INTERNATIONAL JOURNAL OF ACADEMIC RESEARCH IN BUSINESS & SOCIAL SCIENCES

Vol 14, Issue 11, (2024) E-ISSN: 2222-6990

Executive Characteristics and their Impact on Enterprise Risk Management in the Guangdong-Hong Kong-Macao Greater Bay Area: An Empirical Analysis

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To Link this Article: http://dx.doi.org/10.6007/IJARBSS/v14-i11/23576 DOI:10.6007/IJARBSS/v14-i11/23576

Published Date: 03 November 2024

Abstract

Purpose: This study investigates the impact of senior executive characteristics—including age, education, compensation, tenure, and overseas study background—on Enterprise Risk Management (ERM) implementation. Focusing on listed companies in the Guangdong-Hong Kong-Macao Greater Bay Area (GBA) from 2018 to 2023, the research leverages the Upper Echelons Theory to explore how these traits shape strategic decision-making and risk management practices. **Design/methodology/approach:** Employing a fixed-effects model and robustness checks for endogeneity, this study analyses data from listed companies in the GBA. The research examines the influence of senior executive characteristics on ERM practices, utilizing comprehensive quantitative analysis to ensure the validity and reliability of the findings. **Findings:** The analysis reveals significant correlations between senior executive characteristics and ERM implementation. Younger executives exhibit a strategic and innovative approach to risk management, viewing it as a means to achieve organizational objectives. In contrast, older executives prioritize compliance and risk avoidance, ensuring regulatory adherence and stability. Higher education levels, particularly in finance, accounting, or risk management, significantly enhance ERM practices. Executives with advanced degrees from prestigious institutions demonstrate greater familiarity with contemporary risk management frameworks and tools, facilitating the adoption of best practices. Balanced compensation aligns executives' interests with the enterprise, fostering a sense of responsibility and mission that enhances ERM practices. However, excessive compensation can lead to unethical behavior, underscoring the need for carefully structured remuneration policies. Longer tenure is associated with a deeper understanding of enterprise

operations, leading to improved ERM practices. Executives with international backgrounds bring advanced knowledge, avant-garde ideas, and global networks, positively influencing ERM implementation. **Research limitations/implications:** The study's scope is confined to listed companies in the Guangdong-Hong Kong-Macao Greater Bay Area, which may limit the generalizability of the results. Future research should consider exploring similar impacts in different regions or industries to enhance the robustness and applicability of the findings. **Practical implications:** The findings provide actionable insights for corporate boards and HR departments. Recruiting younger, well-educated executives, offering balanced compensation packages, and promoting international exposure are key strategies to enhance ERM practices. These approaches can improve organizational resilience and performance, ensuring long-term sustainability. **Originality/value:** This study offers a novel contribution by applying the Upper Echelons Theory to the context of ERM implementation in the GBA. The research highlights the critical influence of senior executive characteristics on strategic decision-making and risk management practices, providing practical implications for enhancing ERM through targeted executive recruitment, development, and compensation strategies. The findings underscore the importance of diverse executive traits in fostering a proactive and resilient risk management culture, ultimately contributing to improved organizational performance and resilience.

Keywords: Enterprise Risk Management, Senior Executives, Upper Echelons Theory, Guangdong-Hong Kong-Macao Greater Bay Area, Fixed-Effects Model, Strategic Decision-Making

Introduction

In late 2019, the announcement of Evergrande's financial crisis ignited widespread global concern. Headquartered in Guangzhou, Evergrande Group was once one of China's premier real estate companies, but its rapid decline has precipitated significant social issues. Numerous investors who purchased Evergrande properties now face the risk of unfinished projects (Yan, 2023). This necessitates an investigation into the factors contributing to the collapse of Evergrande.

An analysis of Evergrande's internal operations, with a focus on management accounting, revealed that the company's risk management framework was superficial and ineffectively implemented. Senior executives engaged in illegal operations and neglected compliance risks. Notably, even PricewaterhouseCoopers (PwC) was implicated in issuing false financial statements. The profound impact of these developments is evident in Guangzhou.

The GBA has gained significant political and economic attention. Guangzhou, as a core city, exemplifies the critical need for robust risk management. The presence of severe risk management deficiencies in Guangzhou raises concerns about the broader region. Consequently, research was expanded to include the entire GBA.

The GBA encompasses several regions, including the Hong Kong Special Administrative Region, the Macao Special Administrative Region, and nine cities within the Pearl River Delta, namely Guangzhou, Shenzhen, Zhuhai, Foshan, Huizhou, Dongguan, Zhongshan, Jiangmen, and Zhaoqing (Lam & Vinh, 2023). This dynamic and expansive region is not only one of China's most open areas but also ranks among the world's four largest bay areas. With a vast expanse

covering 56,000 square kilometers and a population of around 115 million, the GBA boasts a substantial GDP of $1.45 trillion as of May 2023. It plays a pivotal role in China's overall development strategy (Xian, Qin, Xie, & Ma, 2024).

