Impact of frugal innovations on the social entrepreneurship of Multinational enterprises (MNEs) in developing countries

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ABSTRACT

Aims: The current research is conducted to analyze the impact of frugal innovation on the social entrepreneurship of MNEs in developing countries. The study also aims to identify the effect of economies of scale as the mediating factor between frugal innovation and MNEs.

Method/design: The study is based on a primary quantitative method in which the responses of 200 participants were collected through a survey questionnaire on a 5-point Likert scale.

Findings: Statistical analysis showed a high correlation between the affordability of frugal innovation and the dependent variable of social entrepreneurship of MNEs in developing countries. However, the quality of products has an insignificant impact on the social entrepreneurship of MNEs in developing countries. Moreover, research has found a strong relationship between the mediating factor of economies of scale and the relationship between affordability and social entrepreneurship of MNEs in developing countries.

Future implications: The current research would also help guide future researchers in conducting studies on other developing countries like Iran and Peru, and researchers can consider other independent variables of frugal innovation.

Keywords: Frugal innovation, MNE, social entrepreneurship, developing countries

INTRODUCTION

Frugal innovation is defined as new products that are low in cost, created with methods and designs that require less cost and target the specific main feature of the product (Hossain, 2018). After the introduction of frugal innovation, many sectors like manufacturing, automobiles, food, and

healthcare started working on this innovation. Frugal innovation is a flexible approach, not a new strategy of thinking about utilizing sustainable resources. The developed world has started using frugal innovation to decrease government spending (Prabhu, 2017). Experts call it the entrepreneur's mindset to make an innovative product using minimum resources.

A person that takes the challenge and has the potential to solve problems in the community is known as a social entrepreneur (Petrovskaya & Mirakyan, 2017). Social entrepreneurship is a company's venture to solve social issues and is willing to take the initiative for positive change in society (Saebi, Foss & Linder, 2019). Social entrepreneurship companies are mostly working for the betterment of society and are not focusing too much on making huge revenue.

Frugal innovation is beneficial in developing countries and underdeveloped countries. Developing and underdeveloped countries have less buying power, so the social entrepreneurship of multinational enterprises (MNEs) in these countries is being affected (Santos et al., 2020). Frugal innovation can potentially create a new market to support their business and developing countries' economies. According to Hossain (2021), there is another perspective on frugal innovation: it makes the product or service cheaper, affecting the quality of the product. Experts consider frugal innovation a shortcut and temporary solution to bigger problems. The research was conducted to understand the bigger picture of frugal innovation and its impact on the social entrepreneurship of MNEs in developing countries. Frugal innovation impacts on affordability and quality of products. The study also includes the effect of frugal innovation on the scale of economies and its relation to the social entrepreneurship of MNEs.

The aim and objective of the research are:

- To analyze the impact of frugal innovation on the social entrepreneurship of MNEs in developing countries.
- To identify the effect of economies of scale as the mediating factor between frugal innovation and MNEs.

LITERATURE REVIEW

Analysis of literature on social entrepreneurship indicates that social business within multinational enterprises fulfils a unique mission associated with the formation of shared customer value and corporate social responsibility (Porter and Kramer, 2011). Porter and Kramer (2011) explain shared customer value as an innovative strategy for product development, market satisfaction, and building productive and responsible businesses in the best interest of corporations and society. Corporations might apply shared value as a market tool to satisfy disadvantaged customer groups and offer them better quality products and services at lower prices (Spiess-Knafl et al., 2015). This, in turn, builds the social entrepreneurship of MNEs, especially in developing countries. According to Kotler et al. (2019), confronting social concerns and promoting social transformation includes adjusting the conventional marketing components according to the features of poor customer populations. Therefore, the 4Ps of the marketing mix, product, price, promotion, and place, have to be planned into consideration the customer needs, especially with reference to improving product quality and creating social impact (Kotler et al., 2019). Thus, improving product quality is an essentially significant strategy to develop social entrepreneurship within MNEs in emerging economies.

