



# Business model transformation for frugal innovation during market disruption

Masoud Karami<sup>1</sup> · Arto Ojala<sup>2</sup> · Nikan Mehrara<sup>3</sup>

Received: 6 February 2025 / Revised: 11 November 2025 / Accepted: 24 February 2026  
© The Author(s) 2026

## Abstract

In several developing countries entrepreneurs work under radical uncertainty caused by market disruptions. In this study, we apply effectuation theory to theorize the process through which entrepreneurs innovate their business models to create new opportunities to serve low-income customers in the face of radical uncertainty. Based on an in-depth qualitative multi-case study in Iran, we illustrate how the effectual logic enables entrepreneurs to transform their business models constantly to cope with market disruptions caused by economic sanctions. Our findings contribute to business model innovation and frugal innovation research. We also contribute to effectuation theory by extending its boundary conditions.

**Keywords** Market disruption · Business model innovation · Effectuation · Frugal innovation · Sanctions · Iran

---

✉ Masoud Karami  
masoudkaraminz@gmail.com; Masoud.karami@mmu.ac.uk

Arto Ojala  
arto.ojala@uwasa.fi

Nikan Mehrara  
nike.mehr@gmail.com

- <sup>1</sup> Department of Marketing, International Business and Tourism Manchest, Metropolitan University, United Kingdom
- <sup>2</sup> Arto Ojala School of Marketing Communication University of Vaasa, Finland Graduate School of Management, Kyoto University, Japan
- <sup>3</sup> Nikan Mehrara College of Business and Information Technology, Lawrence Technological University, Southfield, , Michigan, USA



## Introduction

Working amidst market disruption is business as usual for entrepreneurial small firms in some developing countries (Leavy, 2017). Unanticipated events impact supply chains and generate uncertainty for businesses (Strandvik et al., 2018). Economic sanctions have been a dominant method in geopolitical tensions in the second half of the twentieth century, and over 20 countries are under the United Nations (UNDP, 2020) and US sanctions at the time (US Department of the Treasury, 2020). International sanctions put local entrepreneurs under ongoing stress due to market disruptions, such as rising barriers to accessing international supply chains (Vith et al., 2019). Uncertain political and economic situation also banishes foreign investors from these market (Glenn, 2016; Karami et al., 2024; Montes & Nogueira, 2021).

We have limited knowledge of how entrepreneurs work under increasing political and economic sanctions that result in market disruption and cause radical uncertainty in entrepreneurs' decision-making (Afshar Jahanshahi & Brem, 2020; Karami et al., 2024; Meyer & Thein, 2014). Market disruption refers to "unplanned and unanticipated events, which may further influence the flow of goods and materials within a supply chain." (Shen & Li, 2017, p. 697). We argue that market disruption can be beneficial for innovation by creating opportunities for small firms to deviate from established patterns in the marketplace (Gilbert, 2003). Such disruptions open more space for small firms serving low-income customers to revise their business models (BMs) and provide affordable, functional, and user-friendly -frugal- solutions for those customers (Shahid et al., 2023). We integrate effectuation theory, business model innovation (BMI), and frugal innovation to unpack and explain how such conditions necessitate entrepreneurial actions (Ananthram & Chan, 2021; Karami & Hossain, 2024) to make sense of the constantly emerging situations (Foss & Saebi, 2017), and develop frugal solutions to serve low-income customers.

According to effectuation theory, while uncertainty causes threats for some firms, it may work as a source of new opportunities for innovation (Sardari et al., 2024) and creating new products and markets (Read et al., 2016). As such, market disruptions highlight new needs and opportunities in the market (Guckenbiehl et al., 2022) for serving low-income vulnerable customers (Ananthram & Chan, 2021). We argue that to address the uncertainty caused by sanctions, small entrepreneurial firms employ effectual logic to innovate their BMs to activate partnerships, mobilize resources, and co-create frugal solutions. Effectuation enables them to come up with "novel and nontrivial changes to the key elements of [their] firms' BM and/or the architecture linking these elements" (Afshar Jahanshahi et al., 2020; Foss & Saebi, 2017, p. 201; Karami et al., 2022).

We conceptualize BM as a cognitive structure that reflects the entrepreneur's imagination of new opportunities and understanding of the industry and business (Doz & Mikko, 2010; Karami et al., 2022). This includes how entrepreneurs of small firms imagine and operationalize new frugal ways of value creation and delivery. In line with this conceptualization, we define BMI as a process through which entrepreneurs of small firms and other key stakeholders translate their cognitive maps into real BMs by applying their different means and capabilities (Foss & Saebi, 2017; Karami et al., 2022). We also define frugal innovation as providing affordable offer-



ings to users of innovation in developing economies (Balasundaram et al., 2023; Shahid et al., 2023). Against this background, we ask how market disruptions affect the actions and interactions of small firms in developing countries hit by economic and political sanctions. More specifically, we ask: How do small entrepreneurial firms transform their BMs to foster frugal innovation in response to market disruptions caused by international sanctions?

This is an important question in the context of developing and emerging economies (Karami et al., 2024; Peng et al., 2018), where countries are experiencing international sanctions (Aliasghar & Rose, 2023; Meyer et al., 2023), and the entrepreneurship literature is not showing enough attention to the phenomenon (Özdamar & Shahin, 2021). We address the question by conducting a qualitative case study (Eisenhardt, 1989; Yin, 2009), which included five case firms in Iran. The aim is to theorize the process through which entrepreneurs utilize technology to transform their BMs and create new frugal innovation opportunities (Foss & Saebi, 2017; Iqbal & Piwowar-Sulej, 2023) for serving their vulnerable customers (Shahid et al., 2023). We contribute to BMI literature by conceptualizing BMI as a cognitive process through which entrepreneurs transform uncertainty into opportunity. By applying effectuation logic, we demonstrate how entrepreneurial small firms leverage BMI both as a dynamic process and as an outcome of their innovativeness. Additionally, we advance the frugal innovation literature by illustrating how effectual approaches to BMI empower small firms to deliver affordable solutions to their customers. Finally, we extend effectuation theory by broadening its boundary conditions to explain market disruptions—particularly within the context of an Asian economy.

## Theoretical background

### Market disruptions and uncertainty

Radical changes in geopolitical status may result in market disruptions as unplanned and unanticipated situations, influencing the small firms' supply chain (Shen & Li, 2017). The prolonged political crisis between the US and Iran and the following economic embargo brought market disruption and have put Iranian small firms under stress. Uncertain geopolitical status reduces business confidence (Montes & Nogueira, 2021). As a result of such disruptions, small firms and entrepreneurs have been experiencing market disruptions (Vith et al., 2019) for decades in terms of difficulties in having access to new technologies and materials in their value chain (Glenn, 2016). What the embargos impose is the unpredictability of the future for entrepreneurs and small firms in terms of macro factors such as exchange rate, inflation rate, availability of raw material, know-how, and many more. Consequently, the uncertainty of the future, defined as "an individual's perceived inability to predict something accurately" (Miliken, 1987, p. 136), has become a permanent situation for these businesses (Karami & Dubinsky, 2018; Venkuviene & Masteikiene, 2015). This uncertainty portrays Iranian market to foreign investors as a depressed market with an uncertain future (Montes & Nogueira, 2021). Under such conditions, it is difficult



and almost impossible to predict the future and plan a course of action with a certain degree of confidence (Miliken, 1987).

A few empirical studies discuss the uncertainty caused by economic sanctions and embargos. For instance, Charlebois and Camp (2007) have observed how Canadian small firms integrated vertically to cope with the uncertainty imposed by an embargo on Canadian meat. Venkuviene and Ruta (2015) investigated the impact of the Russian Federation's economic embargo on Central and Eastern European countries and observed how the embargo raised uncertainty for small firms. In another interesting study, Morgan (2016) discussed how the US embargo on Cuba created uncertainty regarding the intellectual property rights of small firms in both countries. Finally, Hidalgo and Martinez (2000) observed the uncertainty caused by the US sanctions on Cuban small firms such as family restaurants. In all these studies, the uncertainty of the future and the outcomes of decisions were the main problems entrepreneurs encountered under sanction. However, the impact of sanctions in terms of market disruptions and frugal innovation as a way small firms choose to respond to the resultant uncertainty remains understudied.

