



The Impact of Entrepreneurial Bricolage on Sustainable Entrepreneurship: Exploring the Role of Frugal Innovation

Ali Imran ¹, Jawad Iqbal ²

¹ Department of Management Sciences (DMS), Institute of Business, Management and Administrative Sciences (IBMAS), The Islamia University of Bahawalpur, Pakistan. Email: ali.imran@iub.edu.pk

² Department of Management Sciences (DMS), Institute of Business, Management and Administrative Sciences (IBMAS), The Islamia University of Bahawalpur, Pakistan. Email: jawad.iqbal@iub.edu.pk

ARTICLE INFO

Article History:

Received: December 14, 2023

Revised: March 16, 2024

Accepted: March 17, 2024

Available Online: March 18, 2024

Keywords:

Entrepreneurial Bricolage
Sustainable Entrepreneurship
Frugal Innovation
SEM
Pakistan

Funding:

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

ABSTRACT

This study aims to investigate the determinants that impact sustainable entrepreneurship within the entrepreneurial community in Pakistan. The convergence of globalization and increased consciousness regarding sustainable development has generated tremendous ambition, zeal, and curiosity regarding the course of sustainable entrepreneurship. With these conditions, the study's goal is to investigate potential predictive factors that promote sustainable entrepreneurship among Pakistani entrepreneurs. This research investigated the relationship between entrepreneurial bricolage and sustainable entrepreneurship by employing a frugal innovation as mediators. Through the use of structural equation modelling with partial least squares, 392 responses to a Pakistani survey instrument were analyzed. The findings of this study suggest that there is a relationship between entrepreneurial bricolage and the level of sustainable entrepreneurship. This relationship is mediated by the function of frugal innovation. This research emphasizes the significance of sustainable entrepreneurship in light of the increased environmental and societal consciousness among consumers, as well as global regulations pertaining to environmental safeguarding.

© 2024 The Authors, Published by IRASD. This is an Open Access article distributed under the terms of the Creative Commons Attribution Non-Commercial License

Corresponding Author's Email: ali.imran@iub.edu.pk

1. Introduction

Sustainable entrepreneurship has emerged as a significant area of research, particularly in developing nations where enterprises must not only expand their economic operations but also mitigate the environmental and social risks associated with their operations (Nakyejwe, Kasimu, & Sabi, 2021). Although there has been global economic growth, there has also been a rise in economic, sociological, and environmental risks. Developing countries commonly encounter challenges such as poverty, unemployment, social inequality, environmental issues, and inefficient allocation of human resources (Hanan, Shahira, & Ali, 2021). These and other problems, varying in how bad they are, have made the need for sustainable entrepreneurship. Sustainable entrepreneurship can be defined as an approach to conducting business in which companies balance the environmental, social, and business impacts of their operations in order to attain competitiveness and efficiency (Di Vaio, Hassan, Chhabra, Arrigo, & Palladino, 2022). Pakistan's economy faces major difficulties in maintaining its status as an emerging economy among resource constraints. Inadequate infrastructure investment, political instability, limited resources, difficult access to financing, energy constraints, and water scarcity are a few of the obstacles it faces (N. Hussain, Li, & Sahibzada, 2023). These types of difficulties may prevent small businesses from expanding and remaining viable. Yet, it is proven from previous researches that entrepreneurship can succeed or sustain in such unforeseeable setting specially in the context of underdeveloped regions such as the subcontinent (M.-C. Wang, Chen, & Fang, 2021). Therefore, this study examines the important concepts like entrepreneurial bricolage which are associated with entrepreneurship and have strong contributions for enabling businesses to sustain during above mentioned difficulties. The concept of entrepreneurial

bricolage is initially developed for effectively utilising available resources to address the novel challenges while getting benefits from the emerging prospects (Tsilika, Kakouris, Apostolopoulos, & Dermatis, 2020).

