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Value Creation through Frugal Innovation, Innovation Capability and Knowledge Sharing in a Circular Economy

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Abstract: This study aims to examine the direct effect of innovation capability on value creation. The mediating role of frugal innovation and the moderating role of knowledge sharing are also explored between innovation capability and value creation link. This exploratory study uses quantitative and cross-sectional data collected through questionnaires. Structural equation modelling (SEM) was used to examine the hypothesis. Findings show a significant positive impact of innovation capability on value creation. Results proved that frugal innovation mediates the relations between innovation capability and value creation. Knowledge sharing strengthens the association between innovation capability and value creation in their association. Our research provides a framework for the sustainable advancement of SMEs in a circular economy and recommends that they increase the value creation of the products/services through frugal innovation based on the innovation capabilities. Moreover, knowledge-sharing practices speed up the interplay between innovation capability and value creation in the circular economy.

Keywords: value-creation; frugal innovation; innovation capability and knowledge sharing; circular economy



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1. Introduction

The main objective of value creation is to increase the quality and durability of the products and services, adding to their value and fulfilling the customers' needs [1]. In the current era of technological advancements, value creation is inspiring discussion among business scholars and industrialists [2]. Thus, it is most important to increase the consideration of this word. Additionally, great research is needed to find out the unexplored area of the value creation significance to put it further practical, specifically in the circular economy [3]. The circular economy changes, altering the prior model wherein resources are obtained, and products are made and then wasted [4]. Firms are expanding their innovation processes to obtain the utmost output by focusing on the value creation concept, which plays a significant role in dealing with forthcoming sustainability challenges [5]. Moreover, understanding the significance of value creation of the product and services acts as a means to motivate, introduce and drive sustainable advancements in the firm [6]. In a circular economy, material use is reduced; material-intensive resources are redesigned and reused "waste" as a source of manufacturing the latest products [7]. Value creation of products

and services is increased through the latest technology and possible implementations; value-created products encompass large market shares. However, value creation theoretical determinants are still vague, and examination is required [8]. Previous researchers have overlooked innovation capability as one of the most important determinants. Innovation capability helps in an organisation's problem-solving and innovation activities and is more influential within the firm through innovative ideas and knowledge sharing [9]. Knowledge sharing is the information designing, seeking and distribution for the development of products and services in a firm [10]. Innovation capabilities are the most useful practices that support designing ideas and actions [11]. This capability helps with the creation paradigm, customer knowledge, and latest technical knowledge, which help against competitors' knowledge [12]. Frugal innovation is a vital factor emphasising innovation activities with the help of available resources that reduce operational activities' costs [13]. Moreover, innovation capabilities are the most emergent critical factor in developing strategic, current knowledge, generating new ideas and enhancing the innovation processes in a firm [11]. Previous studies also highlighted that innovation capabilities are an important aspect of SMEs' growth [14]. Innovation capability is positively associated with the performance of SMEs; universally, performance is measured by means of employment growth, income growth and profitability terms [11]. Innovation capabilities are positively linked to entrepreneurship and the performance of business [15]. Innovation capabilities support the enhancement of market innovation, product innovation, development of innovation strategies and implementation of new ideas in SMEs [12]. Frugal innovation provides opportunities to use existing resources innovatively to recognise the latest advancements and encourage better growth for SMEs [16]. SMEs with a high level of knowledge-sharing abilities achieve great business growth compared to those with low-level innovation capabilities of knowledge sharing [17]. In every economy, SMEs are the backbone of industries, and the government provides incentives to make them stronger and develop them further. SMEs support the notion of a stimulated economy, as the growth of the businesses requires a desirable level of discipline, perseverance, prudence, hard work and a good mentality, the opposite of undesirable laziness, etc. [18]. The critical role performed by SMEs in any economy cannot be ignored. Knowledge sharing plays the most critical role in the advancement and innovation processes within the firm. Various researchers have highlighted the critical role of innovation capabilities in increased value creation performance over the last decade; however, few studies have focused on recognising the vital role of innovation capabilities in SMEs' operational practices. This study aims to investigate the impacts of innovation capability on value creation and inspect the mediating role of frugal innovation in the association between innovation capability and value creation. Another main objective of the current study is to examine how the impact of the innovation capability on value creation is weakened or made stronger through the moderation of knowledge-sharing practices in SMEs. Several studies have examined the value creation concept from a different perspective. However, there are restricted studies that have considered value creation from the perspective of a sustainable business model [19], influential factors [20] and how suppliers articulate customer value [21]. Addressing this research gap, our current research explored innovation capability linked to value creation in SMEs. This study is unique as it adds to the previous stream of innovation literature. Firstly, this research provides a new study model by suggesting knowledge sharing as a moderator in the association between innovation capability and value creation. Secondly, the current study proposes methods of management of the innovation practices through developing an understanding of innovation capabilities and value creation and taking action to examine the moderating role of knowledge sharing in the linkage between innovation capabilities and value creation in the SME sector. Furthermore, our paper responds to prior studies' call to examine models in diverse markets; therefore, this study's outcomes show some valuable guidelines in the context of improved innovation capability, frugal innovation, value creation and knowledge-sharing competencies. Hence, the current research will spotlight the following three questions: Q1. What is the impact of innovation capability on value creation? Q2.