H1: The quality of products significantly impacts the social entrepreneurship of multinational enterprises in developing countries.

The large body of literature has little discussion on whether economies of scale have any significant mediating relationship between the quality of products in frugal innovation and social entrepreneurship of MNEs in developing countries. One research highlighted that low-end innovation might necessitate distinct competencies from normal innovation, and the characteristics that govern low-end innovation achievement may vary in significance across settings (Hossain, 2021). Nevertheless, scientific data on frugal innovation is still scarce, especially in modern industrial economies. On the other hand, determining how different frugal innovations relate to business models and sustainable growth constitutes a huge problem (Saebi, Foss & Linder, 2019). An issue that is sometimes forgotten is that frugal innovation should be considered an opportunity

for industrialized and developed economies to achieve sustainable progress. As a result, the globe is currently confronted with a revolutionary paradigm, wherein manufacturing techniques and corporate structures must change to minimize resource usage while simultaneously expanding recycling methods (Petrovskaya & Mirakyan, 2017). The role of economies of scale between the quality of products in frugal innovation and social entrepreneurship within MNEs of developing countries is yet to be explored; hence, the second hypothesis of this research is presented below:

H2: Economies of scale significantly and positively mediates the relationship between the quality of products of frugal innovation and social entrepreneurship of MNEs in developing countries.

The literature analyzed for the affordability factor affecting social entrepreneurship suggests that customers typically prefer affordability over the quality of the products. According to Singh (2012), in emerging economies in developing countries like India and Bangladesh, the customers mainly focus on the affordability of the products. Due to low to limited incomes, consumers are not concerned about the quality they receive products. Instead, they are more concerned about whether they can afford to purchase the product or not. Multinational enterprises in such developing countries are largely affected by this factor. This is because the corporations make decisions regarding their product pricing in consideration of the purchasing power of people.

Companies that offer products at reduced prices as compared to other brands automatically gain more customers. Goyal et al. (2016) state that the majority of the customers are at the base of the pyramid in developing countries. The study provides further evidence by suggesting that consumers who repeatedly experience uncertainty in job security, have low annual incomes, or are entirely unemployed with no consistent source of income, are more attracted to the affordability of a product or service as compared to its quality factor (Goyal et al., 2016). Therefore, multinational companies develop their social entrepreneurship by reducing the prices of necessary products. This not only helps them become social entrepreneurs but also improves their customer base, brand reputation, customer loyalty, and preference ratio in the market. Hence, reducing product prices to affordable margins enables multinational enterprises to make a social impact on the economy where they serve.

H3: The affordability factor has a substantial impact on the social entrepreneurship of multinational enterprises in developing economies.

Firms that sell items at lower prices than competitors do attract more clients immediately (Saebi, Foss & Linder, 2019). To support the prior notion, another research demonstrated that the preponderance of clients in emerging economies is at the bottom of the hierarchy (Santos et al., 2020). The aforementioned study adds to the findings by claiming that clients who are frequently concerned about job safety, possess low yearly salaries, or are completely jobless with no constant stream of income are more drawn to a brand's or service's affordability rather than its quality component. As a result, multinational corporations expand their social entrepreneurship by lowering the prices of essential goods. This not only assists them in becoming social entrepreneurs but also boosts their client base, brand image, client devotion, and marketplace preference percentage. As a consequence, lowering product costs to reasonable margins allows multinational corporations to have a positive social influence on the economies they represent (Kotler et al., 2019). Considering the above discussion, the final hypothesis that will be tested in this study is provided below:

H4: Economies of scale significantly and positively mediates the relationship between affordability and social entrepreneurship of MNEs in developing countries.
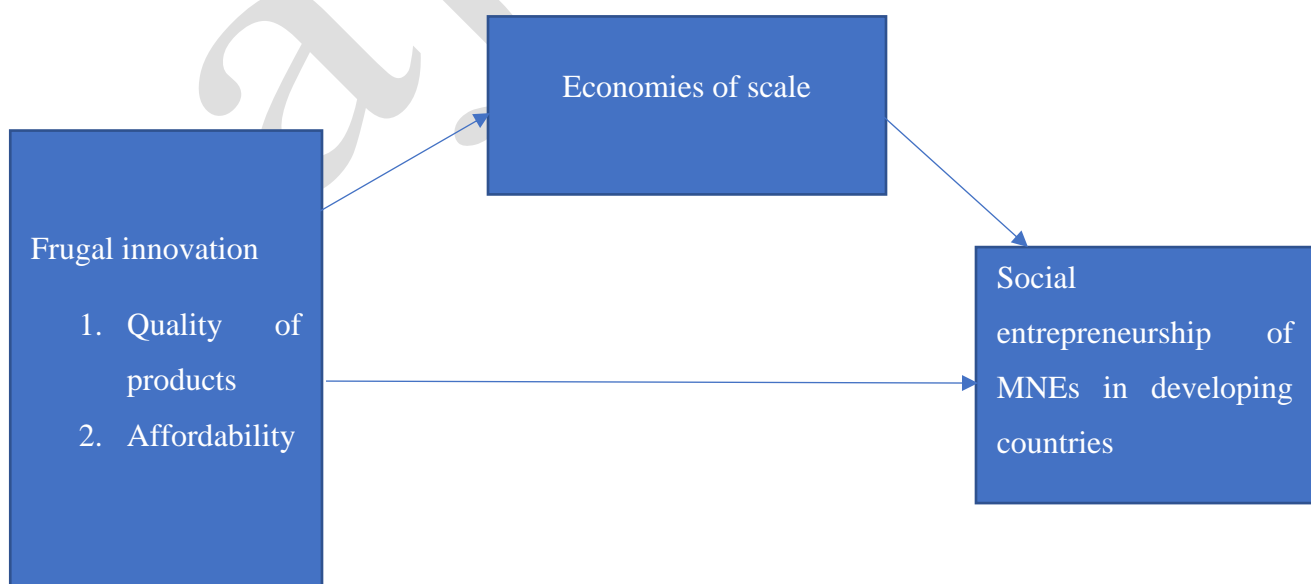
Independen

Figure 1: Concetpual Framework

Source: Author (2022)

METHOD

As defined by, Alharahsheh and Pius (2020), the aspect of research which presents a scientific procedure of making decisions for data collection and interpretation is referred to as research philosophy, categorized into interpretivism, positivism and pragmatism. The philosophy of interpretivism is used for the exploration of human-based opinions, whereas positivism presents facts and figures by empirical analysis. Thus, considering the purpose of the recent study, positivism was used as an approach to determining the results in an objective manner, demonstrating the factual based information on how the role of frugal innovation is vital for the social entrepreneurship of MNEs in developing countries. In addition, positivism was vital for examining the logical, rigour, and credible findings highlighting the responses from a broad population.

Another major aspect of the method is the research approach which is classified into inductive and deductive methods of reasoning. The inductive approach is related to making explicit conclusions observed from specific assumptions, whereas general laws and theories are tested using deductive reasoning to achieve precise findings (Armat et al., 2018). Thus, the deductive approach was effective in the recent study as it allowed obtaining the relationship between causal variables of the study, narrowing down the hypothesis formulation as well as making informed conclusions with credibility and validity. The results were yielded using the deductive approach to determine the link between the factors affecting frugal innovation and social entrepreneurship in economies of scale.

Research design or method is classified into three main categories, including qualitative, quantitative and mixed-methods research. Qualitative research is related to the collection of data in textual format; however, data collection using numbers is carried out through the approach of quantitative research (Strijker, Bosworth and Bouter, 2020). Therefore, the use of the quantitative method was vital for the recent research to explore the findings derived from empirical data and reveal results with higher generalisability and reliability. The objective answers interpreted with quantitative research collected from a large sample size reveal results with better contextual interpretations described in the forms of tables and figures.