There are significant challenges for Pakistan's economy to maintain its status as an emerging economy while having shortages of resources. Pakistan is facing challenges like insufficient investment in infrastructure, political instability, limited resources, restricted access to financing, energy constraint and water shortage (Khan et al., 2021). For businesses specially in underdeveloped countries, concepts like frugal innovation are very useful during these circumstance as it is related to the delivery of new products and services to the underprivileged customers of any poor country (Khanal, Aubert, Bernard, Narasimhamurthy, & Dé, 2022). Frugal innovation refers to the creation or execution of such solutions which are developed and implemented in situations where scarcity of financial, technological, or material resources exist (Akhtar, Nawaz, Tara, & Rehman, 2023; López-Sánchez & Santos-Vijande, 2022). Frugal innovation holds significant value in the developing nations due to fact that entrepreneurship effectively implements frugal innovation which can tackle variety of socioeconomic and environmental challenges (Shahid, Hossain, Shahid, & Anwar, 2023). According to many scholars, frugal innovation is a technical construct that helps to reduce the complex nature of the process which provides value to customers (Sharma & Kumar, 2024). Therefore, after simplifying the operational process during the production, frugal innovation has reduced negative impact on the environmental dimension of sustainable entrepreneurship. Researches have been conducted on frugal innovation with the perspective of knowledge-based view, innovation theory, resource-based view and the network theory (Sharma & Kumar, 2024). However, there is gap of comprehensive examination of how the concept of frugal innovation can be utilized through the lens of effectuation theory. In order to fully utilize the notion of frugal innovation, firms must have easy access to huge resource pool. Unfortunately, firms doing businesses in underdeveloped economies such as Pakistan encounter hurdles in accumulating resources which restricts the execution of frugal innovation (Khattak, Tabash, Yousaf, Radulescu, Nassani, & Haffar, 2022). However, in some instances this resource scarcity serves as the motivation factor too for exploring the novel approaches in pursuit of sustainable entrepreneurship. Innovative methods of combining available resources can form the potential solution of resource scarcity. The effectuation theory enables firms, though the concept of frugal innovation, to deliver new products and services to the markets of under privileged customers by utilising their available pool of resources (Iqbal, Ahmad, & Halim, 2021). The effectuation theory is based on four fundamental principles which include experimentation, flexibility, affordable loss and pre-commitment. Therefore, according to the effectuation theory, the most vital factor for getting the desired outcome is the choice of resources. In short, it is frugal innovation through which firm can use the management philosophy of entrepreneurial bricolage effectively and take advantage of creative possibilities for sustainable businesses.

This paper investigates the role frugal innovation in implementing the concept of entrepreneurial bricolage to attain the sustainable entrepreneurship. The following are the research inquiries that we present.

RQ1: How frugal innovation creates link between entrepreneurial bricolage and sustainable entrepreneurship?

RQ2: Does entrepreneurial bricolage exhibit a positive correlation with frugal innovation?

RQ3: Does entrepreneurial bricolage have a positive correlation with sustainable entrepreneurship?

RQ4: Does sustainable entrepreneurship and frugal innovation go hand in hand?

The subsequent sections of this article are structured as follows. An initial review of the relevant literature concerning the concepts of frugal innovation, entrepreneurial bricolage and sustainable entrepreneurship is presented. Following the methodology and case analysis are the discussion, practical and theoretical implications, and the concluding section.

2. Literature Review

2.1. Theoretical background

This paper depends on the effectuation theory, which Sarasvathy introduced in 2001 as a well-known theory of sustainable entrepreneurship. Sarasvathy (2001) intended to understand the decision-making process in a situation where the market does not yet exist or

where the operating environment is uncertain (Matalamäki, 2017). Effectuation gives an explanation to why individuals eventually establish additional business activities, even if that was not initially their goal when they initiated their business activities. They learn by doing and pursue new business opportunities that arise as a consequence of the necessary changes (Coudounaris & Arvidsson, 2022). The effectuation is based on four principles. Based on these principles of effectuation theory, the best way to deal with uncertainties is to use them to your advantage. Surprises might be perceived as beneficial if we skillfully exploit them to create novel opportunities and businesses (Pacho & Mushi, 2021). Therefore, it can be stated that any entrepreneurial venture begins with an entrepreneurial bricolage mindset, which can effectively exploit unforeseen possibilities and foster frugal innovation. As it enables the attainment of sustainable entrepreneurship, this is particularly relevant for the businesses operating with limited resources (Servantie & Rispal, 2020). This theory integrates the important concepts of frugal innovation, sustainable entrepreneurship and the entrepreneurial bricolage by making it easily understandable to all the participants of business fraternity.

