





## *The show must go on: The role of managers in promoting innovation among Armenian SMEs*

### *El espectáculo debe continuar: El papel de los directivos en el fomento de la innovación entre las PYMEs armenias*

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#### Abstract

The COVID-19 pandemic highlighted the importance of firm innovativeness as a means of surviving and succeeding during periods of extreme uncertainty. This paper examines the role of managerial capabilities as a driver of innovation under uncertainty in small and medium-sized enterprises (SMEs). In particular, we analyze how the propensity to innovate under uncertainty varies according to managers' seniority, educational background, and functional area. Our analysis draws on data from the GLOBE-2020 survey, which includes 213 responses from managers of Armenian SMEs. The results indicate that managers in strategic and support positions demonstrate a higher tendency to pursue innovation under conditions of external turbulence, whereas educational background and seniority do not significantly affect this relationship. This study addresses a gap in the literature by examining the role of managerial characteristics in driving innovation during a crisis within an under-researched developing country context, using Armenia as a case study. The findings underscore the importance of strategic orientation for fostering an innovative firm mindset, as well as the role of entrepreneurial education and the joint efforts of lower-, middle-, and upper-level management in promoting innovation.

**Keywords:** innovation; small and medium-sized enterprises; Armenia; managerial capabilities; uncertainty; entrepreneurship

**JEL Classification:** M10; O30

#### Resumen

La pandemia de COVID-19 puso de relieve la importancia de la capacidad de innovación de las empresas como medio para sobrevivir y prosperar en períodos de extrema incertidumbre. Este artículo examina el papel de las capacidades directivas como motor de la innovación en condiciones de incertidumbre en las pequeñas y medianas empresas (PYMEs). En concreto, analizamos cómo varía la propensión a innovar en condiciones de incertidumbre en función de la antigüedad de los directivos, su formación académica y su área funcional. Nuestro análisis se basa en datos de la encuesta GLOBE-2020, que incluye 213 respuestas de directivos de PYMES armenias. Los resultados indican que los directivos en puestos estratégicos y de apoyo muestran una mayor tendencia a buscar la innovación en condiciones de turbulencia externa, mientras que la formación académica y la antigüedad no afectan significativamente a esta relación. Este estudio aborda una laguna en la literatura al examinar el papel de las características de los directivos en el impulso de la innovación durante una crisis en el contexto de un país en desarrollo poco investigado, utilizando Armenia como caso de estudio. Los resultados subrayan la importancia de la orientación estratégica para fomentar una mentalidad innovadora en la empresa, así como el papel de la formación emprendedora y los esfuerzos conjuntos de los directivos de nivel inferior, medio y superior en la promoción de la innovación.

**Palabras clave:** innovación; pequeñas y medianas empresas; Armenia; capacidades de gestión; incertidumbre; espíritu emprendedor

**Clasificación JEL:** M10; O30

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## 1. Introduction

As one of the dimensions of entrepreneurial orientation, firm innovativeness refers to an organization's overall capability to introduce new products, services, or technological processes to the market (Lumpkin & Dess, 1996; Wang & Ahmed, 2004). It is linked to firm performance (Drucker, 1985; Lumpkin & Dess, 1996; Roberts, 1999) and is crucial for attaining competitive advantage by motivating firms to become pioneers in their respective markets (Naranjo-Valencia et al., 2016).

The COVID-19 pandemic highlighted the importance of innovation during periods of rising uncertainty, not only as a means of succeeding but also of surviving. Although the crisis caused by the coronavirus will eventually fade, the growing trend of uncertainty driven by other factors—such as climate change and digital transformation—will persist (Schatsky, 2020).

As key decision-makers, managers play a pivotal role in fostering a firm's innovative attitude. Adaptation to changing external environments depends on firms' innovation capabilities, which enable them to create and sustain competitive advantage in turbulent times. Through their agility, strategic thinking, communication, and leadership skills, managers transform uncertainty into opportunities to add value and enhance firm performance (Angelshaug et al., 2025; Flynn et al., 2025).

In this study, we aim to deepen understanding of the drivers that enhance the inclination to innovate in response to external volatility by examining distinct managerial characteristics: seniority, educational credentials, and functional roles within the organization.

We draw on data from the GLOBE-2020 survey, focusing primarily on the demographic, innovation, and uncertainty sections of the questionnaire, and on managers based in Armenian SMEs.

Our findings indicate that managers in strategic and support positions are more likely to engage in innovative processes under uncertainty than those in support positions. Furthermore, we find no significant relationship between managers' educational attainment or seniority and their tendency to innovate under conditions of environmental uncertainty. The results suggest that functional area has a significant influence on managers' likelihood of engaging in innovation in response to external turbulence.

This paper extends the prior literature through a novel integration of managerial variables. While numerous studies have examined innovation under uncertainty, few have considered variables such as managerial functional position in combination with educational attainment and seniority. Moreover, studies that address the impact of education and seniority on a firm's capacity to innovate in uncertain environments tend to focus on particular industries and report mixed results. This study addresses this gap by providing a broader perspective centered on small and medium-sized enterprises in a developing country context, using Armenia as a case study.

