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INVESTIGATION OF FINANCIAL INNOVATION IN SMALL AND MEDIUM ENTERPRISES (SMES): EXPLORATION AND VALIDATION OF INSTRUMENT

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Abstract

This study explores and validates of financial innovation regarding Small & Medium Enterprises (SMEs) operating in the selected part of Pakistan. SMEs faced multiple challenges in recent years due to emerging trends and dynamic technology and an innovative environment. The study applied qualitative approach by collecting data from the owners, owner-managers and top management of SMEs through focus groups and interviews. NVIVO software is used for qualitative analysis to derive themes, patterns, and constructs for the validation of the instrument. The findings allow us to suggest factors and frameworks of financial innovation for SMEs that may assist academics in deepening the comprehension of stakeholders and policymakers to refine decision-making by taking financial innovation into account. The study further examines the antecedents and outcomes of financial innovation, distinguishing product and process dimensions. Content validity, reliability, and exploratory factor analysis confirm the instrument's soundness, offering SME owners, managers, and policymakers a dependable tool for assessing innovation practices and supporting sustainable growth.

Keywords: Financial Innovation, Small & Medium Enterprises, Qualitative Method, Pakistan.

1. Introduction

Financial innovation encompasses the development and use of novel technologies, ideas, methodologies, reasoning, data, alterations, and enhancements of existing practices, particularly those driven by technological advancements (Avermaete et al., 2004) but there are less studies regarding implementation of financial innovation in SMEs. The United States, China, Germany, and other prominent economic nations are shifting their economies towards a greater reliance on technology, since information and knowledge are crucial for wealth creation in a technology-centric economy. Financial innovation is a crucial component for enhancing the spread of knowledge, as it signifies that financial actions and data are analyzed to provide varied information for improved decision-making (Dorotinsky & Matsuda, 2002; Rozner, 2008). It is reported that Information technology is used for compilation of appropriate information associated with business purpose (Liu et al., 2011). It requires a technology-based information system with a unified, dispersed device that allows continuous flows from one to different department to another (Sequeira et al., 2012).

Financial innovation is an important aspect of any business, contributing to its growth due to the increased complexity of controlling financial transactions (Khan et al., 2021; Sohu et al., 2023). Appropriate, relevant, and accurate information is considered an effective element for decision making that is linked with low-cost memory and higher computing capacity to easily access content (Gupta & Gupta, 2019).

Moreover, financial innovation could support SMEs for continuous growth (Ratten et al., 2020). It is reported that FI facilitated managers in the collection, storage, and evaluation of accounting records (Al-Hashimy & Yusof, 2021). Similarly, information systems in accounting are considered as a competitive edge in technological innovation, increased awareness, and technological interventions (Gofwan, 2022).

Journal of Business Insight and Innovation
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https://insightfuljournals.com/

Terhorst et al. (2018) said that firms must enhance their adaptability, availability, efficiency, and innovation to address dangers in global and regional competition. Small and medium-sized enterprises may significantly contribute to poverty alleviation via technological advancements driven by industrial expansion and sustainable progress (Dar et al., 2017). FI is a crucial aspect of organizational performance for any organization, and financial innovation can play a vital role in the success of businesses. Internationalization and growing competition across enterprises require a focus on emerging technology and effective use of FI that could affect continued growth. It is found that FI could help the management of SMEs, regulators, and other stakeholders (Lin et al., 2024). This study investigates and explores financial innovation by approaching the SMEs for the quantification and validation of instruments. Moreover, it investigates the antecedents and outcomes of financial innovation among SMEs operating in the selected part of Pakistan.

2. Literature Review

Information and communication technology are influencing firms and corporate entities, especially SMEs, around the world to encourage technology, information, and connectivity. The Technology Acceptance Model (TAM) was proposed by Davis (1989) based on Fishbe's Theory of Reasoned Action (Fishbein & Ajzen, 1977). It has been noted that a person's readiness to adopt technology is a deliberate action that may be predicted by their behavioral goals (Jogiyanto, 2007). TAM enhanced the TRA framework, and it is challenging to claim that such systems have attained success. The efficacy of a system for information may be assessed by four parameters: user contentment, system utilization, decision-making effectiveness, and organizational results (Jogiyanto, 2007). Furthermore, the benefit of technology revealed an individual's choice to use or refrain from using such tools to execute certain tasks (Goodhue & Thompson, 1995).

