

DOI: <https://doi.org/10.7341/20262214>
JEL Codes: D81, D82, L26, M10

Entrepreneurial decision logic profiles and firm performance during crisis: Evidence from Myanmar

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Abstract

PURPOSE: This study seeks to identify the decision logic profiles of entrepreneurs and top-level managers and to determine each profile's association with firm performance. **METHODOLOGY:** A cross-sectional online survey collected data from members of the Myanmar Young Entrepreneurs' Association. The K-means cluster analysis was used as a person-centered approach to identify the composition of causation and effectuation-based decision logics. Structural equation modeling was employed to test the relationship between decision profiles, knowledge exploitation and exploration, and firm performance (sales decline). **FINDINGS:** All the entrepreneurs showed different levels of decision logics, hybridly composed of causation and effectuation. Some entrepreneurs who displayed very high levels of causation and effectuation were named as "active hybridity"; those with moderately high levels of both logics were labelled "moderate hybridity", some with a low level of causation and the lowest level of effectuation were called "passive planners", and others with a much low level of causation and low level of effectuation were termed as "passive effectuators" respectively. Moderately hybrid entrepreneurs exhibited slightly lower levels of exploration and exploitation compared to actively hybrid entrepreneurs, while passive planners and passive effectuators showed significantly lower levels of both activities. Additionally, compared with the sales of actively hybrid entrepreneurs, those of passive effectuators showed a statistically significant lower decline, whereas those of passive planners and moderately hybrid entrepreneurs displayed insignificant differences. Although exploration did not show a statistically significant relationship with sales decline, exploitation did. **IMPLICATIONS:** This study adds to the causation and effectuation literature from a person-centered approach, exploring the association between the different degrees of the composition of decision logics and firm performance. Furthermore, as this research was conducted with decision-makers from companies that faced multiple crises in turbulent times, it serves as a guide for entrepreneurs on how to respond to crises with resilience and sustain their businesses. **ORIGINALITY AND VALUE:** This is the first study to determine the decision profiles of causation and effectuation logics at an individual level in established firms. **Keywords:** entrepreneurial decision-making, causation logic, effectuation logic, hybrid decision logic, person-centered approach, entrepreneurial decision profiles, knowledge exploration, knowledge exploitation, firm performance, sales decline, crisis context, emerging economy, entrepreneurial resilience, managerial cognition, strategic behavior under uncertainty, K-means cluster analysis, structural equation modeling, causation.

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Received 13 June 2025; Revised 21 October 2025; 31 January 2026; Accepted 4 February 2026.

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INTRODUCTION

The inherently changing nature of the business environment such as unknown outcomes regarding the creation of new products and services (Knight, 1921; Townsend et al., 2018), fluctuations in cash flow, legislation procedures, the power plays across the supply network relationships, constant change in customer requirements and demands and the unpredictable national financial systems (Bhamra & Dani, 2011) create challenges for firms to survive, grow, and remain sustainable. For emerging-market countries, environmental uncertainty is more pronounced, presenting various challenges, including weak institutional frameworks, dysfunctional competition (Bruton et al., 2013; Meyer et al., 2009), resource scarcity, and economic and political crises (Yu et al., 2018). These challenges pose significant challenges, leading firms to realign their strategies for business continuity (Fisher et al., 2020; Sirokova et al., 2020).

Following the planning school of thought, some entrepreneurs try to mitigate these uncertainties through prediction and planning, using analyses to identify and exploit opportunities and to develop strategies to achieve goals and implement plans (Ansoff, 1979; Mintzberg, 1978). This approach was named causation by Sarasvathy (2001), who contrasted it with effectuation, where entrepreneurs use available means, invest up to the extent of affordable loss, form alliances, take prior commitment from self-selecting stakeholders, and exploit contingencies to mitigate uncertainties (Chandler et al., 2011; Sarasvathy et al., 2008). Previous literature has focused on the two logics being alternatives to one another (Lascovaia et al., 2019; Nummela et al., 2014; Reymen et al., 2015). However, in a real business environment, the degree of uncertainty is unstable over time (Alvarez & Barney, 2005), and environmental dynamism determines the viability of a causal or effectual approach (Chen & Xu, 2022). Therefore, choosing a specific strategy no longer requires a single choice between causation and effectuation (Galkina et al., 2021). According to Sarasvathy (2001, 2008), the two logics can be balanced in entrepreneurial action and chosen interchangeably depending on the situation. The synergistic coexistence of the two logics has led to a stream of research in effectuation literature (Matalamäki, 2017). However, there is limited knowledge of how these logics are displayed across different levels in actual contexts (Galkina et al., 2021) and their consequences. Grègorie and Cherchem (2020) also noted that prior studies on the coexistence of causation and effectuation were mostly qualitative and called for a deeper explanation of the methodologies and circumstances under which such co-occurrence can prevail, along with its possible impact on firm performance.

Researchers also recommend finding a possible synergistic effect of causation and effectuation on firm performance, as both can coexist (Reymen et al., 2017; Smolka et al., 2018; Yu et al., 2018). Recent studies have shown that their simultaneous or alternating use creates a synergy that improves performance (Braun & Sieger, 2021; Reymen et al., 2017; Smolka et al., 2018; Yu et al., 2018). However, most of these studies have been qualitative, and in quantitative studies, subjective measures have been used to measure firm performance (Alzamora-Ruiz et al., 2021; Cherbib, 2024; Smolka et al., 2018).

The relationship between the use of causation and effectuation on firm performance has been a research trend for about two decades since Saravathy's (2001) introduction of the effectuation concept (Akemu et al., 2016; Appelhoff et al., 2016; Cherbib, 2024; Lascovaia et al., 2019; Shirokova et al., 2020; Watson, 2013; Werhahn et al., 2015; Yu et al., 2023). Among them, only a handful of studies had been conducted in the context of emerging-market countries (Lascovaia et al., 2019; Misbauddin et al., 2024; Shirokova et al., 2021; Yu et al., 2024). Grègorie & Cherchem (2020) noted in their systematic review that internal and/or external constraints may influence the prevalence of effectuation, while they also recognized the co-occurrence of effectuation and causation in prior empirical studies. Shirokova et al. (2021) argued, based on contingency theory (Morgan, 2007), that the effectiveness of decision logics is highly contingent on their fit with environmental factors, and they highlighted the importance of contextual factors in understanding the effect of decision logics on firm performance.

The way entrepreneurs and managers make decisions and choose strategies may differ in a developing-country context, and their responses to the environment may differ from those of their counterparts in developed countries (Shirokova et al., 2020). More substantively, empirical studies have shown that the relationship between planning and firm performance is highly confounded by both endogenous and exogenous factors (Brinckmann et al., 2010). While Miller and Cardinal (1994) demonstrated a strong, direct, positive relationship between planning and firm growth, Rue and Ibrahim (1998) found a weak, positive relationship between planning and sales decline. Effectuation seemed to be more effective in underdeveloped, emerging-market contexts than causation (Shirokova et al., 2021; Zhou & Liou, 2021). While causation reduced firm survival during economic crisis, effectuation was found to be viable for SME survival (Osievskyy et al., 2023). Because of the underexplored cases and inconclusive results, Perry et al. (2012) recommended further analysis to gain more insight into the relationship between entrepreneurial decision logic and performance.

In emerging economies, firms face a tougher environment (Bruton et al., 2013; Meyer et al., 2009; Yu et al., 2018). One current example of such a situation is Myanmar. In Myanmar, the economy had been under various devastating situations ranging from COVID-19 pandemic, to other political and social conflicts, leading to a continuous decline in GDP from -9% in 2020, -12% in 2021, and then, with a slight positive growth from 4% in 2022, again sticking at -1.1% in 2024, according to IMF (2024). Yet, the silver lining of the crisis (Grözinger et al., 2021) still brings firms opportunities to sustain their business and grow under such a trajectory (Giotopoulos et al., 2017). Hence, it is worth examining to address our research questions: how different entrepreneurs prevail under different decision logics in crises or turbulent situations, and how these decision logics affect firm performance, particularly in the current context of Myanmar.