Our findings contribute to the literature on managerial behavior under environmental uncertainty by demonstrating that functional role is a critical determinant of managers' propensity to engage in innovation. Whereas prior research has often emphasized individual characteristics such as education and seniority as drivers of innovative behavior, our results indicate that these attributes do not significantly shape managers' responses to external turbulence. Instead, we show that managers occupying strategic and support positions are substantially more inclined to initiate innovative processes under uncertainty than those in support roles. This insight refines existing theories of managerial decision-making by underscoring the importance of organizational positioning and role expectations in shaping innovation-related behaviors. By highlighting functional area as a key explanatory factor, this study contributes to a more nuanced understanding of how organizations can leverage internal structures to foster innovation in volatile environments.

The paper is structured as follows. Section 2 reviews the literature and develops three hypotheses. Section 3 describes the research design and methodology. Section 4 presents the results of the analysis. Section 5 discusses the main findings, and Section 6 concludes the paper.

## 2. Literature review

### 2.1 Crisis-driven innovation

Innovation is recognized as a tool that managers can use to address the unforeseen consequences of sudden changes in business conditions (Wenzel et al., 2021).

Using a sample of 259 SME managers in Saudi Arabia, Adam and Alarifi (2021) found that the innovation practices adopted by SMEs to address the repercussions of COVID-19 had a positive impact on performance and the likelihood of business survival, an effect further strengthened by external support.

Aiming to contribute to the literature on SME crisis management mechanisms, Clauss et al. (2022) examined the role of temporary business model innovation (BMI) as a tool for SMEs to overcome a crisis. They found that temporary BMI drawing on existing core competencies and positioned in nascent industries represents a viable means by which organizations can adapt to changing external conditions.

Through exploratory research based on phone interviews with 329 managers from SMEs in Spain, Clemente-Almendros et al. (2025) showed that COVID-19-related disruptions to inbound logistics, operations, and marketing had a positive influence on innovation outcomes in SMEs. They also found that the presence of female managers was associated with stronger innovation outcomes, whereas family-owned SMEs exhibited comparatively weaker innovation performance.

However, the capacity to undertake crisis-induced innovation is heterogeneously distributed across firms and varies depending on both external and internal factors.

Beglaryan et al. (2025) empirically examined the propensity of SMEs in Armenia to engage in product, process, and organizational innovation under uncertainty, and how this propensity varies depending on the manager's gender. Their results confirmed a positive relationship between uncertainty and innovation and indicated that male managers have a higher tendency to pursue innovation under conditions of external turbulence.

Lien and Timmermans (2024) showed that pre-crisis experience with innovation and organizational agility are key characteristics associated with higher levels of innovation in response to a crisis, a greater likelihood of increasing resources allocated to innovation during a crisis, and higher expected post-crisis value from innovations undertaken in response to a crisis.

Klyver and Nielsen (2024) examined the extent to which SMEs' pre-crisis preparedness affects their choice of coping strategies during a crisis. Their findings demonstrate that organizational preparedness—characterized by less formalized structures—and cultural preparedness—characterized by entrepreneurial orientation—enable SMEs to be more productive in hostile environments, as they are more likely to adopt innovation strategies in response to a crisis.

Finally, Angelshaug et al. (2025) demonstrated that the greater the turbulence in the external environment, the broader the scope of business model innovation required. In other words, the number of business model components that a firm needs to modify increases with the severity of the crisis it faces.

## 2.2 Entrepreneurship, innovation and managerial capabilities

Entrepreneurial orientation emerged as a concept within the strategic management literature. It is defined as a firm's innovativeness, proactiveness, and risk-taking tendencies when faced with market opportunities (Miller, 1983) and has been identified as a key factor in enhancing the performance of small, medium, and micro enterprises (Beltramino et al., 2023). Covin and Slevin (1991) describe entrepreneurship as a dimension of strategic posture, characterized by a firm's risk-taking propensity, tendency to act in competitively aggressive and proactive ways, and reliance on frequent and extensive product innovation. For the purposes of this study, we draw only on the innovativeness dimension of entrepreneurial orientation, which reflects a firm's tendency to engage in and support new ideas, novelty, experimentation, and creative processes that may result in new products, services, or technological processes.

In characterizing innovativeness, considerable scholarly attention has been devoted to understanding how to improve firms' capacity to innovate (Damanpour, 1987, 1996; Koc & Ceylan, 2007; Mavondo et al., 2005). At the individual level, the drivers of innovation include creativity, leadership, and employee motivation practices (Dani & Gandhi, 2022). In this study, we focus on the individual level—specifically, managers across various functional areas (strategic, core, and support) and with varying levels of educational attainment and seniority.

Damanpour (1996) argued that managers' attitudes toward change may affect decisions related to innovation, while Heine et al. (2003) demonstrated that technological outcomes are heavily dependent on management processes. Zaccaro and Banks (2004) highlighted the role of managerial competencies and skills in managing change. More broadly, managers are central actors in organizations whose skills and abilities account for differences in organizational capabilities and efficiency (Lopez-Cabrales et al., 2006).

