

Top Management Team Diversity, Innovation, and Firm Performance in Vietnam: Evidence from a Transition Economy

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ABSTRACT:

Purpose. This study examines how functional and educational diversity within top management teams (TMTs) influence firm performance in Vietnam, with innovation as a mediating mechanism and business environment volatility as a moderating factor.

Design. Using from a comprehensive data from 320 executives across 136 firms in Vietnam. And employing partial least squares structural equation modelling (PLS-SEM), we provide robust empirical evidence that extends upper echelons theory (UET) beyond Western context.

Findings. The results indicate that TMT diversity enhances innovation, which subsequently improves firm performance. The mediating role of innovation is confirmed, and its positive effect is amplified under volatile environmental conditions.

Research limitations/implications. The study is limited by its single-country, cross-sectional design and the binary measurement of environmental volatility, which may restrict generalisability. Future research should adopt longitudinal or comparative designs and employ more nuanced measures of environmental turbulence to deepen insights into the TMT diversity-firm performance nexus.

Practical implications. The findings highlight that private firms in emerging markets can leverage TMT diversity more effectively by embedding innovation into governance and decision-making structures, especially in dynamic and uncertain contexts.

Social implications. By showing how TMT diversity fosters innovation in turbulent business environments, the study highlights that diverse TMTs can enhance the competitiveness of emerging market firms, support the creation of more resilient employment, and contribute to sustainable economic development under volatile conditions.

Originality/value. This study provides large-scale evidence from Vietnam, clarifying how TMT diversity operates in transition economies. It contributes to the literature on TMTs and innovation in emerging markets by introducing perceptual measures of educational diversity and showing the contingent value of innovation under volatility.

Keywords: Top management team diversity; Innovation; Firm performance; Business environment volatility; Emerging markets.

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1. Introduction

Emerging markets are characterized by policy volatility, institutional voids, and intensified competition, making innovation a prerequisite for firm survival (Meyer & Peng, 2016). In Vietnam, these challenges are amplified by rapid policy shifts, volatile capital flows, and increasing rivalry among both domestic and international players, creating a highly uncertain environment (Meyer & Peng, 2016). Within such contexts, TMTs play a pivotal role in formulating strategic choices that shape firm survival and long-term growth. Drawing on UET, firm performance is argued to be significantly influenced by the demographic characteristics of TMTs (Hambrick & Mason, 1984; Carpenter, Geletkanycz, & Sanders, 2004). Yet, the mechanisms through which TMT diversity enhances firm performance remain contested, particularly under volatile conditions that characterize many emerging economies.

Recent meta-analytic evidence confirms that TMT diversity effects on innovation and performance remain context-dependent and require explicit examination of mediating mechanisms and boundary conditions (Huang, Gao, & Wang, 2025; Hemmert, Cho, & Lee, 2024). Studies published in 2024-2025 demonstrate that the TMT diversity-innovation linkage is strongest when contextual moderators and team-level processes are explicitly modeled, yet few studies have simultaneously tested the complete mediation-moderation framework in emerging Asian economies.

A substantial body of research explores the impact of TMT diversity on strategic outcomes. Functional diversity, reflecting the variety of members' professional backgrounds, is expected to enrich cognitive resources and broaden perspectives for problem-solving (Bunderson & Sutcliffe, 2002; Talke et al., 2010). Educational diversity, which captures differences in academic training and fields of study, can integrate distinct knowledge bases to improve adaptability and decision-making (Milliken & Martins, 1996; van Knippenberg, De Dreu, & Homan, 2004). However, findings remain mixed: while some studies report positive effects (Pitcher & Smith, 2001), others highlight coordination costs and

conflict that may offset potential benefits (Hambrick, Cho, & Chen, 1996).

Despite extensive work on TMT heterogeneity, recent meta-analyses and reviews continue to report inconsistent TMT diversity-firm performance effects and call for models that open the black box via mechanisms and boundary conditions. For example, a meta-analysis of TMT diversity demonstrates that effects vary substantially across contexts and that depends on mediating processes. In line with this, integrative reviews of team and cultural diversity conclude that evidence remains fragmented and context-dependent, and they recommend more studies that explicitly test mediators such as innovation under environmental moderators (Patrício et al., 2022). Taken together, prior syntheses highlight, but rarely test simultaneously, the full TMT diversity-innovation-firm performance chain under the boundary condition of business environment volatility, leaving a clear conceptual and empirical gap.

The external environment further complicates such dynamics. Contingency perspectives argue that the value of innovation depends critically on environmental conditions (Lawrence & Lorsch, 1967). In stable contexts, incremental innovation may suffice and the benefits of TMT diversity-driven innovation may be muted. By contrast, in volatile environments characterized by uncertainty, dynamism, and frequent disruptions, innovation becomes indispensable for resilience and survival (Jansen, Van den Bosch, & Volberda, 2006). Although this logic is intuitive, empirical studies examining the TMT diversity-innovation-firm performance linkage under business environment volatility remain scarce.

