0.096. On average, 11.5% (INVEST mean = 0.115) of the SMEs had external investors, and 7.7% (COCEO mean = 0.077) had a co-CEO structure.

Table 3. Descriptive statistics.

Name of Variable	Mean	Standard Deviation	Minimum	Maximum
DA ^{MJ}	0.093	0.095	0.000	0.672
DA ^{PM}	0.096	0.095	0.000	0.597
INVEST	0.115	0.320	0.000	1.000
COCEO	0.077	0.267	0.000	1.000
CEOEXP	0.301	0.459	0.000	1.000
CEOAGE	0.315	0.464	0.000	1.000
AUDIT	0.312	0.463	0.000	1.000
LSIZE	9.282	0.671	8.517	13.066
LEV	0.414	0.222	0.000	3.523
CFO	741	2464	−60,415	53262
GRW	0.580	59.719	−1.000	9093.000
LAGTA	0.036	3.417	−263.667	524.000
LOSS	0.133	0.340	0.000	1.000

4.2. Analysis of Firm Characteristics and Earnings Management

The regression analyses comprised four models. |DA^{MJ}| was the dependent variable in Models 1 and 2, while |DA^{PM}| was the dependent variable in Models 3 and 4. Models 1 and 3 included year dummy variables, whereas Models 2 and 4 incorporated a time trend variable and its square (Trend and Trend²), along with a dummy variable for the year 2020. This setup was designed to examine whether the COVID-19 pandemic, which had a significant impact on the Korean economy in 2020, caused deviations from typical trends in firms' earnings management. The labels "RE" and "CL" appended to the model names indicate the random effects panel regression and the pooled regression with clustered standard errors, respectively. Control variables and industry dummies based on industrial classification codes were included in each regression model, and this specification was applied consistently across all regression analyses (Tables 4–7). In addition, it should be noted that, for all regression models, the variance inflation factors (VIFs) for the main explanatory variables were below the conventional threshold of 10, with the highest VIF being 2.43, confirming that multicollinearity was not a concern.

4.2.1. Relationship Between the Presence of External Investors and Earnings Management

Table 4 presents the results of the regression analysis examining the relationship between the presence of external investors and the magnitude of earnings management in SMEs. The regression coefficients for INVEST were statistically significant across all models, with magnitudes ranging from 0.011 to 0.013. This indicated that SMEs with external investors (vs. those without external investors) engage in more earnings management and thus have lower earnings quality. Accordingly, Hypothesis 1 was supported.

Leuz et al. [16], using data from 31 countries, classify them by the strength of external investor protection, defined as the extent to which legal rights of outside shareholders are safeguarded and enforced, along with the quality of legal enforcement. They find that strong protection countries such as the U.K. and U.S. exhibit lower earnings management, whereas weak protection countries such as Italy and India show higher levels. In weak protection environments, outside investors often fail to constrain managerial discretion due to information asymmetry and private control benefits, and may even increase incentives to manipulate performance. This pattern may apply to Korean SMEs, where limited investor protection and weak enforcement can cause outside investors to become a source

of performance pressure rather than effective monitors. In such cases, external investors, especially when focused on short-term results, may prompt managers to increase earnings management [75,76]. For example, venture capitalists' impatience for returns can lead privately held SMEs to inflate reported earnings to align with investor demands [77].

Table 4. Results of the regression analysis of the relationship between external investment and earnings management.

