

**Influence of Entrepreneurial Agility on SME Projects Performance: The Mediating role of Effectuation and the Moderating role of Environmental Dynamics**

**Sadia Siddique**

[sadich61@gmail.com](mailto:sadich61@gmail.com)

MS Scholar, Department of Technology & Project Management, International Islamic University, Islamabad.

**Wajid Ali**

[Wajidali.buic@bahria.edu.pk](mailto:Wajidali.buic@bahria.edu.pk)

Assistant Professor, Department of Project management and Supply Chain management, Bahria University, Islamabad.

**Sabir Ali**

[Sabirali.buic@bahria.edu.pk](mailto:Sabirali.buic@bahria.edu.pk)

Senior Lecturer, Department of Project management and Supply Chain Management, Bahria University, Islamabad.

**Muhammad Sohail**

[sohail9003@gmail.com](mailto:sohail9003@gmail.com)

Regional Manager, Department of Training and Compliance, Getz Pharmaceutical (Private) Limited, Pakistan.

**Corresponding Author: \* Wajid Ali** [Wajidali.buic@bahria.edu.pk](mailto:Wajidali.buic@bahria.edu.pk)

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**ABSTRACT**

*This study examines the influence of entrepreneurial agility on firm performance, with effectuation serving as a mediating mechanism and environmental dynamics. This study examines the influence of entrepreneurial agility on SME project performance, emphasizing the mediating role of effectuation and the moderating role of environmental dynamics. Drawing on dynamic capabilities and effectuation theories, the research proposes that entrepreneurial agility enhances project outcomes by enabling SMEs to rapidly respond to changing conditions, while effectuation processes serve as a mechanism through which agile decision-making translates into improved performance. A quantitative, cross-sectional survey was conducted among SME Projects in Pakistan, with responses analyzed using structural equation modeling to test direct, indirect, and interactive effects. Results show that EA positively influences both FP ( $\beta = 0.334$ ,  $p = .038$ ) and EF ( $\beta = 0.628$ ,  $p = .000$ ). EF also enhances FP ( $\beta = 0.372$ ,  $p = .030$ ) and partially mediates the EA and FP relationship. However, ED did not significantly moderate these effects, possibly due to measurement limitations and contextual factors. Managers should prioritize agility and effective decision-making to improve performance, particularly in uncertain environments, without relying on environmental dynamism as the primary driver of success. This study advances entrepreneurship literature by integrating agility and effectuation within a moderated mediation model, while also offering practical insights for SME project competitiveness in emerging markets. The study offers theoretical insights into how can leverage agility and effectuation under dynamic conditions and provides practical implications for managers aiming to optimize project success in uncertain environments.*

**Keywords:** Entrepreneurial Agility, Effectuation, Environmental Dynamics, Firm Performance, SMEs Projects.

## INTRODUCTION

In today's volatile markets, small and medium-sized enterprises (SMEs) face mounting challenges in responding to rapid technological, economic, and competitive shifts. Success no longer depends solely on efficiency but also on the ability to innovate, experiment, and seize emerging opportunities. This adaptive capability, often referred to as entrepreneurial agility (EA), reflects an organization's capacity for rapid decision-making, strategic flexibility, and proactive opportunity pursuit. Entrepreneurs operating in volatile, uncertain, complex, and ambiguous (VUCA) environments are especially reliant on these abilities, as predicting the outcomes of decisions has become increasingly difficult (Pennetta et al., 2023; Bhuvaneswari & Natarajan, 2016; Yao & Li, 2023).

Since the global economy and competitiveness cause quick changes, and intense competition shortens product life cycles, it is evident that conventional management strategies cannot react adequately to these shifts or constantly changing market circumstances (Tajeddini & Mueller, 2018). Scholars suggest that firms should incorporate innovation and entrepreneurial spirit for business success (Etemad, 2015; Tajeddini, Altinay, & Ratten, 2017). Furthermore, academics in strategic management have asserted that entrepreneurial behaviors are crucial to modern businesses' survival, profitability, and growth (Shan, Song, & Ju, 2016).