Vietnam represents a theoretically informative transition economy for examining the boundary conditions of upper echelons theory. Characterized by institutional fluidity, frequent regulatory adjustments, and intensified competitive pressures, Vietnam exhibits a level of environmental volatility comparable to other emerging markets while retaining distinct ownership structures and governance dynamics (Meyer & Peng, 2016). Unlike more institutionalized transition economies

in Eastern Europe or relatively stabilized emerging markets such as China, Vietnam's regulatory and market frameworks remain less predictable and more rapidly evolving. These conditions heighten firms' reliance on adaptive strategic processes, making innovation a critical mechanism through which top management team diversity can be translated into performance outcomes. Accordingly, Vietnam provides a suitable and underexplored empirical setting for testing how TMT diversity, innovation, and firm performance interact under environmental volatility.

This study seeks to address these gaps by examining how functional and educational diversity within top management teams influence firm performance, with innovation serving as a mediating mechanism and business environment volatility as a moderating factor. Drawing on upper echelons theory and contingency perspectives, the study develops and tests an integrated framework that links TMT diversity, innovation, and firm performance under varying environmental conditions.

The empirical analysis is based on survey data collected from 320 executives across 136 private and listed firms in Vietnam. Partial least squares structural equation modelling (PLS-SEM) is employed to test the proposed relationships. Firm performance is measured using multiple indicators across financial, customer, internal process, and learning and growth dimensions, while innovation is modelled as a mediating construct and business environment volatility as a contextual moderator.

Vietnam provides a theoretically interesting setting because it represents a transition economy that shares similarities with but also diverges from other emerging markets. Like China, Vietnam has experienced rapid economic growth under strong state influence. However, unlike China, Vietnam's regulatory framework remains more fluid and less institutionalized, which makes volatility more pronounced. In contrast with Eastern European transition economies, which have gradually stabilized under EU integration, Vietnam's institutional environment remains in flux, characterized by frequent regulatory adjustments

and evolving governance norms. These differences position Vietnam as both distinctive and representative, enabling us to extend the boundary conditions of UET by testing how TMT diversity and innovation operate under conditions of heightened institutional fluidity.

Overall, the study advances UET by clarifying the indirect mechanisms through which TMT diversity shapes firm performance and by positioning innovation as a central mediating process. It further integrates contingency perspectives by modeling business environment volatility as a boundary condition. By providing large-scale evidence from Vietnam, one of Asia's most dynamic transition economies, the study enriches cross-contextual understanding of leadership diversity in emerging markets and offers actionable implications for firms competing under institutional turbulence. In doing so, it contributes to international business research by clarifying how emerging market firms build competitiveness under institutional turbulence.

2. Literature Review and Hypotheses Development

2.1. Upper Echelons Theory and TMT Diversity

UET posits that firm performance is partially predicted by the characteristics of top executives, as their demographic characteristics shape how they perceive and interpret strategic situations (Hambrick & Mason, 1984). Among these characteristics, TMT diversity has been highlighted as a central determinant of firm strategic behaviour and outcomes (Carpenter et al., 2004). Diversity in educational and functional backgrounds reflects the variety of experiences and perspectives within the TMT, which can enrich strategic decision-making and foster innovative thinking (Simons et al., 1999; Bunderson & Sutcliffe, 2002). At the same time, TMT diversity can also generate potential conflicts and coordination costs that undermine team effectiveness (Pitcher & Smith, 2001).

Recent scholarship provides a more nuanced understanding of this duality. Meta-analyses and large-scale reviews demonstrate that the TMT

diversity-firm performance relationship is often indirect and contingent upon mediating mechanisms and contextual moderators. Empirical evidence from European and Asian firms shows that functional and educational heterogeneity strengthen innovation capabilities, but the effects vary with environmental dynamism and governance systems (Ardito et al., 2019). More recent studies further emphasize that in emerging and transition economies, TMT diversity enhances firms' adaptability and resilience, yet its benefits are conditional on organizational processes that channel heterogeneity into innovation (Wagdi & Fathi, 2024).

Taken together, these insights indicate that while TMT diversity represents a valuable strategic resource, its outcomes are highly contingent. The challenge, particularly in emerging markets, is to strike a balance between leveraging diverse cognitive resources and mitigating the coordination costs they entail. Examining this balance remains a vital research direction for advancing UET and understanding how TMT heterogeneity contributes to innovation and firm performance in volatile contexts.