### **BMI for addressing market disruptions**

We conceptualize entrepreneurs' BMs as cognitive maps reflecting their understanding of the market, resources, customers, etc. (Foss & Saebi, 2017). Considering the dynamic nature of entrepreneur's cognition and the importance of learning by doing for them (Karami & Tang, 2019), we focus on BMI as a process wherein entrepreneurs calibrate their cognition of the situation and the way they apply their existing means and take actions and interactions to exploit new opportunities for frugal innovation. BMI has gained increasing attention among practitioners and scholars in the last two decades (Foss & Saebi, 2017). BMI becomes specifically important in entrepreneurship research as BMs are reflections of dynamics in entrepreneurial cognition to make sense of the market, customers, and other important actors (Foss & Saebi, 2017; Karami et al., 2022). In this sense, entrepreneurial BMI is related to the entrepreneur's imagination and judgment of the environmental uncertainty of the future, which brings new opportunities for making a better world (Foss & Saebi, 2017). Entrepreneurs always ask the important question: "How does business model design affect the performance of entrepreneurial firms?" under uncertainty (Zott & Amit, 2007, p.181). As Foss and Saebi's (2017) study reveals, there is a relationship between BMI and the performance of entrepreneurial firms. Entrepreneurs revise established BMs in their industries by challenging and revisiting the existing value propositions and putting forth new value propositions based on new opportunities, new stakeholders, new resources, and actions (Sarasvathy, 2001).

Foss and Saebi (2017, 210) have summarized 14 definitions of BMI. A close reading of the definitions shows the key element of *opportunity* in almost all definitions. All of the definitions are opportunity centric as they all emphasize the changes in the way that business creates, proposes, and delivers value to customers and other stakeholders. As argued by Khanagha et al., (2014, p. 324) "business model innovation activities can range from incremental changes in individual components of BMs, the extension of the existing BM, the introduction of parallel BMs, right through to



disruption of the BM, which may potentially entail replacing the existing model with a fundamentally different one.”

There are three main streams of BMI research, including antecedents and pre-requisites of conducting BMI (e.g., Visnjic & Bart, 2013), the process of BMI (e.g., Berglund & Sandström, 2013), and outcomes achieved through BMI (e.g., Wei et al., 2014). Saebi et al. (2017) investigated the antecedents of BMI and observed that while some BMIs are focused on protecting the business from environmental threats (*Threat-oriented*), others focus on the positive side and pursue new opportunities emerging from the changes (*opportunity-oriented*). Zott & Amit (2007) also compared efficiency-centered versus novelty-centered BM designs and found a positive relationship between the performance and novelty-centered BMs. However, the stream that focuses on the opportunity side of innovating BMs “is usually retrospective, case-based, and inductive rather than predictive and theoretical” (Foss & Saebi, 2017, 212).

We consider BMI as a change process (Berglund & Sandström, 2013). In this stream, BMI is considered a process in which organizations transform their founders’ and managers’ cognitive maps into different components of BMs and continuously improve them by applying their different means and capabilities (Foss & Saebi, 2017). The important role of entrepreneurs’ cognition in BMI is the core focus of this stream. This stream, therefore, focuses on the key issue of BMs “as cognitive structures providing a theory of how to set boundaries to the firm, of how to create value, and how to organize its internal structure and governance.” (Doz & Mikko, 2010, 371). In explaining the process of BMI, the existing research talks about the different stages of BMI (e.g., Girotra & Netessine, 2013), what resources, capabilities, and processes are needed (Demil & Lecocq, 2010), and the critical role of experimentation, making sense and learning by doing (Eppler et al., 2011). BMI as a change process helps us better understand how decision-makers in small firms make sense of market disruptions caused by economic sanctions and innovate their BMs to create and exploit opportunities for serving low-income customers. This is a less studied angle in BMI and frugal innovation literature.

## Frugal innovation

Frugal innovation has received considerable attention from innovation and entrepreneurship scholars in recent years (Shahid et al., 2023). There are several definitions of frugal innovation each emphasizing certain aspects. The convergent aspects of frugal innovation are offering simple solutions to lower-income customers, efficient use of means and resources to focus on essential features of the offerings (Kuo, 2014), to address the basic needs of customers (J. et al., 2020), with affordable prices (Hossain, 2018). The critical aspect of frugal innovation is that it is not just a new method for affordable innovation, but it is a shift in our mindset and managerial philosophy, which employs ‘higher technical and market novelty, to revise our approach to innovation for addressing low-income customers’ needs (Agarwal & Brem, 2017; Chatterjee et al., 2021; Gupta, 2023).



UNICEF<sup>1</sup> defines frugal innovations as “simple products or services often born out of necessity and lack of resources, built by the people who need them the most with locally sourced materials.” In line with this definition, we conceptualize frugal innovation as a new philosophy of innovation that applies technical and market novelty to address the crucial needs of stressed customers who are sanctioned by the global market system. Frugal innovation, therefore, uses available means and fewer resources and concentrates on the affordability of the offerings.

## Effectuation logic and BMI for frugal innovation

Effectuation theory, introduced by Sarasvathy in 2001, redirected our understanding of entrepreneurial cognition and action. Effectuation theory shifts the focus away from competing for scarce resources, such as those constrained by sanctions or embargoes, in pursuit of predetermined goals and competitive advantage, toward an entirely different logic of control (Venkataraman & Sarasvathy, 2001). According to effectuation theory, uncertainty makes it impossible to predict the future and plan for it. This is the case because under radical uncertainty there is not a single future to be predicted; indeed, there is no future unless those to be created by entrepreneurs (Read & Sarasvathy, 2012; Read et al., 2016).

Effectuation theory as a cognitive theory of entrepreneurship helps us unpack founders'/managers' cognitive maps and the dynamics of cognitive mapping (Read et al., 2016). Effectuation theory clearly explains all factors we already discussed in the BMI as a process; namely the role of entrepreneurial cognition, experimentation, learning by doing, means and capabilities, and the governing logic that combines all these factors in the process of BMI (Karami et al., 2022; Sarasvathy, 2001). Effectuation logic enables entrepreneurs to concentrate on opportunities emerging from changes in the environment and successfully innovate their BMs in search of new frugal innovations (Khanal et al., 2022). It gives a clear understanding of how entrepreneurs apply effectual heuristics to make sense of the uncertainty and pull together their personal and professional means to co-create affordable solutions (Heeks et al., 2014; Kerr & Coviello, 2020).

The effectuation process happens at the network level, wherein the focal entrepreneurs, along with the other key stakeholders, interact and share their perception of the uncertainty of the environment and collectively make sense of the situation (Karami et al., 2022; Kerr & Coviello, 2020; Sarasvathy, 2001). The effectual collective cognition enables and motivates stakeholders to transform their pre-commitments into the actual commitment of their limited resources and take required actions (Read et al., 2016) in actualizing the collectively imagined frugal solution in the face of radical uncertainty. The key stakeholders collectively focus on the critical question of *what we can do with our existing means in the face of this perceived uncertainty to create an effect* (Kerr & Coviello, 2020). This collectively constructed cognition enables stakeholders to take the next steps and gradually expand their control over the situation by revising and innovating their BM (Karami et al., 2022).

<sup>1</sup> <https://www.unicef.org/innovation/stories/what-are-frugal-innovations#:~:text=Frugal%20innovations%20are%20simple%20products,so%20in%20a%20sustainable%20manner.>



To sum up, there is a gap in our understanding of the impact of economic sanctions on small firms and the way they overcome the uncertainty caused by the sanctions. Our literature review reveals that while BMI has been discussed as a way for frugal innovation (e.g., Rosca et al., 2017), there is a lack of knowledge about how BMI works under heavy economic sanctions, and what is the mechanism for such BMI to result in frugal innovation in less developed economies. More specifically, the role of BMI in sustaining innovation under economic sanctions in developing countries is under-theorized (Le Bas, 2023).

## Method

### Qualitative multi-case study method

Qualitative research method focuses on collecting, analysing, and interpreting non-numerical data. Its aim is to form an understanding of the phenomenon, rather than to measure it (Creswell, 2014). Within the context of this study, it helps to gain a deeper understanding of how small firms navigate market disruption resulting from economic sanctions, and how they transform their BMs to foster frugal innovation (Yin, 2009). This exploratory approach enabled us to collect and use empirically rich, detailed, and sensitive data that is, in many cases, difficult to reach (Swanborn, 2010). Further, the qualitative case study method facilitates the investigation of a phenomenon that has been understudied and has received rather meager attention in the academic literature (Edmondson & Stacy, 2007; Yin, 2009). The multiple-case study method also enables us to create and develop a more robust theory, as the findings can be deeply grounded from various empirical sources (Eisenhardt & Graebner, 2007). This approach has also been widely applied in the entrepreneurship literature (see e.g., Baucus & Human, 1995; Urbano et al., 2011; Henry & Foss, 2015).