Prior studies have used the effects of causation, effectuation, and their synergy on firm performance through a variable-centered approach (Alzamora-Ruiz et al., 2021; Cherbib, 2024; Smolka et al., 2018). Yu et al. (2024) identified a configuration approach that combines causation and effectuation. Their focus has been on exploring different compositions of effectuation components while fixing the causation component as a single factor. The study did not examine various combinations of both causation and effectuation at the individual level, but rather at the variable level. Shirokova et al. (2021) called for examining combinations of decision logics and their effects on firm performance. However, little research focuses on how contemporary entrepreneurs employ these decision logics in real-world contexts being composed at an individual level. Rather, we had only seen literature focusing on decision logics as separate variables, which may be too ideal to be found exactly at the personal level (Alzamora-Ruiz et al., 2021; Cherbib, 2024; Smolka et al., 2018). To the best of our knowledge, only one study has examined the different compositions of causation and effectuation across various profiles at the interpersonal level; yet this study was limited to student samples in a relatively stable environment (Ilonen et al., 2018). Lascovaia et al. (2019) called for greater use of the configuration approach in the causation and effectuation literature, particularly in crisis situations. Further investigation into the consequences of entrepreneurial decision logics is recommended (Smolka et al., 2018). Therefore, using a person-centered approach to identify the actual composition of decision logics among current entrepreneurs would be a distinctive method and could be used to examine the relationship between each composition and firm performance, particularly in crisis situations.

With an aim to bridge the aforementioned gap in the literature, the purpose of this study is to identify the decision logic profiles of current entrepreneurs and top-level managers and to determine the association between each profile, consisting of causation and effectuation, and firm performance. The sample includes current business owners and top-level managers responsible for making strategic decisions in firms in Myanmar. This study contributes to the causation and effectuation literature by adopting a person-centered approach and focusing on a turbulent environment, such as Myanmar, to shed light on how entrepreneurs survive and adapt to environmental turbulence.

LITERATURE REVIEW

Different decision profiles

To manage the inherent uncertainty, entrepreneurs seek to mitigate its negative impact through their management styles in venture creation, opportunity recognition, and other business operations, such as new product/market development, marketing, and strategy development. From a strategic management perspective, some entrepreneurs address uncertainties through prediction and planning (Nummela et al., 2014), using analyses of past data to forecast the future, setting goals and plans, and developing appropriate strategies to achieve them (Ansoff, 1979; Mintzberg, 1978). This can be called the goal-oriented approach and named as causation by Sarasvathy (2001). Founded in neo-classical microeconomics (Stigler, 1952), the causation approach means making rational choices from available information to maximize utility (Chandler et al., 2011). Causal entrepreneurs focus on market opportunities (Henninger et al., 2020) and invest in opportunities with a higher expected return. These returns are predicted through extensive research and analysis and implemented with a predetermined business plan and the acquisition of required resources (Sarasvathy & Dew, 2005). However, depending on the entrepreneurs, the way they approach strategic decision-making under uncertainty may vary by their cognitive orientation (Nummela et al., 2014).

Sarasvathy (2001) studied how expert entrepreneurs behave in real-world contexts and uncovered an effectual approach to entrepreneurship. Effectuation is an emergent approach that uses available means to control and shape the future, taking affordable loss options, securing stakeholder commitment, and utilizing contingency approaches, rather than predicting and planning in response to environmental changes (Sarasvathy, 2001; 2008). Although causation and

effectuation use different cognitive orientations such as goal and mean orientations respectively, Sarasvathy (2001) proposed that the two logics are not mutually exclusive within an individual. She emphasized that the two concepts are often used interchangeably or in a balanced manner, depending on the situation.

Haynie et al. (2010) argued that causation and effectuation are cognitive strategies (Chen & Xu, 2022) consciously chosen by entrepreneurs through their metacognitive processes. They regard an entrepreneur as “a fully engaged thinker who has multiple cognitive strategies available and chooses among them based on goals, motives, and needs” (Fiske & Taylor, 1991, p. 13). According to the entrepreneurial metacognition theory of Flavell (1979), it is also possible that entrepreneurs with higher cognition processes could use the different strategies either in combination or alternately (Fiske and Taylor, 2013). Literature also found that entrepreneurs use the combination of two logics in the real world (Berends et al., 2014; Galkina & Lundgren-Henriksson, 2017; Galkina et al., 2021). Mitchell et al. (2011) proposed that entrepreneurs recognize multiple alternative approaches to performing a specific task and may choose both causation and effectuation in an entrepreneurial action. Servantie and Rispal (2018) and Smolka et al. (2018) confirmed that entrepreneurs complementarily use causation and effectuation, and that the composition style differs from individual to individual (Sarasvathy, 2009).

A variable-centered approach in which independent variables are used to explain the variance in dependent variables (Stanley et al., 2017) is rather impractical for studying entrepreneurial decision logics. It has limitations when examining the complex interactions among multiple variables (Aguinis, Gottfredson, & Wright, 2011). Person-centered and configural approaches recognize different configurations of variables (Stanley et al., 2017). Likewise, entrepreneurs in the real world can be composed of different decision logics. Gancarczyk and Ujwary-Gil (2021) viewed decision-making as a configural approach—a dynamic blend of logics rather than isolated types. As entrepreneurs with higher metacognitive processes are more aware of situations, cognitive adaptability operates differently across environmental contexts (Haynie et al., 2010). In response to the call by Grègorie and Cherchem (2020), it would be interesting to examine how entrepreneurs’ metacognition operates in turbulent situations at the individual level using a person-centered approach.

On the other hand, individuals can be constrained or propelled through metacognition (Haynie et al., 2010). People who are more constrained are less likely to alternate strategies and adapt to the decision context. The higher the level of metacognitive processes, the more entrepreneurs can adjust their current strategy in response to the situation (Flavell, 1979). While some entrepreneurs frequently combine them (Berends et al., 2014; Galkina & Lundgren-Henriksson, 2017; Galkina et al., 2021), others may rely on a single logic. However, entrepreneurs with more constrained metacognition may cautiously limit their choice to only the most appropriate strategy to avoid making the wrong choice, particularly in times of uncertainty and dynamic situations (Haynie et al., 2010).

Hauser et al. (2020) reminded that entrepreneurs tend to be less active with none of the above-mentioned strategies, instead, putting out fires, especially when they are totally absorbed by current events and crises. As a form of firefighting (Winter, 2003), entrepreneurs lack the opportunity to develop strategies (Aram & Cowen, 1990). Ilonen et al. (2018) also found, in their cluster analysis, that after gaining experience and knowledge, entrepreneurs adopted a coping strategy that was more likely to involve a lack of both causation and effectuation, as well as a hybrid decision logic. Therefore, based on the entrepreneurial metacognition theory, we would like to explore what kind of different decision logic profiles may exist and vary in their cognition process among entrepreneurs, such as a hybrid use of both the decision logics, causation-dominant decision logics, effectuation-dominant decision logics, and coping strategies with no causation and effectuation.

Decision profiles and firm performance

The synergistic effect of causation and effectuation has its own research stream within effectuation research (Matalamäki, 2017). Recent literature examined the effect of their simultaneous use (Braun & Sieger, 2021; Galkina & Lundgren-Henriksson, 2017; Jiang & Tornikoski, 2019; Reymen et al., 2015; Smolka et al., 2018; Yang & Gabrielsson, 2017). However, to the best of our knowledge, little is known about the mechanisms by which the two logics create a synergistic and additive effect, especially from a configural perspective. A better understanding of how the two logics and their combination would help entrepreneurs perform better (Galkina & Jack, 2022).