2.2. Entrepreneurial bricolage and frugal innovation

It is proved by various past studies that challenging conditions encourage the development of novel organisational abilities, known as bricolage and innovative approaches to creativity i.e., frugal innovation (Santos, Borini, de Miranda Oliveira, Rossetto, & Bernardes, 2020). After extensively digging the literature related to entrepreneurship this paper proposes that entrepreneurs must adopt entrepreneurial bricolage strategies in their firms to promote frugal innovation. Firms can acquire this combination of vital notions of entrepreneurship by combining the existing resources to generate new ones, gathering unused external resources, cultivating resilient mindset, allocating resources for the novel applications and reusing low-value resources to generate the possible business opportunities (Scuotto, Cicellin, & Consiglio, 2023). Although entrepreneurial bricolage and frugal innovation exhibit remarkable performance, they still rely on improvisation. Implementing entrepreneurial bricolage is critical for firms with limited resources that wish to achieve frugal innovation (C. Wang & Li, 2023). Subsequent studies have shown that entrepreneurial bricolage is an attribute that can facilitate the development of frugal innovation by businesses. Hence the following hypothesis can be formulated based on the previous debate.

H1: Entrepreneurial Bricolage has a significant and positive impact on Frugal Innovation.

2.3. Entrepreneurial Bricolage and Sustainable Entrepreneurship

As defined earlier, for the creation of novel products, services and business models with the strategic utilisation of available resources firms follow the philosophy of entrepreneurial bricolage (Baker & Nelson, 2005). In contrast to this, sustainable entrepreneurship is generally pertaining to the establishment of a business that is economically feasible, socially diligent and environmentally responsive (Goh, Chong, Jack, & Faris, 2020). Thus, entrepreneurial firms are suggested to adopt entrepreneurial bricolage as a valuable strategy for generation, comprehension and the capitalization of limitless business possibilities (Hanan, Shahira, & Ali, 2021). The practice of entrepreneurial bricolage can enhance the sustainable entrepreneurship by motivating the entrepreneurs so that they can formulate innovative solutions with their existing assets rather than depending on unsustainable external resources (Tsilika et al., 2020). The effectuation theory also provides the confirmation for this idea that the entrepreneurial bricolage has strong influence on sustainable entrepreneurship through its promotion of resource utilisation, calculated risk-taking and establishment of socially and environmentally responsible firms (Nelson & Lima, 2020). Therefore, based on researched literature, we formulate the following hypothesis.

H2: Entrepreneurial Bricolage has a significant and positive impact on Sustainable Entrepreneurship.

2.4. Frugal Innovation and Sustainable Entrepreneurship

Deprived communities of under developed countries like Pakistan can improve their quality of life in term of health, education and energy by establishing close relationship between frugal innovation and social sustainability (Shahid et al., 2023). Frugal innovation is considered as viable solution for achieving sustainable entrepreneurship due to its capacity to tackle economic, social and environmental hurdles which low-income communities encounter

while living in regions with limited resources. Sustainable entrepreneurship can be viewed through an economic lens which explains several challenges it encounters. These obstacles encompass restricted resource accessibility and the perception of diminished profitability (Dima, Bugheanu, Dinulescu, Potcovaru, Stefanescu, & Marin, 2022). Sustainability is considered an inherent component of frugal innovation due to its ease of implementation and accessibility. Certain scholars are of the opinion that frugal innovation can consistently drive towards the development of sustainable solutions (Waqas, Halim, & Ahmad, 2022). Business models that place a higher emphasis on adaptability and simplicity are more resilient, allowing them to persist during periods of economic uncertainty. In underdeveloped countries, frugal innovations prioritise resource optimization and cost-effectiveness, enabling entrepreneurs to address pressing societal needs with limited resources. This contributes to the development of sustainable entrepreneurship (Sharma & Kumar, 2024). Therefore, drawing from the literature, we formulate the following hypothesis.