### Context of the empirical study

For this study, we selected small Iranian entrepreneurial firms that have experienced transforming their BMs and creating new business opportunities for frugal innovation under international sanctions. More detailed, we established three specific criteria to ensure the selected case firms were relevant to the study: i) the firms must demonstrate organizational stability, ii) show clear intentions to continue business operations in the future, and iii) generate revenue through the sale of existing products or services. As it was difficult to find small firms fulfilling all these criteria, we consulted an industry expert who is actively consulting and mentoring small firms in Iran. Based on his advice, we made a list of nine firms that matched these criteria. We contacted and negotiated with the top managers of these firms and requested to participate in the study. Of these nine firms, we ended up with five small firms from different industry sectors (see Table 1), which is typically sufficient for theory building in multi-case study research (Eisenhardt, 1989).



**Table 1** Overview of the case firms

Firm	A	B	C	D	E
Industry	Tourism	Data Processing	Healthcare	Manufacturing / Metering	Logistics / IT
Firm age	6	2	3	5	3
Firm size	12	5	4	7	6
Family Business	Yes	No	Yes	Yes	No
Number of Founders	2	5	2	3	1
Experience of Founders at the beginning	No	No	Yes	Yes	Yes
Local or Int customers	International	Local	Local	Local and International	Local
B2B / B2C/ B2G	B2C	B2B	B2C	B2C / B2G	B2B

## Data collection

We implemented the data collection for this study between February and September 2019. A total of 14 interviews were carried out within the premises of the participating firms (see Table 1). These face-to-face interviews typically took around two to three hours. We applied a semi-structured interview approach as it provides an opportunity to make detailed, open-ended questions, especially when the research topic is nascent and less studied (Edmondson & McManus, 2007). This interview approach also enabled us to ask further questions based on the interviewees' reactions and answers (Myers & Newman, 2007). We had three interviews with each case firm, except for one where we had only two interviews (Firm A). All the interviewees were either co-founders or top managers of the case firms, who had the most relevant information needed for this study (see Table 2).

The interview protocol proceeded as follows. Firstly, we asked questions related to the business idea of the start-up that led to the establishment of the firm. Secondly, we used open questions related to the firm's history and further evolution. Thirdly, we asked more detailed questions related to the changes in the markets, revenue, delivery modes, and technologies. Fourthly, we asked questions focusing on customers and how the firm's products or services bring value to their customers. Finally, we asked about and discussed unpredictable situations in the economy caused by international sanctions, the way the firm copes with these situations, and actions taken to survive in the market.

The interview questions were first planned and written in English. Subsequently, the questions were translated from English into Persian by one of the authors, who is bilingual. All the interviews were conducted in Persian by one of the authors. After the interviews, transcripts (in Persian) were translated from Persian to English. To ensure the validity of the translation, another bilingual co-author double-checked the translations to ensure the validity.



**Table 2** Interviews and secondary sources

Firm	Representative	Date	Length	Other source materials
A	CEO and co-founder	Feb 29, 2019	3.5 h	<ul style="list-style-type: none"> <li>• Official website</li> <li>• Customers' reviews on social platforms</li> <li>• Talking to employees</li> </ul>
	Co-founder	March 2, 2019	2 h	
B	CEO and co-founder	March 5, 2019 March 12, 2019 April 1, 2019	3 sessions, each session around 1 h. Totally 3 h	<ul style="list-style-type: none"> <li>• Official website</li> <li>• Talking to investor</li> </ul>
	CTO and co-founder	March 7, 2019	2.5 h	
	Business Developer and co-founder	March 18, 2019	2.5 h	
C	Co-founder and business developer	March 14, 2019 March 15, 2019	2 sessions Totally 4 h	<ul style="list-style-type: none"> <li>• Official website</li> <li>• Talking to employees</li> <li>• Talking to a competitor</li> </ul>
	HR manager	April 5, 2019	2.5 h	
	Content manager	March 22, 2019	2 h	
D	CEO and co-founder	April 19, 2019	4 h	<ul style="list-style-type: none"> <li>• Official website</li> <li>• Researching this sector and foreign competitors through internet</li> </ul>
	Business developer and co-founder	April 23, 2019	3.5 h	
	CTO and co-founder	May 15, 2019	3.5 h	
E	CEO and co-founder	June 7, 2019	3.5 h	<ul style="list-style-type: none"> <li>• Official website</li> </ul>
	Marketing manager	June 11, 2019	1.5 h	
	CTO	June 11, 2019	2 h	

## Data analysis

We first developed case narratives from each case firm in the data analysis process. This was conducted by synthesizing the transcripts and removing unnecessary data (Eisenhardt, 1989). Next, we coded the interview data based on process coding (Miles et al., 2014). We first looked at the impacts of international sanctions on the case firms' businesses. For instance, when the interviewee noted: "Foreign companies are not present in Iran to outperform our simpler technologies." This was coded as an impact of a sanction restricting foreign firms operating in Iran and therefore, opening new opportunities for small firms. Thereafter, we searched for possible connections between sanctions, new opportunities for frugal innovation, and BMs. For instance, the note: "We started our business by selling tours, but later we turned into a Tour Market Marketplace due to the new sanctions. We changed the BM to offer one comprehensive marketplace tour" was coded as a new opportunity based on sanctions that encouraged a BMI to exploit the opportunity. Figure 1 shows the data structure. We also triangulated our insights with multiple existing secondary data such as official websites, customers' reviews on social platforms, talking to employees, investors, and competitors to guarantee trustworthiness (Duxbury, 2012).



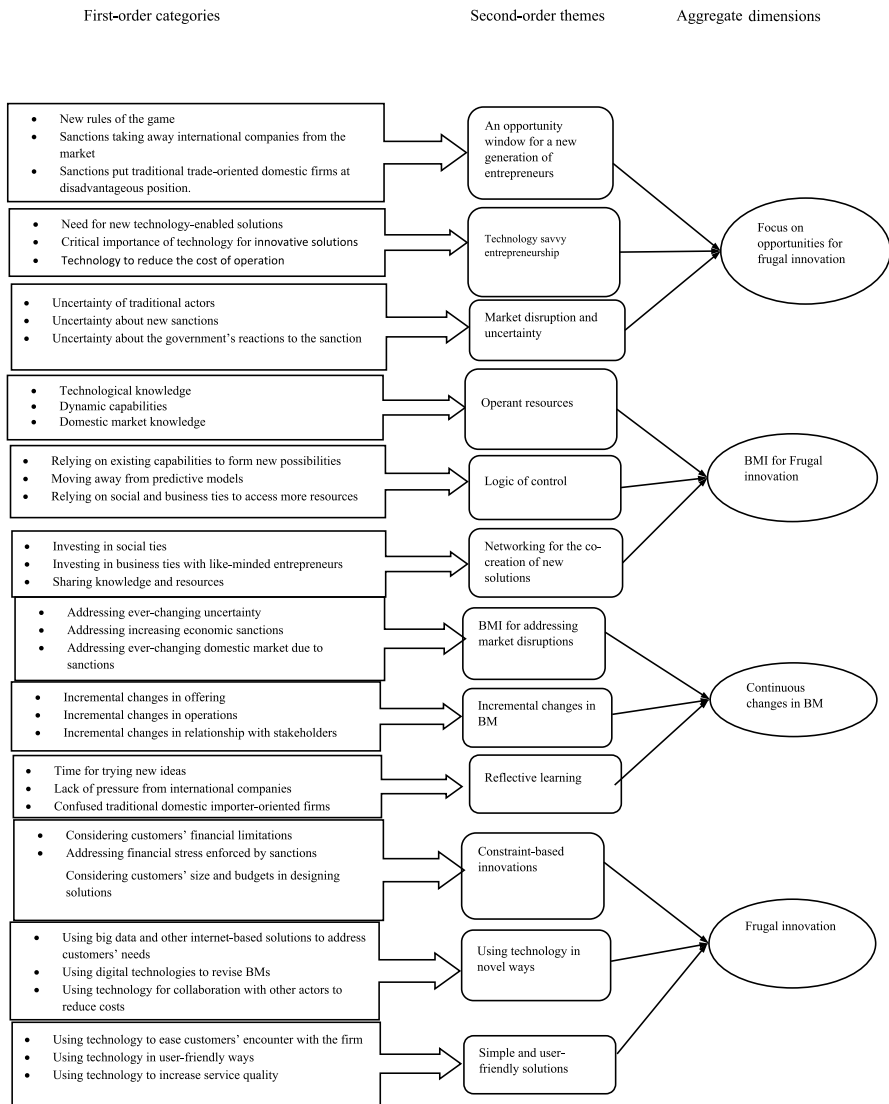


Fig. 1 Data structure

## Findings

### Focus on opportunities for frugal innovation

Almost all the case firms took an entrepreneurial approach to address market disruptions by focusing on new opportunities rather than threats. Entrepreneurs did not focus on the unpredictability of the situation. Instead, they looked at the new demands in the marketplace that were emerging due to the absence of foreign brands and operators, as well as the confusion of the traditional import-oriented businesses



in the local economy. An interesting finding was the impact of the international sanctions on destabilizing the established order in different industries in the country so that small firms could get a chance to challenge the established traditional import-oriented BMs. For instance, the CEO of firm B mentioned that the absence of Google from the market, let them build a business around big data analysis and provide affordable data-based solutions for local business problems. These new solutions changed the nature of the value proposition by focusing on affordability and simplicity, and as a result, relationships with customers, channels, and key resources also changed. The co-founder of firm D highlighted this point: *“Our product has some advantages that are considered valuable by customers. For example, some customers were interested in the decrease in costs due to separating the service lines and cost management. However, upper-class customers consider value, such as making their buildings smart by using our user-friendly app.”*