Previous studies have found a positive relationship between causation and venture growth performance (Brinckmann et al., 2010). Specifically, many studies have found a positive relationship between the causation approach and firm performance in terms of innovation (Kristinsson et al., 2016), research and development (Brettel et al., 2012), and financial performance, such as sales and firm and employment growth (Mayer-Haug et al., 2013; Rue & Ibrahim, 1998). Therefore, variations in the degree of reliance on planning are expected to cause variations in the effectiveness of firm performance.

However, some researchers have questioned the benefits of causation or planning approaches (Burke et al., 2010; Chwolka & Raith, 2012; Delmar & Shane, 2003; Gruber, 2007; Honig & Samuelsson, 2014). In particular, Osiyevskyy et al. (2023) found that effectuation outperformed causation in a firm's survival during a crisis.

Effectuation is especially recommended for uncertain situations, as it enables the discovery and creation of opportunities with available resources (Wiltbank et al., 2006). Using an effectual logic, entrepreneurs engage in simultaneous experimentation with self-selected stakeholders to grasp and adjust viable opportunities in response to frequent changes (Andries et al., 2013). Additionally, partnering with others enables flexibility through expanded resources and continuous goal reconfiguration, leading to the co-creation of novel opportunities for profitability and growth (Wiltbank et al., 2006). Overall, effectuation was found to have a positive impact on firm growth, not only in normal situations but also during turbulent times, such as the turbulence of 2009–2013 in the Eurozone (Matalamäki, 2017), as well as on the subjective measures of profitability and growth (Cai et al., 2017). Additionally, Read et al. (2009) found that effectuation positively impacts firm performance. As noted earlier, Osiyevskyy et al. (2023) found that effectuation increased the firm survival rate during an economic crisis. However, effectuation can be a double-edged sword in new product development, undermining its meaningfulness (Deng et al., 2021).

Although the two concepts appear to be different and mutually exclusive, recent literature shows that causation and effectuation are not competing but complementary and synergistic (Braun & Sieger, 2021; Galkina & Lundgren-Henriksson, 2017; Reymen et al., 2015; Jiang & Tornikoski, 2019). The combined use of causation and effectuation can mitigate each other's disadvantages. Using the causation approach, the firm can clearly set its future direction (Frese et al., 2007) while simultaneously quickly adapting to the situation (Brettel et al., 2012). Yu et al. (2018) proposed combining the two approaches to harness their synergistic effects, particularly in uncertain situations, as they can complement each other's strengths while mitigating their weaknesses. After all, while effectuation creates more flexibility, better predictions can be made from the gathered information owing to causation. They concluded that a combined approach creates a positive impact on firm performance, confirming the findings of Smolka et al. (2018). Hayne et al. (2010) proposed that greater reliance on metacognitive knowledge and experience could lead to a more desirable outcome in the entrepreneurial task. This brings us, in conjunction with the previous literature, to the hypothesis:

H1: Firms classified into a hybrid form of causation and effectuation logic are associated with better performance than those firms that use other empirically classified decision logics.

Decision profiles and knowledge exploitation and exploration

The entrepreneurship paradigm has shifted from a static, trait-based perspective to a more dynamic one based on learning (Gemmell et al., 2011; Wang and Chug, 2014). Entrepreneurial learning can be defined as the process of knowledge acquisition, sharing, integration, and utilization of business practice (Harrison & Leitch, 2005). This process can be implemented in two ways: knowledge exploitation and exploration. Knowledge exploitation involves the refinement or gaining of deeper insights into one's current knowledge and competencies by choosing, producing, striving for efficiency, implementing, and executing; exploration refers to strategies related to managing new entrepreneurial knowledge by searching, experimenting, making variations, taking risks, being flexible, and discovering (March, 1991). Both start-up entrepreneurs and intrapreneurs in established firms first have to decide between causation and effectuation, and then must make strategic choices about investing in different knowledge management or learning strategies, namely, exploitation and exploration (He & Wong, 2004).

Causation allows entrepreneurs to exploit pre-existing knowledge by developing competitive strategies for existing markets (Politis, 2005) and taking advantage of available resources and capacities. Causal components of planning and prediction (Smolka et al., 2018) help entrepreneurs exploit opportunities in a way that enables them to understand the market and demand by using projection or prediction of expected return for managing resources, and business planning as a tool for predicting or minimizing risk (Chandler et al., 2011).

Meanwhile, effectuation-oriented entrepreneurs try to control the future and explore possibilities without predetermined goals (Saravathy, 2001). The principles of effectuation provide entrepreneurs with more opportunities for knowledge exploration (Cai et al., 2017). Examples include experimenting with new product/service/market development (Chandler et al., 2011; March, 1991; Zahra et al., 2006); affordable loss for operating the business within resource constraints (Bruton & Ahlstrom, 2003; Gedajlovic et al., 2012); flexibility to respond to rapid changes in the environment (Dixon et al., 2010; Peng & Luo, 2000), and pre-commitment to strategic alliances (Zhao et al., 2011). Although effectuation is found

to affect exploration, its principles also contribute to exploitation (Guo, 2018). This is evident through experimentation with resource combinations to reach an optimal level (Deligianni et al., 2015; Guo et al., 2016); affordable loss by step-by-step investment to exploit feasible opportunities (Dew et al., 2010); and flexibility to reap emerging opportunities (Alvarez & Barney, 2007; Vera & Crossan, 2005).

Guo (2018) suggested that both causation and effectuation have distinct ways of acquiring and allocating resources and found that both positively affect exploitation. Nonetheless, no significant effect of their interaction on exploitation was found. However, expert entrepreneurs could leverage the knowledge of both causal and effectual logics developed over their experience to seek out additional information and process it to identify opportunities (Politis, 2005). While they use the causation approach with a central focus on planning and prediction for minimizing risk and uncertainty, and it is the best for exploiting knowledge (Sarasvathy, 2001), they will also be able to see the good in both exploitation and exploration and tend to act more ambidextrously, especially when an individual is exposed to different expertise and a wide variety of knowledge (Tempelaar & Rosenkran, 2019). Particularly in times of uncertainty, opportunity decisions are influenced by cognitive skills and personality traits, individually or through their interaction (Mensah et al., 2021). This study assumes that different levels of hybridity may trigger more distinctive utilization of strategies, exploration, and exploitation. Therefore, recalling the meta-cognition theory, we propose that entrepreneurs with higher metacognitive processes who use the hybrid approach to causation and effectuation have greater advantages in exploitation and exploration.

H2(a): Firms classified into a hybrid form of causation and effectuation exhibit higher knowledge exploitation than those firms that use other empirically classified decision logics.

H2(b): Firms classified into a hybrid form of causation and effectuation exhibit higher knowledge exploration than those firms that use other empirically classified decision logics.

Exploitation, exploration, and firm performance

An organization's performance depends on its current capabilities (Davidsson et al., 2009; March, 1991). As exploitation helps to use current and existing knowledge to achieve competitive advantage and efficiency (Zack, 1999), it can improve firm performance. Exploratory learning is expected to improve performance by facilitating the identification of new knowledge (McGrath, 2001; Uotila et al., 2009). Cai et al. (2017) empirically proved the relationship between exploration and new venture performance. Although previous research has empirically shown that both exploration and exploitation impact firm performance (Levinthal & March, 1993; Su et al., 2011), within the constraints of an organization's scarce resources, a choice must be made to make optimal use of each component (Lee & Huang, 2012). Hou et al. (2019) found a positive relationship between exploration and exploitation, mediated by entrepreneurial orientation, and firm performance, measured by sales and other financial performance indicators. Thus, we posit the following:

H3(a): Knowledge exploitation is positively associated with firm performance.

H3(b): Knowledge exploration is positively associated with firm performance.