Innovation diffusion theory is a recognized concept that underpins the spread of technical advancements. It represents the implementation of technology that facilitates the evaluation of innovation rate (Rogers, 2010). It denoted a network of associated entities focused on resolving a substantial challenge to attain a unified mission. The social organization might impact the launch or adjustment of the program, in a favorable or negative manner. The effect of financial innovation on the efficacy of SMEs is seen via the perceived risk highlighted by "Innovation Diffusion Theory (Miller, 2015; Rogers, 1962). It was said that embracing financial innovation has the potential to augment organizational and economical effectiveness (Gabor & Brooks, 2017; Sangwan et al., 2023).

Financial innovation (FI) is defined as "the act of creating and then popularizing new financial instruments, technologies, markets, and institutions." It entails policy changes in regulation and deregulation, as well as use of technical advances in financial and economic transactions (Effiom & Edet, 2022). Innovation involves the production of new concepts, systems, reasoning, information, expansion, improvement, and the progression of established methods, as well as the development of SMEs (Avermaete et al., 2004; Hewitt-Dundas, 2006). It refers to ideas to develop services or products for customers (Cooper & Edgett, 2008). Innovation is seen as a fundamental component of progress and corporate achievement (Slaper et al., 2011). It indicates the creation or application of workable conditions and introduction of new methods of productivity, action, implementation, or monitoring systems, etc. (Crossan & Apaydin, 2010) A firm offering distinctive products is more inclined to achieve success and maintain competitiveness in the market (Tohidi & Jabbari, 2012).

Financial innovation is a strong signal of enhanced efficiency (Calantone et al., 2002; Damanpour & Evan, 1984; Deshpandé et al., 1993; Du & Farley, 2001) having a good influence on productivity, competitiveness, and long-term financial consequences; yet, expenditures have begun in the short term, and the deployment of internal funds may initially suffer more losses, considerably hurting business performance (Walker, 2004). FI would theoretically and digitally improve the organization's productivity and outcome (Antoncic & Hisrich, 2001; Barringer & Bluedorn, 1999; Narver & Slater, 1990) as several studies supported the impact of product innovation on company efficiency (Alegre et al., 2006; Bayus et al., 2003; Camison & Lopez, 2010; Hernández-Espallardo & Delgado-Ballester, 2009). Financial innovation had a substantial effect on the company output as positive effect of creativity on the firm's efficiency (Gunday et al., 2011).

Journal of Business Insight and Innovation
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https://insightfuljournals.com/

Kiende et al. (2019) considered the constraints faced by SMEs for innovation. However, firms are developing innovative products according to customers' requirements for tech-driven product & services (Audretsch & Belitski, 2020) along with innovation and soft skills that had a positive and significant impact on the performance of the firm (Gunday et al., 2011; Putra et al., 2020; Wolff & Pett, 2006). Creativity is a robust enabler for innovative businesses to build value and retain strategic advantages on competitors (Bilton & Cummings, 2009), therefore, more creative companies could be successful by developing new capabilities to achieve greater efficiency and profit (Calantone et al., 2002; Sadikoglu & Zehir, 2010). Companies could become more efficient as a result of innovative products with the financial stability to achieving client pleasure (Na & Kang, 2019; Robinson et al., 2019) because consumers' requirements are evolving at an accelerating rate, and they desire new products and services with cutting-edge technology (Capozza & Divella, 2019).

Financial innovation fostered efficiency and efficacy by augmenting service quality, reducing expenses, and elevating the standard of financial services via the creation of a diverse array of easily available financial products (Machkour & Abriane, 2020). It relates to the implementation of innovative financial instruments, assets, and services including institutional, procedural, and product advancements. Institutional innovation includes new forms of financial institutions, such as tailored credit cards, digital banking, brokerage companies, and comparable organizations. Product innovations include new offerings such as securitized assets and foreign currency mortgages, while process innovations pertain to unique techniques for executing financial transactions via Point of Sale (POS), online banking, and mobile banking (Effiom & Edet, 2022).

