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Article

How Much Does the CEO's Age Impact Corporate Performance Under a Changing Environment?

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Abstract: The recent technological innovations and the consequences of the pandemic are rapidly changing the management paradigm. Organizations that seek to survive and remain competitive must adapt to these changes. One strategy to cope with these environmental changes is to hire a younger CEO. This study aims to empirically analyze how the age of the CEO affects the performance of the firm based on upper echelons theory. Using a sample of 706 CEOs of companies listed on the South Korean public stock market (KOSPI) as of 2023, we found that CEO age is positively related to financial performance. We also found that CEO age is negatively related to risk-taking behavior and innovation. These findings have both practical and theoretical implications, suggesting that the recent shift to the relationship between a long-term perspective and innovation have positive implications. Young CEOs often seek these perspectives and are more willing to be aggressive in investment and risk-taking behaviors in the interests of an innovative business.

Keywords: CEO age; financial performance; R&D investment; R&D intensity; upper-echelon theory



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1. Introduction

The business landscape is dramatically changing. In particular, technological innovations have been rapidly changing in a discontinuous manner. Examples include Alpha Go, an artificial intelligence (AI) program developed by Google, which astonished the world by beating Lee Sedol, the world's top-ranked Go player, in 2016. Another key innovation is ChatGPT, an AI chatbot launched in November 2022. The COVID-19 pandemic from 2019 to 2022 has accelerated a paradigm shift to remote work and contact-free collaboration. One of the strategies to cope with these unprecedented environmental and technological changes has been the changing of CEOs and the hiring of younger CEOs. While previous executive-level managers employed "exploitative leadership" to focus on strengthening their core businesses and cash-generating capabilities with the priority of efficiency, the new generation of CEOs has employed "exploratory leadership" to discover new growth engines for their companies. Demonstrating the correct mechanism of firm innovation, especially in the face of conflicting theoretical predictions about the impact of CEO age among other variables, can have both academic and practical implications, showing which CEOs are more likely to be actively involved in firm performance. This study empirically analyzes whether young CEOs take more risks and lead innovation better and how they affect the financial performance of their firms.

Research results on the relationship between CEO age and firm performance have been mixed. For example, because biological energy levels generally decline as people age (Roberts and Rosenberg 2006; Harman 1991), we expect that managers' attitudes toward changes in the business environment differs by age. For example, younger managers are predicted to be more likely to respond aggressively and optimistically to environmental changes and to adopt investment initiatives even if the outcomes are uncertain or outside of their comfort zone. In contrast, older managers may avoid making bold, uncertain

investment decisions, as the results are not guaranteed. Therefore, this study aims to improve the explanation of the existing literature by analyzing how the age of CEOs affects the risk-taking propensity, innovation acceptance, and subsequent financial performance of the organizations in a rapidly changing management paradigm for business enterprises in Republic of Korea.

This study examined CEOs listed in the company business reports as of 2023, when many environmental changes occurred. Specifically, we examined the financial performance of the firms through an empirical study of 706 CEOs of companies listed on the Korean securities market. This study used hierarchical regression analysis to investigate the relationship between the age of the CEO and the financial performance, debt ratio, and R&D intensity of the firm.

This study is unique in the following ways. First, it differs from previous research by focusing on the age of the CEO and analyzing its relevance to the various perspectives on corporate financial performance. In particular, previous literature has focused on how the age of the CEO affects financial performance and policies (Seo and Chang 2010) without considering how CEO age affects risk-taking propensity and investment preferences. Unlike existing research, this study integrates not only the association between CEO age and corporate performance by dividing corporate performance into long-term and short-term performance, but also how age affects CEOs' risk-taking propensity by focusing on equity—debt ratio. The findings of this study provide additional evidence on the effect of CEOs' personal characteristics, such as age, on management decisions.

This study is organized as follows. Following the introduction of the paper, we review the literature and formulate hypotheses in the next section. We then describe the methodology, including the data collection process, operational definitions of variables, and the statistical process of data gathering. After reporting the results of the empirical analysis, we present the conclusions, implications, and limitations of this study.

2. Theoretical Background and Hypothesis

2.1. Research on CEO Age

According to upper echelons theory, the attitudes, characteristics, and values of executive-level managers have a significant impact on corporate decision making. Numerous studies have supported the theory by providing empirical evidence (Anand et al. 2002; Finkelstein 1992; Hambrick and Mason 1984; Han and Kim 2021). They have argued that characteristics, such as past experience, values, or the personality of top executives, are useful variables to predict the future of a company. The theory is that managers synthesize diverse and complex information to make managerial decisions and that personal characteristics affect not only what information they select, but also how they understand and interpret that information (Finkelstein 1992). Since these early studies, many other studies have measured managerial characteristics in various ways and analyzed how managers' personal characteristics affect managerial decisions.