Recent advances in UET scholarship emphasize the need to consolidate knowledge across different measures, constructs, and levels of analysis, particularly regarding team functioning rather than individual CEO characteristics alone (Bement & Boivie, 2025). Moreover, emerging research on the "stakeholder view of upper echelons" highlights that executives' characteristics generate not only first-order effects on organizational actions but also second-order effects through stakeholder evaluations and reactions (Recendes, Chandler, Huang, & Hill, 2024). These theoretical developments underscore that UET research must move beyond demographic proxies to examine how TMT characteristics translate into strategic processes such as innovation, particularly in volatile institutional environments where cognitive diversity becomes strategically critical.

2.2. Functional Diversity and Innovation

Functional diversity refers to the variety of professional and career backgrounds represented in

the TMT (Bunderson & Sutcliffe, 2002). Such heterogeneity expands the breadth of knowledge and skills available to the team, fostering cross-fertilization of ideas and enabling the exploration of multiple strategic alternatives (Hambrick et al., 1996). Prior research has shown that functionally diverse TMTs are more likely to initiate innovative activities by combining insights across domains (Talke et al., 2010; Østergaard et al., 2011). More recent studies strengthen this view, demonstrating that functional heterogeneity enhances absorptive capacity, stimulates exploratory search, and drives firms' innovation outcomes (Bresciani, Ferraris, & Del Giudice, 2018). These findings underscore that TMTs with higher functional diversity are better positioned to integrate perspectives from marketing, R&D, finance, and operations, thereby generating novel solutions and sustaining innovation in dynamic environments. Additionally, recent empirical evidence from China's high-pollution industries confirms that TMT functional diversity stimulates innovation through reducing tunneling effects and enhancing internal control mechanisms (Yan, Xiao, Li, & Xia, 2024), demonstrating the robustness of this relationship across different emerging market contexts.

H1a: Functional diversity in TMTs is positively associated with innovation.

2.3. Educational Diversity and Innovation

Educational diversity refers to the heterogeneity of academic disciplines and fields of training represented in a TMT. Teams composed of executives with diverse educational qualifications can integrate distinct knowledge domains, analytical approaches, and problem-solving logics, enriching the decision-making process and enhancing adaptability (Milliken & Martins, 1996; van Knippenberg, De Dreu, & Homan, 2004). Such heterogeneity broadens the repertoire of perspectives, fostering constructive debate and creative idea generation (Harrison & Klein, 2007). Prior studies confirm that educational diversity supports innovation by enabling the recombination of disciplinary insights and knowledge bases (Østergaard, Timmermans, & Kristinsson, 2011). More recent research highlights that educationally diverse TMTs are more likely to pursue exploratory

innovation, leverage cross-disciplinary synergies, and adapt effectively under uncertainty. Wagdi and Fathi (2024) show that in emerging economies, educational diversity reinforces firm performance by fostering innovation-driven resilience. Collectively, these findings indicate that in volatile contexts such as Vietnam, educationally diverse TMTs provide a stronger foundation for innovation and organizational sustainability by combining knowledge from engineering, business, law, and social sciences to generate novel strategic solutions. Cross-cultural evidence from manufacturing establishments in Germany and India reveals that educational diversity's impact on innovation varies significantly by cultural context, with stronger effects observed in more egalitarian institutional environments (Hemmert et al., 2024). This suggests that in Vietnam's transition economy, where hierarchical norms coexist with marketization pressures, educational diversity may generate particularly salient innovation benefits.

H1b: Educational diversity in TMTs is positively associated with innovation.

2.4. Innovation and Firm Performance

Innovation is widely acknowledged as a central driver of competitive advantage and superior firm performance (Crossan & Apaydin, 2010; Rosenbusch et al., 2011). Innovative firms are more capable of developing new products, processes, and business models that enhance customer satisfaction, improve efficiency, and secure financial growth. Meta-analytic evidence confirms a robust positive association between innovation and firm performance across diverse contexts, with particularly strong effects in dynamic and uncertain markets (Rosenbusch et al., 2011). Further studies reaffirm that both exploratory and exploitative forms of innovation contribute to sustained performance, and that firms with strong innovation capabilities achieve greater adaptability in volatile environments.

H2: Innovation is positively associated with firm performance.

2.5. The Mediating Role of Innovation

TMT diversity alone does not directly guarantee improved firm performance, its value is often realized through internal processes that transform heterogeneity into strategic advantage. Innovation represents one such process, as functional and educational diversity expand the pool of knowledge and cognitive perspectives available within the TMT, which in turn fuels creative recombination and problem solving (Østergaard et al., 2011). Empirical research shows that diverse TMTs are more likely to promote innovation-oriented strategies that translate into superior performance (Talke et al., 2010; Jansen et al., 2006). Recent evidence strengthens this claim: studies in European, Asian, and family business contexts demonstrate that innovation frequently mediates the link between TMT diversity and firm performance, particularly when firms face resource and institutional constraints (Wagdi & Fathi, 2024). Building on this literature, we conceptualize innovation as a complementary pathway that explains how TMT diversity is converted into competitive advantage and firm performance.