Data collection methods are mainly characterized into primary and secondary methods; that the collection of first-hand data using the interviews or surveys is referred to as primary data; however secondary data is gathered using external sources such as newspaper articles, journal articles, books, etc. (Johnston, 2017). In this research, primary data was gathered using surveys that purpose was to gather a wide range of data to analyze the associations between independent and dependent variables of the study. For this purpose, 200 new social entrepreneurs from India and Bangladesh were selected using convenience sampling. The survey questionnaires were distributed online after taking informed consent from all the respondents to ensure the ethical considerations and meet the requirements of privacy, confidentiality and integrity.

The tool of SPSS was used for performing data analysis and presented findings in an easy manner. Data analysis was carried out using multiple statistical techniques, including descriptive, correlation, and mediation (regression) analysis, to determine the impact of independent variables on the social entrepreneurship of MNEs in developing countries in economies of scale.

RESULTS

Descriptive statistical analysis

Descriptive analysis is conducted to gauge the variations and other patterns within the dataset. In the current examination, the following table shows that the statistical mean of the responses on four variables was around 1.4, which corresponds to the agreed option on the Likert scale. It means that most participants agreed with the statements with minimal standard deviation in the overall distribution.

Table 1. Descriptive analysis

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
							Std. Error		Std. Error
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Error	Statistic	Error
Quality of Products	200	0.25	3.5	1.465	0.51243	0.672	0.172	1.401	0.342
Affordability	200	0	3.75	1.4575	0.86097	0.356	0.172	-0.25	0.342
Economies of Scale	200	0	3.5	1.4175	1.02852	0.332	0.172	-1.043	0.342
Social entrepreneurship of MNEs in developing countries	200	0	4	1.4125	0.97801	0.505	0.172	-0.55	0.342
Valid N (listwise)	200								

Correlation analysis

Correlation analysis is regarded as an integral aspect of variable-involved investigations in the field of statistical investigation. The scientist can use correlation analysis to determine the relationship between the parameters under investigation. It has been argued by Cleophas & Zwinderman (2018) that correlation analysis aids in the refinement of research findings by removing interference from the information (any elements that are not closely related to the factors under evaluation), hence improving the ultimate outputs. The Pearson Coefficient, which is commonly abbreviated as "r," is used to determine the relational relationship. This coefficient has a span of values from -1 to +1 (Liu et al., 2017).

The negative value of Pearson correlation denotes an inverse relationship between the parameters, i.e., an increase in one variable is accompanied by a decrease in the other. On the other hand, a positive correlation indicates a direct relationship (Liu et al., 2017). Furthermore, the Pearson correlation has great relevance since it shows the intensity of the relationship. It is important to remember that a correlation value in the interval of 0 - 0.3 indicates a weak relationship among the parameters (Cleophas & Zwinderman, 2018). The moderate relationship is represented by scores spanning from 0.4 to 0.6, whereas a high connection is represented by values extending from 0.7 to 1.0. The results of the correlation analysis are shown in the table below:

Table 2. Correlations analysis

		Quality of Products	Affordability	Economies of Scale	Social entrepreneurship of MNEs in developing countries
Quality of Products	Pearson Correlation	1	.654**	.486**	.514**
	Sig. (2-tailed)		0	0	0
	N	200	200	200	200
Affordability	Pearson Correlation	.654**	1	.869**	.912**

	Sig. (2-tailed)	0		0	0
	N	200	200	200	200
Economies of Scale	Pearson Correlation	.486**	.869**	1	.976**
	Sig. (2-tailed)	0	0		0
	N	200	200	200	200
Social entrepreneurship of MNEs in developing countries	Pearson Correlation	.514**	.912**	.976**	1
	Sig. (2-tailed)	0	0	0	
	N	200	200	200	200

** Correlation is significant

at the 0.01 level (2-tailed).