Several previous studies have found that the age of the CEO, which is the focus of this study, is an important factor influencing corporate decision making (Forbes 2005; Prendergast and Stole 1996; Serfling 2014). However, it is difficult to draw clear conclusions about the relationship between age and financial performance. For example, Cheng et al. (2024) found a curvilinear relationship between CEO age and R&D spending. They found that both younger and older CEOs invest less in R&D than middle-aged CEOs, which can be interpreted as a result of both younger and older CEOs focusing on short-term profitability rather than long-term investment due to career challenges. However, some studies have suggested a clear tendency demonstrating that younger CEOs prefer long-term performance compared to their older counterparts (Han 2024; Venkateswaran et al. 2022).

Despite these mixed findings, there is a widespread belief that older CEOs tend to prefer stability to risk taking and to emphasize current performance, while younger CEOs tend to be more aggressive and seek long-term performance. Even when older CEOs generate good performance and receive large financial rewards for it, they have a

shorter remaining career span; thus, they do not reap the long-term benefits of increased compensation (Cheng 2004). This phenomenon is related to the CEO's career horizon, where younger CEOs are able to work longer. Taylor (1975) reported that older managers are more conservative in their investment decisions and spend more time and effort collecting and analyzing information than younger managers. In addition, older managers tend to avoid making choices that deviate from their previous decisions because it would mean admitting that their past decisions were wrong (Prendergast and Stole 1996). They are also likely to avoid making risky decisions that threaten the reputation they have built over their careers (Bertrand and Mullainathan 2003). In other words, older managers are more likely to maintain the status quo and/or value short-term performance rather than favor decisions that dramatically change and innovate in the current situation.

Younger CEOs, on the other hand, have a relatively long career ahead of them. If they perform well early in their careers, which will likely lead to a considerable increase in compensation, they can reap the long-term benefits of improved performance for the rest of their careers (Bliss and Rosen 2001). In addition, younger managers are more aggressive and accept more risk (Prendergast and Stole 1996). The younger they are, the more likely they are to make bold decisions to prove that they are competent and are viewed positively (Hirshleifer and Thakor 1992; Zwiebel 1995; Holmstrom 1999; Serfling 2014). This implies that younger age may be associated with higher levels of self-confidence, which leads to riskier decisions, because young CEOs overestimate their abilities and optimistically anticipate the future (Libby and Rennekamp 2012). Serfling (2014) also reported that younger CEOs have an incentive to increase R&D intensity and to intensify diversification, both of which increase operating leverage. Yim and Jung (2020) examined a sample of Korean firms and found that younger CEOs are more inclined to make high-risk, high-return decisions. J. Yim (2019) also empirically demonstrated that younger CEOs have greater incentives to innovate. In addition, models of industry tournament incentives have shown that younger owners are willing to work harder and take more risks because they are competing for the CEO position with their siblings and professional managers (Coles et al. 2020).

This study investigates how the age of the CEO affects short- and long-term perspectives on financial performance by examining the relationship between CEO age and financial and innovative performance for firms listed on the Korean stock market. We also investigate whether R&D intensity and equity—debt ratio differ between young and old CEOs.

2.2. Hypothesis Development

This study empirically examines the effect of managerial age on a firm's short-term performance, risk appetite, and long-term performance. In terms of financial performance, which is often cited as an indicator of short-term performance in the literature, older CEOs have an incentive to elevate current performance by focusing on long-term investments due to their shorter remaining career (Cheng 2004; Taylor 1975). They also do not enjoy long-term benefits even if the rewards from long-term performance are plausible. As a result, older managers tend to gather and analyze information conservatively for different decisions, preferring to make stable decisions that are similar to or consistent with previous decisions (Prendergast and Stole 1996). As a result, they often avoid risky, aggressive, or uncertain decisions to protect their reputation (Bertrand and Mullainathan 2003). In other words, older CEOs are more likely to maintain the status quo or value short-term performance than to make decisions that dramatically change the current situation through innovation. We therefore hypothesize the following.