Product innovation indicated activities to make items for customers for better firm's market position by using the new technology (Dahan & Hauser, 2002; Kaiser, 2001). It is a dynamic mechanism powered by changing technologies, evolving consumer expectations, reducing the life cycle of the product, and growing the global demand (OECD, 2005) by improving the existing ideas, techniques, and procedures to create a new product for customers (Afuah, 2020; Ballot et al., 2015). Process innovation entails the use of novel techniques and instruments to enhance the quality of existing processes (Utterback & Abernathy, 1975) including new machines and digital tools for process innovation (Rosenberg & Nathan, 1982) as well as introduction of a new and substantially changed processing or delivery system (OECD, 2005). Process innovation reduced cost of producing goods, delivery time and production time (Saide & Sheng, 2020) through method utilized for effective and efficient product improvement (Chai et al., 2020; Riesener et al., 2021). It is the process of creating, introducing, and implementing innovations in products, operational methods, and technology for economic results (Diep & Canh, 2022; Nejad, 2022; Putra et al., 2024).

3. Methodology

This study explores financial innovation regarding SMEs based on exploratory sequential methods. A total of twelve interviews with top-level management, i.e., owners or owner-managers of SMEs, have been conducted by using semi-structured and unstructured interview guide as per the saturation point (Esfahbodi et al., 2016; Jorge et al., 2015; Paladino, 2007). Respondents were approached by convenience sampling technique in the qualitative phase. Various approaches for qualitative data analysis, such as coding and theme analysis, word tag clouds, word trees, and tree maps, were employed with the NVIVO software. Data was examined in stages: firstly, recorded data was translated into textual form, then distinct themes were recognized from the textual information, and finally, all associated textual data was coded into distinct linked themes by using "word tree maps" and "word tag clouds".

Moreover, a "Tree Map" is undertaken to assess the relevance of each essential element in the financial information system and financial innovation. In the second phase, a sample size of 550 respondents was determined to whom a structured questionnaire was distributed for data collection through self-administered approach that resulted into response of 380 respondents of SMEs engaged in the energy industry, leather, textile, footwear, wood furniture, woodwork, domestic, and industrial plastic manufacturing, etc., in selected parts of Pakistan. All the items of research instruments for the variables of the study were measured through a Likert scale of five, ranging from "1= strongly disagree to 5= strongly agree". The Data was collected, arranged, compiled, and processed by SPSS for analysis by using appropriate statistical tools and techniques.

Journal of Business Insight and Innovation
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4. Data Analysis and Results

The data undergone examination in two distinct phases: first, qualitative instruments were used to solidify financial innovation based on the existing information, and subsequently, quantitative methods were applied to provide coefficients for validating instruments using structured questionnaire data. NVIVO 15 software was used to analyze qualitative data, including thematic analysis, coding, tree mapping, word tag clouds, and word trees for the identification and validation of themes (Braun & Clarke, 2006).

4.1 Qualitative Findings

4.1.1 Word Tag Cloud. It displays the magnitude of various words based on their frequency of occurrence in textual data. Words with a higher frequency have a larger font size. This study used Word Tag Clouds in two rounds of analysis: before and after the funneling technique. In Figure 4.1. These are the most important words: new products, processes, increasing, materials, technology, and competitiveness.