However, the path to success or failure in entrepreneurial company operations is determined by the decisions made by entrepreneurs (Aujirapongpan, Ru-zhe, & Jutidharabongse, 2020; Robbins, 2003). The most innovative and successful entrepreneurs will maintain Entrepreneurial Agility (EA, hereafter) and outstanding performance (Karimi & Walter, 2021) because firms lacking agility find it challenging to adapt to change in the modern business environment. They will ultimately fall behind their rivals, unable to adapt to market demands and lacking knowledge of emerging business patterns (Wairimu, Liao, & Zhang, 2022; Hindrawati, Dhewanto, & Dellyana, 2022). The term "agility" was coined in 1991 by a committee at the Iacocca Institute, Lehigh University (PA), to explore the US industry's deficiency of international competitiveness (Yusuf, Sarhadi, & Gunasekaran, 1999). Since then, agility has evolved into a paradigm for how institutions should design for digital innovation that prioritizes efficiency and speed (Goncalves et al., 2020). According to Florek, Ujwary, and Godlewska (2021), agility allows firms to persist and overcome tremendous hindrances, such as the global crisis of the COVID-19 pandemic. In this telling, since firms' survival and growth depend primarily on their ability to adapt to the dynamic changes in the business environment, and open innovation (OI, hereafter) involves opening the innovation box to incorporate inside and outside ideas and technologies, the more agile a firm is, the more likely that it will adopt OI (Wang & Kim, 2017). OI represents a company's efforts to develop new resources, ideas, and applications outside its borders (Brown, Davidsson, & Wiklund, 2001; Ireland, Hitt, & Sirmon, 2003; Ali et al., 2024; Ali et al., 2025).

Globalization and intensifying competition have shortened product life cycles, exposing the limitations of traditional management approaches in coping with ongoing market shifts (Tajeddini & Mueller, 2018; Ahmed et al., 2024). To remain competitive, scholars argue that firms must embed innovation and cultivate an entrepreneurial mindset as a foundation for long-term growth and survival (Etemad, 2015; Tajeddini, Altinay, & Ratten, 2017). Within strategic management, entrepreneurial orientation is widely recognized as a critical driver of sustained profitability and growth (Shan, Song, & Ju, 2016). Effectuation theory offers a complementary perspective for understanding entrepreneurial decision-making in such uncertain contexts. Unlike predictive and causal approaches, effectuation emphasizes leveraging existing resources, forming partnerships, and maintaining flexibility to shape outcomes. Integrating EA with effectuation provides a useful lens for understanding how adaptability translates into firm performance. Environmental dynamism, the speed and unpredictability of changes in technology, competition, and consumer preferences, may further condition these relationships. However, empirical research examining

EA, EF, ED, and FP together remain limited, particularly in developing economies. This study addresses this gap by proposing a moderated mediation framework in which EA affects FP both directly and indirectly through EF, with ED acting as a potential contextual moderator.

## **LITERATURE REVIEW**

### **Entrepreneurial Agility and Firm Performance**

Entrepreneurial agility refers to a firm's ability to sense, interpret, and respond rapidly to environmental changes with precision and flexibility (Haider et al., 2021). For SMEs, agility is particularly important as it offsets resource constraints by enabling strategic pivots and innovation in the face of uncertainty (Zulganef et al., 2023). Unlike larger corporations that may rely on formalized processes and economies of scale, SMEs depend on agility to exploit market opportunities and remain resilient in turbulent conditions.

Recent studies emphasize that Entrepreneurial Agility is not limited to operational speed but also encompasses strategic foresight, adaptability in decision-making, and proactive exploration of opportunities (Doz & Kosonen, 2010). It has been associated with higher innovation output, stronger customer responsiveness, and improved firm performance across diverse industries (Sherehiy & Karwowski, 2014). In emerging economies, agility has been shown to enhance resilience against external shocks such as technological disruption and market volatility (Cai, Hughes, & Yin, 2014).

On the other hand, OI entrepreneurial capabilities take the *external* environment as a starting point for improving firm performance and dealing with market exigencies. For example, OI capabilities seek to understand how customer needs and competitive trends are changing, and then the capabilities are directed in alignment within the firm to anticipate shifts in the marketplace. Firms with well-honed OI capabilities look outside the firm to understand market exigencies, e.g. how market opportunities are evolving, and how these can be capitalized in addition to how competitors are behaving in order to create a competitive position. In short, IO and OI entrepreneurial capabilities are both determinants of firm performance (Khan et al., 2025).