Hypothesis 1 (H1). *The older the CEO, the more willing she/he is to increase financial performance.*

Compared to older CEOs, younger CEOs are more likely to take risks and are more willing to invest, even viathrough risk-taking, to make long-term investments. Since

younger CEOs are often at the beginning of their careers, they have a longer career horizon and can accept a more long-term view of their businesses and companies. Younger CEOs tend to invest more in capital expenditures and R&D, indicating a long-term orientation, which is consistent with the growth-oriented nature of young firms and the characteristics of young CEOs (Han 2024). We predict that young CEOs who have a long-term perspective will be less reluctant than older CEOs to invest in businesses that are expected to grow in the future and to take risks for long-term investment. We therefore hypothesize as follows.

Hypothesis 2 (H2). *The younger the CEO, the more willing she/he is to take risks.*

Prior research has suggested that younger CEOs who are at a relatively early stage in their careers are more likely to pursue unconventional decision making (Gibbons and Murphy 1992; Trueman 1986; Prendergast and Stole 1996) to build a positive reputation and demonstrate their competence. For instance, young CEOs are more likely to focus on M&A, R&D intensity, innovation, diversification, and restructuring that are less directly related to current performance (Li et al. 2017; Serfling 2014; S. Yim 2013). They are more driven by the incentive to build a track record and reputation and reap the benefits in the long run. Young CEOs have an incentive to take a long-term view of their careers and to actively participate in the firm's innovation/innovative activities to reap significant non-monetary rewards, even if the activities are uncertain and risky decisions are risky. Therefore, we hypothesize the following.

Hypothesis 3 (H3). *The younger the CEO, the more she/he is willing to increase innovation.*

3. Research Methods

3.1. Data Collection

The sample of this study included firms listed on the securities market of the Korea Exchange in 2023. We excluded companies engaged in financial businesses because the nature and methods of financial business is quite different from those of others. In addition, we synchronized the timing by cutting off each sample at December 2023 to improve the comparability among samples. We excluded firms with a debt-to-equity ratio of more than 1 because they were likely to be outliers in the empirical analysis and distort the results. The necessary market data of the firms to measure the market-based variables were obtained from FnGuide. We excluded firms that had not been listed for at least one year. The data needed to measure CEO age, and other control variables were collected from the TS-2000 of the Korea Listed Companies Council. The final number of firms in our sample was 706 after excluding firms for which we are unable to collect data on the CEO's date of birth, financial data, and stock price data.

3.2. Measuring Variables

3.2.1. Dependent Variables

The dependent variables used in this study were the financial performance, R&D investment, and R&D intensity. Financial performance (profitability) was measured by net income divided by total assets. R&D investment was measured as a percentage of the value of R&D expenditures that have been assetized. This study used R&D intensity, as the majority of literature has used this as a measure of a firm's innovation (Balkin et al. 2000; O'Brien 2003; Hoskisson et al. 1991). R&D intensity was measured as R&D expenses divided by number of employees multiplied by 100 (Kochhar and David 1996; Lee and O'Neill 2003).

3.2.2. Independent Variables

For CEO age, we defined CEO as the executive who was listed as the CEO in the business report, following Korean studies that have explored the effect of CEOs' demographic characteristics (J. Yim 2019). We calculated the CEO's age by subtracting the year of the

CEO's birth from the fiscal year and taking the natural logarithm to define the CEO's age used in this study.

3.2.3. Control Variables

To test the effect of the CEO's age on financial performance, we included variables such as firm size, equity growth rate, and firm value in our model to control for the effects of these variables on the dependent variables. Firm size was the natural logarithm of total assets. Hall and Ziedonis (2001) noted that larger firms can easily enjoy economies of scale because they have the necessary experience to perform well. Debt-to-equity ratio, which is directly related to a firm's bankruptcy risk and can affect firm performance (Kim 2008), was calculated by dividing total debt by equity and multiplying by 100. Equity growth rate was measured by the year-on-year growth rate of capital, and the enterprise value was measured as EBITDA/sales to consider the impact of investment opportunities on enterprise risk.

To explore the relationship between CEO age and R&D investment, we controlled for firm size, debt-to-equity ratio, foreign investor ratio, and CEO ownership. In this model, firm size was measured by the number of employees, and debt-to-equity ratio was calculated by dividing total debt by equity and multiplying by 100. Foreign investor ratio was measured by the percentage of shares held by foreign investors and CEO ownership was measured by the percentage of shares held by managers.