Figure 4.1

Word Tag Cloud

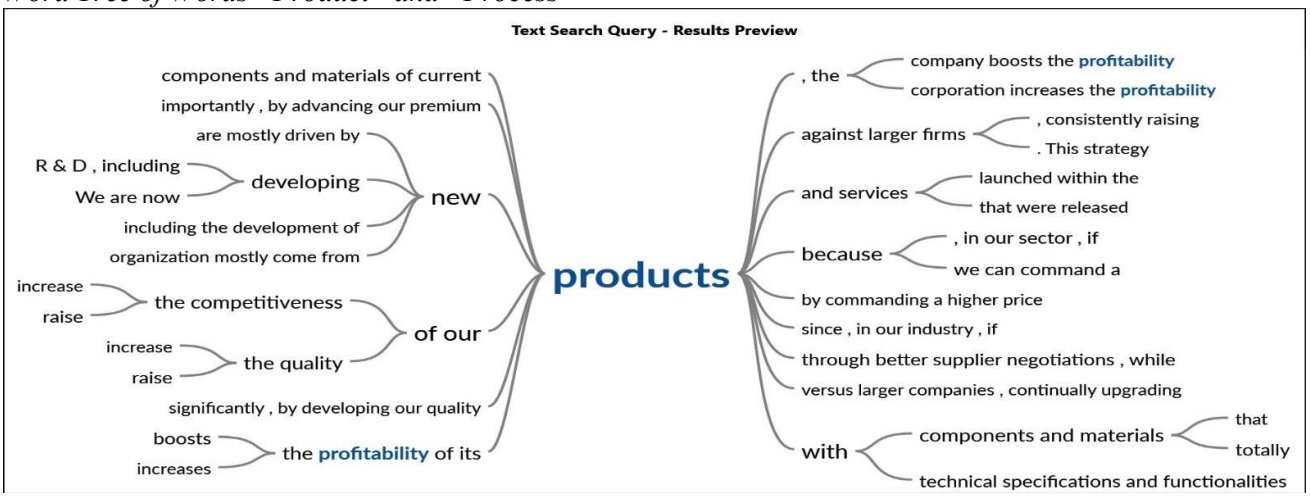


Note. Figure content retained from the original manuscript: a word tag cloud showing the most frequent terms, including new products, processes, increasing, materials, technology, and competitiveness.

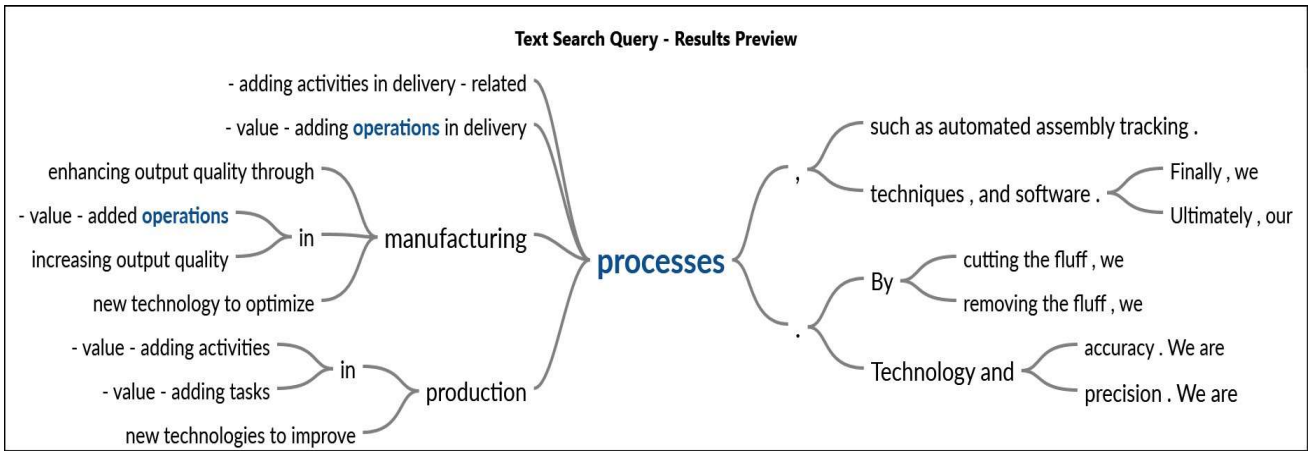
4.1.2 Word Tree Analysis. The main terms in this study are "Product" and "Process"; hence, a word tree has been investigated for the words "Product" and "Process", using the search text query. The word tree of "Product" and "Process", in Figure 4.2, depicts the various patterns of conversation of research participants. The study observed the meaning of financial innovation related to "Product" and "Process"; in this study, by reading line-by-line data where the words "Product" and "Process"; ware used.