*H1: The positive relationship between Entrepreneurial Agility and Firm Performance*

### **Entrepreneurial Agility and Effectuation**

Effectuation is recognized as a strategic entrepreneurial method, known for its collaborative and efficient production of innovative ideas in business (Ali et al., 2024). Effectuation theory emphasizes adaptability by leveraging available means and resources during uncertain times (Xu & Koivumäki, 2019). Effectual reasoning relies heavily on intuition and imagination, with a primary emphasis on capitalizing on contingencies and innovating new markets. Grounded in the logic of control, this approach proves particularly effective in navigating uncertain business landscapes that demand exploration of novel environments. The contributions of Sarasvathy have, in essence, challenged the conventional understanding of decision-making and behavioral patterns in entrepreneurship. Three foundational constructs, utilized by stakeholders as a basis for effectuation, include means-driven action, affordable loss as a norm for evaluation, and the utilization of probabilities (Arend et al., 2015). Effectuation theory emphasizes four fundamental principles: prioritizing short-term efforts, launching manageable ventures, participating in market shaping, and emphasizing strategic alliances and adaptability (Xueyun, 2024).

*H2: The positive influences of Entrepreneurial Agility and Effectuation*

### **Effectuation and Firm Performance**

A number of studies emphasize the influence of financial system development on new venture growth and explain how entrepreneurial outcomes are positively impacted by the availability of sound financial alternatives (Ali et al., 2024). Yet, the extent to which the financial system supports entrepreneurial activity varies from country to country. A well-developed financial market enables entrepreneurs to access appropriate types and amounts of financial resources through the stages of new venture development, while a lack of access to such resources is a substantial barrier to growth. The quality of this institutional pillar can also increase the performance of existing ventures by reducing exit costs for unsuccessful businesses. Further, financial system development is linked to levels of uncertainty faced by entrepreneurs, with well-developed systems supporting venture growth by reducing uncertainty, lessening concerns regarding the ability to acquire key resources on a timely basis. This sort of predictability is a key component of causal behavioral logic, and particularly the reasoning that the entrepreneur sets venture goals, determines resources needed to achieve the goals, acquires those resources, and then acts through the venture to achieve the goals and the indicate that use of effectuation is positively correlated with both higher perceived financial performance and level of innovation employed in the firms. Also, not all effectual constructs have uniform influence on the variables, which explains the formative nature of the logic of effectuation (Shirokova et al., 2021).

*H3: The relationship between Effectuation positively influences Firm Performance.*

**Firm Performance mediates Entrepreneurial Agility and Firm Performance.**

Entrepreneurial Agility refers to a firm's ability to rapidly sense, interpret, and respond to emerging opportunities in dynamic market environments. It is grounded in the entrepreneurial orientation and dynamic capability literature, emphasizing proactiveness, adaptability, fast decision-making, and opportunity exploitation. Firms exhibiting high entrepreneurial agility possess superior market-scanning mechanisms, enabling them to quickly reconfigure resources, redesign processes, and pivot strategies when faced with uncertainty or technological disruption. Prior studies highlight that agile entrepreneurial firms show superior resilience and competitiveness because they respond faster than competitors and capitalize on emerging trends (Haylemariam et al., 2024). As a dynamic capability, entrepreneurial agility provides the strategic foundation for sustained growth and value creation, making it a critical driver of organizational AI success across industries (Ali et al., 2024; Ali et al., 2025).

Extensive research demonstrates that Entrepreneurial Agility has a direct and positive impact on Firm Performance. Agile firms can rapidly align resources, exploit technological changes, and adapt to competitive pressures, resulting in improved profitability, stronger market positioning, and enhanced customer responsiveness (Kurniawan et al., 2021). Entrepreneurial agility enhances innovation performance, supports quick strategic reorientation, and fosters stronger capability renewal, all of which significantly contribute to firm success in dynamic environments. Theoretically, dynamic capability theory posits that the ability to sense and seize opportunities is a primary determinant of long-term competitive performance. Empirical studies further confirm that firms with higher entrepreneurial agility outperform competitors through faster product launches, greater operational speed, and more effective strategic execution, ultimately achieving superior financial and non-financial performance (Yildiz & Aykanat, 2021).