The lack of established foreign providers in the market has provided enough time for these entrepreneurs to try new ways for initiation, ideation, integration, and implementation of frugal solutions. Time has become a luxurious resource for young entrepreneurs and their small firms as they have been able to present their new solutions to the market, get feedback, and further develop their offerings without international competition. The point was clearly mentioned by the CTO of firm D who believes that *“If there were no sanctions, the importers would probably import foreign-made products; therefore, in my opinion, the sanctions are in favor of our business.”* The same idea was mentioned by the CEO of firm A: *“Even if some trading companies import a similar product, the price is not comparable anymore... our product is much cheaper than its foreign counterparts.”*

One of the counterintuitive findings of our study was that sanctions were not interpreted as threats by small firms. The immediate effect of each new sanction was negative for almost all cases, but the long-term impact was different. The difference in short- and long-term impact was an interesting point, considering that these sanctions have been around for over four decades. The uncertainty of the situation provided opportunities for trial and error and learning overtime, which in turn generated new opportunities for small firms, rather than disappointing them from doing business under such conditions. Almost all the interviewees mentioned this point. For instance, the CEO of firm A clearly stated that *“There was no realistic picture of Iran in those comments provided by tourists from Western countries... people had asked questions like: is it safe at all to visit Iran? is there any green areas in Iran? Isn't it an all-dry country?”* He emphasized the hidden opportunity of being unknown as a tourism destination for outsiders who really want to experience it. Firm A took the opportunity to learn from tourists' comments and adjust its online content to address tourists' specific concerns and questions.

The CEO of firm E had a more competitive-oriented picture of new opportunities. He mentioned that *“if the sanctions are removed, the country's macro environment will improve, but on the other hand, with removed sanctions stronger competitors with rich international experience and more resources would give a hard time to small firms like us.”* The same point was mentioned by others, such as the co-founder of firm C: *“Although our innovations are not at a high level, they are affordable and applicable in Iran because large international companies are not present in Iran to*



*outperform our simpler technologies.*” Our interviews revealed that local small firms consider sanctions as a permanent macro-environmental element and always factor it into their strategies. Having this cognitive ability to see the positive side of international sanctions, which has been developed over four decades in the country, enables entrepreneurs to have a different view on sections and the uncertainty caused by them. As such, the perception of uncertainty within such a context was different, and entrepreneurs tended to focus heavily on the opportunities for new frugal solutions.

Sanctions have overcomplicated the regulative institutions and banned international firms from entering Iran. The unfilled gap between the demand for new solutions and the shortage in supply of services and products by the import-oriented traditional business system as well as the absence of international providers due to the sanctions has opened up an opportunity window for a new generation of entrepreneurs who are technology savvy, and able to work together to create new solutions and provide localized affordable solutions and services. For instance, technologies such as Ultrasonic meters as a new solution for urban buildings in developed countries, have not been imported to the Iranian market due to the international sanctions. Firm D, a start-up in the metering industry, not only developed a domestic version of these ultra-sonic meters but also took the time to develop its product further and added a mobile app to enable the product to meet the specific needs of residents in urban buildings. As mentioned by the CTO of the firm, *“If the sanctions get lifted, importers will import international products, and our customers probably will prefer foreign brands. Sanctions target the whole economy and people do not have money to spend on things that are not their primary needs; as such, sanctions have more advantages for us than disadvantages in terms of offering affordable but good enough solutions.”*

The ongoing uncertainty caused by the economic sanction also had another positive impact, in the sense that This shift has highlighted to small firms the necessity of embedding digital capabilities into their BMs, enabling greater adaptability and resilience in the face of disruption. This decision changed almost all elements of their BM. As emphasized by the co-founder of firm B: *“Since our operations are cantered on big data analytics, economic fluctuations have minimal impact on our service production costs, allowing us to maintain a stable profit margin.”* Also, interviewee E stated: *“We made a platform to transmit from traditional to a digitalized model to have direct contact with our customers. This platform enabled us to increase the diversity of our services and become more user-friendly.”*

The unpredictability caused by the sanctions also encouraged these entrepreneurs to enter foreign markets due to the cheaper prices of their offerings. As clearly mentioned by the CEO of firm C, the necessity of entering foreign markets in pursuit of more stable revenue streams worked as a second engine for the firm to double its efforts. The point was clearly raised by the co-founder of firm D: *“Due to the high quality of our products and the high technology that we utilize in our work as well as the low cost of our products, we have received some cooperation propositions from foreign investors.”*



## Effectual BMI for frugal innovation

Effectuation logic enabled the entrepreneurs of small firms to imagine new ways of doing their business and create new opportunities out of market disruptions. This point was raised by the CEO of firm A when he pointed out: *“We started our business with selling tours, but later we turned into a Tour Marketplace due to the new sanctions... The second change occurred 6 months after the first change when we decided not to provide any tours. Instead, we started to provide separate services, such as visas, hotels, tour guides, etc., to make our services simpler and more affordable for our customers. We changed our BM to reach the best process of delivering our services.”*

The key logic that enabled all the following mechanisms was the effectual logic of control. Almost all the case firms stated the critical importance of keeping control over their businesses while passing through different stages of market disruptions. CEO of firm A stated *“We learned that uncertainty management is an important part of our business. Thus, we partnered with some young but like-minded consultants in, and offered them some shares instead of full payments to reduce the cost.”* The critical importance of controlling the situation was also mentioned by the CEO of firm D: *“We minimized our costs by revising our key activities and resources and became agile in responding to sharp environmental changes.”*

In most cases, digital platforms such as Instagram and Facebook were used to overcome the liability of limited resources, manage relationships with key stakeholders, and ensure the agility of the BMs. Technological capabilities were the main advantage of these entrepreneurs. As mentioned by the co-founder and business developer of firm C *“When we turned to social networks, we could easily attract the attention of many psychologists [as our key service providers] and key customers of our service, and almost 25% of our sales come from online service ... Social media also enables us to target Iranian diaspora.”* The CTO of firm B also highlighted the role of digital technologies in terms of efficiency and low cost: *“We benefit from social platforms by analyzing big data to identify potential customers that may be interested in our services, without having to pay for market research services.”*

The process of BMI worked mostly through effectual mechanisms of networking, experiential learning, learning from other stakeholders, resource sharing, and utilizing advanced technology. Utilizing digital technology provided entrepreneurs with a distinct competitive advantage. As stated by the CEO of firm A: *“We utilized our knowledge and experience of new technologies to redesign our product in a relatively short time. We changed our business model to focus only on one marketplace tour. We collected and marketed different tours from different agencies. This business model was much better and more scalable.”* Digital platforms enabled small firms to be agile in their reactions to changing situations. As mentioned by the CTO of firm D: *“Our business model has now evolved to offer complete flexibility.”*

Effectual networking was another key mechanism at work. As mentioned by the co-founder of firm B: *“Our firm consists of a technical team, an investor, and a mentor as board members. This diversified team brings different relational resources to us.”* However, the networks differed in structure and function among the case firms, reflecting nuanced roles shaped by each firm’s strategic objectives and market envi-



ronment. For instance, while firm E heavily relied on social network of its founder, firm D was a family business and only utilized the investor's political ties to approach government-funded projects. These projects were so important in terms of giving the firm enough time to survive and transform its BM to withstand market disruptions. As mentioned by the co-founder of firm D: *"We recruited an investor with a connection with the government. Consequently, we changed our strategy, and with the help of our investor, we began to connect with the government."* The CEO of firm B also raised the importance of business ties: *"We failed in previous attempts to start a business because we did not know the importance of relationships and networks in our business. We now have our investor in our managerial board who brings different projects through his business ties."* The co-founder of firm A highlighted the importance of networks: *"Our business is essentially depending on online payment platforms provided by our partners, and we really cannot survive without them."* The human resource manager of firm C also mentioned the same: *"The psychologists who provide the service are our business partners. Our game-developing team is one of our key partners. Without these ties who supply the key services, we could not make any of these strategic moves."*

Accumulated resources within networks both helped with sense-making of the disruptions and transforming them into new opportunities for frugal innovation. As reported by the CEO of firm B: *"The combination of experts, mentors, and investors was the most important point in our business. These partnerships bring relational and financial resources which are crucial for us."* The co-founder of firm D also highlighted the point: *"It was totally a co-evolutionary process of aggregating complementary resources. The leader of our team brought knowledge of affordable ultrasonic meters. I tried to contribute to developing the business, and our other members were responsible for IT-related and marketing jobs. Our investors are also important part of this process."*

### **Continuous BMI to keep up with changes in the market**

A counterintuitive finding of this study is that the evolving and intensifying economic sanctions, along with the uncertainty they introduced, did not deter entrepreneurial activity; instead, they served as a catalyst for ongoing innovation aimed at overcoming persistent market disruptions. The BMI process of the case firms had a few important aspects.