The connection between the quality of products and social entrepreneurship of MNEs in Developing Countries was discovered to be 0.514. As previously stated, if the correlation coefficients are between 0.3 and 0.7, the relationship between the variables is moderate. As a result, it was discovered that there is a positive and moderate relationship between product quality and MNE social entrepreneurship in developing nations. The association between affordability and social entrepreneurship of MNEs was calculated as 0.654. As previously stated, if the correlation coefficients are between 0.3 and 0.7, the relationship between the variables is moderate. As a result, it was discovered that affordability and MNE social entrepreneurship had a favourable and moderate relationship. The correlation between economies of scale and two independent variables (Quality of Goods and Affordability) was calculated as .486 and .869, respectively. This indicates that the mediator variable has a poor relationship with product quality but a significant relationship with affordability. The correlation value between economies of scale and the dependent variable

(social entrepreneurship of MNEs in developing countries) was calculated to be 0.976. It should be emphasized that there is a significant link between these two factors.

Regression analysis

Regression analysis was finally conducted to gauge the causal relationship between the variables. In the first step, mediation analysis was done by taking the Quality of products as the sole independent variable with the outcome variable of Economies of scale.

Model: 4

   Y: Socentre

   X: Qualprod

   M: Econscal

Sample size: 200

OUTCOME VARIABLE: Econscal

The following model summary shows that the model is low in predictive capacity for the variable with a low R-square value.

Table 3. Summary of the model

R	R-sq	MSE	F	df1	df2	p
0.4855	0.2357	0.8126	61.0701	1.000	198.000	0.000

The following model analysis also explicates the Quality of product is insignificantly causal with Economies of Scale.

Table 4. Model analysis

	coeff	se	t	p	LLCI	ULCI
constant	-0.0101	0.1935	-0.0524	0.9582	-0.3917	0.3714

Qualprod	0.9745	0.1247	7.8147	0.000	0.7286	1.2204

Standardized coefficients

Variable	Coefficient
Qualprod	0.4855

OUTCOME VARIABLE: Socentre

With respect to social entrepreneurship, the following table shows that with a high R-square value, the model is highly predictive of the Quality of product and social entrepreneurship.

Table 5. Summary of the model

R	R-sq	MSE	F	df1	df2	p
0.9774	0.9553	0.0432	2103.082	2.000	197.000	0.000

However, as per the analysis, there is a low predictive capacity between the Quality of products and Economies of scale.

Table 6. Model analysis

	coeff	se	t	p	LLCI	ULCI
Constant	-0.0155	0.0446	-0.3474	0.7287	-0.1035	0.0725
Qualprod	0.0999	0.0329	3.0355	0.0027	0.035	0.1647
Econscal	0.9042	0.0164	55.162	0.000	0.8719	0.9365

Table 7. Standardized coefficients

Variable	Coefficient
Qualprod	0.0523
Econscal	0.9509

TOTAL EFFECT MODEL

OUTCOME VARIABLE: Socentre

Table 8. Summary of the model

R	R-sq	MSE	F	df1	df2	p
0.514	0.2642	0.7073	71.0949	1.000	198.000	0.000

Table 9. Model analysis

	coeff	se	t	p	LLCI	ULCI
constant	-0.0247	0.1805	-0.1367	0.8914	-0.3807	0.3313
Qualprod	0.981	0.1163	8.4318	0.000	0.7516	1.2104

Table 10. Standardized coefficients

Variable	Coefficient
Qualprod	0.514

The following table of the total, direct, and indirect effects explicate an insignificant causal relationship between the Quality of products and social entrepreneurship.