H3. Frugal Innovation has a significant and positive impact on Sustainable Entrepreneurship.

2.5. Mediating Effect of Frugal Innovation between Entrepreneurial Bricolage and Sustainable Entrepreneurship

For establishing sustainable and innovative businesses with limited resources, frugal innovation provides framework which explains its mediation role in the relationship of entrepreneurial bricolage and sustainable entrepreneurship. Frugal innovation inspires entrepreneurs to use entrepreneurial bricolage through promotion of inventive material reuse, cost reduction and technique enhancement so that they can address social, financial and environmental challenges (Berndt, Gomes, & Borini, 2023). Frugal innovation makes the requirements easy, socially and economically wise, for marginalized communities while promoting cost-effective solutions (Cai, Ying, Liu, & Wu, 2019). Frugal innovation can facilitate the connection among exceptional approaches by providing entrepreneurs with tools and strategies to develop progressive services and products. It also considers the environmental and social impact of enterprises while utilising limited resources. This can facilitate the entrepreneurs in the formation of sustainable businesses which positively affect their communities and the society at large (S. Hussain, 2023; Yildiz & Aykanat, 2021). Therefore, we develop the subsequent hypothesis in accordance with reviewed literature.

H4: Frugal Innovation mediates the relationship between Entrepreneurial Bricolage and Sustainable Entrepreneurship.

3. Methodology

Presently, the predominant approaches utilized in existing research have been experimental methods and questionnaire surveys. The conventional techniques for examining data and testing hypotheses consist of regression analysis, structural equation modelling (SEM), variance analysis, factor analysis, cluster analysis, chi-square test, and t-test, among others (Bryman, 2016). This study employs a questionnaire survey and SEM to assess the hypothesis in this study.

3.1. Data collection and Sample procedure

As the leading platforms in Pakistan for reaching the intended audience, the target Chamber of Commerce and SMEDA platforms were chosen for this study. Entrepreneurs comprised the respondent pool. The questionnaire was formulated during the course of the research, and both online and offline responses were obtained from consumers. The investigation accumulated a grand total of 756 questionnaires. Applicants are deemed illegitimate if they fail to respond to more than five queries. The statistical criterion that the effective sample size be at least five times that of the measurement items was satisfied when 392 valid questionnaires were ultimately collected at an effective rate of 51.8%. Valid questionnaires are analysed demographically in the following section. 24% were female and 0.76% were male, with respect to the gender distribution. 3.96% of the participants were younger than 20 years old, 38.51% were between the ages of 21 and 30, 45.08% were between the ages of 31 and 40, 8.40% were between the ages of 41 and 50, and 3.33% were older than 51. Regarding their academic qualifications, 20.13 percent had completed their undergraduate studies, 54.2 percent held a bachelor's degree, and 25.6 percent held a master's degree or higher. Regarding household income, the percentages as follows: 26.47% for annual disposable income below \$120,000, 34.39% for disposable income between

\$121,000 and \$240,000, 21.24% for disposable income between \$250,000 and \$300,000, and 17.9% for more than \$300,000. With respect to professional background, the percentages as follows: 6.81% had less than three years of experience, 35.5% had three to six years of experience, 28.05% had seven to nine years of experience, and 29.64% had beyond ten years of experience.

3.2. Measure

The measurement of critical concepts is primarily accomplished through extensive research on the following topics: (1) literature review; (2) actual, practical scenarios of bricolage, frugal innovation, and sustainable entrepreneurship; and (3) the perspectives of entrepreneurial experts. This paper employs a seven-point Likert scale to assess entrepreneurial bricolage and frugal innovation in the context of sustainable entrepreneurship. The entrepreneurial bricolage measure, consisting of nine items, was developed by (Davidsson, Baker, & Senyard, 2017). The 9-item frugal innovation is evaluated in accordance with the methodology outlined in Rossetto, Borini, Bernardes, and Frankwick (2017). The sustainable entrepreneurship metric is determined using 16 items from the work of Roomi, Saiz-Alvarez, and Coduras (2021).