To demonstrate the relationship between CEO age and R&D intensity, we controlled for firm size, debt-to-equity ratio, foreign investor ratio, and CEO ownership. In this model, firm size was measured by the number of employees, and debt-to-equity ratio was calculated by dividing total debt by equity and multiplying by 100. Foreign investor ratio was measured by the percentage of shares held by foreign investors and CEO ownership was measured by the percentage of shares held by managers.

4. Results

The descriptive statistics and correlation analysis results of the main variables used in the empirical analysis of this study are reported in Tables 1–3.

Hierarchical regression analysis was conducted to examine the effect of CEO age on financial performance and R&D intensity. Table 4 presents the results of the empirical analysis of the effect of CEO age on financial performance. Table 5 presents the effect of CEO age on debt ratio. Table 6 presents the effect of CEO age on R&D intensity.

Table 1. Descriptive Statistics and Correlations for Financial Performance, CEO Age and Other Variables.

	Mean	SD	Financial Performance	Firm Size	Debt Ratio	Equity Growth Rate	Firm Value	CEO Age
Financial Performance	1.331	11.677	1.000					
Firm Size	27.197	1.535	0.239 ***	1.000				
Debt Ratio	105.650	152.908	−0.228 ***	0.091 **	1.000			
Equity Growth Rate	7.372	24.072	0.399 ***	0.031	−0.067	1.000		
Firm Value	10.017	22.658	0.498 ***	0.237 ***	−0.177 ***	0.229 ***	1.000	
CEO Age	4.059	0.151	0.157 ***	0.059	0.079 **	0.048	0.055	1.000

** $p < 0.05$, *** $p < 0.01$.

Table 2. Descriptive Statistics and Correlations for R&D Investment, CEO Age, and Other Variables.

	Mean	SD	R&D	Firm Size	Debt Ratio	Foreign Investor Ratio	CEO Ownership	CEO Age
R&D	0.013	0.032	1.000					
Firm Size	1797.230	6358.777	0.086 **	1.000				
Debt Ratio	105.820	153.091	−0.060 *	0.040	1.000			
Foreign Investor Ratio	8.841	12.083	0.057 *	0.341 ***	−0.097 ***	1.000		
CEO Ownership	3.856	9.250	−0.024	−0.096 ***	−0.089 ***	−0.137 ***	1.000	
CEO Age	4.059	0.151	−0.066 **	0.030	0.079 **	0.004	−0.057 **	1.000

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.**Table 3.** Descriptive Statistics and Correlations for R&D Intensity, CEO Age, and Other Variables.

	Mean	SD	R&D Intensity	Firm Size	Debt Ratio	Foreign Investor Ratio	CEO Ownership	CEO Age
R&D intensity	14,779.926	49,301.993	1.000					
Firm Size	1797.23	6358.777	0.120 ***	1.000				
Debt Ratio	105.820	153.091	−0.062 **	0.040	1.000			
Foreign Investor Ratio	8.841	12.083	0.127 ***	0.341 ***	−0.097 ***	1.000		
CEO Ownership	3.856	9.250	−0.039	−0.096 ***	−0.089 ***	−0.137 ***	1.000	
CEO Age	4.059	0.151	−0.065 ***	0.030	0.079 **	0.004	−0.057 **	1.000

** $p < 0.05$, *** $p < 0.01$.**Table 4.** Regression Results for CEO Age on Financial Performance.

Variables	Model 1				Model 2			
	b	SE	B	t(p)	b	SE	B	t(p)
(Constant)	−32.940	6.365		−5.175 ***	−71.704	11.010		−6.512 ***
Firm Size	1.198	0.236	0.158	5.075 ***	1.161	0.233	0.153	4.976 ***
Debt Ratio	−0.012	0.002	−0.158	−5.147 ***	−0.013	0.002	−0.169	−5.557 ***
Equity Growth Rate	0.146	0.015	0.300	9.784 ***	0.143	0.015	0.295	9.725 ***
Firm Value	0.188	0.017	0.364	11.320 ***	0.184	0.016	0.358	11.240 ***
CEO Age					9.830	2.292	0.127	4.288 ***
F			105.187 ***				89.915 ***	
R ²			0.375				0.391	
adj. R ²			0.372				0.387	

Note. Dependent Variable: Financial Performance. *** $p < 0.01$.

Table 5. Regression Results of CEO Age on R&D Investment.