H3a: Innovation mediates the relationship between functional diversity and firm performance.

H3b: Innovation mediates the relationship between educational diversity and firm performance.

2.6. Moderating Role of Business Environment Volatility

Contingency theory emphasizes that the effectiveness of organizational practices is highly dependent on environmental conditions (Lawrence & Lorsch, 1967). In stable environments, incremental innovation may suffice, and the benefits of TMT diversity are less salient. By contrast, in volatile contexts characterized by rapid and unpredictable shifts in markets, technologies, or regulations, innovation becomes indispensable for survival and growth (Jansen et al., 2006). Recent studies reinforce this contingency logic, showing that environmental dynamism amplifies the payoff of innovation by making adaptability and continuous renewal prerequisites for competitive advantage (Ardito et al., 2019). Accordingly, we argue that the positive impact of

innovation on firm performance is significantly stronger in volatile environments than in stable ones.

H4: Business environment volatility positively moderates the relationship between innovation and firm performance, such

that the relationship is stronger under volatile than under stable environments.

Based on the above research hypotheses development, this study develops a research framework, as shown in Figure 1.

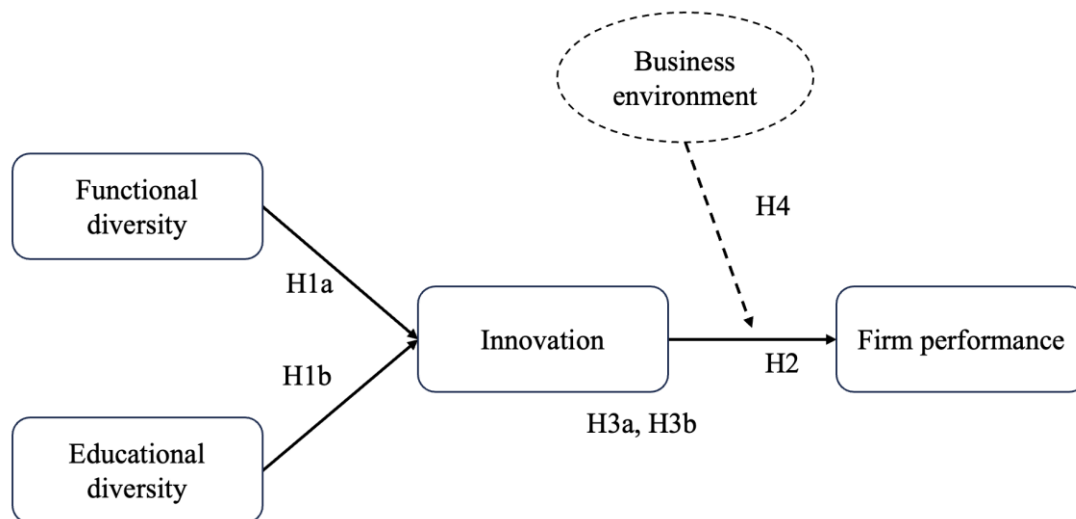


Figure 1. Proposed research model

3. Methodology

3.1. Research Design

This study adopts a quantitative research design using survey data and structural equation modelling (SEM) to examine the hypothesized relationships. SEM is appropriate for this research given its ability to test complex mediation and moderation effects within predictive models (Hair et al., 2021; Sarstedt et al., 2019).

A key methodological contribution of this study lies in the measurement of educational diversity. Most prior research has operationalized educational heterogeneity using Blau's index or Herfindahl - Hirschman type indices, which capture the categorical spread of academic disciplines but neglect how team members interpret and experience such diversity. In contrast, this study adopts perceptual Likert-scale measures that capture 'TMT members' evaluations of how educational diversity shapes strategic discussions and decision-making. This approach captures the cognitive salience of heterogeneity, which is theoretically more relevant for UET, as firm performance depends on how executives perceive and act on differences rather than merge

demographic composition (Hambrick & Mason, 1984).

This measurement strategy is particularly appropriate for emerging markets contexts. In Vietnam and similar institutional environments, formal HR records and archival data are often incomplete or inaccessible. Perceptual measures therefore provide more valid insights into executive cognition in settings characterised by incomplete formal records and weak data infrastructures.

3.2. Sample and Data Collection

The study population comprises private and listed firms in Vietnam. A structured questionnaire was administered to TMT members, defined as executives reporting directly to the CEO (Hambrick & Mason, 1984). Surveys were distributed through three channels: (i) electronic distribution via stock exchange mailing lists, (ii) coordination with industry associations and professional networks, and (iii) direct outreach to firms in major business hubs.