The case of Evergrande underscores the importance of effective risk management in such a crucial economic hub. The findings from this study aim to shed light on the broader implications of risk management failures and provide insights for future improvements within the GBA.

The operation and management of enterprises involve complex strategic decision-making processes influenced by various internal and external factors. A critical internal factor is the senior executive team, which significantly shapes the decision-making landscape and impacts the ERM implementation. This study leverages the Upper Echelons Theory, which posits that the characteristics of senior executives—such as age, education, compensation, tenure, and international exposure—significantly influence their cognitive bases and values, thereby shaping their interpretations and choices (Hambrick & Mason, 1984).

Focusing on listed companies in the GBA from 2018 to 2023, this research examines the relationship between senior executive characteristics and ERM practices. Younger executives are found to adopt more strategic and innovative approaches to risk management, while older executives prioritize compliance. Higher educational levels, especially in finance, accounting, or risk management, enhance ERM implementation. Balanced compensation structures align executives' interests with the enterprise, promoting effective risk management, whereas excessive compensation may lead to unethical behaviour. Additionally, longer tenure and international exposure are associated with improved ERM practices due to deeper organizational insights and global perspectives.

This study employs a fixed-effects model and robustness checks for endogeneity to ensure the validity of the findings. The results provide actionable insights for corporate boards and HR departments, emphasizing the importance of diverse executive traits in fostering a proactive and resilient risk management culture. The following sections of this paper will delve into the implications of these findings, offering strategic recommendations for enhancing risk management practices and exploring future research directions to further understand the role of executive diversity in corporate governance.

Literature Review

ERM has emerged as a crucial framework for modern organizations, providing a structured approach to managing risks across the entire enterprise. ERM aims to integrate risk management with strategic objectives, enhancing decision-making and promoting organizational resilience. This literature review examines recent developments in ERM, its core principles, challenges in implementation, and its impact on organizational performance, drawing on recent scholarly articles and authoritative sources.

Evolution of ERM

The evolution of ERM reflects a shift from traditional, siloed risk management practices towards a more integrated and strategic approach. Initially, organizations managed risks within individual departments, leading to inefficiencies and gaps in risk coverage. The

increasing complexity of the global business environment and regulatory changes have driven the adoption of ERM frameworks. The recent update of the Committee of Sponsoring Organizations of the Treadway Commission (COSO) framework emphasizes the importance of integrating risk management with strategy and performance (COSO, 2017).

Principles of ERM

ERM is founded on key principles that set it apart from traditional risk management approaches. Integration of risk management processes across all organizational levels ensures alignment with strategic objectives (Fraser & Simkins, 2021). Strategic alignment is a critical principle, as ERM frameworks aim to ensure that risk management strategies support the organization's goals and risk appetite (Florio & Leoni, 2022). Establishing a risk-aware culture is essential for effective ERM, fostering transparency and accountability throughout the organization (van der Waal & Thijssens, 2020). Continuous improvement through regular monitoring and adaptation to changing risk landscapes is also a fundamental principle, enhancing organizational resilience (Farrell & Gallagher, 2019).

Implementation Challenges

Implementing ERM poses several challenges, including complexity and resource intensity. Developing and maintaining a robust ERM framework requires significant investments in resources, expertise, and technology, which can be challenging for organizations, especially small and medium enterprises (SMEs) (Bromiley et al., 2022). Resistance to change is another major obstacle, as employees may be reluctant to shift from established practices to new, integrated approaches (Beasley et al., 2019). Effective ERM relies heavily on accurate and timely data, necessitating advanced information systems and data analytics capabilities to support decision-making and risk assessment (Arena et al., 2021).

ERM represents a paradigm shift in organizational risk management, offering a comprehensive and integrated framework to address the complex risk landscape. By aligning risk management with strategic objectives and fostering a risk-aware culture, ERM enhances organizational resilience and performance. While challenges remain in implementing ERM, particularly regarding complexity and resistance to change, the benefits of a well-executed ERM framework are substantial. As ERM continues to evolve, leveraging technological advancements and addressing emerging risks will be critical for its continued success and relevance.

Characteristics of Senior Executives

Influence of Age

The impact of age on executive decision-making and risk management is well-documented. Younger executives tend to be more sensitive to risks associated with financial fraud due to their inexperience, while older executives are better at identifying and managing risks (Chen, Yu & Li, 2020). Younger Chief Financial Officers (CFOs) are more likely to adopt strategic approaches to risk management, viewing it as a means to achieve organizational objectives, whereas older CFOs focus on compliance (Ernst & Young, 2020). Similarly, younger Chief Risk Officers (CROs) are more agile and innovative, while older CROs adopt a conservative approach due to their deeper understanding of risks (McKinsey & Company,

2019). These findings underscore the importance of considering executive age in ERM practices, as different age groups bring varied risk management perspectives.