*H4: The relationship between Firm Performance mediates Entrepreneurial Agility and Firm Performance.*

**Environmental Dynamism moderates the Entrepreneurial Agility and Firm Performance.**

Environmental dynamism reflects the rate and unpredictability of change in external conditions, including technology, competition, and consumer demand (Ahmed et al., 2024). In dynamic environments, firms are

expected to rely more heavily on agility and adaptive decision-making to survive and thrive. High Environmental dynamism contexts are often characterized by shorter product life cycles, rapid innovation, and heightened competitive pressures (Jansen, Van Den Bosch, & Volberda, 2006). Theoretically, Environmental dynamism should amplify the benefits of Entrepreneurial Agility and Firm Performance by increasing the value of flexibility, experimentation, and proactive strategies. However, empirical findings remain mixed. While some studies find that Environmental dynamism strengthens the Entrepreneurial Agility and Firm Performance link (Nadkarni & Narayanan, 2007), others report inconclusive results, suggesting that its impact may depend on measurement approaches or contextual factors such as industry type and regional dynamics (Ali & Khan, 2025).

*H5: The positive relationship between Environmental Dynamism moderates the Entrepreneurial Agility and Firm performance.*

### **Environmental Dynamism Moderates Entrepreneurial Agility and Effectuation**

Prior research has consistently demonstrated a positive link between EA and firm performance (Ali et al., 2024; Zulganef et al., 2023). Effectuation has emerged as a key explanatory mechanism, clarifying how adaptive entrepreneurial behavior translates into superior outcomes (Read et al., 2016). Although theoretical models suggest that ED moderates these relationships, the evidence remains inconsistent, highlighting the need for further empirical exploration (Nadkarni & Narayanan, 2007; Haylemariam et al., 2024). Building on this literature, the present study proposes a moderated mediation framework. Specifically, it argues that EA improves FP both directly and indirectly through EF, while ED conditions the strength of these effects. This integrated perspective offers a richer understanding of how SMEs in dynamic markets balance agility, effectual decision-making, and contextual uncertainty to achieve sustainable performance.

The relationship between entrepreneurial agility and effectuation has gained increasing attention in entrepreneurship and strategic management research. Agile firms, capable of sensing and responding quickly, naturally adopt effectual logic when facing uncertainty. Entrepreneurial agility enhances experimentation, encourages rapid reconfiguration of means, and supports adaptive decision-making, core characteristics of effectuation. Evidence shows that entrepreneurs with higher agility are more likely to embrace iterative learning, leverage emerging contingencies, and build collaborative networks to shape opportunities. Thus, entrepreneurial agility not only facilitates the use of effectual strategies but also strengthens the effectiveness of effectuation in generating innovative solutions and navigating unpredictable market conditions (Salajegheh et al., 2025).

*H6: The positive relationship between Environmental Dynamism moderates the Entrepreneurial Agility and Effectuation.*