Model	Model 1-RE	Model 1-CL	Model 2-RE	Model 2-CL	Model 3-RE	Model 3-CL	Model 4-RE	Model 4-CL
Dependent variable	DA ^{MJ}				DA ^{PM}			
Intercept	0.136 *** (0.011)	0.137 *** (0.017)	0.137 *** (0.011)	0.137 *** (0.017)	0.164 *** (0.011)	0.165 *** (0.018)	0.164 *** (0.011)	0.165 *** (0.018)
INVEST	0.011 *** (0.002)	0.011 *** (0.002)	0.011 *** (0.002)	0.011 *** (0.002)	0.013 *** (0.002)	0.012 *** (0.001)	0.013 *** (0.002)	0.012 *** (0.001)
AUDIT	−0.008 *** (0.002)	−0.007 (0.004)	−0.008 *** (0.002)	−0.006 (0.004)	−0.011 *** (0.002)	−0.009 * (0.004)	−0.010 *** (0.002)	−0.009 * (0.004)
LSIZE	−0.003 *** (0.001)	−0.004 * (0.002)	−0.003 *** (0.001)	−0.004 * (0.002)	−0.007 *** (0.001)	−0.007 * (0.003)	−0.007 *** (0.001)	−0.007 ** (0.003)
LEV	0.006 ** (0.003)	0.004 (0.009)	0.006 ** (0.003)	0.004 (0.009)	0.004 (0.003)	0.001 (0.007)	0.004 * (0.003)	0.001 (0.007)
CFO	0.065 *** (0.004)	0.068 ** (0.022)	0.065 *** (0.004)	0.069 ** (0.022)	0.146 *** (0.004)	0.145 *** (0.016)	0.146 *** (0.004)	0.145 *** (0.016)
GRW	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	−0.000 (0.000)	−0.000 (0.000)	−0.000 (0.000)	−0.000 ** (0.000)
LAGTA	0.000 * (0.000)	0.000 * (0.000)	0.000 * (0.000)	0.000 * (0.000)	0.000 (0.000)	0.000 * (0.000)	0.000 (0.000)	0.000 * (0.000)
LOSS	0.026 *** (0.002)	0.027 *** (0.003)	0.026 *** (0.002)	0.027 *** (0.003)	0.032 *** (0.001)	0.032 *** (0.002)	0.032 *** (0.001)	0.032 *** (0.002)
Y_20	−0.018 *** (0.002)	−0.016 *** (0.001)	−0.010 *** (0.002)	−0.008 (0.004)	−0.023 *** (0.002)	−0.021 *** (0.001)	−0.023 *** (0.002)	−0.022 *** (0.004)
Y_19	−0.008 *** (0.002)	−0.008 *** (0.001)	-	-	−0.007 *** (0.002)	−0.007 *** (0.001)	-	-
Y_18	−0.011 *** (0.002)	−0.011 *** (0.001)	-	-	−0.013 *** (0.002)	−0.013 *** (0.001)	-	-
Y_17	−0.002 (0.002)	−0.001 (0.001)	-	-	−0.007 *** (0.002)	−0.006 *** (0.001)	-	-
Y_16	−0.004 * (0.002)	−0.004 *** (0.000)	-	-	−0.009 *** (0.002)	−0.009 *** (0.000)	-	-
TREND	-	-	−0.004 *** (0.002)	−0.004 (0.004)	-	-	−0.009 *** (0.002)	−0.009 ** (0.003)
TREND2	-	-	0.001 (0.000)	0.000 (0.001)	-	-	0.002 *** (0.000)	0.002 * (0.001)
Adj.R ²	0.063	0.059	0.063	0.059	0.092	0.086	0.092	0.086

Notes. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. Figures in parentheses are standard errors. The variables Y_16–Y_20 denote year dummy variables from 2016 to 2020, respectively, with the base year being 2015. TREND and TREND2 represent the time trend variable and its squared term, respectively. Industry dummies based on 2-digit standard industrial classification codes are included in all models. The labels “RE” and “CL” appended to the model names indicate the random effects panel regression and the pooled regression with clustered standard errors, respectively.

4.2.2. Relationship Between the Presence of a Co-CEO Structure and Earnings Management

Table 5 presents the results of the regression analysis of the relationship between the presence of a co-CEO structure and earnings management in SMEs. The regression coefficients for COCEO were statistically significant in all models, with a value of −0.004. Hypothesis 2 was supported, as the results demonstrated that SMEs with co-CEO structures (vs. those with single-CEO structures) engage in less earnings management and thus report

higher earnings quality. According to Valenzuela and Zheng’s study on U.S. listed firms [17], stronger mutual monitoring among top executives serves to restrain earnings management, whereas an overly cooperative (co-opted) relationship between the CEO and executives tends to increase earnings management. In the case of Korean SMEs, however, the positive monitoring effect appears to be more pronounced than the negative cooperative effect.