A total of 600 questionnaires were distributed, yielding 368 responses (response rate: 61%). After screening for incomplete questionnaires,

inconsistent answers, and firms with fewer than two executive respondents, the final dataset consisted of 320 valid responses from 136 firms, with an average of 2-3 TMT members per firm. This multi-respondent design mitigates single-source bias and enhances the validity of firm-level constructs.

The sample represents diverse industries: manufacturing (28%), services including finance, education, and healthcare (25%), information technology and telecommunications (16%), construction and real estate (18%), and others (13%). Firm sizes also vary: 42% employ fewer than 500 staff, 36% employ between 500 and 2,000, and 22% employ over 2,000 employees. Firm age ranges from newly listed firms (<5 years) to well-established companies (>30 years), with an average of 17.5 years. This heterogeneity enhances external validity and reduces the risk of industry or firm specific findings.

3.3. Measurements

All constructs were measured using established scales adapted to the Vietnamese context. Items were rated on a five-point Likert scale (1=strongly disagree, 5=strongly agree), except for business environment volatility. *Functional diversity* (three items) was adapted from Bunderson & Sutcliffe (2002) and Talke, Salomo, & Rost (2010). *Educational diversity* (three items) was adapted from Milliken & Martins (1996), van Knippenberg et al. (2004), and Harrison & Klein (2007). *Innovation* (six items) was adapted from Prajogo & Ahmed (2006). *Firm performance* with twelve items adapted from Kaplan & Norton (1996). *Business environment volatility* was measured as a binary construct distinguishing between stable and volatile conditions. Following Jansen, Van den Bosch, and Volberda (2006), stable environments are characterized by predictable demand, incremental technological change, and consistent regulatory frameworks, whereas volatile environments are marked by rapid technological shifts, frequent disruptions, and regulatory uncertainty. Respondents were asked to classify their firm's environment accordingly. The details of measurement items was shown in Appendix A.

3.4. Analytical Approach

PLS-SEM was conducted using SmartPLS 4. The procedure followed three stages: (i) measurement model assessment: Internal consistency, convergent validity, and discriminant validity.

(ii) Structural model assessment: Path coefficients, R^2 values, effect sizes (f^2), and predictive relevance (Q^2); (iii) Hypothesis testing via bootstrapping with 5,000 samples. This multi-stage procedure ensures methodological rigor and supports both explanatory and predictive accuracy.

To further strengthen validity, additional robustness checks were performed. First, non-response bias was examined by comparing early and late respondents on key demographic and construct variables; no significant differences were found. Second, common method bias was addressed both procedurally and statistically. Procedurally, anonymity was assured and multiple respondents per firm were collected to reduce single-source bias. Statistically, Harman's one-factor test revealed that no single factor accounted for the majority of variance, and all full collinearity VIFs were below the threshold of 3.3, indicating that common method bias was not a serious concern (Kock, 2015). These robustness checks, combined with the multi-respondent and multi-industry sample design, enhance the credibility of the findings and demonstrate that the reported relationships are not artifacts of method bias or sampling limitations.

4. Research Results and Finding

4.1. Measurement Model Assessment

Tables 1 presents the results of the measurement model assessment. The model was first evaluated for reliability and validity. All constructs demonstrated satisfactory internal consistency, with Cronbach's alpha values ranging from 0.725 to 0.906 and composite reliability (ρ_c) values between 0.801 and 0.927, exceeding the recommended threshold of 0.70. Convergent validity was also confirmed, as the average variance extracted (AVE) for each construct was above the 0.50 benchmark (Fornell & Larcker, 1981).

Multicollinearity was assessed using variance inflation factors (VIF). All items reported VIF values below the critical threshold of 5, indicating no serious multicollinearity concerns (Hair et al., 2019). The discriminant validity was assessed through the Fornell-Larcker criterion: the square root of AVE for each construct exceeded its correlations with other constructs. Additionally, all the Heterotrait-Monotrait (HTMT) ratios were

below the conservative threshold of 0.85, further confirming that the constructs are empirically distinct (Henseler et al., 2015).

These results demonstrate that the measurement model meets the rigorous requirements of SEM research: constructs are internally consistent, conceptually distinct, and free of multicollinearity. This provides a solid foundation for the structural model testing.

Table 1. Reliability and Convergent Validity of Constructs

Construct	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)	R-square
Functional diversity	0.755	0.859	0.671	
Educational diversity	0.739	0.851	0.659	
Innovation	0.906	0.927	0.681	0.842
Firm performance	0.725	0.801	0.586	0.262

4.2. Structural Model Assessment

Tables 2 present the results of the structural model assessment. Both functional diversity ($\beta = 0.187$, $p < 0.001$) and educational diversity ($\beta = 0.202$, $p < 0.001$) exert significant positive effects on innovation, supporting H1a and H1b. Additionally, innovation demonstrates a strong positive effect on firm performance ($\beta = 0.512$, $p < 0.001$), supporting H2.