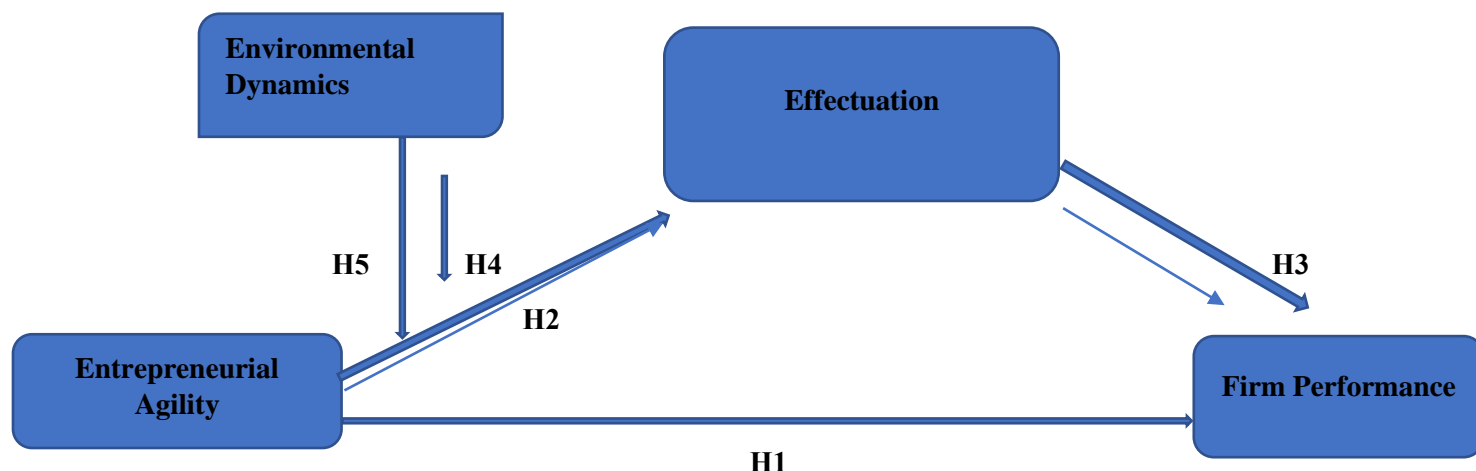
### **Effectuation Theory**

Effectuation, first articulated by Sarasvathy (2001), describes how entrepreneurs make decisions under uncertainty by focusing on means at hand rather than predetermined goals. Five principles define effectuation: bird-in-hand, affordable loss, lemonade, crazy quilt, and pilot-in-the-plane. Together, these principles encourage entrepreneurs to leverage existing resources, experiment with uncertainty, build partnerships, transform contingencies into opportunities, and shape the future through action rather than prediction (Sarasvathy & Venkataraman, 2011; Dew et al., 2009). This approach stands in contrast to causation logic, which relies on forecasting and deliberate planning. Research increasingly highlights that effectual decision-making is particularly valuable in highly dynamic environments, as it enables firms to co-create value with stakeholders and minimize risk exposure (Chandler et al., 2011; Read, Sarasvathy, Dew, & Wiltbank, 2016). Recent work suggests that integrating EA with effectuation creates a powerful



framework for SMEs to convert adaptability into tangible performance outcomes (Haylemariam, Oduro, & Tegegne, 2024).

### Theoretical Model



### METHODOLOGY

This study adopted a quantitative, cross-sectional design to examine the hypothesized relationships between entrepreneurial agility, effectuation, environmental dynamism, and firm performance. The choice of a cross-sectional survey design was guided by its suitability for capturing data from a large sample within a relatively short timeframe. Although longitudinal approaches provide stronger causal inference, the cross-sectional method remains widely accepted in entrepreneurship and management research, particularly for testing theoretical models using structural equation modeling (SEM) (Hair et al., 2021). The study targeted operations in the manufacturing projects in Pakistan. Operating in the manufacturing projects represents a critical component of the country's economy and provides a relevant context for studying entrepreneurial agility in resource-constrained, dynamic environments. A stratified random sampling approach was employed to ensure industry representation. Data were collected through both online and in-person surveys distributed to owners and managers operating in the manufacturing projects. Owners and managers, as they possess the necessary insights into organizational strategies and performance. Following recommendations for SEM analysis, a target sample size of 320 was established to meet minimum statistical power requirements (Hair et al., 2021). After screening for incomplete or invalid responses, the final dataset met the criteria for SEM analysis.

Validated scales from prior studies were adapted to measure the constructs, using a 5-point Likert scale ranging from 1 ("strongly disagree") to 5 ("strongly agree"). Entrepreneurial Agility was assessed through items capturing market sensing, decision-making speed, strategic flexibility, innovation capacity, and customer responsiveness (Haider et al., 2021). Firm Performance was measured using both financial indicators (e.g., growth, profitability) and non-financial indicators (e.g., customer satisfaction, innovation outcomes), consistent with prior SME performance research (Pinto & Slevin, 1988). Effectuation items were adapted from (Sarasvathy, 2001) five principles of effectuation: bird-in-hand, affordable loss, lemonade, crazy quilt, and pilot-in-the-plane. Environmental Dynamism was measured using a scale assessing

perceived unpredictability in technological, competitive, and consumer environments (Ahmed et al., 2022).

Data were analyzed using structural equation modeling (SEM), which allows for the simultaneous estimation of measurement and structural models. This approach was appropriate given the study's focus on both direct and indirect effects, as well as moderation. Measurement reliability and validity were assessed through Cronbach's alpha, composite reliability (CR), and average variance extracted (AVE). Structural paths were tested for significance using beta coefficients and p-values.