How does frugal innovation play a mediating role between innovation capability and value creation? Q3. To what extent does knowledge sharing's moderating role strengthen or weaken the impacts of innovation capability on value creation?

This research paper is structured in the following pattern. Section 2 discusses the literature review of the study. Section 3 contains the methodology, the following section comprises an analysis of the hypothesised variables and the last section includes the discussion of this research paper.

2. Literature Review: Value Creation Theory

Value creation has now become a critical research area in strategic management. The value creation theory is acquired from a neo-classical economist, who describes value theory as the enlightenment of value exchange of price of the goods/services [22]. The value creation concept is applied to entire market sales. In the value creation theory of the firm, value is the idea of surplus in the welfare of someone compared to prior conditions. Such value could be created through increasing income, asset worth, cash flow and welfare [23]. In value creation theory, the value might be reflected as the creation of gain from investment, relationship, trade and other transactions [24]. However, we extend this theory by bringing the concept of innovative value-added products, which are raising the needs of today's market. We reflect on individualised, instant innovation capabilities feedback, novel frugal cooperation structures and the organisational logic of knowledge sharing, which sustain, reinforce and initiate innovation and social change processes in the firm, which in turn, increase value creation processes within the circular economy. The circular economy changes the prior model wherein resources are obtained, products are made and then wasted [4]. The association among these constructs is shown in Figure 1. To bring innovation and create value within a firm and circular economy, we require reorganising our ideas concerning how resources are used, and innovation and value-creation bring changes in our method for acquiring success [25]. However, these means cannot be created in the previous industrial economy laboratory. We have to focus on how today's customers are interconnected and provide feedback about drastically new means of organising resources and improved innovation and value-creation services of the firm [26]. Figure 1 shows Theoretical Framework.

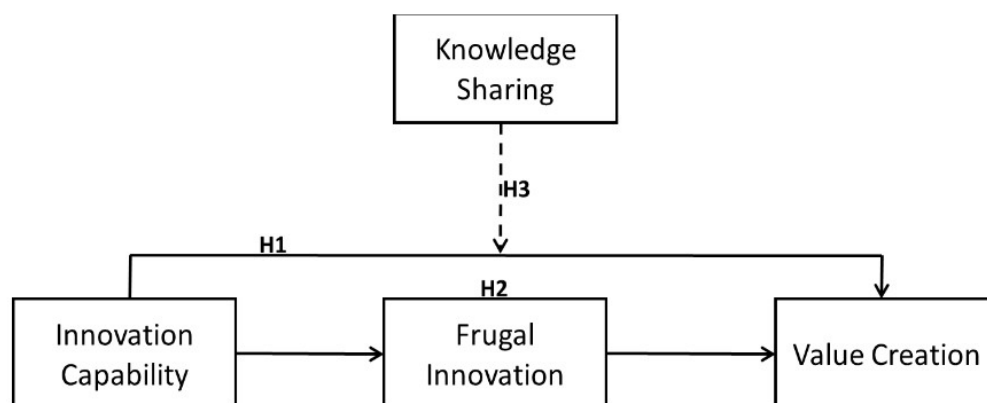


Figure 1. Theoretical Framework.