Effect size (f^2) analysis indicates small-to-moderate substantive effects. The coefficient of determination (R^2) values reveal high explanatory power for innovation ($R^2 = 0.842$) and moderate explanatory power for firm performance ($R^2 = 0.262$).

The very high R^2 for innovation underscores the centrality of TMT heterogeneity in stimulating firms' innovative capacity. This reinforcing the theoretical argument that leadership diversity enriches knowledge bases and strategic alternatives (Hambrick & Mason, 1984). In contrast, the more modest R^2 for firm performance reflects the multifactorial nature of organizational outcomes. While innovation served powerful mechanism translating diversity into performance, it is only one among several determinants of firm success. Firms should therefore complement innovation initiatives with investments in market strategy, operational excellence, and capability building to fully capitalize on the benefits of TMT diversity.

Table 2. Path Coefficients and Hypothesis Testing

Hypothesis	Relationship	Original Sample (O)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P values	Conclusion
H1a	Functional diversity -> Innovation	0.187	0.048	3.912	0.000	Supported
H1b	Educational diversity -> Innovation	0.202	0.048	4.143	0.000	Supported
H2	Innovation -> Firm performance	0.512	0.038	13.343	0.000	Supported

4.3. Mediation Analysis

Table 3 presents the results of the mediation analysis. The mediating role of innovation was tested using a bootstrapping procedure with 5,000 resamples. The results indicate that both functional diversity and educational diversity exert significant indirect effects on firm performance through innovation ($\beta = 0.096$ and $\beta = 0.108$, respectively; both $p < 0.001$). Because the direct effects of TMT diversity on innovation are also significant, these findings provide evidence of complementary (partial) mediation as defined by Zhao, Lynch, and Chen (2010). Thus, both H3a and H3b are

supported. From a theoretical perspective, this result clarifies that the value of 'TMT' diversity is not realized through direct influence on performance but rather through the innovation pathway, thereby offering stronger empirical grounding for UET. From a managerial standpoint, it suggests that diverse TMTs generate performance advantages only when organizational systems are in place to translate heterogeneity into innovative outcomes. This highlights the critical role of innovation governance and cross-functional integration in converting TMT diversity into competitive advantage.

Table 3. Mediation Test Results

Hypothesis	Pathway	Original Sample (O)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P values	Hypothesis Conclusion
H3a	Functional diversity -> Innovation -> Firm performance	0.096	0.025	3.886	0.000	Partial mediation
H3b	Educational diversity -> Innovation -> Firm performance	0.108	0.026	3.887	0.000	Partial mediation

4.4. Moderation Analysis

Table 4 reports the results of the moderation analysis, where the interaction term between innovation and business environment volatility was included. The interaction effect is positive and significant ($\beta = 0.643$, $p < 0.001$), supporting H4. This finding indicates that the impact of innovation on firm performance is substantially stronger under volatile environments than under stable ones. From a practical perspective, this result underscores that when firms operate in turbulent

markets, characterized by regulatory shifts, technological disruption, and intensified competition, innovation becomes a decisive factor for survival and competitiveness. By contrast, in more stable settings, incremental improvements may be sufficient to sustain performance, and the marginal payoff of innovation is comparatively lower. This asymmetry highlights the contingent value of innovation, which not only drives performance but also serves as a buffer enabling firms to withstand volatility and seize opportunities arising from uncertainty.

Table 4. Moderation Test Results

Hypothesis	Relationship	Original Sample (O)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P values	Conclusion
H4	Business Environment* Innovation -> Firm Performance	0.643	0.091	7.084	0.000	Supported

5. Contributions

5.1. Theoretical contributions

The empirical findings provide strong support for the proposed research model. Both functional and educational diversity within TMTs exert significant positive effects on innovation, consistent with prior studies highlighting the cognitive and informational benefits of heterogeneous professional and educational backgrounds (Bunderson & Sutcliffe, 2002; Østergaard et al., 2011). These results align with international evidence from OECD economies, which emphasizes that human capital diversity contributes to innovation-led growth, although effects are moderated by institutional stability and governance systems (OECD, 2021).

This study makes several key theoretical contributions. First, it implicitly confirms innovation as the central mediating mechanism linking TMT diversity to firm performance. While earlier research often assumed innovation's role implicitly or treated it as one multiple outcomes, this study provides direct empirical evidence of innovation as the primary pathway. The mediation analysis demonstrates that the TMT diversity-firm performance relationship operates largely indirectly through innovation, providing stronger empirical grounding for UET's proposition that managerial attributes influence organizational outcomes through strategic choices and processes (Hambrick & Mason, 1984). This adds conceptual clarity to a literature where direct effects of TMT diversity have frequently produced mixed or inconclusive results.