METHODOLOGY

Sample and data collection

Data were collected from October to November 2022 from firm owners and top-level managers associated with the Myanmar Young Entrepreneurs' Association (MYEA). Founded in 2009, the MYEA, a non-profit organization, serves as a platform for young entrepreneurs in Myanmar to network, exchange ideas, and interact with regional and international businesses. Although the exact number of members could not be obtained due to several crisis situations, including safety and security concerns, it had 1,714 member companies by 2019, before the COVID-19 pandemic, according to Myanmar Insider (2019). First, we contacted the MYEA's executive committee and obtained permission to conduct an online survey. This survey was conducted using Google Forms and consisted of a structured questionnaire with questions on entrepreneurial decision-making logic, knowledge exploitation and exploration, firm performance, and members' general demographic information. With the assistance of the secretariat, the purpose of the study was explained, and the Google Form link was distributed to all members via email. Once the purpose of the study was explained and the confidentiality of data was assured, members were requested to ensure that firm owners or top-level managers responsible for strategic

decision-making in the company responded to the survey. The survey was completed by November 30th, 2022, and 249 responses were received. The questionnaire was distributed to 800 members, with a response rate of 31.12%, which was relatively low owing to COVID-19 and the political situation. Some member organizations had become inactive, and a few others could not be contacted for safety concerns. Of the 249 responses, 232 (93.2%) were considered valid. When choosing companies, we limited the scope to those established before 2019 to include those that had faced both COVID-19 and other political-social crises. To check for late-response bias, we split the sample into two groups: those who responded in the first wave of questionnaire distribution (180) and those who responded in the second wave (52 valid responses), and examined main variables such as effectuation, causation, and performance. The independent-samples t-test showed no significant difference between the early and late respondents on the main variables. Participants included 128 females (55.2%) and 104 males (44.8%). Of the 170 respondents, 170 were owners, and 62 were top-level managers. Their ages ranged from 23 to 53 years. The average age of the respondents was 42.1 years.

Measures

The questionnaire comprised four sections: (1) demographic and general information and firm performance; (2) entrepreneur's decision-making logic; (3) knowledge exploitation and exploration; and (4) manipulation check to ensure that effectuation is not considered as having any strategy at all (Hauser et al., 2020). The questionnaire was structured around previously well-established measures from the literature and developed in the Myanmar language. The double back-translation method was used to ensure linguistic equivalence and face validity. A pilot test was conducted with 10 executive members at the online meeting to validate the constructs and understandability of the language context.

Decision logics: Causation and effectuation

Martin-Navarro et al. (2021) developed both causation and effectuation measures: a 7-item unidimensional construct to measure causation and 17 items across 5 dimensions to measure effectuation: means-orientation, partnership, affordable loss, contingency, and control orientations. These measures were used for measuring causal and effectual propensity. These propensity measures seem suitable for this study, as we aimed to measure decision logics rather than behaviors. Using a 7-point Likert scale ranging from "1 = strongly disagree" to "7 = strongly agree," respondents were asked to recall causal and effectual propensity and orientation when making their business decisions. "I prefer to have predetermined goals and to strive to achieve the results of these goals," and "I pursue those initiatives for which I personally have the relevant competencies," are sample items pertaining to causation and effectuation, respectively. Although these measures were primarily intended for potential entrepreneurs, the authors also recommended this scale for use by entrepreneurs and managers of established companies, as they are considered able to evaluate themselves with respect to the implementation of strategic orientation.

Knowledge exploitation and exploration

Entrepreneurs' knowledge exploitation and exploration behaviors were measured using Popadiuk's (2012) six-point bipolar scale. Exploitation and exploration are second-order latent constructs composed of different dimensions. The four exploitation dimensions reflect entrepreneurs' choice of strategy in competition, strategy orientation, efficiency, and partnership. The two exploration dimensions reflect the strategic choice in knowledge practices and innovation. Sample items of exploitation include "Degree of existing knowledge utilization" and "Time horizon for organizational strategy." Those of exploration include "Volume of new ideas generation" and "Focus on totally new products and processes."

Firm performance: Sales decline

To measure firm performance, we used an objective measure of the percentage change in sales over a three-year period from 2020 to the end of 2022 (Zahra, 1993). This measure was chosen considering that it reflected how well a company related to its external environment in the face of both COVID-19 and other political and social crises. Following Nakhok (2022) and Zahra (1993), we requested that respondents report their percentage change in sales relative to 2019, the year before COVID-19 struck. To reflect the firm survival, we just regarded 0 for no decline and/ or sales increase, 1 for sales decline up to 20%, 2 for sales decrease up to 20 to 29%, 3 for sales decrease up to 30 to 39%, 4 for a decrease up to 40 to 49%, and 5 for a decrease of 50% and above.

Control variables

Variables affecting the choice of decisions, practices, and firm performance were treated as control variables. At the individual level, we controlled for respondents' gender, age, and years of experience because these factors may have a significant influence on the entrepreneurs' use of decision logics and firm performance (Lumpkin & Dess, 2006; Manolova et al., 2020; Schmidt et al., 2020; Werner, 2020). At the firm level, we controlled for firm size at the base year, firm age, and industry type. Industries are classified by their vulnerability during a crisis: highly vulnerable, indifferent, or more resilient (McKinsey and Company, 2020). For example, tourism, hospitality, manufacturing, logistics, commercial trade, and retail are highly vulnerable during a crisis; media services and agriculture are indifferent, while health, telecom, on-demand services, and private education sectors benefit during a crisis (Manolova et al. 2020).

Manipulating variables

Hauser et al. (2020) suggested that the idea of effectuation may be confused with ad hoc decision-making owing to the lack of a strategy. The mean results for the two variables also showed that respondents had no practice of absence of strategy (mean = 3.207), while effectuation showed a mean of 5.752, which is moderately high, and showed a significant difference from absence of strategy ($t = 28.309$, $p < 0.000$). The mean value of causation was also high, with 5.770. Pearson's correlation coefficient among effectuation, causation, and the absence of strategy was also insignificant.

Data analyses

Data analyses involved three steps. The first consisted of assessing the reliability and validity of first-order latent constructs and conducting a confirmatory factor analysis (CFA) to create second-order factors for exploitation and exploration variables in Statistical Package for the Social Sciences Analysis of Moment Structures (SPSS AMOS) version 23. The second involved using standardized values of causation and effectuation in K-means clustering to identify the decision logics of entrepreneurs and top-level managers, as this method is recognized as flexible, efficient, and easy to implement (Ikotun et al., 2023). To determine the optimal number of clusters, the elbow method, the most traditional approach, was used (Shi et al., 2021). The third involved using cluster dummy variables to conduct an ordinal regression analysis to test the relationship between decision profiles, ordinary least squares regression analysis for testing the relationships between knowledge exploitation and knowledge exploration, and firm performance. When forming the dummy clusters, actively hybrid entrepreneurs were treated as the reference group, assumed to be an extreme or ideal group of entrepreneurs based on metacognitive processes (Guo, 2018; Haynie et al., 2010; Smolka et al., 2018). In addition, due to unequal cluster sizes, the ordinal nature of the dependent variables, and sparse outcome-covariate combinations, we conducted Monte Carlo Simulations to assess the finite-sample performance of the ordinal regression. We re-estimated ordinal regression using 5000 replications via repeated simulations, bias, empirical standard errors, and confidence-interval coverage for the key coefficients.