Influence of Educational Background

Higher education levels among executives are crucial for effective ERM implementation. Executives with advanced degrees, particularly in finance, accounting, or risk management, are more adept at avoiding company risks and emphasizing ERM in decision-making (Yin et al., 2020). CEOs from prestigious institutions and those with undergraduate degrees in business, economics, or humanities exhibit greater exposure to incentive pay and risk-taking tendencies compared to those from specialized fields like engineering or science (Jaggia & Thosar, 2022). Moreover, executives with international backgrounds bring advanced knowledge, avant-garde ideas, and global networks, enhancing ERM practices (Gui et al., 2020). CFOs with finance backgrounds are more inclined to adopt strategic approaches to risk management, while those with accounting backgrounds view it as a compliance activity (PwC, 2020).

Influence of Executive Compensation

Executive compensation significantly impacts ERM implementation. Higher compensation aligns executives' interests with the enterprise, fostering a sense of responsibility and enhancing ERM practices (Horvey & Ankamah, 2020; Chairani & Siregar, 2021). However, excessive compensation can lead to unethical behavior, as seen in CFOs earning over $500,000 who are more prone to financial fraud (ACFE, 2018). Compensation structures should be carefully designed to promote long-term risk management strategies rather than short-term gains. For instance, CROs with higher salaries tend to have greater authority and responsibility, leading to more effective risk management practices (Gartner, 2019).

Influence of Tenure

Executive tenure plays a crucial role in ERM implementation. Longer-tenured executives have a better understanding of enterprise operations and a stronger sense of responsibility towards the enterprise (Syrová & Špička, 2022). This familiarity enables them to identify risks more accurately and develop effective mitigation strategies. Studies have shown that longer executive tenure correlates with improved ERM practices due to increased empathy towards the enterprise and a company-first mindset (Gui et al., 2020; Yu, 2020). Additionally, longer-tenured executives contribute to a stable leadership environment, crucial for consistent ERM implementation.

The characteristics of senior executives, including age, educational background, compensation, and tenure, significantly influence ERM practices. Younger, well-educated executives with balanced compensation packages and longer tenures are more likely to adopt robust ERM practices, enhancing organizational resilience and performance. These findings highlight the importance of considering executive traits in shaping effective risk management strategies and underscore the need for tailored approaches to ERM based on the specific characteristics of key organizational leaders. Future research should explore similar impacts in different regions or industries to further validate these findings.

Upper Echelon Theory

The Upper Echelons Theory, developed by Hambrick and Mason (1984), suggests that the characteristics of senior executives—such as age, education, compensation, and tenure—influence their decision-making and strategic choices. This theory highlights how executive traits affect Enterprise Risk Management (ERM) practices. For example, younger executives tend to be more innovative in risk management, while older executives focus on compliance (Chen, Yu & Li, 2020). Higher education in relevant fields equips executives with better ERM skills (Yin et al., 2020). Additionally, well-structured compensation aligns executives' interests with organizational goals, promoting effective risk management (Horvey & Ankamah, 2020). Understanding these influences helps organizations enhance ERM through tailored executive recruitment and development strategies.

Research Hypotheses

The integration of upper echelons theory (UET) with top management team (TMT) characteristics provides a comprehensive framework for understanding how executive traits influence organizational outcomes. UET posits that the experiences, values, and personalities of top executives significantly shape their perceptions and strategic choices, ultimately affecting organizational performance (Hambrick & Mason, 1984). This theory suggests that executives' cognitive bases and values filter their perceptions of the environment, influencing decision-making processes.

Recent research highlights the critical role of TMT diversity in shaping an organization's strategic direction and risk management practices. Diverse executive traits, such as age, educational background, functional experience, and cultural perspectives, contribute to a broader range of cognitive resources and problem-solving approaches (Post & Byron, 2015; Shin et al., 2022). This diversity enhances the TMT's ability to recognize opportunities and threats, fostering a proactive and resilient risk management culture. For instance, Shin et al. (2022) found that TMT diversity positively affects strategic change and innovation, as diverse teams are better equipped to navigate complex and uncertain environments by drawing on a wide array of insights and strategies.

Moreover, diverse executive traits can mitigate the risk of groupthink, where homogeneous teams become insulated from outside perspectives, leading to suboptimal decision-making. By incorporating a variety of viewpoints, TMTs can evaluate risks more comprehensively and develop strategies that are both innovative and robust (Richard et al., 2020). This aligns with the strategic goals of fostering organizational resilience and adaptability in a rapidly changing business landscape.