4. Data analysis and Results

Data analysis for this study was conducted using SPSS 23.0 and SmartPLS. Initial assessments were conducted to determine the reliability and validity. Furthermore, to verify that the structural paths and the model were capable of achieving satisfactory fitting, confirmatory factor analysis was performed on the structural equation model (SEM). The reliability of the latent variables was assessed through the utilization of composite reliability (CR). Each latent variable in this study has a CR value between 0.871 and 0.992, which is greater than 0.7, as shown in Table 1. With a CR of 0.927 for the entire sample, the measurement of variables has high reliability. Validity analysis is in progress. The average variance extraction value (AVE) of each latent variable was greater than 0.5, indicating that the measurement of variables converged well. Moreover, all factor outer loadings exceeded 0.6, indicating that all constructs loaded in their respective factors.

Table 1: Outer loadings, Reliability and Convergent Validity

Latent Construct	Items	Outer Loadings	Composite Reliability	AVE
Entrepreneurial Bricolage	EB1	0.788	0.886	0.567
	EB2	0.804		
	EB3	0.804		
	EB4	0.824		
	EB5	0.647		
	EB6	0.628		
Frugal Innovation	FI1	0.642	0.871	0.531
	FI2	0.643		
	FI3	0.704		
	FI4	0.799		
	FI5	0.768		
	FI6	0.796		
Sustainable Entrepreneurship	SE1	0.739	0.922	0.517
	SE2	0.774		
	SE3	0.779		
	SE4	0.769		
	SE5	0.655		
	SE6	0.705		
	SE7	0.707		
	SE8	0.722		
	SE9	0.703		
	SE10	0.675		
	SE11	0.671		

Discriminant validity must be established during the data analysis. This illustrates the distinctions between each construct. When the square root of the AVE for a particular construct exceeds the correlation of all other constructs, discriminant validity is established. See table 2

Table 2: Discriminant Validity

	Entrepreneurial Bricolage	Frugal innovation	Sustainable Entrepreneurship
Entrepreneurial Bricolage	0.753		
Frugal innovation	0.633	0.728	
Sustainable Entrepreneurship	0.531	0.721	0.719

The goodness-of-fit formula was employed in the concluding stage to validate the hypothesized model. Such are the criteria R2. The percentage indicates how much the independent variables influence the variation in the dependent variables. R2 is utilized to account for the model's variance. The statistical method R2 is utilized to elucidate the regressive nature of the postulated relationships. R2 for frugal innovation is 0.40, which indicates that entrepreneurial bricolage only accounts for a 40% variation in frugal innovation. The R2 value for sustainable entrepreneurship is 0.519, indicating that the frugal innovation only accounts for a 51.9% variation. R2 value is substantial in the present investigation.

Table 3: R Square

	R Square	R Square Adjusted
Frugal innovation	0.401	0.400
Sustainable Entrepreneurship	0.520	0.519

4.1. Structural paths

The current investigation employed 500 bootstrapping with 392 participants in order to determine the statistical significance of the model's path coefficient. The exhaustive estimates of the structural model are presented in Table 4. The first hypothesis (H1) proposes a link between entrepreneurial bricolage and sustainable entrepreneurship through frugal innovation. The results indicate a statistically significant and positive correlation ($\beta = 0.463$) with respect to the proposed hypothesis ($p = 0.000$). As a result, H1 is upheld. The relationship between frugal innovation and entrepreneurial bricolage is directly and positively represented by the second hypothesis. At a 1% level of confidence, the results indicate that entrepreneurial bricolage positively influences frugal innovation ($\beta = 0.637$). The postulated hypothesis is therefore validated. The third hypothesis posits that sustainable entrepreneurship and frugal innovation are positively and directly related. The results indicate that frugal innovation is a robust and statistically significant predictor ($\beta = 0.727$) of sustainable entrepreneurship ($p = 0.000$). The relationship between sustainable entrepreneurship and entrepreneurial bricolage is positively significant, according to the fourth hypothesis. The full mediation and partial mediation are distinguished using the direct hypothesis. Therefore, it can be concluded that the partial mediation is supported by the significant direct result.