RESULTS

Data validation

As the exploitation and exploration measurement items were taken from Popadiuk (2012), who treated them as second-order factors composed of two and four dimensions, respectively, we checked the reliability and validity of the first-order factors, including causation and effectuation. Cronbach's alpha values for causation and effectuation were 0.744 and 0.783, respectively, well above the cut-off criterion of 0.70. For exploitation, first-order factors were efficiency ($\alpha = 0.82$), strategic orientation ($\alpha = 0.684$), competition ($\alpha = 0.828$), and partnership ($\alpha = 0.667$). Although some factors were below 0.70, the other dimensions were above this level. Raharjanti et al. (2022) assumed an alpha value from 0.60 to 0.80 as deemed acceptable. For exploration, the first-order factors, knowledge and innovation practices had good reliability scores of 0.829 and 0.776. Next, confirmatory factor analysis (CFA) was conducted using the measurement model for first-order factors only. Convergent and discriminant validity were confirmed for all the first-order variables. Table 1 shows that their average variance extracted (AVE) is greater than 0.50, and the square root of the AVE is greater than the correlation. A fair level of fitness was observed in the CFA result of the measurement model with that of the first-

order with $\chi^2 / \text{degree of freedom (df)} = 1.756$, comparative fit index (CFI) = 0.926, incremental fit index (IFI) = 0.927, root mean square error of approximation (RMSEA) = 0.057. Therefore, we moved to construct the second-order model in AMOS, and the model fit indices indicated a good fit: $\chi^2/\text{df} = 1.632$, CFI = 0.935, IFI = .936, RMSEA = 0.052.

Table 1. Correlation matrix among first-order latent variables

Latent Variables	1	2	3	4	5	6
1. Knowledge Practices	0.718					
2. Innovation	0.506**	0.775				
3. Efficiency	0.646**	0.535**	0.796			
4. Strategic Orientation	0.494**	0.487**	0.609**	0.721		
5. Competition	0.416**	0.431**	0.494**	0.615**	0.809	
6. Partnership	0.362**	0.341**	0.387**	0.437**	0.461**	0.718

Note: ** Correlation is significant at the 0.01 level (2-tailed); the square root of AVE was inserted in the diagonal boxes.

After forming the second-order constructs of exploitation and exploration, we tested the convergent and discriminant validity of the entire model. Table 2 presents the correlation matrix among the second-order construct variables. Again, convergent and discriminant validity were confirmed for the main variables. Table 2 shows that their AVEs are greater than 0.50, and their square roots are greater than the correlations. In addition, because all variables were collected from a single respondent in a single questionnaire, there is a potential for common-method bias. We checked Harman’s single-factor test in SPSS, and the total variance extracted by a single factor was 21.94%, which is well below 50%, suggesting no serious common method bias.

Table 2. Correlation matrix of the main variables

Latent Variables	Minimum	Maximum	Mean	Std Dev	1	2	3	4
1. Effectuation	4.47	7.00	5.752	0.497	0.737			
2. Causation	3.43	7.00	5.770	0.620	0.562**	0.727		
3. Exploration	1.67	3.90	3.14	0.452	0.385**	0.387**	0.735	
4. Exploitation	0.96	2.59	1.913	0.334	0.350**	0.392**	0.574**	0.829

Note: ** Correlation is significant at the 0.01 level (2-tailed); The square root of AVE was inserted in the diagonal boxes.

Descriptive statistics

Before conducting further analysis, we examined the descriptive statistics of the respondents to understand the nature of the respondents and the general condition of the main variables. Mean, standard deviation, and the minimum and maximum values were reported in Table 2. The results showed that respondents exhibit high levels of both causation and effectuation, with mean values of 5.752 and 5.770, respectively. Therefore, we can generally assume that respondents practice a hybrid of effectuation and causation in reality. It was found that respondents had a moderate level of exploration (3.14) and a low level of exploitation (1.913) during data collection. Out of the total 232 respondents, 97 were in highly vulnerable industries, 50 were in highly beneficial ones, and 85 were in indifferent industries. Among them, 103 reported no sales decline, 33 reported up to 20% decline, 17 reported 30% decline, only 12 reported up to 50% decline, and 29 reported more than 50% decline.

Cluster analysis

To further understand the composition of decision logics among respondents, a cluster analysis identifying the decision profiles of respondents was performed using the elbow method in RStudio to determine the optimal number of clusters (K). As shown in Figure 1, the line flattens with no significant difference after point 4; thus, we assumed the optimal number of clusters is 4 and proceeded to analyze the K-means clustering in SPSS 26 with 4 as the predetermined number of clusters (see Figure 2). The analysis results show that the pair of causation and effectuation significantly contributes to the different clusters, with p-values less than 0.001.

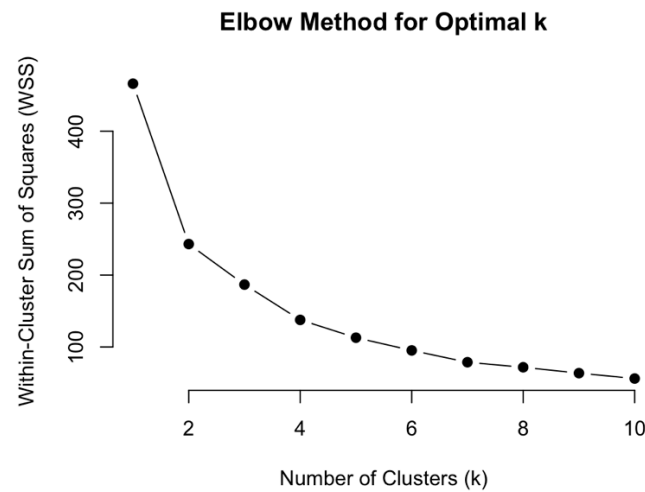


Figure 1. Elbow method for optimal cluster numbers

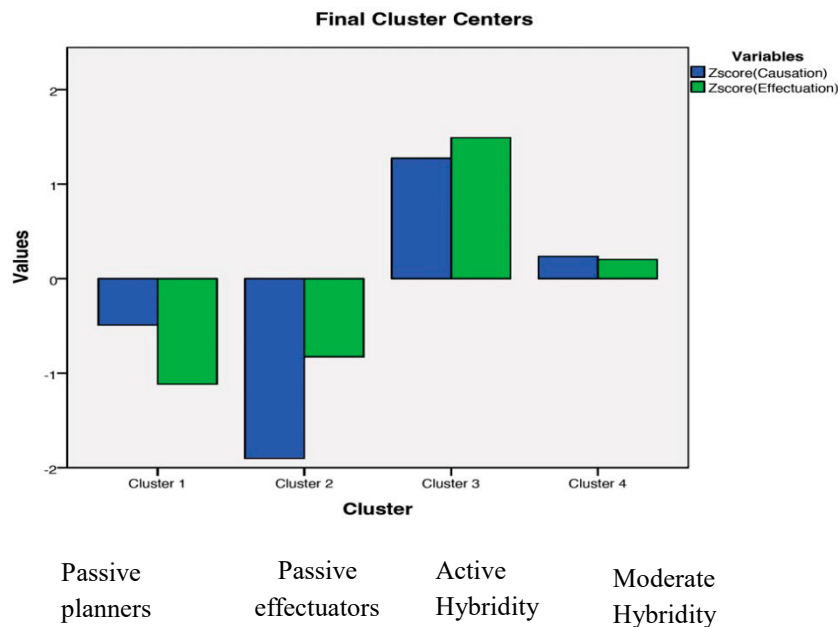


Figure 2. K-Means cluster analysis

Among the four hybrid clusters identified, Cluster 1 comprised 51 entrepreneurs with low levels of both causation and effectuation and a slight emphasis on causation. This group was named the “passive planners” group because the entrepreneurs displayed greater adaptability and caution, having not relied heavily on planning. Cluster 2, with 26 entrepreneurs, displayed lower levels of both causation and effectuation but was more clearly dominated by effectuation, with entrepreneurs in the group exhibiting a reactive approach. Thus, the group was named “passive effectuators.” The 34 entrepreneurs in Cluster 3 displayed the highest levels of both causation and effectuation. Therefore, the group was called “active hybridity,” as the entrepreneurs were both good at causation and effectuation. The group of 121 entrepreneurs in Cluster 4 displayed moderate levels of both causation and effectuation, earning it the label “moderate hybridity,” as the entrepreneurs demonstrated adaptability to both logics.