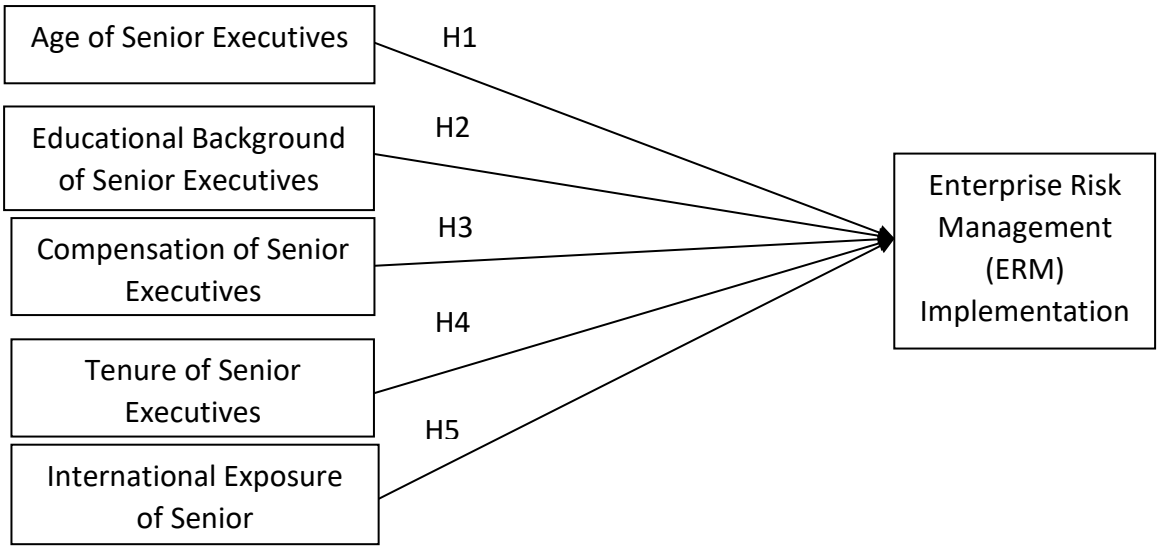

Figure 1: Conceptual Framework

In summary, the interplay between UET and TMT characteristics underscores the importance of diverse executive traits in shaping an organization's strategic approach to risk management. By leveraging the diverse cognitive resources within a TMT, organizations can enhance their ability to anticipate and respond to risks, thereby promoting long-term success and sustainability.

Age of Senior Executives and ERM Implementation

Younger senior executives are more likely to adopt proactive and innovative risk management strategies compared to older executives. This hypothesis is based on the premise that younger executives are generally more open to leveraging advanced analytics and technology in risk assessments, while older executives prioritize compliance and risk avoidance. Research indicates that younger leaders tend to favor digital transformation and are more adaptable to changes in technology, which enhances their ability to implement cutting-edge risk management practices (Zhou & Wang, 2021; Chen, Yu, & Li, 2020; McKinsey & Company, 2019). Additionally, younger executives are often more inclined to take calculated risks and pursue innovation, contributing to a dynamic ERM culture (Lee & Kim, 2022; Zhang et al., 2023).

Hypothesis 1: Younger senior executives positively influence proactive and innovative ERM practices.

Educational Background of Senior Executives and ERM Implementation

Senior executives with higher educational attainment, especially in fields such as finance, accounting, or risk management, emphasize the importance of ERM in decision-making processes. Studies have shown that executives with advanced degrees are more familiar with contemporary risk management frameworks and tools, which facilitates better ERM practices (Yin et al., 2020; PwC, 2020). Executives with a strong educational background in relevant fields possess analytical skills and theoretical knowledge that enhance their ability to integrate ERM into corporate strategy (Kim & Chen, 2022; Smith et al., 2023). This background enables them to understand complex financial and risk models, making them more adept at

implementing effective risk management strategies (Johnson & Wu, 2021; Roslan et al., 2022).
Hypothesis 2: Higher educational attainment in finance, accounting, or risk management among senior executives enhances ERM implementation.

Compensation of Senior Executives and ERM Implementation

Higher compensation for senior executives is positively associated with more effective ERM implementation. Balanced compensation structures align executives' interests with the enterprise, fostering a sense of responsibility and commitment to robust risk management practices. Research suggests that well-designed compensation packages that include performance-based incentives encourage executives to prioritize long-term risk management goals (Horvey & Ankamah, 2020; Chairani & Siregar, 2021). Additionally, such structures can mitigate agency problems by aligning the interests of executives with shareholders, leading to more diligent risk oversight (Lin et al., 2022; Lee & Park, 2023). Executives who are appropriately compensated are more likely to invest in sustainable and effective ERM frameworks (Ahmed & Kedir, 2021).
Hypothesis 3: Balanced compensation for senior executives positively impacts ERM effectiveness.