Variables	Model 1				Model 2			
	b	SE	B	t(p)	b	SE	B	t(p)
(Constant)	0.014	0.002		7.142 ***	0.071	0.033		2.134 ***
Firm Size	4.078×10^{-7}	0.000	0.079	1.970 **	4.156×10^{-7}	0.000	0.081	2.010 **
Debt Ratio	-1.343×10^{-5}	0.000	-0.063	-1.647 *	-1.241×10^{-5}	0.000	-0.058	-1.520
Foreign Investor Ratio	5.710×10^{-5}	0.000	0.021	0.519	5.655×10^{-5}	0.000	0.021	0.514 *
CEO ownership	-6.693×10^{-5}	0.000	-0.019	-0.494	-7.801×10^{-5}	0.000	-0.022	-0.576
CEO Age					-0.014	0.008	-0.065	-1.719 *
F(p)		2.151 ***				2.316 ***		
R ²		0.012				0.016		
adj. R ²		0.007				0.009		

Note. Dependent Variable: R&D investment. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 6. Regression Results of CEO Age on R&D Intensity.

Variables	Model 1				Model 2			
	b	SE	β	t(p)	b	SE	β	t(p)
(Constant)	12,900.323	2901.358		4.446 ***	99,669.897	49,489.345		2.014 **
Firm Size	0.703	0.309	0.091	2.274 **	0.715	0.309	0.092	2.315 **
Debt Ratio	-19.145	12.174	-0.059	-1.573	-17.592	12.188	-0.055	-1.443
Foreign Investor Ratio	353.843	164.350	0.087	2.153 **	352.994	164.106	0.087	2.151 **
CEO ownership	-125.939	202.095	-0.024	-0.623	-142.841	202.023	-0.027	-0.707
CEO Age					-21,402.680	12,186.164	-0.066	-1.756 *
F(p)		4.751 ***				4.429 ***		
R ²		0.026				0.031		
adj. R ²		0.021				0.024		

Note. Dependent Variable: R&D intensity. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

To test hypothesis 1, we performed regression analysis and the results are presented in Table 4. The regression analysis included two steps. First, we included the control variables firm size, debt-to-equity ratio, equity growth rate, and firm value to determine the impact on financial performance excluding the independent variable (CEO age), as shown in Model 1. Next, we examined the impact of CEO age by adding the variable into the analysis, controlling variables on financial performance (Model 2). The F value of Model 1 was 105.187 ($p < 0.001$), and that of Model 2 was 89.915 ($p < 0.01$), indicating that the regression models adequately explained variances of the dependent variables. In both Models 1 and 2, VIF was less than 10, which confirmed that there was no multicollinearity issue among the variables. The analysis showed that CEO age has a statistically significant effect on financial performance, supporting hypothesis 1 ($\beta = 0.127$, $p < 0.01$).

To test hypothesis 2, we examined the impact of the control variables firm size, debt ratio, foreign investor ratio, and CEO ownership on R&D investment without the independent variable (Model 1 in Table 5). We then included the CEO age and examined its effect on R&D investment (Model 2). The F-value of Model 1 (2.151) and that of Model 2 (2.316) indicated that both regression models were statistically appropriate ($p < 0.05$). In Model 1, the effects of firm size and CEO ownership on innovative performance were significant but, in Model 2, the significant effect of CEO ownership disappeared. Adding the independent variable (CEO age) was significant with low probability (10% level). Thus, hypothesis 2

is supported, but the level of significance was not as high as in the previous regression models ($\beta = -0.065$, $p < 0.1$).

To test hypothesis 3, we examined the impact of the control variables firm size, debt ratio, foreign investor ratio, and CEO ownership on R&D intensity (R&D intensity intensity) without the independent variable (Model 1 in Table 6). We then included the CEO age and examined its effect on R&D intensity (Model 2). The F-value of Model 1 (4.751) and that of Model 2 (4.429) indicated that both regression models were statistically appropriate ($p < 0.01$). In Model 1, the effects of firm size and CEO ownership on innovative performance were significant but, in Model 2, the significant effect of CEO ownership disappeared. Adding the independent variable (CEO age) was significant with low probability (10% level). Thus, hypothesis 3 is supported, but the level of significance was not as high as in the previous regression models ($\beta = -0.066$, $p < 0.1$).

5. Discussion

This study explored the impact of CEO age on the firm's organizational strategy in a rapidly changing business environment. Specifically, we hypothesized that younger CEOs tend to focus on long-term performance rather than short-term performance, are more willing to take risks, and are more likely to adopt aggressive investment strategies by raising R&D intensity. To test these hypotheses, we analyzed a sample of 706 CEOs of companies listed on the stock market in Republic of Korea as of 2023. While the results of the regression analyses indicate that all of our hypotheses are accepted with statistical significance, the effect of CEO age on R&D investment is lower than we had expected.