## RESULTS AND ANALYSIS

According to the author (Ammeter, 2019) suggested methods for assessing internal consistency include the use of Cronbach's alpha, as well as measures of convergent validity such as composite reliability and average variance extracted. Discriminant validity can also be evaluated using these methods. In addition, the evaluation of item loading was conducted and may be seen in Appendix A. Cronbach's alpha was used to assess the internal consistency and reliability of the measurement items, and all variables had values greater than 0.70. Convergent validity is evaluated by measuring composite reliability and average variance extracted. The composite reliability is a measure that spans from 0 to 1, where values above 0.70 are considered satisfactory (Graciola et al., 2020). All measurement values for the variables fall within the acceptable thresholds, indicating that the data are both valid and reliable.

**Table 1: Reliability and convergent validity**

Variable	Cronbach Alpha	rho_A	CR	AVE
Entrepreneurial Agility	0.81	0.82	0.89	0.71
Firm Performance	0.84	0.72	0.78	0.79
Effectuation	0.87	0.71	0.80	0.76
Environmental Dynamism	0.82	0.75	0.82	0.87

Note. CR = Composite Reliability; AVE = Average Variance Extracted.

The reliability and validity of the constructs were first assessed. As shown in Table 1, Cronbach's alpha values for entrepreneurial agility (0.82), effectuation (0.72), and firm performance (0.71) exceeded the 0.70 threshold, indicating acceptable internal consistency. Environmental dynamism, however, showed weaker reliability ( $\alpha = 0.532$ ), though its composite reliability (0.854) and average variance extracted (AVE = 0.629) remained within acceptable ranges. Composite reliability values for all constructs exceeded the recommended cutoff of 0.70, confirming convergent validity (Hair et al., 2021).

The A concept's "discriminant validity" is defined as its amount of empirical distinction from other constructs in the structural model. As recommended by (Fornell and Larcker, 1981), it is crucial to compare each construct's squared inter-construct correlation with its average variance extracted (AVE) to make sure that every structural model construct has been thoroughly studied. The correlations and square-rooted AVEs for each construct are also shown in Table 2. Good discriminant validity is evidenced by the fact that all square-rooted AVEs were located at large distances from the diagonal correlation values.

**Table 2: Correlation Analysis**

Variables	EA	FP	EFF	ED
Entrepreneurial Agility	1	0.420**	0.290**	0.209**
Firm Performance	--	1	0.546**	0.285**
Effectuation	--	--	1	0.393**
Environmental Dynamics	--	--	--	1

Note. EA = Entrepreneurial Agility; FP=Firm Performance; EFF= Effectuation; ED= Environmental Dynamics.

In Table 2 Result Shown results show that entrepreneurial agility, firm performance, and environment dynamics, with all variables to a strong relationship and values are 0.420\*\*, 0.290\*\*, 0.393\*\*, and similarly, discriminant validity is established when the shared variance of one construct is greater than the shared variance of all other constructs. All the variables have been correlated and significant positive impact.

**Table 3: Variance inflation factor**

Variable	EA	FP	EFF	ED
Entrepreneurial Agility	1.00		1.24	1.00
Firm Performance	1.00		1.01	1.00
Effectuation	1.00		-0.10	1.00
Environmental Dynamics			1.29	

Note. EA = Entrepreneurial Agility; FP=Firm Performance; EFF= Effectuation; ED= Environmental Dynamics.

A statistic that is widely utilized for the purpose of determining whether or not formative indicators are collinear is known as the variance inflation factor (VIF). When the VIF score is five or higher, it indicates that there are significant issues regarding the collinearity among the indicators of the variables that are formatively measured. It has been stated by the author (Becker et al., 2015) that concerns with collinearity can occur even at lower VIF levels of 3. Because of this, the VIF ratings ought to be at around three or lower. There were no worries with collinearity because all of the observed VIFs were lower than 3.

**Table 4: Mediation Analysis**

Variables	Coeff (β)	CI	Sign (p)
Entrepreneurial Agility	0.47***	0.57	***
Firm Performance		0.33***	0.45
Effectuation	0.16***	0.24	***
Environmental Dynamics	0.06	0.17	***

Note. \*\*p < 0.05; \*\*\*p <0.001; Note. EA = Entrepreneurial Agility; FP=Firm Performance; EFF= Effectuation; ED= Environmental Dynamics.