According to Muller and Zenker (2001), the knowledge necessary for innovation can be either generated within the organization or acquired from the external environment—from partners, competitors, suppliers, and customers. Drawing on turbulent external environments, managers can adapt internal structures and processes through the acquisition of new knowledge and changes in routines to meet customer needs. Consequently, managers' possession of an appropriate behavioral repertoire for driving improvement is crucial for undertaking innovation (Martínez-Ros & Orfila-Sintes, 2012), and their perception of innovation ultimately influences the degree to which it is fostered within the firm (Iorgulescu & Răvar, 2013).

Dutta et al. (2005) defined capability as the ability to transform resources into outcomes, involving the synchronization of tasks and the utilization of resources to attain a particular result—a process through which individuals or organizations construct the building blocks of business competency. Accordingly, managerial capabilities represent combinations of knowledge, experience, and productive attributes, as well as the functional and technical skills required to perform tasks, solve problems, and operate effectively under uncertainty (Campion et al., 2011; Leblanc & James, 2010; Marcus et al., 2007).

Heubeck (2023) examined the specific managerial capabilities that drive innovation in today's digital economy, focusing on managers' dynamic capabilities and their three underlying drivers—managerial human capital, social capital, and cognition—as direct antecedents of digital firms' innovativeness. The findings demonstrate that only a complete portfolio of managers' dynamic capabilities promotes innovativeness in digital firms.

Shaw et al. (2024) demonstrated that successful SME innovations often depend on managers or owners who foster participatory environments and decentralized management structures, which empower employees to engage actively in the absorption of new knowledge and thereby drive innovation.

Given the importance of identifying the managerial characteristics that lead managers to pursue innovation, this study explores how the propensity to innovate under uncertainty varies according to managerial seniority, educational background, and whether the manager occupies a strategic or non-strategic position.

### 2.3 Educational attainment and seniority of managers

Since the development of the resource-based view (RBV), managerial capabilities have been viewed as key determinants of resource utilization and subsequent firm growth (Brinckmann & Hoegl, 2011; Burger-Helmchen, 2009; Colombo & Grilli, 2005). According to Camisón (2005), managerial capabilities are an important source of competitive advantage, as they determine how an organization's resources and capabilities are deployed and ultimately converted into valuable products and value creation. The author distinguishes two components of managerial capabilities: a technical component, reflecting managers' know-how, and a cognitive component, reflecting management's values and personality. Macrae (1992) further suggests that the education, training, and experience of senior managers are major distinguishing factors between high-growth and low-growth SMEs. Prior studies also document a positive relationship between human capital and entrepreneurship, showing that higher levels of education and accumulated experience are positively associated with the formation of innovative ventures (Dvouletý et al., 2022; Hanák & Grežo, 2020; Martin et al., 2013).

Managing innovation requires considerable experience, knowledge, and training on the part of managers. Knowledge relevant to innovation can be derived from both experience and formal qualifications (Martínez-Ros & Orfila-Sintes, 2012). A manager's experience is shaped by time in the profession, decision-making exposure, training, international career experience, and the variety of prior roles held (Camisón, 2005), while qualifications reflect the manager's educational background—particularly the level of managerial and technological education attained (Camisón-Haba et al., 2019).

In their study of the hospitality industry, Martínez-Ros and Orfila-Sintes (2012) found that although managers' skills and capabilities are positively related to innovation-related decisions and their implementation, experience alone is not sufficient to manage innovation-driven change. By contrast, Mabula et al. (2020) demonstrated that managerial experience in SMEs has a positive impact on the ability to manage dynamic resources—such as technology and finances—effectively, thereby enhancing firm innovation and competitive advantage.

Rubio-Andrés et al. (2023) showed that, under external turbulence induced by the pandemic, commitment to innovation in SMEs may be more consequential for managers with higher levels of education. The authors demonstrated empirically that more highly educated managers are better able to convert SMEs' innovative capacity into superior firm performance, whereas less educated managers find it more difficult to translate innovation into business results.

The extant literature also establishes that top managers play an essential role in fostering organizational innovation by identifying and exploiting opportunities and creating an environment conducive to the generation and diffusion of knowledge (Al-Refaie et al., 2011; Denti & Hemlin, 2012; Elenkov et al., 2005; Huang et al., 2009; Jung et al., 2003; Kim et al., 2012; Makri & Scandura, 2010; Ryan & Tipu, 2013). Nevertheless, the role of middle managers in promoting firm innovativeness should not be overlooked. While senior leaders recognize the need for continuous innovation, lower- and middle-level managers—with their direct proximity to day-to-day operations—are often best positioned to generate new ideas (Kanter, 2004).

Expanding the concept of dynamic managerial capabilities to middle management, Greven et al. (2023) theorized that middle managers' capabilities to sense, seize, and reconfigure opportunities and assets enhance product ambidexterity. Their results showed that middle managers' general human capital (specialized

education), structural social capital (managerial ties), and relational social capital (trust) are positively related to product ambidexterity, whereas their cognitive social capital (solidarity) is negatively related.