2.1. Innovation Capability and Value Creation

Firm innovation capability helps in the development and invention of the latest patterns of innovation through new techniques, technologies and a new variety of raw materials [15]. These innovation activities positively impact the value creation practices. Innovation capability enable firms to introduce latest products/services and management techniques linked to products and services [27]. The newest product/services invention ways arise from the intentional effort of an organisation to make an innovative idea, concerning extensive market technological and firm ambiguity that leads toward the

value creation of the latest products [28]. Value creation refers to the quality of the latest job, service, product and task as recognised by customers related to speed, quality and performance needs [29].

Moreover, SMEs probably want to innovate when they enjoy resources and face a vague environment [30]. Innovation capability facilitates value creation procedures [31]. Innovation capability facilitates the value creation process by highlighting how organisations can benefit from existing resources [32]. Innovation capabilities help develop a readily identifiable method related to how resources are integrated, reconfigured and acquired, which increases the value creation of the specific product/service [33]. Innovation capabilities support the generation and modification of operational methods, which provide advanced benefits and identify critical factors that lead to the establishment of the product and service toward a goal of value creation [34]. Innovation capabilities emphasise significant factors such as knowledge formation, learning and achievement of new benefits that meet customers' needs and increase the value creation of particular products and services [35]. These capabilities draw attention to the procedures by which the latest firm knowledge is acquired, and value is created [36]. Employees' innovation capability in the firm helps in integrating and acquiring the latest information and knowledge, which could be employed in a manner that is positively associated with innovation processes [37]. The innovations in products and services are connected with customers' satisfaction which further enhances value creation; hence firms' innovation capability is an antecedent of value creation [38].

H1. *Innovation capability is directly linked with value creation.*

2.2. Mediates through Frugal Innovation

Innovation capabilities are the main source of innovative knowledge and information from external and internal stakeholders [39]. Organisations obtain advantages of novel ideas by formulating the latest procedures and techniques for designing products and services [40]. Alternatively, frugal innovation is a means by which business firms can use available resources for innovation activities and processes [41]. Business firms integrate new knowledge and information using innovation capabilities to establish innovation activities and processes [39]. Previous research documented that innovation capability helps in the innovation process by providing innovative ideas, which sequentially increase the value creation of the product and services [42]. This study recognised the intervening function of frugal innovation between the innovation capabilities and the value creation process of the product and services. Innovation capability helps in the creation of innovative ideas, procedures and methods for acquiring the latest information and knowledge required for the innovation activities and processes of a firm [43]. Through a frugal innovation mechanism, firms can use the information received from different sources to support innovation activities to increase the value creation of the product and services [44]. Frugal innovation supports firms in redesigning their operations, which is a considerable cost reduction. Innovation capabilities provide different opportunities and innovative ideas, information and knowledge that enhance frugal innovation in the firm to increase the value creation of the products and services [45]. Innovation capability facilitates the development of innovative actions/ideas, which provide more incredible speed and proficiency in the innovation processes for increasing the value creation of the product and services in the firm [41]. Though sometimes firms have sufficient resources to perform innovative activities, frugal innovation is the mechanism by which firms reduce costs and increase the value creation of their products/services [43].

H2. *Innovation capability and value creation are mediated through frugal innovation.*

2.3. Knowledge Sharing as Moderator

Infrastructural abilities help improve firm performance; however, they entail lavish outlay and time that mostly emerging-market SMEs cannot make available [46]. Therefore, most SMEs emphasise knowledge sharing that is easy and simple to adopt within the firm,

increasing the value creation of the products and services [47]. Value creation is dependent on learning and technical information derived from improvement, innovation and initiation of the knowledge/technology through innovation capabilities [48]. Innovation capabilities help enhance technology, information and knowledge sharing in the firm, which increases the value creation of the different products and services. Various firms face difficulties and challenges due to a lack of knowledge sharing in their internal and external environment [18]. Thus, businesses can add to their competitive success by focusing on the value creation of the products and services through advanced technology and the latest knowledge diffusion in the circular market [49]. In a circular economy, material use is reduced, material-intensive resources are redesigned, and “waste” is reused as a source for manufacturing the latest products [50]. Knowledge sharing can increase value creation, while innovation capabilities are more significant for bringing innovation within firms [45,51]. The moderating role of knowledge sharing will strengthen innovation capabilities’ effect on value creation. This study determined the impact of knowledge-sharing on the SMEs’ value creation process. Knowledge sharing has been linked to innovative performance, whereas their moderating role can critically affect the firm’s knowledge derivation and value creation abilities. Thus, knowledge sharing can strengthen the link between innovation capability and value creation. The firm’s innovation capability is necessary for innovation processes and activities in the organisation; similarly, knowledge sharing increases the impact of innovation capabilities on value creation [52].