The silhouette coefficient for the four-cluster K-means solution was 0.36, indicating moderate cohesion and separation among clusters (Kaufman & Rousseeuw, 1990). To further understand the cluster structure, an analysis of variance (ANOVA) test and post-hoc multiple-group comparisons for the clusters were conducted using SPSS, with the contributing variables being causation and effectuation, as well as other demographic characteristics such as age, gender,

experience, firm size, and industry. Table 3 presents the results. Although causation and effectuation were significant contributors, the post-hoc test results showed no significant difference in effectuation between Clusters 1 and 2, that is, the passive planners and passive effectuators. However, because the two clusters showed significant differences in causation, they were assumed to be distinct.

The mean age, start-up experience, and gender of the entrepreneurs were significantly different across the four clusters, indicating that younger entrepreneurs are more hybrid in nature, while older entrepreneurs are more cautious in decision-making. Additionally, the results revealed that while more males are passive planners, more females are hybrid entrepreneurs. The post hoc test also showed a significant difference in gender between the passive planners and the active hybridity groups. Furthermore, more respondents have start-up experience in the moderate hybridity, passive planners, and active hybridity groups.

Table 3. Cluster characteristics

	F	P	Clusters			
			Passive planners	Passive effectuators	Active hybridity	Moderate hybridity
N			51	26	34	121
Mean causation	201.80	<0.001	5.47	4.60	6.57	5.92
Mean effectuation	169.13	<0.001	5.21	5.35	6.49	5.86
Mean age of entrepreneurs/managers	3.36	0.020	42.43	46.12	40.65	41.32
Gender: male			37	12	14	65
female	3.38	0.019	14	14	20	56
Experience	1.74	0.160	10.35	14.58	12.15	12.10
Firm size	0.30	0.828	588	198	158	503
Firm age	1.22	0.302	53.18	13.62	10.94	13.59
Industry-highly vulnerable	0.83	0.481	14	4	6	22
Industry-indifferent	0.44	0.736	22	13	12	51
Industry-most beneficial	1.013	0.388	15	9	16	48
Start-up - entrepreneurs			29	20	26	95
No start-up - managers	3.090	0.028	22	6	8	26

Next, the other hypotheses were tested using ordinal and linear regression analyses in SPSS to examine relationships between decision profiles and exploitation, exploration, and sales decline as firm performance, and the mediating effects. We controlled for age, gender, work experience, start-up experience, firm size, firm age, and industry.

Table 4. Ordinal logistic regression results predicting sales decline

Predictor	B	S.E.	Wald	P	95% CI	Odds-ratio
Cluster 1 (passive planners)	-0.316	0.461	0.470	0.493	-1.220, 0.588	0.73
Cluster 2 (passive effectuators)	-1.113*	0.562	3.920	0.048	-2.214, -0.011	0.33
Cluster 4 (moderate hybridity)	-0.670	0.367	3.325	0.068	-1.390, -0.050	0.51
Exploitation	-0.973*	0.473	4.223	0.040	-1.901, -0.045	1.60
Exploration	0.467	0.352	1.755	0.185	-0.224, 1.157	0.38
Age	0.024	0.024	1.000	0.317	-0.023, 0.070	1.02
Gender	-0.539*	0.265	4.137	0.042	-1.059, -0.020	0.58
Experience	0.009	0.024	0.146	0.695	-0.037, 0.055	1.01
Start-up	-0.052	0.309	0.028	0.866	-0.657, 0.553	0.95
Firm size	0.000	0.000	0.061	0.805	0.000, 0.000	1.00
Firm age	-0.002	0.003	0.454	0.501	-0.009, 0.004	1.00
Industry: Highly vulnerable	0.597*	0.282	4.499	0.034	0.045, 1.149	1.82
Industry: Highly beneficial	-0.787*	0.368	4.582	0.032	-1.508, -0.066	0.46

Predictor	β	S.E.	Wald	P	95% CI	Odds-ratio
LR χ^2 (13)	33.261 (p = 0.002)					
Nagelkerke R ²	0.140					
Test of parallel lines	χ^2 (52) = 45.142, p = 0.738					

Note: Reference category for clusters: cluster 3 (Active hybridity); * indicates significance at 0.001 (2-tailed), 0.01, and 0.05 levels, respectively. S.E.: Standard error; P: p-value.

Table 5. Monte Carlo simulations result for ordinal regression

Predictor	True β	Mean β	Bias	Empirical S.E.	Mean model S.E.	95% CI coverage
Gender	-0.539	-0.570	-0.031	0.277	0.270	0.945
Exploitation	-0.973	-1.030	-0.056	0.498	0.482	0.948
Exploration	0.467	0.506	0.040	0.373	0.359	0.941
Industry: Highly vulnerable	0.597	0.642	0.045	0.295	0.288	0.944
Industry: Highly beneficial	-0.787	-0.808	-0.021	0.390	0.378	0.940
Cluster 1: Passive planners	-0.316	-0.310	0.006	0.485	0.470	0.947
Cluster 2: Passive effectuators	-1.113	-1.184	-0.071	0.599	0.576	0.942
Cluster 4: Moderate hybridity	-0.670	-0.687	-0.017	0.383	0.374	0.946

Note: Monte Carlo simulation based on the fitted proportional-odds logit model. Outcomes were simulated using estimated coefficients and thresholds under a logistic error distribution while preserving the observed covariate structure (N = 232). Bias = mean($\hat{\beta}$) - β . Empirical S.E. denotes the standard deviation of estimates across replications. CI coverage reports the proportion of 95% Wald confidence intervals containing the true parameter.

From the ordinal regression analysis results in Table 4, regarding sales decline, the passive effectors profile ($\beta = -1.113$, $p = 0.048$) showed lower sales decline, indicating better performance than the active hybridity group. Both the passive planners ($\beta = 0.316$, $p = 0.493$) and the moderate hybridity group ($\beta = -0.670$, $p = .068$) did not have a significant difference from the active hybridity group. Thus, Hypothesis 1, which proposed that a hybrid form of cluster performs better than other clusters, is not supported. While exploitation had a statistically significant relationship with sales decline ($\beta = -0.973$, $p = 0.040$), exploration did not ($\beta = 0.467$, $p = 0.185$). Thus, Hypothesis H3(a) is supported; however, and H3(b) is not supported. Odds ratios and confidence intervals are also reported in Table 4 to exhibit the effect magnitude. Exploitation is associated with lower odds of a severe sales decline (OR = 0.38, 95% CI (0.15, 0.96)). Cluster comparisons also show that lower sales decline risk for passive effectuators (OR = 0.33, 95% CI (0.11, 0.99)) compared to the reference group, active hybridity, although the results for smaller clusters need to be interpreted cautiously and exploratorily, given unequal cluster sizes. The Monte Carlo simulation results reported in Table 5 indicate that parameter estimates and confidence intervals from the ordinal regression model are well-behaved in finite samples. This supports the reliability of the reported results.