Table 5. Results of the regression analysis of the relationship between a co-CEO structure and earnings management.

Model	Model 1-RE	Model 1-CL	Model 2-RE	Model 2-CL	Model 3-RE	Model 3-CL	Model 4-RE	Model 4-CL
Dependent variable	DA ^{MJ}				DA ^{PM}			
Intercept	0.124 *** (0.011)	0.124 *** (0.015)	0.125 *** (0.011)	0.125 *** (0.015)	0.149 *** (0.011)	0.151 *** (0.019)	0.149 *** (0.011)	0.151 *** (0.019)
COCEO	−0.004 * (0.002)	−0.004 ** (0.001)	−0.004 * (0.002)	−0.004 ** (0.001)	−0.004 ** (0.002)	−0.004 ** (0.001)	−0.004 ** (0.002)	−0.004 ** (0.001)
AUDIT	−0.008 *** (0.002)	−0.007 (0.004)	−0.008 *** (0.002)	−0.006 (0.004)	−0.010 *** (0.002)	−0.009 * (0.004)	−0.010 *** (0.002)	−0.009 * (0.004)
LSIZE	−0.002 (0.001)	−0.002 (0.001)	−0.002 (0.001)	−0.002 (0.001)	−0.005 *** (0.001)	−0.005 (0.003)	−0.005 *** (0.001)	−0.005 (0.003)
LEV	0.006 ** (0.003)	0.003 (0.009)	0.006 ** (0.003)	0.003 (0.009)	0.004 (0.003)	0.001 (0.007)	0.004 (0.003)	0.001 (0.007)
CFO	0.064 *** (0.004)	0.067 ** (0.023)	0.064 *** (0.004)	0.067 ** (0.022)	0.145 *** (0.004)	0.143 *** (0.016)	0.145 *** (0.004)	0.144 *** (0.016)
GRW	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	−0.000 (0.000)	−0.000 (0.000)	−0.000 (0.000)	−0.000 ** (0.000)
LAGTA	0.000 * (0.000)	0.000 * (0.000)	0.000 * (0.000)	0.000 * (0.000)	0.000 (0.000)	0.000 * (0.000)	0.000 (0.000)	0.000 * (0.000)
LOSS	0.027 *** (0.002)	0.028 *** (0.003)	0.027 *** (0.002)	0.028 *** (0.003)	0.033 *** (0.001)	0.033 *** (0.002)	0.033 *** (0.001)	0.033 *** (0.002)
Y_20	−0.018 *** (0.002)	−0.016 *** (0.001)	−0.010 *** (0.002)	−0.008 (0.004)	−0.022 *** (0.002)	−0.021 *** (0.001)	−0.023 *** (0.002)	−0.022 *** (0.003)
Y_19	−0.008 *** (0.002)	−0.008 *** (0.001)	-	-	−0.007 *** (0.002)	−0.007 *** (0.001)	-	-
Y_18	−0.011 *** (0.002)	−0.011 *** (0.001)	-	-	−0.013 *** (0.002)	−0.013 *** (0.001)	-	-
Y_17	−0.002 (0.002)	−0.001 (0.001)	-	-	−0.007 *** (0.002)	−0.006 *** (0.001)	-	-
Y_16	−0.004 * (0.002)	−0.004 *** (0.000)	-	-	−0.009 *** (0.002)	−0.009 *** (0.000)	-	-
TREND	-	-	−0.004 ** (0.002)	−0.004 (0.004)	-	-	−0.009 *** (0.002)	−0.009 ** (0.003)
TREND2	-	-	0.001 (0.000)	0.000 (0.001)	-	-	0.002 *** (0.000)	0.002 * (0.001)
Adj.R ²	0.062	0.058	0.062	0.058	0.091	0.085	0.090	0.085

Notes. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. Figures in parentheses are standard errors. The variables Y_16–Y_20 denote year dummy variables from 2016 to 2020, respectively, with the base year being 2015. TREND and TREND2 represent the time trend variable and its squared term, respectively. Industry dummies based on 2-digit standard industrial classification codes are included in all models. The labels “RE” and “CL” appended to the model names indicate the random effects panel regression and the pooled regression with clustered standard errors, respectively.