Using data from Chinese companies, Xu et al. (2023) found that a seniority culture is negatively associated with innovation efficiency. Similarly, Ying et al. (2022), also drawing on data from China, found a negative association between seniority and corporate innovation, particularly among high-tech firms.

From the perspective of dynamic capabilities theory, we posit that lower- and middle-level managers are often closer to operational processes, customer feedback, and emerging inefficiencies. This proximity may enhance their ability to sense environmental turbulence and seize the opportunities it presents. By contrast, top-level managers, with their broader view of long-term positioning and greater distance from day-to-day operations, may be less attuned to environmental changes that give rise to innovation opportunities.

Furthermore, an organization's dynamic capabilities are substantially shaped by managers' capacity to interpret ambiguous information, envision alternative courses of action, and orchestrate resource reconfigurations. A higher level of education may therefore play an important role in strengthening these capabilities through broader knowledge bases and stronger analytical skills.

Based on the literature reviewed above, we propose the following hypotheses:

**H1:** *Lower- and middle-level managers tend to engage more in innovation activities (product, process, and organizational) under uncertainty than top-level managers.*

**H2:** *Managers with higher levels of education tend to engage more in innovation activities (product, process, and organizational) under uncertainty than those with lower levels of education.*

## 2.4 Strategic versus non-strategic managerial roles

Dynamic and uncertain environments present firms with value-creation opportunities in which the potential for competitive advantage resides. Managers must therefore be quick to identify and exploit these opportunities to secure a superior competitive position.

The resource-based view (RBV) posits that a firm's competitive advantage lies in its unique and inimitable strategic resources—resources that are valuable, rare, inimitable, and non-substitutable (Barney, 1991). Such resources are difficult to accumulate and are characterized by causal ambiguity, properties that confer sustainable competitive advantage. However, a strategic resource generates value only when it embeds viable opportunity options that management can seize in a timely manner by actively managing firm-specific risk through a business model that is scalable, flexible, and sustainable. It is management's opportunity focus and timely exploitation of the valuable options embedded in a strategic resource that ultimately render that resource valuable. Porter (1985) further argues that competitive advantage derives not from a firm's resources alone but from the value-creating activities consistent with its strategic position—whether a cost leadership or differentiation strategy—and from the activity drivers that support those value-creating activities.

Heubeck and Meckl (2022) examined the role of managerial capabilities as antecedents of strategic change and firm performance. Using a sample of German Industry 4.0 firms, they provided new insights into the significance of managerial capabilities in a digital economy. Drawing on dynamic managerial capabilities theory, the study demonstrated that managerial human capital—composed of leadership and entrepreneurial skills—is a critical facilitator of digital business model transformation and resultant firm performance. Focusing on the role of individual-level behaviors and actions in the digital transformation of international SMEs, Jafari-Sadeghi et al. (2023) found that entrepreneurs act as strategic transformation managers capable of driving firms toward successful digitalization. The authors expanded the antecedents of the theory of planned behavior by grouping them into four categories: managers' capabilities in technology management, knowledge management, entrepreneurial and innovation management, and leadership and managerial capacities.

Singh et al. (2023) noted that recent research on strategic leadership and innovation has shifted its focus toward digitalization, which is transforming how business is conducted. In particular, the digital transformation facilitated by emerging technologies has given rise to new business models and forms of governance, underscoring the need for strategic leaders to identify and develop the core competencies and key success factors that enable them to steer their organizations toward timely and relevant innovation—maximizing value creation and sustaining competitive advantage.

Viewed through the lens of dynamic capabilities theory, managers in strategic functions are directly engaged in scanning market signals, evaluating competitive threats, and identifying opportunities for organizational renewal, whereas managers in support and primary functions tend to focus on maintaining efficiency, ensuring continuity, and executing established routines. Managers in strategic functions are therefore better positioned

to sense environmental changes, seize innovation opportunities, and orchestrate resource reconfigurations.

**H3:** *Managers involved in strategic functions tend to engage more in innovation activities (product, process, and organizational) under uncertainty than those in support and primary functional areas.*

### 3. Research design and methodology

#### 3.1 Sample and sources of information

We use data from the GLOBE-2020 survey to test our hypotheses. This survey was administered by the Center for Business Research and Development at the American University of Armenia and was conducted among small and medium-sized Armenian enterprises. In line with the EU definition, the SME classification in Armenia is based on three criteria: employment, turnover, and balance sheet total. Specifically, micro-enterprises are defined as having fewer than ten employees and an annual turnover or balance sheet total not exceeding AMD 100 million (€185,580). Small enterprises are defined as having fewer than 50 employees and an annual turnover or balance sheet total not exceeding AMD 500 million (€927,900). Medium-sized enterprises are defined as having fewer than 250 employees, an annual turnover not exceeding AMD 1,500 million (€2,783,700), or an annual balance sheet total not exceeding AMD 1,000 million (€2,041,380)<sup>1</sup>.