H3. *Knowledge sharing plays a moderating role between innovation capabilities and value creation.*

2.4. Theoretical Framework

The Theoretical Framework of this study based on the literature review is presented in Figure 1.

3. Methodology

3.1. Research Design

In this study, we used a quantitative research method that provides knowledge of the social world and an understanding of confidence intervals and sample size variables. It also provides information about all constructs, the value of test statistics, degree of freedom, etc., which improve the significance level and provide reliable and factual outcomes [53].

3.2. Data Collection

For data collection, we used a questionnaire survey sent to 455 senior managers, chief executive officers and owners of the SMEs operating in the country. Some questionnaires were sent through e-mail addresses obtained from concerned SME managers, and some have been distributed in hard-copy form in January 2022. Questionnaire added in Appendix A. This data collection took two and a half months. We only considered senior managers, CEOs and owners, and other employees or managers who were not included in this research because they might have different views than those suited to the constructs used in this study. In this study, we used a sample size of 455; due to the probability of 0.05, a target sample size of 455 was deemed necessary. SMEs were regarded for this research because other industry firms may have a different pattern of business and facilitation. The current study ignored huge organisations and corporations as they have the latest knowledge, information and technology compared to the SMEs. Small and medium enterprises can obtain an advantage by fulfilling business environmental gaps and reducing low-labour costs, which decrease overall costs.

In the same way, government policies also support SMEs because their excellent performance leads to overall emerging market growth. Non-probability and sampling method was used to select respondents, and the cross-sectional survey method was used to collect primary data. A total of 366 questionnaire responses were received back out of 455 questionnaires. From those, 315 questionnaires were complete and taken for further data analysis. The remaining 140 questionnaires were incomplete and therefore discarded,

making a response rate of 69.23%. The high response rate may be due to our cover letter that highlights this study benefits and is vital for the SME sector. Participants' privacy was ensured in each step of data collection. The questionnaires were divided into two sections. In Section 1, demographic variables detail is mentioned. Demographic variables highlighted that all participants were men, and participants' ages ranged from 25 to 65 years, with the highest being 83% for 30–45 years. Out of the total, 157 respondents had a master's degree, 137 had bachelor-level education, and 21 had below 12 years of education. Our targeted sample was senior managers, CEO and owners of SMEs. In Section 2, items of the constructs were mentioned. Table 1 shows the sample characteristics.

Table 1. Sample Characteristics.

S.N	Position	Respondents	
		Total Response Percentage	
1	Chief Executive Officers	95	30%
2	Owners/Managing Directors	89	28%
3	Senior Managers	61	19%
4	Researcher & Development Managers	70	22%
Total		315	100%

3.3. Measures and Measurements

This study included four latent variables, namely, innovation capability (independent variable), knowledge sharing (moderating variable), frugal innovation (mediating variable) and value creation (dependent variable). The measurement of the construct is done through a 5-item Likert scale. All the variables are measured through their respective items. The details of items of each variable are presented in the questionnaire. The variables used in this study were directly measured from their relevant items previously tested by researchers.

3.4. Innovation Capability

We adapted 6 item scales from [54] to measure innovation capability.

3.5. Frugal Innovation

Frugal innovation is measured through 10 item scale adopted from [55].

3.6. Value Creation

The measurement of the value creation is done through 4 item scales adapted from [56].

3.7. Knowledge Sharing

The 6-item scale is adapted from [54] to measure knowledge sharing.

4. Analysis

4.1. Discriminant and Construct Validity

Table 2 shows the result of construct validity and discriminant validity of variables Innovation Capability, Frugal Innovation, Knowledge Sharing and Value Creation. Results proved that factor loading was greater than 0.70. We also apply Fornell and Larcker's approach [57] to prove average variance extract was greater than 0.50. The composite reliability value (CR) was greater than 0.50, on the other hand, Cronbach's alpha value was greater than 0.70 and (Cronbach's alpha) α was greater than 0.70. Therefore, the measurement results and findings proved that our research was valid and reliable.