Firstly, in all cases, BMI was an ongoing incremental change to the initial BM in reaction to market disruptions. The evolutionary nature of the BMI process helped small firms learn from each disruption and change their BMs accordingly. They successfully adapted their BMs to accommodate the emerging disruptionAs mentioned by the co-founder of firm A: *"Ongoing sanctions always challenge us. We tried to factor in the ongoing uncertainty in our BM. For instance, our gateways may be cut off, or our money from our foreign customers may be blocked at any time. Thus, we tried to consider alternatives for our gateway servers and always have a large amount of money as a reserve to solve any unpredictable problems caused by the disruptions. However, this hasn't been all that bad because, after all, we have learned how to adjust our BM."*

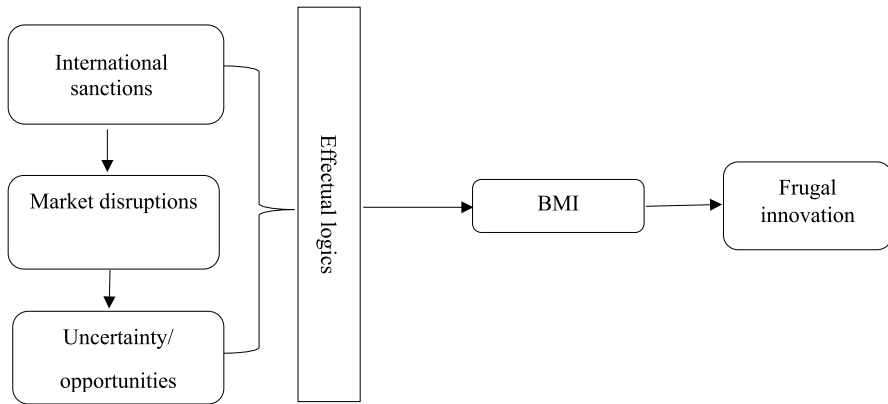


Secondly, the other important aspect of the BMI process was time. The absence of international brands and operators from the domestic market due to the economic sanctions provided a great opportunity for the case firms to take their time and reflect on their experiences and mistakes and work out different solutions for different issues in the absence of international brands. The lack of competitive pressure from the international operators and the disinterest and confusion of traditional import-oriented competitors in the local market provided enough time for small firms to work out effective solutions at each stage and evolve their BMs accordingly. This opportunity to explore alternative BMs and derive insights from iterative learning contributed significantly to the development of a dynamic capability for continuous BMI. Both points were clearly stated by the CEO of firm C: *“We have had time to reflect on these constant changes, as there is no powerful foreign competitor in the market, and the traditional domestic firms are also out of the game due to our new digital-based BMs. We are now trying to facilitate online payment for our overseas market, which will enable us to have access to international markets with a huge potential to recover our loss.”*

Thirdly, another mechanism that facilitated and enabled continuous BMI was learning. Learning by doing, as well as learning from others, facilitated the evolution of their BMs. Economic sanctions provided a massive opportunity for all of the case firms to take their time and learn about different elements of their BM and how to change them to address market disruptions. As a result, the case firms could afford to try new ideas and invent new solutions and products for their market without being concerned about the reactions from major international competitors. As such, the entrepreneurs had enough time to try their new offerings, get feedback, and further develop their solutions. The process was so effective that some of them started presenting their offerings in foreign markets in a relatively short amount of time. This point was stated by the co-founder of firm A: *“We worked on this BM for six months... Our analysis revealed numerous contradictions in the tour design process, highlighting the complexity and challenges involved. Later, we changed our BM to offer a single comprehensive tour. After a while, we restructured our business model once again and identified that the core issue lay within the tour offerings. By this revised BM, we could get the attention of some young European adventure tourists who were after affordable but comprehensive tours.”* Learning also facilitated the process of networking with other innovative small firms who were interested in further developing their new ideas. For instance, the CEO of firm E pointed: *“We have thought about items we can offer besides our service. As we have been thinking about these matters over the years, a few small firms have appeared as serious competitors to established actors in the market. We analyzed their BMs and concluded that we can develop a similar digital-based BM.”*

Figure 2 illustrates our suggested model.





**Fig. 2** Market disruption, and effectual BMI for frugal innovation

## Discussion and conclusion

Our findings provide a clear picture of how small firms in an Asian economy heavily hit by economic sanctions continually revise their BMs to address changes in the market and thrive. More specifically, we showed that entrepreneurs of small firms apply effectual logics to make sense of disruptions in the market, identify emerging opportunities, and transform their BMs to develop frugal innovations for their customers who are losing their purchasing power due to the sanctions. We found that economic sanctions imposed to Iranian economy cause market disruptions which impacts small firms. However, our findings reveal that those businesses look at opportunities coming out of market disruptions, rather than focusing on threats, and move on to utilize those opportunities by continually revising their BMs to adapt them to their changing situations and develop frugal solutions for their customers. This is a novel finding. The extant literature on the impact of economic sanctions on small firms is shallow and requires more robust theorization of such an important phenomenon which is rising in the world by moving towards multilateral order. Our findings revealing the positive impact of economic sanctions on small firms in terms of developing new opportunities and thriving in long term, is in line with observations that firms under sanctions had higher research and development expenditures, prioritize innovation in their business processes (Hesarzadeh, 2025), and further develop digital entrepreneurship (Khachaturyan et al., 2021). Our findings are also in line with Rosca et al., (2017) revealing that small firms can develop frugal innovation through BMI. However, we provide further details on how BMI works under heavy economic sanctions. Our findings add more details about the effectual mechanisms for such BMI in less developed Asian economies. More specifically, our findings elaborate on the role of BMI in sustaining innovation under economic sanctions in developing countries (Le Bas, 2023).



## **Effectual BMI for frugal innovation under uncertainty**

Our findings provide interesting insights on the process of BMI by small firms under economic sanctions. We develop three propositions about the effectual process of BMI by small firms under market disruption caused by sanctions. First, economic sanctions disrupt the market, which generates radical uncertainty for all economic actors in the market, because of the unpredictability of changes in the supply chain (Shen & Li, 2017). However, entrepreneurs of small firms who apply effectual logic in their decisions and actions consider uncertainty as a source of new opportunities for change in the dominant logic of their industry (Gassmann et al., 2016). New opportunities emerge as larger firms who are highly dependent on international supply chains, lose control over their operations and adopt a “wait-and-see” approach (Yan et al., 2025). This lack of initiative creates opportunities for smaller firms that can act swiftly and decisively by leveraging their soft resources (e.g., human capital, familiarity with new technologies). We, therefore, formulate the following proposition:

**P1** *The greater the extent to which entrepreneurial small firms employ effectual logic, the more likely they are to identify new business opportunities under conditions of radical uncertainty (caused by international sanctions).*

Second, entrepreneurs who successfully apply effectuation to make sense of the changes in their environment, leverage BMI as a mechanism to take actions and translate uncertainty into new opportunities. Business model provides a comprehensive picture of the key stakeholders and relationships among them in an industry and how any change in small firm’s offering or processes may impact each of those stakeholders (Gassmann et al., 2016). As such, business model provides an effective platform for making sense of new opportunities, further developing and transforming them into new products, relationships or processes (Karami et al., 2022). Small firms who apply effectuation logic, take control of their actions through systematic approach to BMI which enable them to challenge the dominant logic in their industry by revising different elements of their business model, that is who they serve, what they offer, how they offer and why their BMI make them economically sustainable. As such, we formulate the following proposition:

**P2** *Entrepreneurs of small firms who apply effectuation logic are more likely to engage in BMI, which in turn helps them challenge the dominant logic in their industries and transform environmental uncertainty into new opportunities.*

Third, considering the heavy impact of economic sanctions on customers’ purchasing power, small firms adapt their business model and focus on affordable, and contextualized solutions with the application of new technologies. Small firms apply effectuation to network with like-minded actors in the market who have the same understanding of the changes in the market (Read et al., 2016) to develop quality solutions with affordable prices for customers who are suffering from sanctions. Effectuation logic fosters a pragmatic orientation toward solutions, requiring a systematic approach to BMI (Gassmann et al., 2016; Karami et al., 2025). Such a pragmatic



approach to business model innovation results in frugal innovation, which enables firms to offer quality products to customers (Shahid et al., 2024) and challenges the dominant industry logic of importing and distributing expensive innovations with minimal or no value added by local actors. As such, we formulate the following proposition:

**P3** *Small firms that apply effectual logic in their BMI under international sanctions are more likely to develop frugal solutions to cope with constrained customer purchasing power, which in turn increases their ability to challenge the dominant logic in their industries.*

### Theoretical implications

This study set out to investigate how small firms transform their BMs under radical uncertainty caused by market disruptions. Investigating market disruptions caused by international political and economic sanctions provides an opportunity to study small firms' entrepreneurial reactions to those changes and how they develop new opportunities for offering frugal solutions to their customers. Furthermore, this lens enabled us to understand better how these firms withstand heavy sanctions and evolve by transforming their BMs for frugal innovations. Table 3 summarizes the findings.