Table 11. Total impact of X on Y

Effect	se	t	p	LLCI	ULCI	c_cs
0.981	0.1163	8.4318	0.000	0.7516	1.2104	0.514

Table 12. Direct impact of X on Y

Effect	se	t	p	LLCI	ULCI	c'_cs
0.0999	0.0329	3.0355	0.0027	0.035	0.1647	0.0523

Table 13. Indirect effect(s) of X on Y:

	Effect	BootSE	BootLLCI	BootULCI
Econscal	0.8811	0.1028	0.6725	1.0776

Table 14. Completely standardized indirect effect(s) of X on Y:

	Effect	BootSE	BootLLCI	BootULCI
Econscal	0.4617	0.0524	0.3517	0.5552

Further, Affordability was taken as the sole independent variable.

Model: 4

    Y: Socentre

    X: Afford

    M: Econscal

OUTCOME VARIABLE: Econscal

With the outcome variable of Economies of scale, the following model summary shows the high predictive ability of the model under study.

Table 15. Summary of the model

R	R-sq	MSE	F	df1	df2	p
0.8692	0.7555	0.2599	611.9384	1.000	198.000	0.000

Table 16. Model analysis

	coeff	se	t	p	LLCI	ULCI
constant	-0.0959	0.071	-1.3508	0.1783	-0.236	0.0441
Afford	1.0384	0.042	24.7374	0.000	0.9556	1.1211

Table 17. Standardized coefficients

Variable	Coefficient
Afford	0.8692

OUTCOME VARIABLE: Socentre

With the outcome variable of social entrepreneurship also, the model shows high predictive ability as the R-square value is high.

Table 18. Summary of the model

R	R-sq	MSE	F	df1	df2	p
0.9846	0.9694	0.0296	3120.762	2.000	197.000	0.000

Table 19. Model analysis

	coeff	se	t	p	LLCI	ULCI
constant	-0.0282	0.0241	-1.1713	0.2429	-0.0756	0.0193
Afford	0.2927	0.0286	10.2243	0.000	-0.2363	0.3492
Econscal	0.7153	0.024	29.8461	0.000	0.6681	0.7626

Table 20. Standardized coefficients

Variable	Coefficient
Afford	0.2577

Econscal	0.7523

OUTCOME VARIABLE: Socentre

Table 21. Model Summary

R	R-sq	MSE	F	df1	df2	p
0.9116	0.831	0.1624	973.9404	1.000	198.000	0.000

The following model analysis indicates that Affordability has an insignificant contribution as the sole variable to social entrepreneurship.

Table 22. Model analysis

	coeff	se	t	p	LLCI	ULCI
constant	-0.0968	0.0561	-1.7244	0.0862	-0.2075	0.0139
Afford	1.0355	0.0332	31.208	0.000	0.9701	1.101

Table 23. Standardized coefficients

Variable	Coefficient
Afford	0.9116

In the following tables of total, direct, and indirect effects, it can be seeming that the total effect is high, albeit affordability does not have a significant direct effect on social entrepreneurship.

Table 24. Total impact of X on Y

Effect	se	t	p	LLCI	ULCI	c_cs
1.0355	0.0332	31.208	0.000	0.9701	1.101	0.9116

Table 25. Direct effect of X on Y

Effect	se	t	p	LLCI	ULCI	c'_cs
0.2927	0.0286	10.2243	0.000	0.2363	0.3492	0.2577

The following table indicates that with a zero value between LLCI and ULCI, economies of scale significantly mediate the relationship between affordability and economies of scale.