4.3. Analysis of Managerial Characteristics and Earnings Management

4.3.1. Relationship Between CEO Experience and Earnings Management

Table 6 presents the results of the regression analysis of the relationship between CEO experience and earnings management. The regression coefficient for CEOEXP was consistently −0.011 and statistically significant across all models. Hypothesis 3 was supported, as the results showed that SMEs with more experienced CEOs (vs. those with less experienced

CEOs) engage in less earnings management and thus report greater earnings quality. Chou and Chan’s study [18] also indicates that, in the U.S. banking industry, CEO experience is generally associated with reduced earnings management; however, it tends to increase earnings management in high pay–performance sensitivity banks and during periods of financial crisis.

Table 6. Results of the regression analysis of the relationship between CEO experience and earnings management.

Model	Model 1-RE	Model 1-CL	Model 2-RE	Model 2-CL	Model 3-RE	Model 3-CL	Model 4-RE	Model 4-CL
Dependent variable	DA ^{MJ}				DA ^{PM}			
Intercept	0.120 *** (0.011)	0.121 *** (0.015)	0.121 *** (0.011)	0.121 *** (0.015)	0.146 *** (0.011)	0.148 *** (0.019)	0.146 *** (0.011)	0.148 *** (0.019)
CEOEXP	−0.011 *** (0.001)	−0.011 *** (0.001)	−0.011 *** (0.001)	−0.011 *** (0.001)	−0.011 *** (0.001)	−0.011 *** (0.001)	−0.011 *** (0.001)	−0.011 *** (0.001)
AUDIT	−0.008 *** (0.002)	−0.006 (0.004)	−0.008 *** (0.002)	−0.006 (0.004)	−0.010 *** (0.002)	−0.009 * (0.004)	−0.010 *** (0.002)	−0.009 * (0.004)
LSIZE	−0.001 (0.001)	−0.001 (0.001)	−0.001 (0.001)	−0.001 (0.001)	−0.004 *** (0.001)	−0.004 (0.003)	−0.004 *** (0.001)	−0.004 (0.003)
LEV	0.006 ** (0.003)	0.003 (0.009)	0.006 ** (0.003)	0.003 (0.009)	0.004 (0.003)	0.001 (0.007)	0.004 (0.003)	0.001 (0.007)
CFO	0.064 *** (0.004)	0.067 ** (0.022)	0.065 *** (0.004)	0.068 ** (0.022)	0.145 *** (0.004)	0.144 *** (0.016)	0.145 *** (0.004)	0.144 *** (0.016)
GRW	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	−0.000 (0.000)	−0.000 (0.000)	−0.000 (0.000)	−0.000 *** (0.000)
LAGTA	0.000 * (0.000)	0.000 * (0.000)	0.000 * (0.000)	0.000 * (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 * (0.000)
LOSS	0.027 *** (0.002)	0.028 *** (0.003)	0.027 *** (0.002)	0.028 *** (0.003)	0.033 *** (0.001)	0.034 *** (0.002)	0.033 *** (0.001)	0.034 *** (0.002)
Y_20	−0.018 *** (0.002)	−0.016 *** (0.001)	−0.009 *** (0.002)	−0.008 (0.004)	−0.022 *** (0.002)	−0.021 *** (0.001)	−0.023 *** (0.002)	−0.022 *** (0.003)
Y_19	−0.008 *** (0.002)	−0.008 *** (0.001)	-	-	−0.007 *** (0.002)	−0.006 *** (0.001)	-	-
Y_18	−0.011 *** (0.002)	−0.011 *** (0.001)	-	-	−0.013 *** (0.002)	−0.013 *** (0.001)	-	-
Y_17	−0.001 (0.002)	−0.000 (0.001)	-	-	−0.007 *** (0.002)	−0.006 *** (0.001)	-	-
Y_16	−0.004 * (0.002)	−0.003 *** (0.000)	-	-	−0.009 *** (0.002)	−0.008 *** (0.000)	-	-
TREND	-	-	−0.004 ** (0.002)	−0.004 (0.004)	-	-	−0.009 *** (0.002)	−0.009 ** (0.003)
TREND2	-	-	0.000 (0.000)	0.000 (0.001)	-	-	0.002 *** (0.000)	0.002 * (0.001)
Adj.R ²	0.064	0.061	0.064	0.061	0.092	0.087	0.092	0.087