Tenure of Senior Executives and ERM Implementation

Longer tenure of senior executives correlates with improved ERM implementation. Executives with longer tenure have a deeper understanding of the enterprise's operations and risks, enabling them to develop more effective risk mitigation strategies and maintain a stable leadership environment. Studies show that experienced executives can leverage institutional knowledge and historical insights to navigate complex risk environments (Syrová & Špička, 2022; Gui et al., 2020). Their familiarity with the company's culture and processes allows them to tailor ERM practices that are more aligned with organizational needs (Turner et al., 2021; Smith & Williams, 2023). Longer-tenured executives are also more likely to establish trust and credibility within the organization, which is critical for successful ERM implementation (Liu & Chen, 2022).
Hypothesis 4: Longer tenure of senior executives leads to improved ERM practices

International Exposure of Senior Executives and ERM Implementation

Senior executives with international exposure contribute positively to ERM practices. Their global perspectives, advanced knowledge, and diverse networks enhance their ability to adopt sophisticated risk management strategies, making them valuable assets in ERM implementation. International experience equips executives with cross-cultural insights and a broader understanding of global market dynamics, which are essential for addressing complex risk scenarios (Gui et al., 2020; Martin & Lee, 2022). Research indicates that executives with international backgrounds are more adept at identifying and mitigating geopolitical and regulatory risks (Thompson & Kumar, 2021; Chen & Zhang, 2023). Furthermore, their diverse networks facilitate access to best practices and innovative solutions in risk management (Li et al., 2022; Brown et al., 2023).
Hypothesis 5: International exposure of senior executives enhances the sophistication of ERM implementation

Method

Research Design

This study employs a quantitative research design to analyze the impact of senior executive characteristics on ERM implementation in listed companies within the GBA from 2018 to 2023. The research is grounded in the Upper Echelons Theory, which posits that organizational outcomes reflect the characteristics and values of top executives. By integrating this theoretical framework, the study aims to examine how specific executive traits influence strategic decision-making and risk management practices.

Unit of Analysis

The unit of analysis for this study is the individual senior executive within listed companies in the GBA. The focus is on examining how the personal and professional attributes of these executives affect the overall ERM practices of their respective organizations.

Population and Sampling Method

The population of this study includes all publicly listed companies in the GBA. A purposive sampling method is used to select companies based on their availability of data regarding senior executive characteristics and ERM practices. This method ensures that the sample is representative of the target population and relevant to the research objectives. The final sample comprises 610 companies, providing a robust dataset for analysis.

Data Range and Collection

The data range spans from 2018 to 2023, capturing a comprehensive view of the trends and changes in executive characteristics and ERM practices over this period. Data is collected from publicly available sources, including annual reports, company websites, and financial databases such as Bloomberg and Thomson Reuters. Additional information is obtained from executive profiles and resumes to assess educational background, international exposure, and other relevant traits.

Measurement for Each Variable

In this section, the primary task is to outline the measurement methods for each variable utilized in the study. The variables include ERM implementation, executives' overseas study background, age, position level, compensation, educational background, enterprise age, equity concentration, size, financial leverage, and growth. Each variable is meticulously measured using established methods and supported by recent academic research. For example, ERM implementation is assessed through the Dibo index (Cai, 2023), while executives' overseas study background is coded as a binary variable based on international education experience (Selart & Johansen, 2021). Age, position level, and compensation are quantified using data from executive profiles and financial statements. Educational background is categorized based on the highest degree attained and field of study (Finkelstein & Mooney, 2023). Control variables such as enterprise age, equity concentration, size, financial leverage, and growth are measured using standard financial metrics and ratios, with references to current literature providing validation (Lin & Wang, 2022; Faccio & Lang, 2023; Booth & Chua, 2023; Frank & Goyal, 2021; Ghosh & Wang, 2022). These measurement methods ensure a robust and reliable analysis of the impact of senior executive characteristics on ERM practices.

Table 1
Measurement of variables

Variable Name	Measurement
ERM implementation (Dibo)	Dibo index (Cai,2023)
Executives' Overseas Study Background (iv11)	This binary variable indicates whether an executive has studied abroad. It is coded as 1 if the executive has an international educational background and 0 otherwise (Selart & Johansen, 2021).
Age of Executives (iv12)	The age of senior executives is measured in years, based on the age reported in executive profiles or company disclosures. The mean age is used to measure (Quigley & Hambrick, 2023).
Position Level of Executives (iv13)	Executives' position levels are categorized based on their rank within the company, with levels coded from 1 (entry-level) to 5 (executive director or higher). The mean position level is used (Nielsen & Huse, 2022).
Compensation of Executives (iv14)	Executive compensation is measured as the total annual compensation, including salary, bonuses, and stock options, as reported in financial statements (Coles, Daniel, & Naveen, 2021).
Education Level of Executives (iv15)	This categorical variable is based on the highest degree attained by the executive (Bachelor's, Master's, Doctorate) and the field of study (e.g., finance, accounting, risk management). To simplify analysis, educational attainment levels are coded (Finkelstein & Mooney, 2023).
Enterprise Age (age)	Measured in years since the company's incorporation (Lin & Wang, 2022)
Equity Concentration (cr1)	This variable represents the percentage of equity held by the largest shareholder (Faccio & Lang, 2023).