Table 2. Shows Composite Reliability, FL and Average Variance Extracted.

Description	Items	FL	Cronbach's Alpha	CR	AVE
Innovation Capability	06	0.72–0.84	0.83	0.93	0.78
Frugal Innovation	10	0.74–0.86	0.84	0.92	0.72
Knowledge Sharing	06	0.76–0.88	0.86	0.96	0.74
Value Creation	04	0.70–0.82	0.85	0.94	0.76

4.2. CFA Result

Table 3 shows the confirmatory factor analysis model. We tested four different models to access the model fitness. Results are presented in Table 2 that demonstrate that our 4-factor model was fit to data (RMSEA = 0.05, $\chi^2 = 1025.21$, $df = 427$; $\chi^2/df = 2.401$; CFI = 0.93; GFI = 0.94).

Table 3. Confirmatory Factor Analysis (CFA).

Model Description	χ^2	Df	χ^2/df	REMESA	GFI	CFI
Hypothesized four-factor model	1025.21	427	2.401	0.05	0.94	0.93
Three-factor model	1166.47	345	3.381	0.13	0.84	0.83
Two-factor model	1245.47	355	3.508	0.18	0.73	0.72
Single-factor model	1422.63	365	3.898	0.22	0.65	0.64

4.3. Correlation Result

Table 4 shows the results of correlation and descriptive statistics. Results proved our theory, and all variables link significantly with dependent variables. Innovation Capability is significantly links with Value Creation ($r = 0.38^{**}$, $p < 0.0001$). Frugal Innovation is significantly linked with Value Creation ($r = 0.24^{**}$, $p < 0.0001$). Similarly, Knowledge Sharing is significantly linked with Value Creation ($r = 0.36^{**}$, $p < 0.0000$).

Table 4. (Correlation Results).

Variable	Skewness (Kurtosis)	1	2	3	4	5	6	7	8
1 Business Age	1.36 (3.43)	1.00							
2 Business Size	1.13 (3.11)	0.116 **	1.00						
3 Respondent Experience	1.51 (3.98)	0.215 **	0.86 *	1.00					
4 Respondent Education	2.33 (2.56)	−0.03	0.07	1.00	1.00				
5 Innovation Capability	1.98 (2.34)	−0.02	−0.18	0.01	−0.10	1.00			
6 Frugal Innovation	2.24 (3.56)	0.04	−0.05	0.093 *	−0.02	0.164 **	1.00		
7 Knowledge Sharing	2.51 (3.67)	−0.09	−0.15	−0.04	0.042 *	0.267 **	0.327 **	1.00	
8 Value Creation	2.43 (3.91)	0.03	−0.12	−0.05	−0.12	0.380 *	0.249 **	0.365 **	1.00

Note: * = significant at $p < 0.00$, ** = significant at $p < 0.05$.

4.4. Hypothesis Testing

Table 5 shows the hypothesis testing of H1 through simple linear regression analysis. This proposed that H1 is positively significant. Innovation capability positively affects value creation ($\beta = 0.16^{**}$, $p = \text{sign}$); hence H1 was proved. The VIF scores also confirm that multicollinearity is not an issue in this research, as its value was less than 10.0.

Table 5. (Innovation Capability to Value Creation).

Detail	Hypothesis Description	B	F	T-Value	Sig	Remarks
Model #1	Innovation Capability → Value Creation	0.16	10.850	0.225	0.000	Accepted

H2 proposed that Frugal Innovation mediates between Innovation Capability and Value Creation. We conducted Preacher and Hayes's [58] analysis using the 5000-bootstrap method at a 95% confidence level. Table 5 shows the indirect effect of Innovation Capability on Value Creation through Frugal Innovation. Table 6 and Figure 2 present the path analysis results and findings proving that Innovation Capability predicts Frugal Innovation ($B = 0.347$, $t = 7.324$, $p = 0.000$). Path 'b' proved direct the effect of Frugal Innovation on Value Creation ($B = 0.244$, $t = 7.542$, $p = 0.000$). Path 'c' proved total effect of Innovation Capability on Value Creation ($B = 0.266$, $t = 3.143$, $p = 0.000$). Path 'c' proposed that when frugal innovation was controlled direct effect of Innovation Capability on Value Creation was reduced and non-significant, proving full mediation ($B = 0.183$, $t = 1.461$, $p = 0.137$). Path 'ab' shows the results of the indirect effect in the last portion of Table 5. The results of indirect effect prove Frugal Innovation acts as mediator ($B = 0.186$, Lower = 0.1452 to Upper = 0.2634). The last row of Table 6 displays the importance and value of the Sobel Test were significant given the "Z" value = of 7.652. Therefore, H2 was proved, and it is proved that the Innovation Capability and Value Creation link are mediated through frugal innovation.