BMI is an important topic in entrepreneurship and strategic management (Täuscher & Nizar, 2017). This study examined BMI as a process to reflect on the radical changes in small firms' macro environment. We used effectuation theory and theorized the process of BMI through which entrepreneurs leverage their knowledge of new technologies to transform their BMs or some elements of it to create new opportunities for frugal innovation. As such, our study is a step forward in theorizing the BMI process (Foss & Saebi, 2017) during market disruptions. Our findings revealed that small firms concentrate on the positive side of the limitations that sanctions put on a country in terms of servicing low-income vulnerable customers. We integrated effectuation theory and its emphasis on serendipity with BMI, and frugal innovation literature. As shown in our study, these small firms constantly change their BMs which in turn makes them more resilient and adaptive to their new situations, opening new space to serve low-income customers. As such, our study moves forward the existing literature on drivers and processes of frugal innovation in developing countries suffering from heavy international sanctions.

We contribute to the BMI literature by explaining how effectuation enables small firms to innovate their BMs for frugal innovation in response to market disruptions, showing that effectuation enables small entrepreneurial firms to consider BMI as a process and an outcome of their innovativeness. We also contribute to frugal innovation literature by explaining it as a result of effectual BMI. This highlights the promise of frugal innovation research as a rapidly growing field with strong potential to explain innovation dynamics in non-Western, often labelled developing economies—particularly within the Asian context. (Liu, 2024a). Finally, the findings of the current study also contribute to the effectuation theory (Sarasvathy, 2001) by extending its boundary conditions to accommodate the context of developing economies with market disruptions (Lema et al., 2021). Effectuation theory considers Knightian



**Table 3** Summary of the findings

Firm	A	B	C	D	E
Any change in Business Model	Yes	Yes	Yes	Yes	Yes
Change in target customers	Yes	No	No	No	Yes
Delivery Model	Direct connection with customers / internet based	Direct connection with customers / human-based	Direct connection with customers / internet based	Direct connection with customers	Direct connection with customers / internet based
Value for Customers	A great user experience / comprehensive info / Completely digitalized	Help managers to make better decisions	Cheap product and services	For customers: reduction in costs / a new product with different options For government: continuous monitoring and removing paper bills	Providing services in a shorter time and with more reliability
Product Differentiation	Yes	No	Yes	No	Yes
Localized Knowledge	Tech: No Industry: Yes	Yes	Tech: No Industry: Yes	Yes	Tech: No Industry: Yes
The Most Important Resource	Financial capital; Human Resource	Human Resource networks qualified investor	Human Resource	Human Resource Financial Capital	Human Resource
Important Partners	Transaction suppliers	Investors	developers	Investors / Infrastructure Provider	Company representatives
Digital Services	Cloud / Affiliated Marketing	Social media such as LinkedIn	Social media to promote and also as a medium to apply soft pressure to get their rights	Social media to promote and also as a force on entities that want to destroy them by unequal rights and powers	mostly focus on search engines



**Table 3** (continued)

Firm	A	B	C	D	E
Challenges of Country	Good in overall but have some undesirable effects	Not important so much as it is under control	Unpleasant event It is good but has some unpleasant effects It is bad but we can see opportunities	Extremely affected by the challenges that the country faces Environmental challenges have been good for us Have some opportunities and challenges	Not important so much Economic challenges for our country lower consumers' purchasing power The demand for our services has been reduced a lot

uncertainty as one of its boundary conditions, however, this study conceptualizes uncertainty as an ongoing change in the macro environment, which requires decision-makers to revise their assumptions constantly and apply their effectual logic to make sense of the changes and create new opportunities for frugal innovation out of those changes (Shahid et al., 2023). The constant nature of changes in the political and economic environment provides a unique context for decision-makers to navigate through by effectually innovating their BMs. Such conditions provide a clear example of Knightian uncertainty where there is no future to be predicted. In such conditions, reflecting on everyday decisions and their outcomes and learning how to learn or double-loop learning become vitally important (Argyris, 2002). Double loop learning is not investigated in effectuation research, although it is mentioned in effectuation literature. The constantly changing macro environment due to the international sanctions provides a unique uncertain condition that extends the concept of uncertainty in effectuation theory. As theorized in effectuation theory, when entrepreneurs imagine a new future out of the uncertainty of the situation, they move on and take action to effectuate a new future. Whereas in our study, the situation changes constantly, and entrepreneurs have to change their BMs constantly to catch up with changes in the market. As such, we extend the boundaries of effectuation theory to accommodate such uncertain and complex conditions. Our findings show that not only the unpredictability of the future caused by sanctions was the source of frugal innovation, but the ever-changing and growing nature of those sanctions was also an important factor in terms of providing ongoing opportunities for learning in the absence of international competitors and adding to the resilience and resourcefulness of these entrepreneurs (Liu, 2024b). Manifested in the BMs of these entrepreneurs, the ongoing sanctions force them to innovate their BMs instantly to catch up with changes.

### Practical implications

The findings of this study provide some useful implications for the founders and managers of small firms who work amidst market disruption. First, founders/manag-



ers of small firms need to have a clear understanding of market disruptions and look for new opportunities for frugal innovations arising from those disruptions in the absence of large international firms. Due to the impact of international sanctions, both businesses and consumers have experienced a significant decline in purchasing power, prompting a growing demand for more cost-effective alternatives. Small firms can reimagine their BM to (e.g., reengineering their supply chain and production methods) to produce affordable solution for their customers, such as ultrasonic meters in our study.

Second, founders/managers of small firms need to have a clear understanding of the different blocks of their existing BM, such as key partners, key activities, key resources, and customer segments, to make sense of the changes in the environment in terms of their impact on any of these blocks. Small firms can use different BM tools, such as road mapping to imagine and define alternative paths to transform their existing BMs into future BMs (DeReuver et al., 2013) or BM stress testing to control the robustness of their BM under different conditions (Haaker et al., 2017). Effectuation logic enables them to make decisions and transform existing BMs as it provides a clear view of resources, partnership, and learning (Xu & Koivumäki, 2019).

Third, as shown in our study, digital platforms play a vital role in reducing business costs. For instance, small firms can utilize app-based services without physical branches which can reduce their operational costs significantly. Digital platforms can provide competitive advantage for small firms by reduce overhead, promoting accessibility to customers across the market, and enabling innovation with minimal financial costs.

Finally, small firms can adopt co-creative BMs and engage their suppliers, customers and other stakeholders in their value creation and delivery process. For instance, startups can connect their customers through digital platforms to share insights, equipment and logistics. As shown in our study for small firms who are active in tourism and health care industries, collaborations with other actors in the market can increase small firms' market presence, reduce their marketing costs, and eventually increase their market share.

### **Limitations and future research directions**

This study has its own limitations. First, we conceptualized international sanctions and their impact on uncertainty in the macro environment. This is a unique phenomenon that is the case only for a few countries in the world. However, this conceptualization opens the door for future research to consider different sources of uncertainty beyond the immediate environment of small firms. It can extend the boundaries of market disruptions. The current pandemic has proved the fragility of businesses' macro environment and the undeniable impact of its market disruptions on small firms' business practices. Future research can focus on the changes in scope and types of entrepreneurship activities (Zahra, 2021) in the post-pandemic area, as well as economies that are under ongoing international sanctions.

Second, this study focused only on small firms and did not investigate large businesses. Considering the impact of market disruptions on all businesses regardless of their size, future studies can investigate large businesses' actions and interactions in



addressing different disruptions, such as environmental, and market disruptions. Size, age, experience, and the operand resources that large businesses own may enable them to focus on different strategies. As such, a comparison between small resource-poor businesses and large businesses may provide a better image in addressing how these firms cope with the uncertain situation (Zahra, 2021).