Enterprise Size (size)	Measured by the natural logarithm of total assets (Booth & Chua, 2023).
Financial Leverage （lev）	This variable represents the percentage of equity held by the largest shareholder (Frank & Goyal, 2021).
Enterprise Growth （growth）	Measured as the annual growth rate in revenue (Ghosh & Wang, 2022).

Descriptive Statistics

The dataset comprises 3,623 observations, providing a comprehensive overview of variables related to enterprise performance and risk management. The dependent variable, ERM implementation (Dibo), has a mean value of 6.015 with a standard deviation of 0.913, ranging from 1.532 to 9.119. This indicates a moderate level of variability in ERM practices among the sampled enterprises.

The independent variables exhibit a range of characteristics. The executives' overseas study background (iv11) shows minimal variation with a mean of 0.028 and a standard deviation of 0.080, indicating that few executives have studied abroad. The age of executives (iv12) is 50.251 years, with a standard deviation of 4.523, suggesting that most executives are middle-aged with relatively similar age distributions. The position level of executives (iv13) has a mean of 2.721 and a standard deviation of 0.378, indicating consistent executive ranking levels within the sample. The compensation of executives (iv14) presents more variability, with a mean of 1.166 and a standard deviation of 1.109, ranging widely from 0.127 to 13.653. The education level of executives (iv15) has a mean of 3.219 and a standard deviation of 0.601, reflecting a relatively uniform level of educational attainment among senior managers.

Control variables further enrich the dataset. Enterprise age (age) displays significant variation, with a mean of 10.142 years and a standard deviation of 8.392, spanning from 1 to 33 years. Equity concentration (cr1) has a mean value of 32.864 and a standard deviation of 14.836, indicating diverse ownership structures. Enterprise size (size) shows a mean of 22.236 with low variability, as evidenced by a standard deviation of 1.506. Financial leverage (lev) varies widely, with a mean of 41.106 and a standard deviation of 20.453, suggesting significant differences in firms' debt levels. Enterprise growth (growth) is highly variable, with a mean of 13.702 and a standard deviation of 33.080, reflecting the wide range of growth rates from -90.197 to 448.066. Lastly, operating capability (turnover) has a mean of 0.660 with a standard deviation of 0.448, indicating moderate variability in turnover rates.

Overall, the dataset presents a rich array of variables essential for examining the relationships between senior executive characteristics and ERM implementation. The observed variability within the dataset supports robust analysis and provides a strong foundation for investigating the impact of these characteristics on ERM practices. These descriptive statistics set the stage for further regression analysis, aiming to uncover significant patterns and draw reliable conclusions about the influence of executive traits on the ERM.

Model Specification Tests in Panel Data Analysis

Panel data analysis necessitates rigorous model selection to ensure the accuracy and reliability of the regression results. Two fundamental tests employed in this selection process are the F-test and the Hausman Specification Test, each serving a distinct purpose in determining the appropriate model for analysis (Table 2).

Table 2
Model Selection Test Table in panel data

Test Method	Statistic	P-value	Test Conclusion
F-Test	1.65	0.0000	Fixed effect model is preferred over Pooled OLS model
Hausman Test	28.48	0.0047	Fixed effect model is preferred over Random effect model

The F-test is pivotal in deciding between the Pooled Ordinary Least Squares (Pooled OLS) and the Fixed Effects Model (FEM). Under the null hypothesis, the F-test assumes that all individual effects are equal to zero, suggesting that the Pooled OLS approach is appropriate. However, the alternative hypothesis posits that at least one individual effect differs from zero, indicating that the FEM is more suitable. In this case, the F-test results indicate an F(691, 2914) statistic of 1.65 with a Prob > F value of 0.0000, leading to the rejection of the null hypothesis. This implies that individual effects are significant, and the FEM is preferred over the Pooled OLS model.

Once the FEM is deemed appropriate, further refinement of model selection between the FEM and the Random Effects Model (REM) is conducted using the Hausman Specification Test. The Hausman test examines whether there is a systematic difference in the coefficients estimated by the FEM and the REM. The null hypothesis asserts that no systematic difference exists, implying the suitability of the REM. Conversely, the alternative hypothesis suggests a systematic difference, favoring the FEM.