Data collection was conducted across two periods—September 28 to October 1, 2020, and November 26 to December 31, 2020—using the computer-assisted telephone interviewing (CATI) method, yielding a final sample of 319 respondents. The questionnaire comprised 86 items, and each interview lasted an average of 51 minutes. To reduce common method bias, all interviewers attended a three-day training session prior to data collection, covering the survey's main objectives and procedural and methodological requirements. To further mitigate bias, the questionnaire included both positively and negatively worded items. For quality control purposes, all interviews were subject to the following verification procedures: supervision by the data collection coordinator, callback checks, and logic and duration review (100% of interviews). Following this review, six responses that failed to meet quality standards were removed from the dataset.

For the purposes of our analysis, the data were cleaned to include only managers employed by Armenian SMEs, resulting in a final sample of 213 responses from 136 SMEs.

#### 3.2 Measures

The demographic, innovation, and uncertainty sections of the questionnaire were used to test our hypotheses. These sections comprised items measured using five-point and seven-point Likert scales, as well as polar questions, which were subsequently coded and grouped for analysis.

**Educational attainment, tenure, and position type.** The demographic section of the questionnaire included items relating to managers' educational attainment, tenure, and position type (see Table A1).

**Innovation.** The innovation section comprised three sets of items covering product, process, and organizational innovation. Definitions were drawn from the Community Innovation Survey (Eurostat, 2018) and the Oslo Manual (OECD, 2005). Product innovation is defined as "a new or improved good or service that differs significantly from the firm's previous goods or services and that has been introduced to the market" (Eurostat, 2018). Process innovation is defined as "a new or improved business process for one or more business functions that differs significantly from the firm's previous business processes and that has been implemented within the firm" (Eurostat, 2018). Organizational innovation is defined as "a new organizational method in business practices, workplace organization, or external relations" (OECD, 2005). To quantify innovation, we used measures adapted from Daft (1978), Kimberly and Evanisko (1981), and Damanpour (1987).

**Environmental uncertainty.** This variable was measured using the market orientation framework introduced by Jaworski and Kohli (1993).

#### 3.3 Statistical analysis

To test our hypotheses, average scores for uncertainty and for product, process, and organizational innovation were calculated from items using a five-point Likert scale (1 = low, 5 = high).

Table 1 presents the variables used in the analysis along with the items comprising each measure. Uncertainty was measured as the mean score of managers' perceptions of two phenomena: the degree to which customer or beneficiary preferences change over time and the pace of technological change in their field (min = 1, max = 5). Product innovation was measured as the mean score of managers' perceptions of the development and market introduction of new products or services and the time and human resources devoted to new product or service development relative to competitors. Process innovation was measured as the mean score of three

items capturing the extent of changes to existing processes, the initiation of new process development, and responsiveness to new processes developed by other firms in the same field. Organizational innovation was measured as the mean score of three items capturing the extent of administrative innovation, the search for new administrative systems, and the initiative to integrate new administrative systems into the organization.

**Table 1.** Description of variables

Variable	Scale	Items Included in Measure
Uncertainty	1-5 (1 = low, 5 = high)	Managers' perceptions of: (1) the degree to which customer or beneficiary preferences change over time; (2) the pace of technological change in their field.
Product Innovation	1-5 (1 = low, 5 = high)	Managers' perceptions of: (1) the development and market introduction of new products or services; (2) the time and human resources devoted to developing new products or services, relative to competitors.
Process Innovation	1-5 (1 = low, 5 = high)	Managers' perceptions of: (1) the extent of changes to existing processes; (2) the initiation of new process development; (3) responsiveness to new processes developed by other firms in the same field.
Organizational Innovation	1-5 (1 = low, 5 = high)	Managers' perceptions of: (1) the extent of administrative innovation; (2) the search for new administrative systems; (3) the initiative to integrate new administrative systems into the organization.

To assess the internal consistency of the multi-item constructs used in this study, reliability analysis was conducted using Cronbach's alpha ( $\alpha$ ). Product innovation demonstrated acceptable reliability ( $\alpha = 0.73$ ), while organizational innovation exhibited high internal consistency ( $\alpha = 0.90$ ). Environmental uncertainty returned a lower coefficient ( $\alpha = 0.48$ ), which may be attributable to the small number of items used to capture this construct. Process innovation was measured using a single item and therefore did not permit calculation of internal consistency. The reliability results are presented in Table 2.

**Table 2.** Reliability of multi-item constructs

Construct	Number of Items	Cronbach's Alpha ( $\alpha$ )
Environmental Uncertainty	2	0.48
Product Innovation	2	0.73
Organizational Innovation	2	0.90
Process Innovation	1	—

## 4. Results of the analysis

Table 3 presents the descriptive statistics for the survey respondents. Approximately 59% of respondents represented senior management, while the remaining 41% represented lower- and middle-level management. About 38% of managers held strategic positions, whereas 53% occupied primary roles. More than 81% of respondents had a master's or doctoral degree.