Table 6. Regression coefficients, standard errors, and summary statistics for the multiple linear regression model with clusters (active hybridity as the baseline) as predictor variables

Dependent Variables	Exploitation				Exploration			
	B	S.E	β	P	B	S.E	β	P
Cluster 1: Passive planners	-0.392***	0.072	-0.437	<0.001	-0.475***	0.096	-0.487	<0.001
Cluster 2: Passive effectuators	-0.416***	0.083	-0.414	<0.001	-0.591***	0.111	-0.393	<0.001
Cluster 4: Moderate hybridity	-0.180***	0.060	-0.257	0.003	-0.232**	0.081	-0.269	<0.001
Gender	-0.016	0.043	0.099	0.716	0.090	0.057	-0.023	0.119
Age	0.001	0.004	0.017	0.845	-0.004	0.005	0.017	0.402
Experience	0.005	0.004	0.111	0.123	0.008	0.005	0.111	0.134
Start-up	-0.007	0.050	-0.102	0.123	0.063	0.067	-0.102	0.348
Firm Size	-0.00	0.000	-0.015	0.809	-0.000	0.000	-0.015	0.321
Firm Age	0.00	0.000	-0.080	0.197	0.000	0.000	-0.080	0.212
Industry_ highly vulnerable	-0.02	0.047	-0.029	0.675	-0.014	0.063	-0.029	0.820
Industry_ highly beneficial	0.058	0.056	0.072	0.301	0.060	0.076	0.072	0.426

Dependent Variables	Exploitation				Exploration			
	B	S.E	β	P	B	S.E	β	P
R-square		0.191				0.203		
F-value		4.737				5.06		
Sig		<0.001				<0.001		

Notes. ***, **, and * indicate significance at 0.001 (2-tailed), 0.01, and 0.05 levels, respectively; S.E.: Standard error; P: p-value; n: number of participants.

Table 6 shows that all clusters are significantly poorer than the active hybridity group in both exploitation and exploration. Compared with active hybridity group, the passive planner group ($\beta = -0.437, p < .000; \beta = -0.487, p < 0.001$) had the lowest exploitation and exploration, followed by passive effectuators profile ($\beta = -0.414, p < .000; \beta = -0.393, p < 0.001$) while the moderate hybridity group showed slight but significantly lower exploitation and exploration ($\beta = -0.257, p = 0.003; \beta = -0.269, p < 0.001$). Thus, Hypotheses 2 (a) and (b) are supported. The OLS Monte Carlo results for both exploitation and exploration indicate negligible bias and near-nominal 95% CI coverage for all coefficients.

Table 7. Monte Carlo simulations result for OLS regression on exploitation

Predictor	True β	Mean β	Bias	Empirical S.E.	Mean Model S.E.	95% CI Coverage
(Intercept)	1.950	1.950	-0.002	0.152	0.152	0.947
Cluster 1: Passive planners	-0.212	-0.212	-0.000	0.054	0.054	0.949
Cluster 2: Passive effectuators	-0.236	-0.237	-0.000	0.068	0.069	0.954
Cluster 4: Moderate hybridity	0.180	0.180	0.000	0.061	0.061	0.950
Gender	-0.016	-0.015	0.001	0.043	0.043	0.949
Age	0.001	0.001	0.000	0.004	0.004	0.947
Exp	0.005	0.005	-0.000	0.004	0.004	0.949
Start-up	-0.077	-0.077	0.000	0.050	0.050	0.949
Firm size	-0.000	-0.000	0.000	0.000	0.000	0.947
Firmage	-0.000	-0.000	0.000	0.000	0.000	0.949
Industry: Highly vulnerable	-0.020	-0.019	0.001	0.047	0.047	0.951
Industry: Highly beneficial	0.0585	0.059	0.000	0.057	0.057	0.945

Note: Monte Carlo simulation based on the fitted OLS model. For each replication, outcomes were generated as $y = X\beta + \epsilon$, with $\epsilon \sim N(0, \sigma^2)$, preserving the observed covariate structure (N = 232). Bias = mean ($\hat{\beta}$) - β . Empirical S.E. is the standard deviation of estimates across replications. Mean Model S.E. is the average model-based standard error. CI coverage is the proportion of 95% Wald confidence intervals containing the true parameter.

Table 8. Monte Carlo simulations result for OLS regression on exploration

Predictor	True β	Mean β	Bias	Empirical S.E.	Mean model S.E.	95% CI coverage
(Intercept)	3.110	3.110	0.001	0.203	0.204	0.951
Cluster 1: Passive Planners	-0.243	-0.243	0.000	0.073	0.073	0.948
Cluster 2: Passive Effectuators	-0.359	-0.360	-0.001	0.092	0.092	0.948
Cluster 4: Moderate Hybridity	0.232	0.231	-0.002	0.082	0.081	0.948
Gender	0.090	0.090	0.000	0.057	0.057	0.952
Age	-0.004	-0.004	0.000	0.005	0.005	0.946
Exp	0.008	0.008	-0.000	0.005	0.005	0.945
Start-up	0.063	0.0621	-0.001	0.067	0.067	0.947
Firm Size	-0.000	-0.000	0.000	0.000	0.000	0.945
Firmage	-0.000	-0.000	-0.000	0.000	0.000	0.947
Industry: Highly vulnerable	-0.014	-0.01	-0.001	0.063	0.063	0.942
Industry: Highly Beneficial	0.060	0.062	0.001	0.077	0.076	0.944

Note: Monte Carlo simulation based on the fitted OLS model. For each replication, outcomes were generated as $y = X\beta + \epsilon$, with $\epsilon \sim N(0, \sigma^2)$, preserving the observed covariate structure (N = 232). Bias = mean ($\hat{\beta}$) - β . Empirical S.E. is the standard deviation of estimates across replications. Mean Model S.E. is the average model-based standard error. CI coverage is the proportion of 95% Wald confidence intervals containing the true parameter.

DISCUSSION

The objectives of this study were to identify the decision logics of entrepreneurs and determine their influence on firm performance through knowledge exploitation and exploration. We sought to explore entrepreneurs' decision profiles of causation and effectuation using a person-centered approach in established firms, following the previous study by Ilonen et al. (2018), which examined student entrepreneurs. Ilonen et al. (2018) found two decision-making profiles among entrepreneurs: hybrid and coping strategy, with low levels of both causation and effectuation among students after their training. A significant difference between Ilonen et al. (2018) and our study was that our research identified various configurations in which the composition of causation and effectuation differed, rather than a single hybrid form of the two logics. As the sample included experienced entrepreneurs, various hybrid profiles were identified. While some used high or moderate hybridity in causation and effectuation, others used lower levels of causation and effectuation as passive planners and passive effectuators. Entrepreneurs with the lowest level of causation and a relatively narrow gap between causation and effectuation were termed passive planners, and those with the lowest level of causation and a relatively wide gap between causation and effectuation were considered part of the effectuation-dominated profile (passive effectuators).

The findings demonstrate that causation and effectuation can coexist, as suggested by An et al. (2020), Cohen & Wirtz (2022), Galkina et al. (2021), Galkina & Jack (2021), Koller et al. (2022), Pöschl (2022), and Yu et al. (2018), among entrepreneurs and top-level managers, varying from low to very high hybridity, rather than strictly following a single hybrid form of decision logic. Somewhat similar to the findings of Ilonen et al. (2018), where students who faced stagnation and were unable to achieve hybridity turned to coping strategies, our study found that some entrepreneurs used passive approaches. These approaches are evident in the passive planner and passive effectuator profiles, but they do not represent a complete absence of strategy. Because of the multiple crises, a considerable number of entrepreneurs seemed to put out fires, as Hauser et al. (2020) mentioned, and chose to wait and see, using some extent of causation and effectuation, with relatively lower but still considerable levels of both decision logics. Instead of taking the initiative actively, as seen in the active hybridity group with extensive use of causation and effectuation, these entrepreneurs adopt a more passive approach. They tend to go with the flow and adjust their strategies (Doern et al., 2019; Saridakis, 2012), implementing passive strategies that reflect the turbulent situation faced by entrepreneurs in Myanmar, trying to put out their fire to some extent (Hauser et al., 2020).