Table 4: Structural Paths

				Sample Mean (M)	T Statistics	P Values
H1	Entrepreneurial Bricolage	->	Frugal innovation -> Sustainable Entrepreneurship	0.463	11.031	0.000
H2	Entrepreneurial Bricolage	->	Frugal innovation	0.637	15.901	0.000
H3	Frugal innovation	->	Sustainable Entrepreneurship	0.727	19.426	0.000

5. Discussion and Conclusion

On the basis of the findings, small and medium enterprises (SMEs) of Pakistan can use frugal innovation to design the cost-effective and easily accessible services and products for a large customer base specially in underdeveloped economies. This method also seeks to reduce waste and lessen harm to the environment. Small and medium-sized enterprises (SMEs) can improve the use of their financial support, reduce costs and grow by implementing frugal innovation through entrepreneurial bricolage to gain sustainable entrepreneurship (De Marchi, Pineda-Escobar, Howell, Verheij, & Knorringa, 2022). This framework does not only provide the solution for the sustainable operations and but also enable firms to operate aggressively in the market. Also, they can carefully incorporate entrepreneurial bricolage and frugal innovation into their business models by knowing the mediating role of frugal innovation. This will promote the long-term success and the sustainable business in Pakistan's tough business environment.

The objective of this empirical research was to gain insight into sustainable entrepreneurship as it pertains to Pakistan. Furthermore, this research has established the groundwork for entrepreneurs in terms of their mindset and endeavors concerning sustainability. The study additionally offers recommendations on which tools and technologies businesses may implement in order to qualify as sustainable entrepreneurs. From a pragmatic standpoint, the current investigation furnished substantiation regarding the advantages of sustainable entrepreneurship, thereby notifying proprietors of businesses to be mindful of such endeavors. This study additionally made a contribution by providing empirical evidence regarding the economic benefits that businesses can attain through the implementation of entrepreneurial sustainability. Attaining and maintaining sustainable entrepreneurship is a complex and time-consuming process that requires an organization to invest in sustainability initiatives in order to fulfil the societal and environmental expectations of stakeholders. Government regulation and international environmental protection expectations are additional factors that significantly influence an organization's decision regarding its involvement in sustainability.