In Table 4, the results show that analysis of Entrepreneurial Agility has been significantly positive to Firm Performance ( $\beta = 0.47***$ ,  $p < 0.001$ ), and Entrepreneurial Agility has been significantly positive to Environmental Dynamics ( $\beta = 0.33$ ,  $p < 0.001$ ). The result of the Entrepreneurial Agility has been significantly positive to Firm Performance, with has been significant positive Effectuation ( $\beta = 0.16***$ , CI (0.24).

**Table 5: Moderation Analysis**

Variables	Coeff (β)	CI	Sign (p)
Entrepreneurial Agility	0.41***	0.52	***
Firm Performance		0.42***	0.53
Effectuation	0.17***	0.28	***
Environmental Dynamics	0.21**	0.32	**

Note. \*\*p < 0.05; \*\*\*p <0.001; Note. EA = Entrepreneurial Agility; FP=Firm Performance; EFF= Effectuation; ED= Environmental Dynamics.



In Table 5, the results show that analysis of Entrepreneurial Agility has been significantly positive to Firm Performance ( $\beta = 0.41^{***}$ ,  $p < 0.001$ ), and Entrepreneurial Agility has been significantly positive to Environmental Dynamics ( $\beta = 0.53$ ,  $p < 0.001$ ). The result of the Entrepreneurial Agility has been significantly positive to Firm Performance, with has been significant positive Effectuation ( $\beta = 0.21^{***}$ , CI (0.24).

**Table 6: Path Coefficients**

<b>Paths</b>	<b>Hypotheses</b>	<b>Standard Beta</b>	<b>T Statistics</b>	<b>P Values</b>	<b>Decision</b>
EA -> FP	H1	0.38	7.40	***	Supported
EA -> Eff	H2	0.27	1.48	0.170	supported
Eff -> SFP	H3	0.29	5.28	***	Supported
ED x Eff -> EA	H4	0.19	3.67	***	Supported
EA -> ED -> FP	H5	0.19	3.66	***	Supported

Note. \*\* $p < 0.05$ ; \*\*\* $p < 0.001$ ; Note. EA = Entrepreneurial Agility; FP=Firm Performance; EFF= Effectuation; ED= Environmental Dynamics.

While these results diverge from some prior studies (e.g., Nadkarni & Narayanan, 2007), they align with other research showing inconsistent effects of ED in entrepreneurial contexts (Dess & Beard, 1984; Eisenhardt & Martin, 2000). Several factors may explain this outcome. First, the relatively weak internal consistency of the ED measure ( $\alpha = 0.532$ ) may have constrained its explanatory power, even though composite reliability and AVE values were acceptable. Second, the contextual characteristics of Pakistani SMEs may have influenced the findings. In highly uncertain environments, where volatility is a constant rather than an exception, entrepreneurs may already operate under a “default” assumption of dynamism. As such, ED may not differentiate the strength of relationships between agility, effectuation, and performance in this context.

Rather than viewing these results as a limitation, they provide an important insight: environmental dynamism may not always serve as a boundary condition in highly turbulent markets. This suggests that in emerging economies, where uncertainty is pervasive, managerial focus should remain on cultivating agility and effectual decision-making regardless of external dynamism levels. The overall model demonstrated an acceptable level of fit. The standardized root mean square residual (SRMR) was 0.10, which is considered borderline acceptable. While some scholars recommend stricter cutoffs ( $\leq 0.08$ ), others argue that values up to 0.10 may still be adequate in exploratory research and studies using complex models (Hu & Bentler, 1999; Henseler et al., 2016). Given the model’s theoretical grounding and adequate reliability and validity indices, the fit was deemed acceptable for interpretation.

## DISCUSSION

This study investigated how entrepreneurial agility (EA) affects firm performance (FP), with effectuation (EF) as a mediating mechanism and environmental dynamics (ED) as a potential moderator. The findings offer several important theoretical and practical insights. The results confirm that EA has a significant positive impact on FP, both directly and indirectly. This finding supports prior research suggesting that agile firms are better equipped to identify and exploit market opportunities, adapt strategies rapidly, and deliver superior performance outcomes (Haider et al., 2021; Zulganef et al., 2023). In the context of Pakistani SME projects where resources are often constrained, agility appears to be a critical capability that allows firms to remain competitive and resilient. Effectuation was found to partially mediate the relationship between EA and FP, highlighting its role as a mechanism through which agility translates into performance outcomes. This result is consistent with (Sarasvathy, 2001) theory of effectual decision-making, which emphasizes leveraging existing resources, partnerships, and contingencies rather than