Second, the moderation analysis further reveals that environmental volatility significantly amplifies the diversity – innovation –

performancerelationship. Consistent with contingency theory, the positive impact of innovation on firm performance is stronger in turbulent conditions, where adaptability is a prerequisite for survival. This finding resonates with evidence from transition economies such as Eastern Europe, where firms in volatile industries leverage innovation more intensively than those operating in stable contexts (Wagdi & Fathi, 2024).

Third, it advances the conceptualization and measurement of educational diversity by operationalizing it as a perceptual rather than purely demographic construct. Traditional approaches using Blau's index or Herfindahl-Hirschman indices capture categorical heterogeneity but neglect how team members cognitively process and act upon educational differences (Harrison & Klein, 2007). Our perceptual measurement approach captures executives' evaluations of how educational diversity shapes strategic discussions and decision-making, aligning with UET's emphasis on cognition over demography. This methodological innovation is particularly valuable in emerging market contexts where formal HR records are often incomplete or inaccessible. It responds to recent calls for skill-oriented perspectives on TMTs that complement traditional role-oriented research (Pinski, Hofmann, & Benlian, 2024), especially relevant as emerging market firms increasingly compete on knowledge-intensive capabilities rather than cost advantages alone.

Vietnam presents a unique institutional configuration that differs meaningfully from other transition economies. Whereas Eastern European firms have benefited from EU integration and relatively stable regulatory frameworks, Vietnamese

firms continue to operate in an environment marked by frequent and unpredictable policy shifts. This makes innovation not only a driver of competitiveness but also a buffer against institutional volatility. In this respect, Vietnam represents a particularly informative case offering rare empirical insights into how leadership diversity and innovation interact in contexts where institutional rules are still emerging and contested. Similar institutional fluidity and market turbulence are also observed in Latin America and Africa, suggesting that the mechanisms identified in Vietnam may resonate more broadly across diverse emerging market contexts.

These findings demonstrate that UET's score assumptions – that TMT characteristics shape organizational outcome through strategic procedures – hold robustly in emerging market contexts characterized by institutional fluidity and rapid change. By confirming that TMT diversity translates into superior performance primarily through innovation, and that this relationship is contingent on environmental volatility, this study extends the external validity of UET beyond mature Western setting. It highlights the theoretical value of examining leadership diversity in contexts where institutional frameworks are still evolving, challenging the explicit Western centric assumptions that have long dominated upper echelons research.

5.2. Managerial implications

The findings of this study yield several actionable implications for executives and policymakers in Vietnam's private and listed firms. First, leveraging TMT diversity through innovation. Boards of directors and CEOs should regard functional and educational diversity not as an end in itself but as a strategic resource requiring deliberate management. Executives should regularly assess whether cross-functional R&D teams are established and whether platforms exist for marketing, finance, and operations leaders to exchange insights. If such mechanisms are absent, immediate actions should include forming cross-functional task forces, institutionalizing structured knowledge-sharing sessions, and linking executive incentives to innovation

outcomes. Without these structures, the potential of diversity may remain dormant or even counterproductive due to coordination costs and conflict.

Second, implications for firms in high-volatility sectors. In industries facing rapid technological disruption and regulatory turbulence, such as information technology, logistics, and financial services, innovation is not optional but a survival imperative. Firms in these sectors should leverage diverse TMTs to champion exploratory innovation, for example through digital platforms, fintech solutions, or smart logistics initiatives. Fintech firms in Vietnam could benefit from establishing dedicated regulatory radar teams composed of legally trained and technically skilled executives to anticipate policy shifts and adapt product strategies accordingly. Similarly, logistics firms should initiate pilot projects that combine IT, operations, and finance expertise to experiment with blockchain or AI-enabled supply chain systems. In Vietnam, where fintech and e-logistics markets are expanding under regulatory uncertainty, cognitively diverse leadership teams can provide the foresight and agility required to remain competitive. Unlike in China, where policy support has stabilized fintech growth, Vietnam's regulatory volatility underscores the critical importance of adaptive innovation governance.

Third, implications for firms in more stable sectors. In industries such as traditional manufacturing and construction, where demand patterns are relatively predictable and technological change is incremental, innovation should focus on efficiency, quality, and compliance. Firms in these sectors should channel TMT diversity toward incremental process innovation. For instance, manufacturing firms in Ho Chi Minh City could convene cross-disciplinary meetings involving engineering, finance, and sustainability officers to align on lean manufacturing targets and green compliance standards. Construction firms should mobilize diverse expertise to digitalize project management or adopt eco-friendly building technologies, thereby meeting rising sustainability demands from regulators and international clients.