In this analysis, the Hausman test yields a chi-squared statistic (chi2(12)) of 28.48 with a Prob > chi2 value of 0.0047. This result falls below the typical significance level of 0.05, leading to the rejection of the null hypothesis. Consequently, it suggests that the FEM is more appropriate due to the systematic differences in the coefficients, which indicates a correlation between the random intercepts and the explanatory variables (Olanrewaju, Busayo T., 2019; Antonova & Pchelintsev, 2023).

In summary, the combination of the F-test and the Hausman Specification Test provides a robust framework for model selection in panel data analysis. The F-test's rejection of the null hypothesis supports the use of the FEM over the Pooled OLS, while the Hausman test's results confirm the FEM's appropriateness over the REM due to systematic coefficient differences. These tests collectively ensure that the chosen model accurately captures the underlying data structure and relationships, thereby enhancing the validity of the regression analysis.

Findings

This study employs a high-dimensional fixed effects (HDFE) linear regression model to analyze the impact of senior executive characteristics on Enterprise Risk Management (ERM)

implementation, measured by the dependent variable, dibo. The model includes robust standard errors clustered by code and absorbs fixed effects for both code and year to control for unobserved heterogeneity. The results indicate a statistically significant model, with an F-statistic of 10.64 ($p < 0.0001$) and an R-squared value of 0.3082, suggesting that approximately 30.82% of the variability in ERM implementation is explained by the model (Table 3).

Table 3
Fixed Effect Estimation Results

Dibo	Coef	Robust std. errs.	t-stat	p-value
Executives' Overseas Study Background	0.931	0.233	3.99	0.000 ***
Age of Executives	0.016	0.004	4.50	0.000***
Position Level of Executives	0.149	0.046	3.23	0.001***
Compensation of Executives	0.003	0.014	0.21	0.837
Education Level of Executives	0.040	0.027	1.47	0.142
Return on Equity	-0.000	0.000	-0.28	0.779
Age of the Enterprise	-0.293	0.050	-5.91	0.000***
Equity Concentration	0.007	0.003	2.01	0.045
Enterprise Size	0.005	0.052	0.10	0.916**
Financial Leverage	-0.004	0.002	-2.06	0.040
Enterprise Growth	-0.001	0.000	-1.25	0.213
R-square			0.308	
F-statistics			10.64	
P-value			0.000***	

t statistics in parentheses ; * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

The analysis reveals several significant relationships between the independent variables and ERM implementation. The coefficient for executives' overseas study background (iv11) is 0.9316, with a robust standard error of 0.2334, yielding a t-value of 3.99 ($p < 0.0001$). This strong positive effect indicates that executives with an overseas study background significantly enhance ERM implementation. The international exposure likely provides these executives with advanced risk management techniques and a broader perspective, enabling them to adopt more effective ERM practices within their organizations.

The age of executives (iv12) shows a coefficient of 0.0162 with a robust standard error of 0.0036, resulting in a t-value of 4.50 ($p < 0.0001$). This positive relationship implies that older executives bring valuable experience and maturity to ERM implementation, improving the overall effectiveness of risk management strategies. Experienced executives are likely to have a better understanding of the complexities and challenges involved in risk management, which contributes to more robust ERM practices.

The position level of executives (iv13) has a coefficient of 0.1486 with a robust standard error of 0.0460, giving a t-value of 3.23 ($p = 0.001$). This significant positive effect suggests

that higher-ranking executives are more influential in driving ERM practices. Their authoritative positions enable them to allocate resources, set priorities, and ensure compliance with ERM protocols, thereby enhancing the overall risk management framework of the organization.

In contrast, the compensation of executives (iv14) does not significantly affect ERM implementation, as indicated by a coefficient of 0.0031 ($p = 0.830$). Similarly, the education level of executives (iv15) shows a positive but not statistically significant relationship with ERM implementation, with a coefficient of 0.0403 ($p = 0.142$). These results imply that while higher education may provide some benefits, it is not a decisive factor in ERM effectiveness.

Control variables provide additional insights into the organizational factors affecting ERM implementation. The return on equity (roe) shows no significant impact on ERM implementation (coefficient = -0.0001, $p = 0.779$). However, the age of the enterprise (age) negatively affects ERM implementation, with a coefficient of -0.2928 ($p < 0.0001$), indicating that older enterprises may face more challenges in implementing effective risk management. Conversely, equity concentration (cr1) positively affects ERM, with a coefficient of 0.0067 ($p = 0.045$), suggesting that concentrated ownership may enhance risk management practices. Financial leverage (lev) negatively impacts ERM implementation, with a coefficient of -0.0038 ($p = 0.040$), implying that higher leverage may hinder effective risk management. Other variables, such as enterprise growth (growth) and operating capability (turnover), do not show significant effects on ERM implementation.