Figure 4.2

Word Tree of Words "Product" and "Process"



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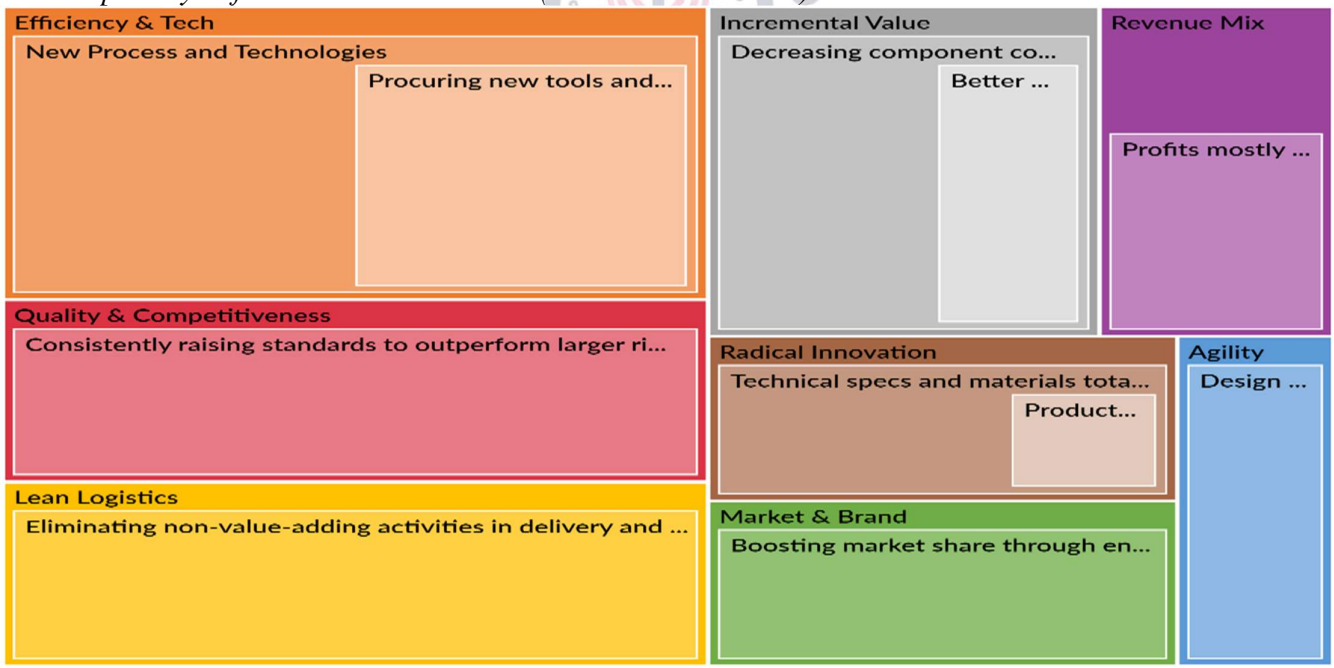


Note. Figure content retained from the original manuscript: text search query results for "products" and "processes."

4.1.3 Tree Map Analysis for Financial Innovation (Product and Process). This map shows the significance of each theme of this study. Figure 4.3 shows financial innovation in two parts (product and process innovation). The product innovation demonstrates quality & competitiveness, market and brand, radical innovation, and incremental value. The process innovation, efficiency & tech, agility, lean logistics, and revenue mix.

Figure 4.3

Tree Map Analysis for Financial Innovation (Product and Process)



Note. Figure content retained from the original manuscript: tree map showing product innovation themes (quality & competitiveness, market and brand, radical innovation, and incremental value) and process innovation themes (efficiency & tech, agility, lean logistics, and revenue mix).

4.2 Quantitative Findings

The output of qualitative findings shows the researcher how to identify the items related to financial innovation, determinants of product and process innovation. The product innovation determinants are quality & competitiveness, market and brand, radical innovation, and incremental value. The process innovation determinants are efficiency & tech, agility, lean logistics, and revenue mix.