Notes. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. Figures in parentheses are standard errors. The variables Y_16–Y_20 denote year dummy variables from 2016 to 2020, respectively, with the base year being 2015. TREND and TREND2 represent the time trend variable and its squared term, respectively. Industry dummies based on 2-digit standard industrial classification codes are included in all models. The labels “RE” and “CL” appended to the model names indicate the random effects panel regression and the pooled regression with clustered standard errors, respectively.

4.3.2. Relationship Between CEO Age and Earnings Management

Table 7 presents the results of the regression analysis of the relationship between CEO age and earnings management in SMEs. The regression coefficients for CEOAGE were statistically significant and ranged from −0.009 to −0.010. Hypothesis 4 was supported, as the results demonstrated that SMEs with older managers (vs. those with younger CEOs) engage in less earnings management and thus exhibit greater earnings quality. Le et al.’s

study [19] also found that, among listed Vietnamese real estate firms from 2007 to 2016, higher CEO age was associated with lower levels of earnings management, which was attributed to the tendency of older CEOs to be more conservative and ethical.

Table 7. Results of the regression analysis of the relationship between CEO age and earnings management.

Model	Model 1-RE	Model 1-CL	Model 2-RE	Model 2-CL	Model 3-RE	Model 3-CL	Model 4-RE	Model 4-CL
Dependent variable	DA ^{MJ}				DA ^{PM}			
Intercept	0.121 *** (0.011)	0.122 *** (0.015)	0.122 *** (0.011)	0.122 *** (0.015)	0.147 *** (0.011)	0.149 *** (0.018)	0.147 *** (0.011)	0.149 *** (0.018)
CEOAGE	−0.009 *** (0.001)	−0.010 *** (0.001)	−0.009 *** (0.001)	−0.010 *** (0.001)	−0.009 *** (0.001)	−0.009 *** (0.001)	−0.009 *** (0.001)	−0.009 *** (0.001)
AUDIT	−0.008 *** (0.002)	−0.006 (0.004)	−0.007 *** (0.002)	−0.006 (0.004)	−0.010 *** (0.002)	−0.009 * (0.004)	−0.010 *** (0.002)	−0.009 * (0.004)
LSIZE	−0.001 (0.001)	−0.002 (0.001)	−0.001 (0.001)	−0.002 (0.001)	−0.004 *** (0.001)	−0.005 (0.003)	−0.004 *** (0.001)	−0.005 (0.003)
LEV	0.004 (0.003)	0.001 (0.009)	0.004 (0.003)	0.001 (0.009)	0.002 (0.003)	−0.001 (0.007)	0.002 (0.003)	−0.001 (0.007)
CFO	0.064 *** (0.004)	0.067 ** (0.023)	0.064 *** (0.004)	0.067 ** (0.023)	0.145 *** (0.004)	0.143 *** (0.016)	0.145 *** (0.004)	0.144 *** (0.016)
GRW	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	−0.000 (0.000)	−0.000 (0.000)	−0.000 (0.000)	−0.000 ** (0.000)
LAGTA	0.000 * (0.000)	0.000 * (0.000)	0.000 * (0.000)	0.000 * (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 * (0.000)
LOSS	0.027 *** (0.002)	0.028 *** (0.003)	0.027 *** (0.002)	0.028 *** (0.003)	0.033 *** (0.001)	0.034 *** (0.002)	0.033 *** (0.001)	0.034 *** (0.002)
Y_20	−0.017 *** (0.002)	−0.016 *** (0.001)	−0.009 *** (0.002)	−0.007 (0.004)	−0.022 *** (0.002)	−0.021 *** (0.001)	−0.023 *** (0.002)	−0.021 *** (0.003)
Y_19	−0.007 *** (0.002)	−0.007 *** (0.001)	-	-	−0.006 *** (0.002)	−0.006 *** (0.001)	-	-
Y_18	−0.010 *** (0.002)	−0.011 *** (0.001)	-	-	−0.013 *** (0.002)	−0.013 *** (0.001)	-	-
Y_17	−0.001 (0.002)	−0.000 (0.001)	-	-	−0.007 *** (0.002)	−0.006 *** (0.001)	-	-
Y_16	−0.004 * (0.002)	−0.004 *** (0.000)	-	-	−0.009 *** (0.002)	−0.009 *** (0.000)	-	-
TREND	-	-	−0.004 ** (0.002)	−0.004 (0.004)	-	-	−0.009 *** (0.002)	−0.009 ** (0.003)
TREND2	-	-	0.000 (0.000)	0.000 (0.001)	-	-	0.002 *** (0.000)	0.002 * (0.001)
Adj.R ²	0.064	0.060	0.063	0.060	0.092	0.087	0.092	0.086