Third, although it is a useful source of knowledge about an understudied country (Shultz et al., 2014), it has certain limitations in terms of the generalizability of its findings. Future research can build on the findings of this current research to run a large-scale quantitative study across a few more countries that are experiencing different disruptions at the national level to gain more generalizable findings. National culture may provide a good lens to look at different approaches that decision-makers take in different countries. Hofstede's cultural model, The Globe project, and the World Value Survey may provide a good starting point.

**Data availability** The data for this study is in the Iranian language (Farsi) and can be made available if required by the editors.

## Declarations

**Conflict of interest** There is no potential financial or non-financial conflict of interest.

**Open Access** This article is licensed under a Creative Commons Attribution 4.0 International License, which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons licence, and indicate if changes were made. The images or other third party material in this article are included in the article's Creative Commons licence, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons licence and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this licence, visit <http://creativecommons.org/licenses/by/4.0/>.

## References

- Afshar, J. A., & Brem, A. (2020). Entrepreneurs in post-sanctions Iran: Innovation or imitation under conditions of perceived environmental uncertainty? *Asia Pacific Journal of Management*, 37(2), 531–551.
- Agarwal, N., & Brem, A. (2017). Frugal innovation-past, present, and future. *IEEE Engineering Management Review*, 45(3), 37–41.
- Aliasghar, O., & Rose, E. L. (2023). Adjustment strategies for firms affected by international sanctions. *Multinational Business Review*, 31(4), 586–601.
- Ananthram, S., & Chan, C. (2021). Institutions and frugal innovation: the case of Jugaad. *Asia Pacific Journal of Management*, 38, 1031–1060.
- Argyris, C. (2002). Double-loop learning, teaching, and research. *Academy of Management Learning & Education*, 1(2), 206–218.
- Balasundaram, S., Sathiyaseelan, A., & Zirkler, M. (2023). Jugaad in organizational settings: Exploring the Jugaad leadership competencies. *Asian Business & Management*, 22(5), 1877–1912.
- Le Bas, C. (2023). *The Economics of Frugal Innovation: Technological Change for Inclusion and Sustainability*. Edward Elgar Publishing.



- Baucus, D. A., & Human, S. E. (1995). Second-career entrepreneurs: A multiple case study analysis of entrepreneurial processes and antecedent variables. *Entrepreneurship Theory and Practice*, 19(2), 41–71.
- Berglund, H., & Sandström, C. (2013). Business model innovation from an open systems perspective: Structural challenges and managerial solutions. *International Journal of Product Development*, 18(3–4), 274–285.
- Charlebois, S., & Camp, R. D. (2007). Environmental uncertainty and vertical integration in a small business network: the case of natural valley farms inc. *Journal of Enterprising Communities: People and Places in the Global Economy*, 1(3), 252–267.
- Chatterjee, S., Chaudhuri, R., & Vrontis, D. (2021). Antecedents and consequence of frugal and responsible innovation in Asia: through the lens of organization capabilities and culture. *Asia Pacific Journal of Management*, 41(3), 979–1003.
- Creswell, J. W. (2014). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*. Sage Publication.
- Demil, B., & Lecocq, X. (2010). Business model evolution: In search of dynamic consistency. *Long Range Planning*, 43(2–3), 227–246.
- Doz, Y. L., & Mikko, K. (2010). Embedding strategic agility: A leadership agenda for accelerating business model renewal. *Long Range Planning*, 43(2–3), 370–382.
- Duxbury, T. (2012). Towards more case study research in entrepreneurship. *Technology Innovation Management Review*, 2(3).
- Edmondson, A. C., & Stacy, E. M. (2007). Methodological fit in management field research. *Academy of Management Review*, 32(4), 1246–1264.
- Eisenhardt, K. M. (1989). Building theories from case study research. *Academy of Management Review*, 14(4), 532–550.
- Eisenhardt, K. M., & Graebner, M. E. (2007). Theory building from cases: Opportunities and challenges. *Academy of Management Journal*, 50(1), 25–32.
- Eppler, M. J., Hoffmann, F., & Bresciani, S. (2011). New business models through collaborative idea generation. *International Journal of Innovation Management*, 15(06), 1323–1341.
- Foss, N. J., & Saebi, T. (2017). Fifteen years of research on business model innovation: How far have we come, and where should we go? *Journal of Management*, 43(1), 200–227.
- Gassmann, O., Frankenberger, K., & Sauer, R. (2016). *Exploring the field of business model innovation: New theoretical perspectives*. Springer.
- Gilbert, C. (2003). The disruption opportunity. *Mit Sloan Management Review*, 44(4), 27.
- Girotra, K., & Netessine, S. (2013). OM forum—Business model innovation for sustainability. *Manufacturing & Service Operations Management*, 15(4), 537–544.
- Glenn, C. (2016). A year on, Iran's nuclear deal is helping its economy, but not as much as some hoped. Quartz, July 13, 2016. <https://qz.com/729036/a-year-on-irans-nuclear-deal-is-helping-its-economy-but-not-as-much-as-some-hoped/>.
- Guckenbiehl, P., & Corral de Zubielqui, G. (2022). Start-ups' business model changes during the COVID-19 pandemic: Counteracting adversities and pursuing opportunities. *International Small Business Journal*, 40(2), 150–177.
- Gupta, A. K. (2023). *Frugal innovations* (pp. 236–237). In Dictionary of Ecological Economics. Edward Elgar Publishing.
- Haaker, T., Bouwman, H., Janssen, W., & de Reuver, M. (2017). Business model stress testing: A practical approach to test the robustness of a business model. *Futures*, 89, 14–25.
- Heeks, R., Foster, C., & Nugroho, Y. (2014). New models of inclusive innovation for development. *Innovation and Development*, 4(2), 175–185.
- Henry, C., & Foss, L. (2015). Case sensitive? A review of the literature on the use of case method in entrepreneurship research. *International Journal of Entrepreneurial Behavior & Research*, 21(3), 389–409.
- Hesarzadeh, R. (2025). US sanctions, workforce dynamics, and corporate entrepreneurship: Evidence from Iran. *International Journal of Islamic and Middle Eastern Finance and Management*, 18(2), 422–440.
- Hidalgo, V., & Martinez, M. (2000). Is the US economic embargo on Cuba morally defensible? *Logos: A Journal of Catholic Thought and Culture*, 3(4), 100–120.
- Hossain, M. (2018). Frugal innovation: A review and research agenda. *Journal of Cleaner Production*, 182, 926–936.