Journal of Business Insight and Innovation
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Table 1
Items of Instrument

Determinants	Items Modified/Developed
Item Codes	Product Innovation
PI-1	Financial innovation provides new energy for the development of new products.
PI-2	Financial innovation enables your organization to raise the quality of its products.
PI-3	Financial innovation enables your organization to enhance the competitiveness of the products.
PI-4	Financial innovation enables your organization to enhance the market share of the products.
PI-5	Financial innovation enables your organization to enhance the corporate image and prestige.
PI-6	Financial innovation enables you to enhance the product line, which means developing new products to capture market share.
PI-7	Financial innovation enables you to develop new products with new technical specifications and functionalities which differing from the current products.
PI-8	Financial innovation enables you to develop new products with new components and materials which differing from current products.
PI-9	Financial innovation enables you to decrease manufacturing costs in the components and materials of current products.
PI-10	Increasing manufacturing quality in components and materials of current products.
PI-11	Your organization often boosts profitability of the newly developed products.
PI-12	Financial innovation enables you to purchase new tools and equipment to decrease the customers' lead time.
	Process Innovation
PRI-1	Financial innovation often enables your organization to introduce new technologies to improve production or process procedures.
PRI-2	Financial innovation enables your organization often to procure new tools or equipment to boost production or work efficiency.
PRI-3	Financial innovation enables us to design our products faster than our competitors.
PRI-4	Financial innovation enables us to produce new products faster than our industry rivals.
PRI-5	Financial innovation enables us to produce new products by using new tools and high-quality equipment of high quality.
PRI-6	Financial innovation enables determining and eliminating non-value-adding activities in delivery-related processes.
PRI-7	Financial innovation enables decreasing variable costs and increasing delivery speed in delivery-related logistics processes.
PRI-8	Financial innovation enables increasing output quality in manufacturing processes, techniques, machinery, and software.
PRI-9	Financial innovation enables determining and eliminating non-value-adding activities in production processes.
PRI-10	Financial innovation enables increasing the use of the latest technology.
PRI-11	Financial innovation enables the profits of our organization mostly come from new products and services.

4.2.1 Content Validity Test. The instrument's authenticity was verified by eight subject professionals, including four from SMEs management and four from Pakistan's finest institutions with extensive experience and expertise. Experts reviewed the study instrument and offered input based on recommended items. It is advised to compute CVI (content validity index) at both scale (S-CVI) and item

Journal of Business Insight and Innovation
Volume 5 Issue 4, 2026
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https://insightfuljournals.com/

level (I-CVI). The instrument's content validity meets the specified thresholds (S-CVI ≥ 0.8, ICSV ≥ 0.78) and is good (Polit et al., 2006).

Table 2

CVI Analysis of Financial Innovation Instrument

Item Code	E-1	E-2	E-3	E-4	E-5	E-6	E-7	E-8	No. of agreements	Items of CVI
PI-1	1	1	1	1	1	1	1	1	8	1.00
PI-2	1	1	0	1	1	1	1	1	7	0.88
PI-3	1	1	1	1	1	1	0		7	0.88
PI-4	1	1	1	1	1	1	1	1	8	1.00
PI-5	1	1	1	1	0	1	1	1	7	0.88
PI-6	1	0	0	0	1	1	1	0	4	0.50
PI-7	1	1	1	1	0	1	0	1	6	0.75
PI-8	1	1	1	1	1	1	0	1	7	0.88
PI-9	1	1	1	1	1	1	1	1	8	1.00
PI-10	1	1	1	1	1	1	1	1	8	1.00
PI-11	1	1	1	1	1	1	1	1	8	1.00
PI-12	1	1	0	1	0	1	0	1	5	0.63
PRI-1	1	1	1	1	1	1	1	1	8	1.00
PRI-2	1	1	1	1	1	1	1	1	8	1.00
PRI-3	1	1	1	1	1	1	1	1	8	1.00
PRI-4	1	0	1	0	0	1	1	1	5	0.63
PRI-5	1	1	0	1	0	1	0	1	5	0.63
PRI-6	1	1	1	1	0	1	1	1	7	0.88
PRI-7	1	1	1	1	1	1	1	1	8	1.00
PRI-8	1	1	1	1	1	1	1	1	8	1.00
PRI-9	1	1	1	1	1	1	1	1	8	1.00
PRI-10	1	1	1	1	1	1	1	1	8	1.00
PRI-11	1	1	1	1	1	1	1	1	8	1.00
Mean CVI	23	21	19	21	17	23	19	21	Mean CVI	0.8913
Portion Relevance	1	0.91	0.82	0.91	0.73	1	0.82	0.91	S-CVI/AVE	0.8913
No. of Items before CVT				No. of Items after CVT					No. of Items dropped	
23				18					5	