relying solely on predictive strategies. By adopting effectual logic, agile entrepreneurs are able to convert flexibility into tangible business results, such as improved innovation and customer responsiveness. This integration of EA and EF contributes to a more nuanced understanding of how adaptability fosters performance in uncertain environments. Contrary to expectations, ED did not significantly moderate the relationships between EA, EF, and FP. While this finding diverges from some prior studies that suggest ED strengthens entrepreneurial outcomes (Nadkarni & Narayanan, 2007), it aligns with other research reporting inconsistent moderating effects (Dess & Beard, 1984; Eisenhardt & Martin, 2000).

Several explanations may account for this result. First, the measurement of ED demonstrated relatively weak internal consistency, which may have limited its ability to capture the construct fully. Second, the context of Pakistani SME projects provides a plausible theoretical explanation: in environments where uncertainty and volatility are already pervasive, entrepreneurs may operate under an implicit assumption of dynamism. In such settings, external uncertainty may not significantly alter how agility and effectuation influence performance. Far from being a limitation, this finding advances the ongoing debate about the role of ED in entrepreneurial research. It suggests that ED may not universally serve as a boundary condition but instead may exert context-dependent effects. This perspective opens avenues for future research to explore whether ED influence varies across industries, levels of market maturity, or cultural settings.

This study contributes to the literature in three key ways. First, it extends research on entrepreneurial agility by demonstrating its direct and indirect effects on performance through effectuation. Second, it integrates effectuation into the agility–performance link, offering a more comprehensive explanation of how adaptive strategies create value in uncertain environments. Third, it challenges assumptions about the universal moderating role of environmental dynamism, showing that its influence may be weaker or even negligible in highly turbulent markets. For managers of SME projects the findings highlight the importance of cultivating both agility and effectual decision-making. Investing in practices that enhance flexibility, rapid decision-making, and innovation can directly improve performance. At the same time, adopting an effectual mindset, leveraging existing resources, building stakeholder partnerships, and embracing contingencies can help firms translate agility into sustainable outcomes. Notably, managers should not rely on environmental conditions to dictate the value of agility; instead, they should embed agility and effectuation as core strategic capabilities, regardless of perceived environmental dynamism.

## CONCLUSION

This study examined the relationship between entrepreneurial agility (EA) and firm performance (FP), incorporating effectuation (EF) as a mediating mechanism and environmental dynamism (ED) as a moderating factor. In conclusion, this study demonstrates that entrepreneurial agility and effectuation are powerful drivers of firm performance in SME projects, even in highly uncertain contexts. By advancing a moderated mediation framework, it contributes to both theory and practice, while also opening pathways for further inquiry into the role of environmental dynamics. The findings confirm that EA enhances FP both directly and indirectly through EF, underscoring the value of agility and effectual decision-making in driving SME project performance. However, ED did not significantly moderate these relationships, suggesting that in highly uncertain contexts, such as Pakistani SME projects, external dynamism may not meaningfully alter the benefits of agility and effectuation. From a practical standpoint, the results highlight the importance of embedding agility and effectuation as core strategic capabilities, and organizations should focus on cultivating flexibility, rapid decision-making, and stakeholder partnerships to achieve sustainable performance gains. Importantly, these practices remain valuable regardless of environmental dynamism, meaning firms should not wait for external uncertainty to justify agility-oriented strategies. Despite its contributions, this study has several limitations. First, the cross-sectional design restricts the ability to draw strong causal inferences. Future studies should employ longitudinal

approaches to better capture how agility and effectuation evolve. Second, the measurement of environmental dynamics demonstrated relatively weak reliability, suggesting the need for more robust scales in future research. Third, the study was conducted within a single national context. While Pakistani SME projects provide valuable insights into an emerging economy, the findings may not be generalizable to other cultural or economic settings.

Future research should address these limitations by employing longitudinal designs, refining the measurement of ED, and conducting comparative studies across industries and regions. Incorporating qualitative approaches may also enrich understanding of how entrepreneurs perceive and respond to environmental dynamism.

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