- Iqbal, Q., & Piwowar-Sulej, K. (2023). Frugal innovation embedded in business and political ties: transformational versus sustainable leadership. *Asian Business & Management*, 22(5), 2225–2248.
- Karami, M., & Hossain, M. (2024). Marketing intelligence and small firms' performance: the role of entrepreneurial alertness and effectuation. *Marketing Intelligence & Planning*, 42(1), 168–189.
- Karami, M., & Tang, J. (2019). Entrepreneurial orientation and SME international performance: The mediating role of networking capability and experiential learning. *International Small Business Journal*, 37(2), 105–124.
- Karami, M., Baber, W. W., & Ojala, A. (2022). The effectual process of business model innovation for seizing opportunities in frontier markets. *Technovation*, 117, 1–14.
- Karami, M., Karimi, Y. M., Akbari, M., & Gnoth, J. (2024). Rural women entrepreneurship: when femininity compensates for institutional hurdles. *Asian Business & Management*, 23(5), 738–766.
- Karami, M., Araujo, C. F., Tang, J., & Roldan, L. B. (2025). Creativity, alertness, and entrepreneurship: a multilevel meta-analysis. *Journal of Small Business Management*, 63(5), 2079–2116.
- Kerr, J., & Coviello, N. (2020). Weaving network theory into effectuation: a multi-level reconceptualization of effectual dynamics. *Journal of Business Venturing*, 35(2), Article 105937.
- Khachaturyan, A. A., Khachaturyan, K. S., & Evdokimov, S. Y. (2021). *The problem of ensuring the sustainable development of the digital enterprise in the context of economic sanctions. In Sustainable Development of Modern Digital Economy: Perspectives from Russian Experiences* (pp. 243–251). Cham Springer International Publishing.
- Khanagha, S., Volberda, H., & Oshri, I. (2014). Business model renewal and ambidexterity: structural alteration and strategy formation process during transition to a cloud business model. *R&D Management*, 44(3), 322–340.
- Khanal, P. B., Aubert, B. A., Bernard, J. G., Narasimhamurthy, R., & Dé, R. (2022). Frugal innovation and digital effectuation for development: The case of Lucia. *Information Technology for Development*, 28(1), 81–110.
- Kuo, A., et al. (2014). Creating social value through frugal innovation. In S. D. H. Tsai, T. Y. C. Liu, & J. Jersan Hu (Eds.), *Entrepreneurship in Asia: Social enterprise, network and grassroots case studies* (pp. 53–70). World Scientific Publishing Co. Pte. Ltd.
- Leavy, B. (2017). Two strategies for innovating in the face of market disruption. *Strategy & Leadership*, 45(4), 9–18.
- Lema, R., Kraemer-Mbula, E., & Rakas, M. (2021). Innovation in developing countries: Examining two decades of research. *Innovation and Development*, 11(2–3), 189–210.
- Liu, Y. (2024a). Reviving the aspiration, fostering impactful research, and contributing to the sustainable development and societal impact at Asian Business and Management. *Asian Business and Management*. <https://doi.org/10.1057/s41291-024-00262-9>
- Liu, Y. (2024b). Asia's institutional innovation, cross-boundary learning, and resilience in business and society fostering international collaborations around the world. *Asian Business & Management*. <https://doi.org/10.1057/s41291-024-00284-3>
- Meyer, K. E., & Thein, H. H. (2014). Business under adverse home country institutions: The case of international sanctions against Myanmar. *Journal of World Business*, 49(1), 156–171.
- Meyer, K. E., Fang, T., Panibratov, A. Y., Peng, M. W., & Gaur, A. (2023). International business under sanctions. *Journal of World Business*, 58(2), Article 101426.
- Miles, M. B., Huberman, A. M., & Saldana, J. (2014). *Qualitative data analysis*. sage.
- Morgan, C. (2016). Bloqueo and small business: Revisiting trademark protections amidst changing United States-Cuba relations. *Loy. u. Chi. Int'l l. Rev.*, 13, 141.
- Myers, M. D., & Newman, M. (2007). The qualitative interview in IS research: examining the craft. *Information and Organization*, 17(1), 2–26.
- Özdamar, Ö., & Shahin, E. (2021). Consequences of economic sanctions: the state of the art and paths forward. *International Studies Review*, 23(4), 1646–1671.
- Peng, M. W., Lebedev, S., Vlas, C. O., Wang, J. C., & Shay, J. S. (2018). The growth of the firm in (and out of) emerging economies. *Asia Pacific Journal of Management*, 35, 829–857.
- Read, S., & Sarasvathy, S. (2012). Co-creating a course ahead from the intersection of service-dominant logic and effectuation. *Marketing Theory*, 12(2), 225–229.
- Read, S., Sarasvathy, S., Dew, N., & Wiltbank, R. (2016). Response to Arend, Sarooghi, and Burkemper (2015): Cocreating effectual entrepreneurship research. *Academy of Management Review*, 41(3), 528–536.



- De Reuver, M., Bouwman, H., & Haaker, T. (2013). Business model roadmapping: A practical approach to come from an existing to a desired business model. *International Journal of Innovation Management*, 17(01), Article 1340006.
- Rosca, E., Arnold, M., & Bendul, J. C. (2017). Business models for sustainable innovation—an empirical analysis of frugal products and services. *Journal of Cleaner Production*, 162, 133–145.
- Saebi, T., Lien, L., & Foss, N. J. (2017). What drives business model adaptation? the impact of opportunities, threats and strategic orientation. *Long Range Planning*, 50(5), 567–581.
- Sarasvathy, S. D. (2001). Causation and effectuation: toward a theoretical shift from economic inevitability to entrepreneurial contingency. *Academy of Management Review*, 26(2), 243–263.
- Sardari, M., Tajeddin, M., & Karami, M. (2024). Assessing motivational factors and effectual mechanisms' impact on developing radical innovation in small firms. *Journal of Small Business Management*. <https://doi.org/10.1080/00472778.2024.2360049>
- Shahid, M. S., Hossain, M., Karami, M., & Anwar, T. (2023). Frugal entrepreneurship: a way to seize business opportunities for low-income customers. *Asia Pacific Journal of Management*. <https://doi.org/10.1007/s10490-023-09899-0>
- Shahid, M. S., Hossain, M., Karami, M., & Anwar, T. (2024). Frugal entrepreneurship: a way to seize business opportunities for low-income customers. *Asia Pacific Journal of Management*, 41(4), 1989–2019.
- Shen, B., & Li, Q. (2017). Market disruptions in supply chains: a review of operational models. *International Transactions in Operational Research*, 24(4), 697–711.
- Shultz, C. J., Mark, P., Detlev, Z., & Deniz, A. (2014). My Iranian road trip—comments and reflections on videographic interpretations of Iran's political economy and marketing system. *Journal of Macromarketing*, 34(1), 87–94.
- Strandvik, T., Holmlund, M., & Lähteenmäki, I. (2018). “One of these days, things are going to change!” how do you make sense of market disruption? *Business Horizons*, 61(3), 477–486.
- Swanborn, P. (2010). *Case study research: What, why and how?* SAGE Publications, Inc.
- Täuscher, K., & Nizar, A. (2017). Visual tools for business model innovation: Recommendations from a cognitive perspective. *Creativity and Innovation Management*, 26(2), 160–174.
- UN Department of Political and Peacebuilding Affairs. (2022). Subsidiary Organs of the United Nations Security Council. Accessed January 21, 2022. [https://www.un.org/securitycouncil/sites/www.un.org/securitycouncil/files/subsidiary\\_organ\\_factsheets.pdf](https://www.un.org/securitycouncil/sites/www.un.org/securitycouncil/files/subsidiary_organ_factsheets.pdf)
- Urbano, D., Toledano, N., & Ribeiro-Soriano, D. (2011). Socio-cultural factors and transnational entrepreneurship: a multiple case study in Spain. *International Small Business Journal*, 29(2), 119–134.
- US Department of the Treasury. (2020). Sanctions Programs and Country Information. <https://home.treasury.gov/policy-issues/financial-sanctions/sanctions-programs-and-country-information>.
- Venkuvienė, V., & Ruta, M. (2015). The impact of Russian Federation economic embargo on the Central and Eastern European countries business environments. *Procedia Economics and Finance*, 26, 1095–1101.
- Visnjic, I., & Bart, V. L. (2013). Successfully implementing a service business model in a manufacturing firm. *Cambridge Service Alliance*, 54(6), 1161–1179.
- Vith, S., Achim, O., Markus, A. H., & Renate, E. M. (2019). Envisioning the ‘sharing city’: governance strategies for the sharing economy. *Journal of Business Ethics*, 159(4), 1023–1046.
- Von J., S., Kuester, S., Schuhmacher, M. C., & Shainesh, G. (2020). What frugal products are and why they matter: a cross-national multi-method study. *Journal of Cleaner Production*, 246, Article 118977.
- Wei, Z., Dong, Y., Biao, S., & Meng, G. (2014). The fit between technological innovation and business model design for firm growth: evidence from China. *R&D Management*, 44(3), 288–305.
- Yan, J., Williams, D. W., & Hunt, R. A. (2025). A real options reasoning perspective on entrepreneurs' decision-making over time. *Entrepreneurship Theory and Practice*. <https://doi.org/10.1177/10422587251371133>
- Yin, R. K. (2009). *Case study research: Design and methods*. Sage, 5
- Zahra, S. A. (2021). International entrepreneurship in the post covid world. *Journal of World Business*, 56(1), Article 101143.
- Zott, C., & Raphael, A. (2007). Business model design and the performance of entrepreneurial firms. *Organization Science*, 18(2), 181–199.



**Masoud Karami** is a Reader in the Department of Marketing, International Business and Tourism at Manchester Metropolitan University, in the UK. Masoud's research area is Entrepreneurial co-creation, Effectuation theory, and International Entrepreneurship, and he has published in journals such as the Journal of Business Venturing, Technovation, Asian Business & Management, Journal of Business Research, Small Business Economics, and Journal of Small Business Management, among others. Masoud has a PhD in Management-Marketing from the University of Tehran and a second PhD in International Entrepreneurship from the University of Otago.

**Arto Ojala** is a professor of International Business at the University of Vaasa, Finland. He is also Adjunct Professor in Knowledge Management at Tampere University. Ojala's research is at the cross-section of entrepreneurship, international business, and information systems. His articles have been published in the Journal of Small Business Management, Journal of World Business, Technovation, International Business Review, Journal of International Marketing, International Marketing Review, and Information Systems Journal, among others. Ojala has a PhD in economics from the University of Jyväskylä.

**Nikan Mehrara** is an entrepreneur and mentor primarily interested in the health and data sectors in Iran and has fundraised for two different startups other than his own three startups. His has a bachelor's degree in industrial engineering and an MBA. Nikan's education and entrepreneurship experience has provided him with deep knowledge of the Iranian startups community, financial institutions, and venture capital.