Table 26. Indirect effect(s) of X on Y:

	Effect	BootSE	BootLLCI	BootULCI
Econscal	0.7428	0.0366	-0.6719	0.8166

Table 27. Completely standardized indirect effect(s) of X on Y:

	Effect	BootSE	BootLLCI	BootULCI
Econscal	0.6539	0.0199	0.6167	0.6945

DISCUSSION

The current research was conducted with an aim to determine the impact of frugal innovation on the social entrepreneurship of MNEs in developing countries. It was observed that frugal innovation is promising in environments which are known as resource-scarce for better emphasis on the quality of products (Porter and Kramer, 2011). Additionally, the quality of frugal products is based on the uplifting quality of life and the aesthetic aspects, and the use of efficient production techniques also creates value for the quality of products. Consequently, the eco-friendly aspects, easy-to-use materials and meeting consumer enhance the quality of products via frugal innovation; however, as presented in the study by Kotler et al. (2019), frugal innovation uplift sustainable development with reduced costs and affordable options. In addition, technological advancements are utilized to create a higher return on investments assuring affordable product development using frugal innovation. The research also demonstrated a strong correlation between affordable pricing

in low-income countries with supporting low-cost frugal innovations affordable by new entrepreneurs.

Furthermore, the effect of economies of scale as the mediating factor between frugal innovation and MNEs was also observed in the current study. Goyal et al. (2016) demonstrated in their research that MNEs occasionally view home-based product creation as a realistic strategy for satisfying the demands of low-income clients utilizing frugal innovation due to the lack of transferrable expertise in emerging nations. Singh (2012) asserts that consumers prioritize product affordability in developing nations with expanding economies like Bangladesh and India. Due to their poor or limited means, customers are less worried about the quality of the things they purchase and more concerned about their ability to pay for them. This aspect has a significant impact on multinational firms in these emerging nations. . According to the literary findings by Spiess-Knafl et al. (2015), the entrepreneurs focus on sufficient quality at lower costs of manufacturing using renewable materials assuring affordability in frugal innovation.

Notwithstanding, since entrepreneurs serve underprivileged clients and encourage sustainability, the frugal innovations that start at the grassroots level in emerging economies have a big potential to change society (Hossain, 2021). Thus, the recent study also concluded that to address the needs of the neglected BoP people in emerging economies like India. Thus, frugal innovation arises in the environment of resource constraint and institutional vacuum as correlation analysis showed a strong correlation of economies of scale with social entrepreneurship. Nonetheless, growth arguably has increased the regional, functional, and industrial diversity and fragmentation of innovation in economies of scale (Hossain, Simula & Halme, 2016). The findings from regression analysis revealed that the impact of quality of products via frugal innovation is moderate but significant on the social entrepreneurship of MNEs in developing countries. It also showed that the impact of affordability of products via frugal innovation is insignificant to the social entrepreneurship of MNEs in economies of scale.

S. No	The hypothesis was developed and tested	Status of the hypothesis

1	The quality of products has a significant impact on the social entrepreneurship of multinational enterprises in developing countries.	Rejected
2	Economies of scale significantly and positively mediate the relationship between the quality of products of frugal innovation and the social entrepreneurship of MNEs in developing countries.	Accepted
3.	Affordability has a significant impact on the social entrepreneurship of MNEs in developing countries.	Accepted
4	Economies of scale significantly and positively mediate the relationship between affordability and social entrepreneurship of MNEs in developing countries.	Accepted

Table 28: Hypothesis Summary

CONCLUSION

The purpose of this study was to investigate the influence of frugal innovation on MNEs' social entrepreneurship in developing nations. The findings revealed that frugal innovation promotes sustainable development by lowering costs and providing more inexpensive solutions. Furthermore, technical breakthroughs are used to provide larger returns on investments, ensuring that product development is inexpensive through frugal innovation. The studies also revealed a substantial link between inexpensive pricing in low-income nations and new entrepreneurs' ability to promote low-cost frugal inventions.

The current research concentrated on a few aspects of frugal innovations in social entrepreneurship. A future study might close the gap between the importance of economies of scale and their influence on the affordability of social entrepreneurship in underdeveloped countries. Furthermore, the current research will aid future researchers in doing a case-based investigation on social entrepreneurship in undeveloped countries such as Iran and Peru, and scientists will be able to explore additional frugal innovation independent determinants.

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