Notes. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. Figures in parentheses are standard errors. The variables Y_16–Y_20 denote year dummy variables from 2016 to 2020, respectively, with the base year being 2015. TREND and TREND2 represent the time trend variable and its squared term, respectively. Industry dummies based on 2-digit standard industrial classification codes are included in all models. The labels “RE” and “CL” appended to the model names indicate the random effects panel regression and the pooled regression with clustered standard errors, respectively.

4.4. Relationship Between the COVID-19 Period and Earnings Management

Based on the parameter estimation results for the 2020 dummy variable (Y_20) in Tables 4–7, models with year-specific dummy variables as well as those with trend variables showed that earnings management in 2020 was significantly lower than that in other years. This finding indicated that compared to non-COVID-19 periods, SMEs engaged in less earnings management during the COVID-19 period and thus reported greater earnings quality. Accordingly, Hypothesis 5 was supported. However, this finding differs from studies on listed firms in European countries and China [20,21], which report that earn-

ings management increased during the COVID-19 period, particularly among financially distressed firms. In the case of Korean SMEs, however, the government implemented large-scale fiscal support measures to prevent a wave of bankruptcies, which may instead have contributed to a reduction in earnings management.

COVID-19 had an unprecedented impact worldwide [56], with the scope and nature differing from that of previous economic crises. The rapid and global spread of COVID-19 led to a worldwide economic recession. Nations implemented various measures to mitigate this economic downturn [57]. The Korean government introduced extensive support policies for SMEs to help them tackle the challenging business environment created by the pandemic. This included providing guarantee support, loan maturity extensions, and business stabilization funds amounting to KRW 50 trillion [58,59]. Additionally, societal and economic perceptions attributed the poor financial performance of SMEs to COVID-19, an uncontrollable external factor, rather than to managerial inefficiencies. Therefore, despite market uncertainty and pandemic-induced poor financial performance, SMEs may have had reduced motivation to engage in earnings management owing to the extensive government support and prevailing perceptions.

It should also be noted that, additionally, we conducted a supplementary analysis to examine whether the effects of firm- and CEO-level characteristics on earnings management fundamentally differed between the pre-pandemic and pandemic periods by including interaction terms between the individual determinants and year fixed effects. However, none of these interaction terms yielded statistically significant results in a robust manner. This suggests that the influence of CEO and firm characteristics on earnings management did not materially differ between the COVID-19 and non-COVID-19 periods. (Detailed results of this supplementary analysis are available from the authors upon request.)