**Table 3.** Descriptive statistics by education, seniority, and position type

		Education			Seniority		Position Type		
		Bachelor's or below	Master's	Doctoral	Lower/mid management	Senior management	Strategic	Primary	Support
n (%)		18.8%	69.5%	11.7%	40.8%	59.2%	37.6%	53.0%	9.4%
<b>Uncertainty</b>	M	4.11	3.91	3.84	3.95	3.93	4.06	3.91	3.65
	SD	0.75	0.75	0.78	0.73	0.77	0.68	0.79	0.78
<b>Product Innovation</b>	M	3.84	3.94	4.11	3.89	3.98	4.11	3.83	3.88
	SD	0.84	0.69	0.77	0.75	0.72	0.68	0.74	0.80
<b>Process Innovation</b>	M	3.85	3.90	4.04	3.89	3.92	3.97	3.83	4.08
	SD	0.81	0.63	0.69	0.68	0.67	0.65	0.69	0.66
<b>Organizational Innovation</b>	M	3.85	3.75	4.08	3.79	3.82	3.87	3.73	3.98
	SD	0.75	0.72	0.73	0.74	0.73	0.71	0.74	0.77

N = 213. M = mean; SD = standard deviation. Education, seniority, and position type are mutually exclusive groupings within each category. Percentages reflect the proportion of respondents in each subgroup

Prior to hypothesis testing, correlations among the key study variables were examined to assess the relationships between the different dimensions of innovation and perceived environmental uncertainty. The results indicated moderate positive correlations among the innovation variables, suggesting that, although the constructs are related, they capture distinct aspects of firm innovativeness. The correlation matrix is presented in Table 4.

**Table 4.** Correlation matrix of key variables

Variable	1	2	3	4
1. Uncertainty	—			
2. Product Innovation	0.39***	—		
3. Process Innovation	0.34***	0.68***	—	
4. Organizational Innovation	0.36***	0.58***	0.64***	—

Diagonal entries represent the absence of a self-correlation. \*\*\*  $p < .001$

To test Hypotheses 1, 2, and 3, multivariate regression models were estimated. Separate ordinary least squares (OLS) regressions were conducted for product, process, and organizational innovation. In each model, managerial seniority, educational attainment, and position type were entered simultaneously as predictors, along with perceived environmental uncertainty. Several firm-level characteristics, including company size and tenure in the current position, were included as control variables where data were available.

The regression results are presented in Table 5. Across all three models, environmental uncertainty demonstrated a strong positive association with innovation outcomes. Higher perceived environmental turbulence was associated with greater engagement in product innovation ( $\beta = 0.30$ ,  $p < .001$ ), process innovation ( $\beta = 0.24$ ,  $p < .001$ ), and organizational innovation ( $\beta = 0.24$ ,  $p < .001$ ).

Managerial seniority and educational attainment did not exhibit statistically significant effects on any of the three innovation measures, suggesting that hierarchical position and formal educational credentials do not substantially shape managers' responses to environmental uncertainty in terms of innovation engagement.

By contrast, position type showed more pronounced effects. Managers in strategic roles demonstrated higher levels of product innovation than those in other functional roles, although this effect was only marginally significant ( $p \approx .07$ ). More substantial differences emerged for process innovation, where both strategic and support managers displayed higher levels of engagement than those in primary functional roles. Similarly, support managers exhibited higher levels of organizational innovation than their counterparts in other functional areas.

Overall, the regression results indicate that environmental uncertainty is a key driver of innovation activity in Armenian SMEs, while managerial functional role exerts a stronger influence than either seniority or education. These findings reinforce the interpretation that a manager's position within the organization shapes the manner in which environmental uncertainty is translated into innovative behavior.

**Table 5.** Multivariate regression results

Variable	Product Innovation	Process Innovation	Organizational Innovation
Seniority (high vs. lower/mid)	0.07	0.04	0.08
Education (master's)	0.13	0.06	-0.05
Education (doctoral)	0.31	0.39†	0.37†
Strategic position	0.20†	0.27*	0.14
Support position	0.13	0.49*	0.40*
Environmental uncertainty	0.30***	0.24***	0.24***
Company size	0.12*	0.12*	0.07
<i>n</i>	211	211	211
$R^2$	0.147	0.131	0.119

Entries are standardized regression coefficients ( $\beta$ ). †  $p < .10$ ; \*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$

## 5. Discussion and implications

With respect to managerial seniority, a negative relationship was anticipated; however, the analysis indicates that position in the organizational hierarchy does not have a statistically significant effect on innovation engagement (Table 5). This may be explained by the fact that innovative activity within the firm is a joint effort of middle- and senior-level management, with both levels playing equally important roles. As Heyden et al. (2018) noted, similarity in professional characteristics between top and middle management facilitates management innovation, while Birken et al. (2015) argued that top managers' support influences middle managers' commitment to innovation implementation. Although frontline employees interact with customers and sense the need for innovation, middle managers serve as a bridge between employees and senior management, translating emerging ideas into actionable initiatives (Kanter, 2004).