References

- Akhtar, K., Nawaz, N., Tara, N., & Rehman, M. (2023). The Beginning of Digital Technology: The Impact of Financial Technology on the Performance of Banking Sector in Pakistan. *Business Review of Digital Revolution*, 3(2), 70-77. doi:<https://doi.org/10.62019/BRDR.03.02.08>
- Baker, T., & Nelson, R. E. (2005). Creating something from nothing: Resource construction through entrepreneurial bricolage. *Administrative science quarterly*, 50(3), 329-366. doi:<https://doi.org/10.2189/asqu.2005.50.3.329>
- Berndt, A. C., Gomes, G., & Borini, F. M. (2023). Exploring the antecedents of frugal innovation and operational performance: the role of organizational learning capability and entrepreneurial orientation. *European Journal of Innovation Management*. doi:<https://doi.org/10.1108/EJIM-06-2022-0320>
- Bryman, A. (2016). *Social research methods*: Oxford university press.
- Cai, Q., Ying, Y., Liu, Y., & Wu, W. (2019). Innovating with limited resources: The antecedents and consequences of frugal innovation. *Sustainability*, 11(20), 5789. doi:<https://doi.org/10.3390/su11205789>
- Coudounaris, D. N., & Arvidsson, H. G. (2022). How effectuation, causation and bricolage influence the international performance of firms via internationalisation strategy: a literature review. *Review of International Business and Strategy*, 32(2), 149-203. doi:<https://doi.org/10.1108/RIBS-08-2020-0092>
- Davidsson, P., Baker, T., & Senyard, J. M. (2017). A measure of entrepreneurial bricolage behavior. *International Journal of Entrepreneurial Behavior & Research*, 23(1), 114-135. doi:<https://doi.org/10.1108/IJEBR-11-2015-0256>
- De Marchi, V., Pineda-Escobar, M. A., Howell, R., Verheij, M., & Knorringa, P. (2022). Frugal innovation and sustainability outcomes: findings from a systematic literature review. *European Journal of Innovation Management*, 25(6), 984-1007. doi:<https://doi.org/10.1108/EJIM-02-2022-0083>
- Di Vaio, A., Hassan, R., Chhabra, M., Arrigo, E., & Palladino, R. (2022). Sustainable entrepreneurship impact and entrepreneurial venture life cycle: A systematic literature review. *Journal of Cleaner Production*, 134469.
- Dima, A., Bugheanu, A.-M., Dinulescu, R., Potcovaru, A.-M., Stefanescu, C. A., & Marin, I. (2022). Exploring the research regarding frugal innovation and business sustainability through bibliometric analysis. *Sustainability*, 14(3), 1326. doi:<https://doi.org/10.3390/su14031326>
- Goh, C. S., Chong, H.-Y., Jack, L., & Faris, A. F. M. (2020). Revisiting triple bottom line within the context of sustainable construction: A systematic review. *Journal of Cleaner Production*, 252, 119884. doi:<https://doi.org/10.1016/j.jclepro.2019.119884>
- Hanan, A., Shahira, A., & Ali, M. (2021). Drivers of Sustainable Entrepreneurship Among SMEs in Pakistan: Does Entrepreneurial Knowledge Matter? *Indonesian Journal of Innovation and Applied Sciences (IJIAS)*, 1(2), 161-176.
- Hussain, N., Li, B., & Sahibzada, H. E. (2023). Government support to Pakistani women entrepreneurs during the COVID-19 pandemic. *Public Administration and Policy*, 26(1), 80-92. doi:<https://doi.org/10.1108/PAP-02-2022-0010>