Table 6. (Mediating Effect of Frugal Innovation between IC and Value Creation).

Paths Description			Beta	T-Value	SE	Remarks
Innovation Capability→FI (Path a)			0.347	7.324	0.034	0.000
FI→Value Creation (Path b)			0.244	7.542	0.031	0.000
Innovation Capability→Value Creation (Path c)			0.266	3.143	0.018	0.000
Innovation Capability→Value Creation (Path c')			0.183	1.461	0.049	0.137
Model summary for DV Model: $R^2 = 0.14.57$; $F = 26.653$; $p = 0.000$						
Bootstrap for the indirect effect of IV on DV through mediator “ab path”.						
Model Detail	Data	Boot	SE	Lower	Upper	Remarks
IC→FI→VC	0.186	0.126	0.36	0.1452	0.2634	0.0000
Sobel Test Z = 7.65						

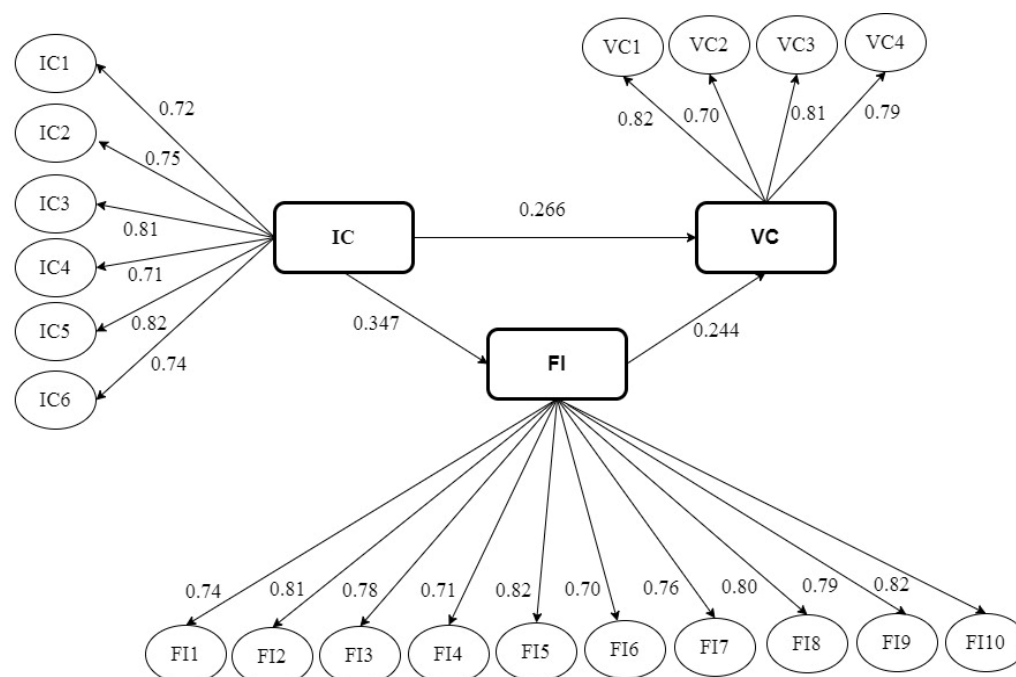


Figure 2. The Path Model Re-specification.

Table 7 shows the moderation results of knowledge sharing using hierarchical regression analysis of the direct link between Innovation Capability and Value Creation. Results indicated the KS was a significant moderator and played a significant role in working against the relationship between Innovation Capability and Value Creation, i.e., ($\beta = 0.28$, $** p < 0.01$).

Table 7. Hierarchical Regression results in moderating the effect of Knowledge Sharing.