Regarding educational attainment, the analysis did not find a statistically significant relationship with innovation engagement. One possible explanation is that the vast majority of respondents (81%) held master's or doctoral degrees, resulting in insufficient variation in educational attainment to detect significant

differences. As Mabula et al. (2020) suggested, managerial experience may therefore be a more consequential differentiating factor than educational level. Another explanation may lie in the specificities of the Armenian entrepreneurial landscape. According to the Global Entrepreneurship Monitor (GEM, 2020) report, Armenia lags behind the GEM average in entrepreneurial education, which is identified as one of the areas most in need of strengthening. This suggests that, while managers may hold advanced degrees, they may lack specific knowledge of entrepreneurship, constraining their capacity to innovate under uncertainty. Reviewing the entrepreneurial ecosystem in Armenia, Keshishyan and Boghosian (2020) examined entrepreneurial creativity among Armenian startup founders, defining creativity as the systematic identification and exploitation of opportunities and arguing that innovation is the process by which creative ideas are transformed into profitable solutions. Consistent with the present findings, the authors reported that the entrepreneurial creativity of Armenian startup founders and entrepreneurs was not significantly affected by education or knowledge level.

The GEM (2025) report further contextualizes these findings, noting that despite regulatory progress, significant structural weaknesses persist. Entrepreneurial education continues to receive among the lowest scores in GEM assessments, with Armenia ranking 49th out of 56 countries for post-school entrepreneurial education and only marginally higher at primary and secondary levels. The transfer of research and development (R&D) from academic institutions to businesses is also weak, with Armenia ranking 42nd on this indicator, undermining the potential for innovation-led activity. Notably, whereas respondents with the highest levels of education (master's degree or above) were the most optimistic about business prospects in the GEM 2019 report (58.7%), by 2024 this group had become the least optimistic (40.9%). This shift may indicate that highly qualified individuals assess current economic uncertainties and innovation-related opportunities with greater caution. Taken together, these findings suggest that entrepreneurship in Armenia requires a broader policy vision—one that goes beyond financial support and encompasses education, digital inclusion, and structural incentives that enable scaling, innovation, and long-term business survival. The report also highlights the importance of aligning entrepreneurship development with Armenia's national development goals and the United Nations Sustainable Development Goals (SDGs), particularly with respect to promoting inclusive growth, reducing inequality, and fostering sustainable economic transformation.

Turning to position type, the findings indicate that under conditions of environmental uncertainty, managers' functional role—specifically, whether they occupy a strategic versus a primary or support position—plays an important role in determining the firm's engagement in product, process, and organizational innovation. The multivariate regression analysis suggests that functional role is a stronger determinant of innovation behavior than either education or seniority. The results also confirm that perceived environmental uncertainty is positively associated with all three dimensions of innovation, suggesting that external turbulence acts as a catalyst for innovative responses among Armenian SMEs. This is consistent with extant literature, which holds that an entrepreneurial orientation and mindset lead SMEs to seek novel solutions when confronting environmental challenges, enhancing firm performance during crises by prompting them to exploit opportunities and actively engage in innovation strategies (Klyver & Nielsen, 2024).

Under conditions of heightened uncertainty, the innovative advantage of strategic and support managers becomes more pronounced, as their roles are structurally designed to interpret ambiguity, coordinate across organizational boundaries, and reconfigure established routines. Uncertainty increases information complexity and reduces the reliability of established procedures, making cross-functional sensemaking and adaptive decision-making more critical (Furnari et al., 2021). Strategic managers, who routinely engage in environmental scanning and long-term positioning, are better equipped to detect weak signals and translate them into product or process innovations, consistent with contemporary dynamic capabilities research (Tece, 2018; Wilden & Gudergan, 2015). Support managers, whose responsibilities span multiple units, similarly gain access to diverse knowledge flows that become particularly valuable when the environment is volatile and established practices lose their effectiveness (Andriopoulos & Lewis, 2010; Mom et al., 2007). Role expectations also shift under uncertainty: organizations increasingly rely on these managers to stabilize operations through process improvements and to redesign structures to maintain flexibility (Vuori & Huy, 2016). By contrast, primary functional managers, whose work is more operational and routine in nature, face greater constraints and heightened risk aversion when uncertainty rises, limiting their capacity to innovate (Bledow et al., 2017). Uncertainty thus amplifies the structural, cognitive, and resource advantages associated with strategic and support roles, resulting in higher levels of process and organizational innovation relative to primary functional positions.

The coordination of exploratory and exploitative innovation activities follows different organizational logics and is prone to tensions over the allocation of corporate resources. Strategic human resource (HR) practices that address such paradoxes—by complementing and integrating processes—can facilitate resource allocation during innovation efforts and improve employee innovation performance (Combs et al., 2006; De Clercq et al., 2013). Employees at innovative firms report that managers maintain clear and open communication, ensuring that employees understand how their contributions matter. Employees are provided with meaningful opportunities to contribute to both operational routines and key decisions, rather than simply being directed. When employees observe that their feedback is heard and acted upon, their sense of organizational belonging

is strengthened. Managers at such firms also facilitate knowledge sharing for new employees and provide access to external training programs and expert-led development opportunities. HR practices that emphasize personal growth alongside business objectives further reinforce employee commitment and promote information sharing, results orientation, and job security (Xiao & Björkman, 2006). Strategic HR practices also foster high-quality social exchange relationships between employees and the organization, which, in turn, increase employees' willingness to participate in organizational innovation activities (Clark & Payne, 1997).