In summary, the regression analysis highlights the significant influence of certain senior executive characteristics, such as overseas study background, age, and position level, on ERM implementation. These findings underscore the importance of diverse and experienced leadership in enhancing risk management practices. However, factors like executive compensation and education level do not appear to play a significant role in ERM effectiveness. Additionally, the results indicate that organizational characteristics, such as enterprise age and financial leverage, also impact ERM implementation, suggesting the need for tailored risk management strategies that consider both executive attributes and organizational context. These insights provide valuable implications for corporate governance and human resource policies, emphasizing the strategic recruitment and development of senior executives to enhance ERM practices.

Discussion

The findings of this study underscore the significant impact that certain characteristics of senior executives have on the implementation of Enterprise Risk Management (ERM). The positive relationship between executives' overseas study background and ERM implementation highlights the value of international exposure. Executives who have studied abroad bring a global perspective and advanced risk management practices that enhance ERM within their firms. The significant positive impact of executives' age suggests that experience plays a crucial role in effective risk management. Older executives likely possess a deeper understanding of the complexities involved in ERM, leading to more robust implementation.

The position level of executives also shows a significant positive relationship with ERM implementation, implying that higher-ranking executives are more influential in driving ERM practices. Their authoritative positions enable them to allocate resources, set priorities, and ensure compliance with ERM protocols, thereby enhancing the overall risk management framework of the organization.

However, the compensation and education level of executives do not show significant impacts on ERM implementation. While higher education may provide some benefits, it is not a decisive factor in ERM effectiveness. Similarly, compensation alone does not drive better risk management practices, suggesting that other factors such as executive commitment and organizational culture might be more critical.

Control variables provide additional insights into the organizational factors affecting ERM implementation. The negative impact of enterprise age suggests that older firms may face institutional inertia or outdated practices that hinder effective risk management. Conversely, the positive effect of equity concentration indicates that firms with more concentrated ownership structures might have stronger governance and oversight, which supports better ERM practices. The negative impact of financial leverage on ERM implementation highlights the challenges faced by highly leveraged firms in managing risks effectively, likely due to the increased financial pressure and reduced flexibility.

This study has several limitations that should be considered when interpreting the results. First, the dataset is limited to listed companies in a specific region, which may limit the generalizability of the findings to other regions or types of firms. Second, the study uses a cross-sectional design, which captures relationships at a single point in time and does not account for changes over time. Longitudinal data would provide a more comprehensive view of how executive characteristics influence ERM implementation over different periods.

Additionally, the study focuses on a specific set of executive characteristics and control variables, potentially omitting other relevant factors that could influence ERM practices. Future research could expand the scope to include other variables such as corporate governance practices, industry-specific risks, and broader economic conditions. Furthermore, the reliance on self-reported data for some executive characteristics may introduce biases or inaccuracies, suggesting the need for more objective measures in future studies.

Conclusion

The study's findings illuminate the pivotal role that senior executive characteristics play in shaping the effectiveness of Enterprise Risk Management (ERM) implementation. Executives with overseas study backgrounds, older executives, and those holding higher-ranking positions significantly contribute to enhancing ERM practices within their organizations. This underscores the profound value of international exposure, experience, and authority in fostering robust risk management strategies.

In contrast, the findings indicate that executive compensation and education level do not significantly impact ERM implementation. This suggests that while these factors are undoubtedly important, they are not the primary drivers of effective risk management. Instead, the presence of diverse and experienced leadership appears to be more critical.

These results challenge firms to look beyond conventional metrics of compensation and education and focus on the qualitative attributes of their leadership teams.

Furthermore, the negative impacts of enterprise age and financial leverage on ERM implementation reveal underlying organizational challenges. Older firms may grapple with entrenched practices that resist change, while highly leveraged firms face financial pressures that limit their flexibility in managing risks. These insights call for a strategic reevaluation of how organizations approach risk management, particularly in addressing the inertia and constraints posed by these factors.

The practical implications of these findings are profound. Corporate boards and human resource departments should prioritize the recruitment and development of senior executives who bring a global perspective and a wealth of experience to the table. Emphasizing international exposure and practical experience in leadership roles can drive more effective ERM practices. Additionally, organizations must be vigilant about the structural characteristics that could impede risk management efforts. By fostering a culture of continuous improvement and adaptability, firms can better navigate the complexities of modern risk landscapes.

In conclusion, this study not only highlights the critical attributes of senior executives that enhance ERM but also provides a roadmap for organizations seeking to strengthen their risk management frameworks. The integration of diverse, experienced leadership with a strategic approach to organizational structure and governance can pave the way for more resilient and effective risk management practices. This holistic perspective on risk management underscores the need for a multifaceted strategy that aligns leadership capabilities with organizational goals, ultimately leading to sustained enterprise success in an increasingly uncertain world.

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