Detail	Value Creation					
	Beta	T-Value	Beta	T-Value	Beta	T-Value
Step-1						
Business age	0.06	0.25	0.02	1.35	0.02	0.24
Business size	0.04	0.22	0.15	0.86	0.14	0.76
Respondent education	0.14	0.28	0.11	0.12	1.03	1.34
Respondent experience	0.16	0.24	0.14	0.94	0.05	0.14
Step 2						
Innovation Capability			0.34 *	7.65	0.32 *	3.52
Knowledge Sharing			0.26 *	5.75	0.34 *	4.75
Step 3						
ICxKS					0.28 **	2.35
F		5.18 **		16.26 *		14.35 *
R ²		0.02		0.24		0.25
R ² Change				0.28		0.01

Notes: * $p < 0.05$, ** $p < 0.01$ (two-tailed); and results of VIF were below the threshold level.

Analysis proved that all the proposed hypotheses of this study had been accepted; the details are also presented in Table 8.

Table 8. Details of Hypotheses Acceptance.

Hypotheses	Details	Remarks
H1	IC is directly linked with the VC	Accepted
H2	IC and VC are mediated through FI	Accepted
H3	KS plays moderating role between IC and VC	Accepted

Note: KS = Knowledge Sharing, IC = Innovation Capability, VC = Value Creation.

5. Discussion and Conclusions

The current research has proposed three hypotheses and examined the direct association between innovation capability and value creation (H1). This study also explores the mediating role of frugal innovation (H2) and the moderating role of knowledge sharing (H3).

The H1 of current research predicted that innovation capability positively affects the value creation of the products and services. The outcomes show a positive vital relationship between innovation capability and value creation and enlighten that using innovation capability can lead to improved value creation activities. The H1 findings are consistent with prior studies that Firm innovation capability help in the development and invention of the latest patterns of doing things through new techniques, technologies and a new variety of raw material [13]. These innovation activities positively impact the value creation practices. The newest product/service invention methods arise from the intentional effort of an organisation to make an innovative idea, concerning extensive market technological and firm ambiguity that leads toward the value creation of the latest products [21]. SMEs probably want to innovate when they enjoy resources and face a propitious environment [23]. Innovation capability facilitates the value creation procedures [24].

The H2 of the research demonstrated the positive impact of frugal innovation on the relationship between innovation capability and value creation. This positive connection highlights the importance of innovation capability, especially from the perspective of SMEs. The findings show that innovation capabilities are the main source of innovative knowledge and information from external and internal stakeholders [32]. Organisations obtain advantages of novel ideas by formulating the latest procedures and techniques for designing products and services [33]. Alternatively, frugal innovation is a means by which business firms can use available resources for innovation activities and processes [34]. Business firms integrate new knowledge and information using innovation capabilities to establish innovation activities and processes [32]. Previous research documented that innovation capability helps in the innovation processes through innovative ideas, which sequentially increase the value creation of the product and services [35]. This study recognised the intervening function of the frugal innovation between innovation capabilities and the value creation process of the product and services. Innovation capability helps in the creation of innovative ideas, procedures and methods for acquiring the latest information and knowledge required for the innovation activities and processes of a firm [36]. Through a frugal innovation mechanism, firms can use the information received from different sources to support innovation activities to increase the value creation of the product and services [37]. Frugal innovation supports firms in redesigning their operations, which is a vast means of cost reduction. Innovation capabilities provide different opportunities and innovative ideas, information and knowledge that enhance frugal innovation in the firm to increase the value creation of the products and services [38].

Therefore, the outcomes of the H2 proved the valuable mediating role of frugal innovation. The H3 of our study suggested the moderating role of knowledge sharing in linking innovation capability and value creation. Knowledge sharing is a predictor of enhancing innovative activities in relation to innovation capability and value creation of the product and services. Both value creation and knowledge sharing affect the performance of the SME sector. Therefore, the outcomes of the H3 emphasised that high-level knowledge sharing could improve the impacts of innovation capability on the value creation of the product and services. The findings show the critical role of knowledge sharing in strengthening the association between innovation capability and value creation. These results are consistent with the prior study's findings that Value creation depends on learning and technical information derived from improvement, innovation and knowledge/technology initiation through innovation capabilities [41]. Innovation capabilities help enhance technology, information and knowledge sharing in the firm, which increases the value creation of the different products and services. Various firms face difficulties and challenges due to a lack of knowledge sharing in their internal and external environment [16]. Thus, businesses can add to their competitive success by focusing on the value creation of the products and services through advanced technology and the latest knowledge diffusion [42]. Knowledge sharing can increase value creation, while innovation capabilities are more significant for bringing innovation within firms. The moderating role of knowledge sharing will make the more potent effect that innovation capabilities have on value creation. This study determined the knowledge-sharing impact on the SMEs' value creation process. Knowledge sharing has been linked to innovative performance, whereas their moderating role can critically affect the firm's knowledge derivation and value creation abilities [43].