## 6. Conclusion

The environmental uncertainty generated by the COVID-19 pandemic made innovation not a choice but a necessity for firms seeking to survive and succeed. This was particularly true for SMEs, which were disproportionately affected by the crisis. Given the critical role of managers in fostering a firm's innovative attitude, this study examined the impact of managerial characteristics on the propensity of Armenian SMEs to innovate under uncertainty—specifically, how innovation engagement varies with managerial seniority, educational attainment, and functional area. The results indicate that managers in strategic and support roles exhibit a higher propensity to pursue innovation under conditions of external turbulence, whereas educational attainment and seniority do not significantly influence this relationship. These findings underscore the importance of the manager's functional area in shaping a firm's innovative behavior. In uncertain environments, firms face both threats and opportunities; it is the strategic orientation of managers that enables firms to identify and seize these opportunities, converting them into sources of competitive advantage.

This study makes two principal contributions. First, it advances the literature on strategic management and innovation by demonstrating that the manager's functional role is a key driver of innovation under uncertainty. Second, it highlights the value of formal entrepreneurial education and corporate training in supporting SME innovation initiatives. Such training should emphasize the development of soft skills—including critical thinking, problem-solving, and adaptive decision-making—since innovation provides managers with the tools to respond effectively to unforeseen changes in the external business environment. Developing this portfolio of dynamic managerial capabilities should therefore be integrated into the strategy formulation process itself.

From a macro-organizational perspective, investment in enabling environments can cultivate managerial innovation. Firms should provide supportive infrastructures, greater discretion, and the freedom to exercise innovative capabilities. Innovation requires additional energy and resources; thus, firms should actively supplement internal resources with external financing, skills development programs, and external expertise when internal capacity is insufficient. Organizations seeking to enhance innovation performance must also foster a climate of psychological safety. Strategic HR practices that promote inclusive leadership, constructive feedback, and tolerance for calculated risk-taking reinforce employee engagement in innovation, encouraging them to propose new ideas and participate in innovation activities.

At the institutional level, entrepreneurial education should be systematically strengthened through coordinated efforts among educational policymakers, professional bodies, and business associations. A national policy framework promoting entrepreneurial education and expanding managerial discretion can support a more robust innovation ecosystem. Policymakers should embed entrepreneurship into formal curricula, creating a foundation for a thriving innovation-driven economy.

Armenia continues to demonstrate a strong entrepreneurial spirit, with high levels of business activity and societal support for entrepreneurship. Competitive dynamics increasingly shape entrepreneurial behavior, complementing necessity-driven motives with a rising focus on wealth creation. Despite ongoing government reforms, gaps in innovation adoption, digital integration, and investment readiness—particularly among women, rural entrepreneurs, and smaller firms—remain significant constraints on sustainable growth.

This study has several limitations. First, the single-country focus limits generalizability. Second, the data reflect conditions at the onset of the COVID-19 pandemic. Third, approximately 90% of surveyed SMEs were based in Yerevan, and medium-sized enterprises were underrepresented relative to micro and small firms. Finally, the limited demographic items in the survey constrained the range of control variables, excluding factors such as industry type, ownership structure, and firm age.

Future research could explore several avenues. Expanding the analysis to a cross-country context would allow examination of how institutional and cultural factors moderate the relationship between managerial characteristics and innovation under uncertainty. Longitudinal studies of SMEs' post-COVID innovation behavior could assess innovation as a crisis recovery mechanism. Additional research might examine internal factors—such as employee gender distribution and educational attainment, managers' risk attitudes, or ownership/family involvement—and firm-level characteristics, including firm age, location, and industry sector. Finally, studying external factors such as institutional embeddedness could offer insights into the cultural norms shaping managerial innovation in Armenian SMEs.

## Disclosure statement

No potential conflict of interest was reported by the authors.

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## Data Availability Statement

Available on request from the authors

## Footnotes

<sup>1</sup> According to the report *Small and Medium Entrepreneurship in the Republic of Armenia* (National Statistical Committee of the Republic of Armenia, 2019), there were 75,180 registered companies in Armenia in 2019, of which 135 were large, 4,272 were small, and 743 were medium-sized. The largest category consisted of micro-enterprises, totaling 70,030, of which 31,547 had no salaried employees. Based on these figures, the survey can be considered broadly statistically representative

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## Appendix A Educational attainment, tenure, and position type

**Table A1.** Educational attainment, tenure, and position type

Item	Question
D7	What is the highest level of formal education you have completed? If you are currently a student, indicate the highest degree you have obtained to date.
	1. No formal education
	2. Elementary education
	3. Incomplete secondary education
	4. Complete secondary education
	5. Post-secondary education (e.g., vocational training)
	6. Some university education (attended university but did not graduate, or obtained a non-degree certificate)
	7. Bachelor's degree or equivalent
	8. Master's degree or equivalent
	9. Doctoral degree or equivalent
10. Other (please specify)	
D8	Which of the following best describes your current position?
	1. Lower-level management
	2. Middle-level management
	3. Upper-level management
4. Not part of the management structure	
D12	What type of work do you usually perform in your main job or activity? If you carry out more than one function, indicate the primary one (or the one with the lowest number among the options listed).
	1. Strategic functions
	2. Core/primary functions
3. Support functions	