- Hussain, S. (2023). Impact of Entrepreneurship Skills and Business Opportunity on Digital Entrepreneurship: As Study on the Role of Social Media as Mediator. *Business Review of Digital Revolution*, 3(1), 38-44. doi:<https://doi.org/10.62019/BRDR.03.01.05>
- Iqbal, Q., Ahmad, N., & Halim, H. (2021). Insights on entrepreneurial bricolage and frugal innovation for sustainable performance. *Business Strategy and Development*, 4 (3), 237-245. In.
- Khan, R. U., Mahmood, A., Ahmed, M., Mustafa, M. J., Alshamsi, M. K., Iqbal, Q., & Salamzadeh, Y. (2021). Impact of network structure on sustainable competitive performance among Pakistani small and medium enterprises: does government financial support matter? *Journal of Global Entrepreneurship Research*, 11(1), 579-591. doi:<https://doi.org/10.1007/s40497-021-00295-w>
- 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. doi:<https://doi.org/10.1080/02681102.2021.1920874>
- Khattak, A., Tabash, M. I., Yousaf, Z., Radulescu, M., Nassani, A. A., & Haffar, M. (2022). Towards innovation performance of SMEs: investigating the role of digital platforms, innovation culture and frugal innovation in emerging economies. *Journal of Entrepreneurship in Emerging Economies*, 14(5), 796-811. doi:<https://doi.org/10.1108/JEEE-08-2021-0318>
- López-Sánchez, J. Á., & Santos-Vijande, M. L. (2022). Key capabilities for frugal innovation in developed economies: insights into the current transition towards sustainability. *Sustainability science*, 1-17.
- Matalamäki, M. J. (2017). Effectuation, an emerging theory of entrepreneurship—towards a mature stage of the development. *Journal of Small Business and Enterprise Development*, 24(4), 928-949. doi:<https://doi.org/10.1108/JSBED-02-2017-0030>
- Nakyejwe, K. S., Kasimu, S., & Sabi, H. M. (2021). Sustainable entrepreneurship of small businesses in Uganda: A confirmatory factor analysis. *African Journal of Business Management*, 15(5), 139-151. doi:<https://doi.org/10.5897/AJBM2021.9207>
- Nelson, R., & Lima, E. (2020). Effectuations, social bricolage and causation in the response to a natural disaster. *Small Business Economics*, 54, 721-750. doi:<https://doi.org/10.1007/s11187-019-00150-z>
- Pacho, F. T., & Mushi, H. (2021). The effect of effectuation set of means on new venture performance: flexibility principle as a mediating factor. *Journal of Entrepreneurship in Emerging Economies*, 13(5), 819-837. doi:<https://doi.org/10.1108/JEEE-02-2020-0023>
- Roomi, M. A., Saiz-Alvarez, J. M., & Coduras, A. (2021). Measuring sustainable entrepreneurship and eco-innovation: A methodological proposal for the Global Entrepreneurship Monitor (GEM). *Sustainability*, 13(7), 4056. doi:<https://doi.org/10.3390/su13074056>
- Rossetto, D. E., Borini, F. M., Bernardes, R. C., & Frankwick, G. L. (2017). *A new scale for measuring frugal innovation: the first stage of development of a measurement tool*. Paper presented at the VI SINGEP–International Symposium on Project Management, Innovation, and Sustainability.
- Santos, L. L., Borini, F. M., de Miranda Oliveira, M., Rossetto, D. E., & Bernardes, R. C. (2020). Bricolage as capability for frugal innovation in emerging markets in times of crisis. *European Journal of Innovation Management*, 25(2), 413-432. doi:<https://doi.org/10.1108/EJIM-06-2020-0225>
- Scuotto, A., Cicellin, M., & Consiglio, S. (2023). Social bricolage and business model innovation: a framework for social entrepreneurship organizations. *Journal of Small Business and Enterprise Development*, 30(2), 234-267. doi:<https://doi.org/10.1108/JSBED-02-2022-0094>
- Servantie, V., & Rispal, M. H. (2020). Bricolage, effectuation, and causation shifts over time in the context of social entrepreneurship. In *Social entrepreneurship and bricolage* (pp. 49-74): Routledge.
- Shahid, M. S., Hossain, M., Shahid, S., & Anwar, T. (2023). Frugal innovation as a source of sustainable entrepreneurship to tackle social and environmental challenges. *Journal of Cleaner Production*, 406, 137050. doi:<https://doi.org/10.1016/j.jclepro.2023.137050>
- Sharma, M. G., & Kumar, S. (2024). Probing frugal innovation from the quality lens. *The TQM Journal*. doi:<https://doi.org/10.1108/TQM-06-2023-0188>
- Tsilika, T., Kakouris, A., Apostolopoulos, N., & Dermatis, Z. (2020). Entrepreneurial bricolage in the aftermath of a shock. Insights from Greek SMEs. *Journal of Small Business &*

- Wang, C., & Li, X. (2023). Knowledge integration and entrepreneurial firms' frugal innovation in the service industry. *Journal of Business & Industrial Marketing*, 38(3), 429-443. doi:<https://doi.org/10.1108/JBIM-03-2021-0188>
- Wang, M.-C., Chen, P.-C., & Fang, S.-C. (2021). How environmental turbulence influences firms' entrepreneurial orientation: the moderating role of network relationships and organizational inertia. *Journal of Business & Industrial Marketing*, 36(1), 48-59. doi:<https://doi.org/10.1108/JBIM-05-2019-0170>
- Waqas, A., Halim, H. A., & Ahmad, N. H. (2022). Design leadership and SMEs sustainability; role of frugal innovation and technology turbulence. *International Journal of Systematic Innovation*, 7(4), 1-17. doi:[https://doi.org/10.6977/IJoSI.202212_7\(4\).0001](https://doi.org/10.6977/IJoSI.202212_7(4).0001)
- Yildiz, T., & Aykanat, Z. (2021). The mediating role of organizational innovation on the impact of strategic agility on firm performance. *World Journal of Entrepreneurship, Management and Sustainable Development*, 17(4), 765-786. doi:<https://doi.org/10.1108/WJEMSD-06-2020-0070>