4.2.2 Construct Reliability. The reliability of the economic model and specification was used to measure the degree of regularity. The Cronbach alpha coefficient was used to determine the reliability of the instrument. In the same circumstance, the analysis would be extremely accurate if the same conclusion were drawn (Castañón et al., 2009). The alpha factor is the most frequently used estimate of reliability for a multiple-item scale, with a coefficient of 0.70 or above, which is considered good reliability (Yao et al., 2022).

Table 3

Reliability and Internal Consistency

Variables	Construct	Cronbach Alpha	Items
Financial Innovation		.935	18
	Product innovation	.875	9
	Process innovation	.878	9

4.2.3 Exploratory Factor Analysis (EFA). The measuring instrument was refined by exploratory factor analysis and data adequacy checks, such as Bartlett's sphericity test (Churchill, 1979). Table 4 shows a Kaiser-Meyer-Olkin statistic of 0.676 > 0.50 (*p* < .001). The sample size is acceptable for factor analysis,

Journal of Business Insight and Innovation
Volume 5 Issue 4, 2026
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with low uniqueness and large variance (Hair et al., 2010). Table 5 shows the two financial innovation indicators, "product innovation" and "process innovation".

Table 4

KMO and Bartlett's Test for Financial Innovation

KMO and Bartlett's Test	
Kaiser-Meyer-Olkin Measure of Sampling Adequacy	.676
Bartlett's Test of Sphericity	
Approx. Chi-Square	1035.024
df	153
Sig.	.000

Table 5

Rotated Matrix Factor

Item Codes	**1**	**2**
PI-1	.730	
PI-2	.819	
PI-3	.679	
PI-4	.827	
PI-5	.763	
PI-6	.734	
PI-7	.703	
PI-8	.621	
PI-9	.705	
PRI-1		.802
PRI-2		.784
PRI-3		.886
PRI-4		.718
PRI-5		.769
PRI-6		.788
PRI-7		.791
PRI-8		.804
PRI-9		.893

Table 6 shows the final form of the determinants and items generated through qualitative and quantitative research, including replies from experts, professionals, and respondents.

Table 6

Key Determinants and Their Instrument

Financial Innovation Determinants	
Determinants	**Items of Instrument**
Item Codes	**Product Innovation**
PI-1	Financial innovation provides new energy for the development of new products.
PI-2	Financial innovation enables your organization to raise the quality of its products.
PI-3	Financial innovation enables your organization to enhance the competitiveness of the products.
PI-4	Financial innovation enables your organization to enhance the market share of the products.
PI-5	Financial innovation enables your organization to enhance the corporate image and prestige.
PI-8	Financial innovation enables you to develop new products with new components and materials which differing from current products.

Journal of Business Insight and Innovation
Volume 5 Issue 4, 2026
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https://insightfuljournals.com/

PI-9	Financial innovation enables you to decrease manufacturing costs in the components and materials of current products.
PI-10	Increasing manufacturing quality in components and materials of current products.
PI-11	Your organization often boosts profitability of the newly developed products.
	Process Innovation
PRI-1	Financial innovation often enables your organization to introduce new technologies to improve production or process procedures.
PRI-2	Financial innovation enables your organization often to produce new tools or equipment to boost production or work efficiency.
PRI-3	Financial innovation enables us to design our products faster than our competitors.
PRI-6	Financial innovation enables determining and eliminating non-value-adding activities in delivery-related processes.
PRI-7	Financial innovation enables decreasing variable costs and increasing delivery speed in delivery-related logistics processes.
PRI-8	Financial innovation enables increasing output quality in manufacturing processes, techniques, machinery, and software.
PRI-9	Financial innovation enables determining and eliminating non-value-adding activities in production processes.
PRI-10	Financial innovation enables increasing the use of the latest technology.
PRI-11	Financial innovation enables the profits of our organization mostly come from new products and services.