5.1. Theoretical Implications

This research provides valuable theoretical implications. In the context of the theoretical implications, this study argued that improving innovation processes and value creation of products/services required new methods. In the stream of literature, we focus on innovation and value creation of innovative products through innovation capabilities which provide helpful knowledge, competencies and information about novel ideas. We also emphasise how frugal innovation helps in the value creation of products and services.

Thirdly, this research examined knowledge sharing's moderating role in the association between innovation capability and value-creation. When a knowledge-sharing ecosystem exists, innovation capability and value creation of products and services cannot be diminished. Thus, firms must focus on the knowledge-sharing paradigm in SMEs. Our study is empirical; in future studies, researchers can adapt and use this study's measurement scales.

5.2. Practical Implications

This study provides several practical implications for SMEs; firstly, our research supports managers to concentrate on understanding the significance of implementing innovation capabilities for the improved value creation of the products and services. Secondly, findings demonstrated that the mediating role of frugal innovation could affect innovation capability and value creation of the products/services. Hence, a firm should emphasise the frugal innovation capabilities of employees through good strategies that will enhance their innovation capability and value creation of the products and services. Thirdly, in the SMEs of an emerging economy, knowledge sharing acting as a moderator is very complex to detect as it is an unobserved variable. Management should focus on the development of knowledge-sharing practices which positively influence the value creation of products and services. Therefore, our research provides a framework for the sustainable advancement of SMEs in developing economies and recommends that they increase the value creation of the products/services through knowledge-sharing practices based on innovation capabilities.

5.3. Limitations and Future Directions

Our research has limitations that act as opportunities and directions for future studies. Firstly, this study's data collection is done from the SME sector; in future studies, data may be collected from other big industries and sectors. Secondly, the study's sample size is small as data were gathered from 315 respondents; thus, the sample size may be increased in future studies, and data were collected from large corporations. Finally, the current study primarily focused on examining the effects of innovation capability on value creation. We explored the roles of frugal innovation mediating and knowledge sharing moderating in this association. In future studies, researchers can use other moderating and mediating variables in this association.

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Appendix A

Table A1. Questionnaire.

Variable	Items	Constructs
Innovation capability	IN1	
	IN2	Our firm often seeks and tries new innovative ideas.
	IN3	Our firm tries to find a new method for developing products and things.
	IN4	Our firm's operating ways are creative and novel.
	IN5	Our company launches new products and services to the market.
Frugal innovation	FI1	Our firm knows the importance of innovation capabilities in the development processes of products and services.
	FI2	Our firm first has introduced a novel, innovative products in the market during the last three years.
	FI3	
	FI4	Our firm regularly focuses on core functionality more willingly than other additional functions.
	FI5	Our firm frequently seeks novel solutions.
	FI6	Our firm often pays attention to improving the durability of services and products.
	FI7	Our firm always offers good quality and cheap services and products.
	FI8	Our firm tries to decrease the cost of the production process.
	FI9	Our firm frequently offers to reduce the final products and services price.
	FI10	Our firm regularly focuses and cares about the sustainability of the environment in operational methods.
Value creation	VC1	Our firm tries to increase our partnership with the local firms.
	VC2	Our firm finds effective and efficient ways/solutions to meet environmental needs.
	VC3	Our firm tries to fulfil the customers' needs through available means by offering cheap products.
	VC4	
Knowledge sharing	KS1	In our firm, innovation capabilities have increased and cost savings have already been achieved.
	KS2	In our firm we focused on the innovation activities which provide great benefits.
	KS3	In our firm, we not only focus into the product quality and production scale, we also pay attention to the efficiency and readiness of the product.
	KS4	In our firm we pay attention in the areas where competitors do not focus.
	KS5	
	KS6	

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