Our inquiry is based on upper echelons theory, which argues that the background, experience, values and beliefs of top managers influence management and decision making for organizations. Based on this theory, we predicted that a firm's strategic and financial decisions are influenced by the CEO's characteristics. The results of this study indicate that the CEO's biological age can influence strategic decision making. Its findings have both theoretical and managerial implications, suggesting that there are positive aspects to the leadership shift to the younger generation and young CEOs have an incentive to be aggressive and risk-seeking. In addition to financial performance, appropriate non-monetary rewards, such as reputation, are important to young CEOs when managing firms, as well as for their own career management.

This study found that the age of the CEO affects the strategic decisions of the organization. However, this conclusion does not imply a direct causal relationship between CEO biological age and firm profitability, leveraged investment, or R&D intensity. Rather, it is more likely that the relationship between CEO age and strategic and financial decision making is indirect. For example, younger executives tend to have to compete with more internal peers than older counterparts. According to tournament theory, the more competition there is within an organization, the more pressure there is to perform well, which can lead to bolder investment decisions (Schwarz and Severinov 2009). In this case, the intensity of competition within the organization would be a direct factor in bold investments. Thus, intensity of competition could be one of the intervening factors between CEO age and strategic investment decision or firm performance.

Our expectation that younger CEOs are more active in R&D intensity because they are more interested in innovation was statistically significant, but not strongly so ($p < 0.1$). This finding suggests that the appointment of a younger CEO does not necessarily lead to greater investment in innovation. Investing in R&D is a highly strategic decision that considers the external environment and internal capabilities. While younger executives seek to achieve a competitive advantage through successful innovation, they need time to decide which business areas to develop for future growth of the business. Our results also suggest that even younger CEOs may be reluctant to make aggressive investments in the first place. If their innovative investments fail, it could tarnish their reputation, which could weigh on them for the rest of their careers. The relationship between CEO age and R&D intensity is likely to be curvilinear rather than linear.

The results of this study imply recommendations for organizational management. First, organizations need to pay more attention to developing young leaders to increase sustainability. Today, more than ever, organizational leaders need to more closely communicate with their employees. Younger leaders have the advantage of being able to better engage with younger employees, which will help revitalize the organizational culture. Younger leaders also have an advantage over older leaders in driving the organization's digital transformation, including AI, which is required in the current business environment, represented as the digital revolution.

Second, organizations need to consider the risks of appointing younger leaders. Our research shows that younger CEOs are more likely to make R&D investment. While such investments can increase the long-term sustainability of the organization, it also means that these younger CEOs take on more risk. Not all R&D investments are successful. R&D investment is risky and has a high likelihood of failure. Therefore, long-term investment decisions need to be made carefully.

Third, there should be a balance between younger and older leaders in the organization. We found that, as the CEO ages, short-term profitability tends to increase and financial risk tends to decrease, suggesting that older CEOs are more effective at improving financial health. Older leaders are usually more experienced in managing businesses and organizations. Their wisdom and experience is a valuable asset to an organization and should be reflected in the way younger leaders run their organizations. Therefore, generational change should not be seen as a reason to exclude older leaders, but rather to build organizational systems and structures that reflect their experience and wisdom.

Future research should further refine the explanatory power of our findings by including macroeconomic factors, such as market conditions, industry characteristics, and the overall economic environment, which may affect the relationship between CEO age and firm performance, risk aversion, and innovation. We do not conclude that all leaders should be replaced with younger leaders to respond to today's changing environment. Organizations should be strategically and culturally rejuvenated, but the changes should be made with a clear vision and strategic goals. Changing to younger CEOs must be accompanied by the necessary resources and funding for change, building a slimmer and faster organizational structure, and expanding the technology infrastructure and business networks.

Despite the relevant findings, this study has a limitation of focusing only on top managers as leaders of organizational strategy and decision makers. Organizational capability reflects not only the characteristics and capabilities of the CEO, but also those of all organizational members. Our study ignores other organizational members as we focus on top management. Exploring the characteristics of all organizational members that influence the strategic decisions and direction of an organization would be an interesting research topic to overcome this limitation of our study. Another limitation is that this study focused only on Korean CEOs. Future studies should test our results in other cultural contexts with a flatter decision-making structure and that may not be as hierarchical or heavily influenced by Confucian hierarchical values.

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