5. Conclusion

Small and medium-sized enterprises are crucial to economic development. Financial innovation is essential for contemporary small and medium-sized enterprises. This research examines the precursors and consequences of financial innovation in small and medium-sized enterprises in certain regions of Pakistan. This research examines the factors influencing financial innovation and confirms their validity. The market landscape evolves daily, necessitating a competitive approach (such financial innovation) to attain performance improvements. Financial innovation was developed as a potent strategic element.

The research used a mixed-method approach to assess and authenticate the financial innovation tool for small and medium-sized enterprises. The pertinent examination used both qualitative and quantitative information. NVivo was used to do theme analysis to examine factors and trends, which were subsequently extracted to identify possible drivers. Scholars conducted comprehensive interviews and focus groups prior to aggregating feedback from pertinent experts, professionals, and practitioners using a structured questionnaire in English. The qualitative analysis findings of the word tag cloud indicate that many words, like new products, processes, increasing, materials, technology, and competitiveness. The word tree analysis shows the two words, product and process. The tree map analysis shows that product innovation demonstrates quality & competitiveness, market and brand, radical innovation, and incremental value. Process innovation, efficiency & tech, agility, lean logistics, and revenue mix.

The qualitative findings show that financial innovation in SME's determine by two dimensions: product and process innovation. The quantitative findings of financial innovation show that the determinants are product innovation and process innovation. The instrument validity was verified by content validity analysis by eight professionals from SME's and Pakistan's top institutions with extensive work experience in the field. The experts reviewed 23 items, and they excluded 5 items from the total; after the CVT analysis, 18 items were available for further construct analysis. The construct analysis shows that the value of Cronbach's alpha is greater than the .70, which is considered good reliability. The exploratory factor analysis checks the adequacy of the data by using Bartlett's sphericity test. The significance value of the test is .000, which is considered acceptable for factor analysis (Hair et al., 2010).

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The study's conclusions rigorously analyze the interplay between financial innovation and research by investigating their association. The findings imply that the insights detailed in this research may serve individual SMEs and policymakers. Drawing on SMEs' own judgments, this research reveals that they must always take initiative in leveraging the resources supplied by the FI and adopt novel methodologies for their offerings and operations. Effectively using this potential for innovation will let SMEs play a pivotal role in improving performance. This study seeks to elucidate the influence of organizational dynamics on the efficacy of small and medium-sized enterprises. This analysis allows policymakers and the government to evaluate the demand for possibilities for SMEs in Pakistan.

6. Limitation and Future Directions

These results can help us identify future study recommendations. In the first place, the sample of this analysis is SMEs operating in Pakistan. Consequently, the first stage of study is concerned with the need to perform a variety of studies aimed at testing our findings in different countries. A cross-country investigation can strengthen our results to be generalized. The breadth of this study encompasses numerous domains. Conversely, progress can be made by augmenting the sample size. Future investigators may delve into the financial innovation determinants through a mixed-methods approach in qualitative interviews. Furthermore, subsequent research could examine these determinants concerning the performance of small and medium-sized enterprises (SMEs).

Authors' Contributions

All the authors have read and approved the final manuscript.

Ethics Statement

This study adhered to all ethical standards of research during the conducting of this study. We collected data from secondary sources, and no human participants were involved in the collection of data. Therefore, there is no conflict of interest of any human participant to this study.

Conflict of Interest Statement

The author/s declare that there is no conflict of interest regarding the publication of this article.

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Data Availability

The datasets generated and analysed during the current study are available from the corresponding author upon reasonable request. The authors are committed to transparency and will provide detailed methodological information and analysis protocols upon request.

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