Finally, building innovation-oriented governance. Across all industries, managers should ensure that innovation is not left to chance but embedded in governance structures. This involves creating formal innovation committees at the board level, establishing cross-functional task forces within the TMT, and linking performance appraisals directly to innovation metrics. For example, a listed firm in Ho Chi Minh City could institutionalize quarterly innovation scorecards as part of executive evaluations. In the Vietnamese context, where many firms are still transitioning from founder-driven to professionally governed models, embedding innovation into governance systems is critical for institutionalizing resilience and ensuring competitiveness in regional and global markets.

In sum, the study highlights that the value of TMT diversity is contingent on environmental conditions: under volatility, diversity enables adaptability and survival; under stability, it fosters efficiency and compliance. For Vietnamese firms, the practical lesson is clear, TMT diversity generates performance advantages only when systematically channeled into structured innovation practices tailored to industry dynamics.

6. Limitations and Future Research

While this study offers novel insights, several limitations should be acknowledged to guide interpretation and inform future research.

First, contextual specificity. The empirical setting is Vietnam, a transition economy with distinctive institutional and market features such as rapid regulatory shifts, evolving corporate governance norms, and uneven capital market development. These characteristics make Vietnam a highly relevant case for testing the boundary conditions of UET, but they may also constrain the direct generalizability of findings to more mature economies. Future research could extend the analysis through cross-country comparisons, for example by contrasting Vietnam with other transition economies in Asia (e.g., China) or Eastern Europe, to assess the extent to which the moderating role of environmental volatility is context-dependent.

Second, this study employed a cross-sectional survey design, which restricts the ability to infer causality or to capture the dynamic interplay between TMT diversity, innovation, and firm performance over time. Longitudinal or panel data designs would allow scholars to observe how leadership heterogeneity shapes innovation trajectories and long-term competitiveness, particularly as firms transition between stable and volatile environments.

Third, measurement of environmental volatility. Business environment volatility was operationalized as a binary construct (stable vs. volatile). Although this approach is parsimonious and reflects the dichotomous perceptions of executives in emerging markets, it may oversimplify the nuanced gradations of environmental turbulence. Future studies could employ multi-item Likert-type scales or objective indicators (e.g., industry-level volatility in demand, technological change, or regulatory shifts) to generate richer assessments of environmental dynamism. Fourth, scope of diversity dimensions. The study focused on functional and educational diversity, but other dimensions, such as gender, age, tenure, or psychological capital, may also influence innovation and firm performance. Future research should broaden the scope of diversity constructs and examine potential interactions among demographic, cognitive, and psychological attributes of TMTs. Additionally, Vietnam's private capital market experienced a 35% decline in capital deployed in 2024 despite sustained deal activity, reflecting a shift toward fundamentals-driven investment (VPCA, 2025). Future research could examine whether TMT diversity effects vary across different phases of market cycles—boom versus correction periods—as resource constraints may moderate the innovation-performance relationship.

7. Conclusion

This study advances understanding of how TMT diversity contributes to firm performance in emerging markets. Analysing functional and educational diversity in Vietnamese TMTs, the findings confirm that innovation serves as the primary mediation mechanism through which diversity translates into superior performance.

Importantly, this relationship is contingent on environment conditions: the innovation-performance linkage significantly stronger in volatile environments, underscoring the contingent nature of strategic processes in transition economies.

Overall, the study provides novel evidence from Vietnam that enriches cross-contextual understanding of how TMT diversity enhances competitiveness in emerging markets. By linking TMT heterogeneity to innovation and firm performance under environmental volatility, the research demonstrates that diverse TMTs are not merely symbolic but represent a critical strategic resource for firms navigating uncertainty in globalising markets. In doing so, the study not only advances theory but also provides insights into how emerging market firms can leverage TMT diversity to strengthen their position within global value chains. Findings from Vietnam are not idiosyncratic but reflect broader dynamics observable across emerging markets experiencing rapid institutional transformation, from Southeast Asian economies pursuing Industry 4.0 transitions

to Latin American and African contexts navigating governance reforms. By demonstrating that diverse TMTs generate competitive advantages primarily through innovation pathways, and that these advantages are amplified under volatility, this study reinforces the external validity of UET across transition economies and enriches cross-contextual understanding of how leadership heterogeneity contributes to organizational resilience under institutional turbulence. As Vietnam positions itself as a regional innovation hub with government backing and rising private capital sophistication (VPCA, 2025), the strategic imperative for firms is clear: cultivating diverse TMTs and embedding innovation into governance structures are not discretionary choices but survival prerequisites in globally competitive, institutionally fluid markets.

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