There was a larger number of entrepreneurs in the moderate hybridity group, and a smaller proportion in the active hybridity group. This indicates that, in times of crisis, these entrepreneurs try to be both flexible and cautious at the same time. According to the descriptive statistics, especially in terms of firm size, larger firms were more modest and showed greater goal orientation as passive planners, or, if hybrid, were moderately hybrid. Smaller firms tended to prevail more in effectuation, either as passive effectuators or with active hybridity. This finding aligns with Suder (2024) and Soininen et al. (2012), who showed that small firms adjust their entrepreneurial orientation—especially risk-taking, innovativeness, and proactiveness—when faced with turbulent environments, such as the COVID-19 pandemic.

Hypothesis 1 highlights the relationship between decision profiles and firm performance. In the present study, firm performance was measured in terms of sales decline to reflect resilience during turbulent times. Firms were more resilient (i.e., had less sales decline) where entrepreneurs had passive effectuator decision profiles. In comparison, firms where entrepreneurs had active hybridity profiles were less resilient. It seems best to be modestly effective rather than very active in the market during times of crisis (Kurana et al., 2022). Passive planners and moderately hybrid entrepreneurs showed no significant differences in sales performance compared with those with active hybridity. This finding aligns with Shirokova et al. (2021), which suggests that effectuation performs better in an uncertain environment. Keeping the decision logic hybrid to some extent yields similar performance. This result still echoes Suder's (2024) conclusion that firms that proactively enhanced all dimensions of entrepreneurial orientation (risk-taking, innovativeness, and proactiveness) during recovery recorded the greatest improvements in performance. Our results validate this finding by showing that entrepreneurs who modestly integrate both effectual and causal logic—rather than relying on one in isolation—are more resilient to sales declines, highlighting the performance advantage of dynamic, dual-engagement strategies.

Hypothesis 2 tests the relationship between decision profiles and knowledge exploitation and exploration, expecting that a hybrid form of causation and effectuation profiles would be better at both exploitation and exploration. According to the results, compared to active hybridity, moderate hybridity had a slightly negative effect on both exploration and exploitation. Additionally, both passive planners and passive effectuator entrepreneurs scored lower on exploration and exploitation than those with active hybrid profiles. According to the metacognition theory, entrepreneurs who use

higher cognitive processes and a hybrid decision logic are better at knowledge exploration and exploitation. The finding of this study is that the combined use of logic can enhance entrepreneurial processes, consistent with previous literature (Laskovaia et al., 2017; Reymen et al., 2015; Smolka et al., 2018).

Hypothesis 3 examines the relationship between exploitation, exploration, and firm performance. While no significant relationship was found between exploration and firm performance, exploitation had a negative, significant relationship with sales decline. Causation and its subsequent exploitation action were found to have more negative effects on firm performance during crises than effectuation and exploration (Andries et al., 2013; Cai et al., 2017; Matalamäki, 2017; Read et al., 2009).

Contributions of the study

Responding to the call by Galkina et al. (2021) and Grégorie & Cherchem (2020) to seek a deeper understanding of when, where, and how the decision logics prevail and to investigate their effect on firm performance, this study tries to determine the decision profiles of causation and effectuation logics at an individual level in established firms in a crisis-turbulent environment. Previous studies found a relationship between the interaction of causation and effectuation and performance in uncertain situations (Pöschl, 2022; Yu et al., 2018), including during the venture creation process (Galkina & Jack, 2022; Galkina et al., 2021; Ilonen et al., 2018; Koller et al., 2022), and dynamic (Cohen & Wirtz, 2022) and crisis situations (Harms et al., 2021; Khurana et al., 2021). However, many studies were qualitative (Grégorie & Cherchem, 2020) or variable-centered, except for that by Ilonen et al. (2018). Therefore, it was difficult to determine the actual structure of the decision logics and their effects.

This study classified entrepreneurial decision profiles using a person-centered approach with cluster analysis. Although Ilonen et al. (2018) used the same approach for the venture creation process with student entrepreneurs as samples, this study applied it to established firms with corporate entrepreneurs, extending it to examine links with knowledge exploration, exploitation, and firm performance in a turbulent environment. This can shed light on the nature of corporate entrepreneur decision-making styles and their relative impact on entrepreneurial performance. Theoretically, the findings contribute to the literature on causation and effectuation from a person-centered perspective. We found that entrepreneurs used both effectuation and causation, with varying levels of activity in crisis situations, ranging from very active to moderate or fair. Hypothesis 1 also found that a moderate level of effectuation is best during a crisis, rather than being highly proactive.

In practice, this study can guide entrepreneurs on how to respond in a crisis to survive and sustain their businesses. This study was conducted in turbulent situations on entrepreneurs and top managers from companies that faced multiple crises. The findings suggest that during these times, firms should strive to survive by avoiding excessive activity. Rather than firms that actively seek opportunities and strategies, entrepreneurs should maintain sufficient flexibility with a low level of hybridity to demonstrate better performance. During a crisis, passive strategies may play better, particularly in the short term. In other words, rather than preparing a plan, entrepreneurs should just go with the flow, with no strict strategy, while remaining flexible enough to utilize effectuation and achieving the lowest sales decline compared to other firms. However, in the long run, especially when market conditions are more stable, the more active hybrid nature of entrepreneurs may lead to better performance through greater exploitation and exploration (Hou et al., 2019). Firms should not explore much in times of turbulence, but should cautiously move with what they know.

CONCLUSION

Business environments are uncertain and dynamic. Entrepreneurs should be able to respond properly to any situation to survive and sustain their business. As entrepreneurs and managers respond to environmental changes with their own strategies, their resilience, performance, and survival may vary. This study helps understand the decision logics adopted by entrepreneurs in the real world and their impact on firm performance in turbulent environments. By using a person-centered approach, this study could identify distinct decision profiles among entrepreneurs in a turbulent context. The study could explore four levels of hybridity in causation and effectuation, ranging from active hybridity to moderate hybridity to hybridity with a somewhat dominant role for causation and/or effectuation. Additionally, it contributes to theoretical understanding of the different degrees of composition of causation and effectuation and their relations with firm performance in general.

Limitations and suggestions for future studies

Because this study was conducted during a highly vulnerable period, data accessibility was a major challenge in its implementation. A larger sample size would have helped provide more generalizable results. A cross-sectional survey design was the major limitation to generalizing the findings. Future studies should use the same approach with a larger sample, either in the same situation or in other contexts, such as stable, dynamic, or emerging economies, and use longitudinal data to generalize the findings. In particular, the study's respondents were entrepreneurs and top-level managers associated with the MYEA. Future studies should use a broader sampling frame to improve generalizability. Additionally, owing to limited access to the data, non-response bias could not be examined. Another limitation was lower reliability scores for two of the first-order factors of exploitation, which may have affected the accuracy of the data. We recommend that future researchers replicate to improve generalizability. A mixed-methods approach combining quantitative and qualitative methods is highly recommended to understand how entrepreneurs interact to survive/achieve prosperity. The sales data highlights differences in sales between the year before COVID-19 and the average of the three years following the pandemic, amid a politically unstable environment. Original sales data were not included or controlled, which may have influenced the potential significance of the data. Finally, this study could not prove causality rigorously, as the analysis was based on observational data. Future researchers may implement experimental research designs and analyses.

Acknowledgement

We would like to convey our appreciation to some people who provided their best efforts for our data collection in their best possible ways, especially Daw Yee Wyne Oo, managing director of A1 group of companies, who introduced us to the executive members of the Myanmar Young Entrepreneurs' Association (MYEA) and engaged herself in our data collection. We are truly indebted to all the Executive Committee members, especially U Win Htet Maung Maung, the secretary, and the respondents from MYEA.

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Conflicts of interest

The authors declare no conflicts of interest.

Citation (APA Style)

Thein, K. S., Takahashi, Y., Makino, E., & Soe, A. S. (2026). Entrepreneurial decision logic profiles and firm performance during crisis: Evidence from Myanmar. *Journal of Entrepreneurship, Management and Innovation*, 22(1), 57-77. <https://doi.org/10.7341/20262214>