5. Conclusions

This study offers several noteworthy insights into the determinants of earnings management in small- and medium-sized enterprises (SMEs). First, SMEs with external investors engage in more earnings management than their counterparts without such investors. This pattern suggests that when external investors prioritize short-term performance, they may inadvertently encourage opportunistic financial reporting. Second, SMEs adopting co-CEO structures demonstrate lower levels of earnings management than those led by a single CEO, implying that shared leadership fosters more balanced decision-making and effective internal oversight. Third, firms managed by more experienced CEOs exhibit lower earnings management, consistent with the view that experience cultivates rational decision-making and conservative accounting practices. Fourth, SMEs led by older CEOs engage in less earnings management than those under younger leadership, aligning with prior evidence that managerial age is associated with greater conservatism in decision-making. Finally, earnings management was markedly lower during the COVID-19 period compared to non-pandemic periods. This reduction can be attributed to the Korean government's extensive financial and non-financial support measures, coupled with the prevailing societal perception that poor SME performance during the pandemic was the result of uncontrollable external shocks rather than managerial shortcomings—factors that collectively diminished the incentive for earnings manipulation.

These findings carry several implications. First, the heightened earnings management observed in investor-backed SMEs underscores the potential value of enhanced monitoring mechanisms and more tailored disclosure requirements to counteract short-termism and better align investor incentives with sustainable growth. Second, the negative association between earnings management and leadership characteristics—such as co-CEO structures, greater CEO experience, and older CEO age—suggests that governance frameworks might

benefit from incorporating managerial maturity, decision-making style, and collaborative leadership considerations into succession planning, leadership development, and board oversight processes. Third, the reduction in earnings management during the COVID-19 period indicates that timely, targeted government interventions, accompanied by public communication that frames performance declines as externally driven, can influence managerial behavior and reduce opportunistic reporting.

From a broader perspective, this study contributes to the corporate governance literature by highlighting how ownership composition, leadership attributes, and external crises can interact to shape financial reporting practices in SMEs—a topic that has received limited scholarly attention. While these findings are specific to the Korean context and the period examined, they may offer useful reference points for policymakers, investors, and practitioners seeking to improve SME reporting quality under similar conditions. Future research could extend these insights by examining other institutional settings or exploring additional firm-level and environmental factors that influence earnings management in SMEs.

The limitations of this study are as follows. First, this study adopts a residual-based approach to measure discretionary accruals, which is a common methodology in earnings management research. However, Chen et al. [78] pointed out that using residuals from a first-stage regression as dependent variables in a second stage may introduce statistical bias. Despite this concern, our approach is consistent with recent studies [79–82] that continue to employ residual-based measures in conjunction with two-stage least squares estimation, reflecting their established use in prior research and acceptance in the academic field. Future research should consider Chen et al.'s recommendations [78], such as jointly estimating both equations, redefining the model, or including the first-stage predictors in the second stage, to mitigate potential bias. Second, the analysis period is relatively short (2015–2020), excluding outcomes after the resolution of the COVID-19 pandemic. This temporal constraint limits the generalizability of the findings to more recent economic and market conditions. Future research should incorporate post-pandemic data to analyze a more extended period.

Author Contributions: Both authors equally contributed to all aspects of this study. All authors have read and agreed to the published version of the manuscript.

Funding: This research was funded by Konkuk University in 2024.

Data Availability Statement: The datasets generated during and/or analyzed during the current study are available from the corresponding author on reasonable request.

Conflicts of Interest: The authors declare no conflicts of interest.

Abbreviations

The following abbreviations are used in this manuscript:

DA	Discretionary accruals
KCGF	Korea Credit Guarantee Fund
ROA	Return on assets
SMEs	Small- and medium-sized enterprises

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