UCP
Journal of Business
Perspectives

**Financial Literacy, Behavioral biases and Risk Perception:
Evidence from the London Stock Exchange**

Syed Jawad Ali Kazmi, Faisal Siddiqui, Sikandar KhaliIshaq,
Muhammad Irfan, Murtaza Ahmed

Systematic Literature Review on Capital Budgeting Techniques

Wasim Abbas Shaheen, Tayebba Saleem, Noman Shafi, Usman
Ullah

**Ripple Reaction towards Corporate Social Responsibility and
Profitability: A Sustainable Model for Emerging Economy**

Hina Najam

**Comparative study of Customer Perceived Value in Pre and Post
Purchase Stage: A Case of University Students**

Usman Ehsan

**Blockchain-Enabled Supply Chain Financing, Firm Performance
and Financial Capital Availability: A Tri-Variate Interaction
Analysis for Small and Medium Family Enterprises**

Elijah Asante Boakye, Bright Nana Kwame Ahia, Millicent Adu-Damoah

-University of Central Punjab

UCP Journal of Business Perspectives (UCP-JBP)

Volume 2
Issue 2

Faculty of Management Sciences
University of Central Punjab, Lahore, Pakistan

• **Dr. Deepanraj Balakrishnan**
Area: Engineering Management
Department of Mechanical Engineering,
Prince Mohammad Bin Fahd University, Al Khobar, 31952, Saudi Arabia.

• **Dr. Fiza Qureshi**
Area: Finance
University of Southampton. Malaysia, 79200.

• **Dr.Ahmed Samour**
Area: Finance
College of Commerce and Business Administration
Dhofar University, Salalah, Sultanate of Oman.

• **Prof. Samira Ben Belgacem**
Area: Economics
Princes Nourah Binte Abdul Rehman University,
Riyad. Saudi Arabia

• **Prof. Awais Gulzar**
Area: Finance
Waikato Management School, University of Waikato
New Zealand.

• **Dr. Shuja Iqbal**
Area: Management
School of Management, Jiangsu University,
Zhenjiang, China.

National Members

- **Dr. Imran Shafique**
  Area: HRM & OB
  Associate Professor
  COMSATS University Islamabad, Pakistan

- **Dr. Munazza Saeed**
  Area: Marketing
  Assistant Professor
  FAST School of Management
  National University of Computer & Emerging Sciences, Pakistan

- **Dr. Muhammad Zia Aslam**
  Area: Management and Entrepreneurial Physiology
  Assistant Professor
  Faculty of Business and Management Sciences
  Superior University, Pakistan

- **Dr. Hammad Raza**
  Area: Finance
  Assistant Professor
  Laylpur Business School,
  Government College University, Faisalabad, Pakistan

- **Prof. Dr. Rizwana Bashir**
  Area: Management
  Associate Dean
  Lahore Garrison University, Lahore, Pakistan.

- **Dr. Rab Nawaz Lodhi**
  Area: Management
  Associate Professor
  Punjab University, Lahore, Pakistan

- **Prof Dr Saman Attiq**
  Area: Marketing
  NUST Business School
  Natural University of Sciences and Technology, Pakistan

Editorial

With great enthusiasm, we present the Volume II Issue II of the UCP Journal of Business Perspectives. This issue brings together a collection of empirical and theoretical studies that explore the evolving landscape of business practices, financial decision-making, corporate responsibility, and the integration of emerging technologies for innovation and organizational performance. The research featured in this issue provides critical insights into the challenges and opportunities businesses face in an increasingly complex global economy. A common thread running through this issue is the intersection of financial acumen and strategic adaptability. Financial literacy is crucial in mitigating behavioral biases and fostering informed investment decisions. Similarly, capital budgeting techniques are evolving to incorporate sustainability considerations, ensuring investment decisions align with long-term financial and environmental goals. Corporate social responsibility (CSR) enhances firm profitability and stakeholder trust, especially amid economic uncertainties. Customer perception and value creation are increasingly crucial, especially in service industries like higher education, where institutions must strategically manage student experiences. Meanwhile, technological advancements, particularly blockchain-enabled supply chain financing, are reshaping financial capital accessibility and firm performance, providing small and medium enterprises with innovative solutions to enhance operational efficiency and competitiveness. Collectively, these studies underscore the need for businesses to adopt a multidimensional approach to strategic decision-making that integrates financial literacy, sustainability, stakeholder engagement, and technological innovation. As organizations navigate an era of rapid transformation, the insights presented in this issue serve as a foundation for future research and practical applications in finance, marketing, corporate responsibility, and technology management. We thank the authors for their valuable contributions, the reviewers for their insightful feedback, and the editorial team for their dedication to maintaining high academic standards. We encourage scholars and practitioners to build upon these insights, fostering sustainable growth and innovation in an ever-evolving business landscape.

Dr. Muhammad Athar Siddiqui
Editor-in-Chief
UCP Journal of Business Perspectives

Disclaimer

The views expressed in these articles are solely those of the respective authors and do not necessarily reflect the views of the Editorial Board or the management and staff of the University of Central Punjab. While every effort has been made to ensure the accuracy of the information provided by the authors, the Editorial Board does not accept any responsibility for any errors or omissions or breach of copyrights, if any.

Table of Contents

Financial Literacy, Behavioral biases and Risk Perception: Evidence from the London Stock Exchange

Syed Jawad Ali Kazmi[1*], Faisal Siddiqui[2], Muhammad Irfan[1], Sikandar Khalil Ishaq[1], Murtaza Ahmed[3]

ABSTRACT

The study's primary objective is to analyze the impact of Financial Literacy on the behavioral biases of individual investors mediated by risk perception evidence from the London Stock Exchange. Utilizing data gathered from 458 LSE investors, the study validates that FL dramatically lowers BB by raising RP. The results show that financially knowledgeable investors are more suited to evaluate risks precisely, thereby reducing prejudices such as loss aversion, overconfidence, and anchoring. RP converts financial information into more logical investing choices as a vital intermediary. Emphasizing the need for focused financial education programs to improve investor decision-making, the study helps behavioral finance by offering empirical data from one of the most powerful financial markets worldwide. Although the cross-sectional character of the study restricts causal inference, the findings provide insightful analysis for legislators, financial institutions, and teachers trying to create more stable and efficient markets by raising financial literacy.

Keywords: Financial Literacy; Behavioral biases; Risk perception; London Stock Exchange

1. INTRODUCTION

The intricacy of the factors influencing investors' decisions has piqued the curiosity of many in the area of behavioral finance Almansour et al. (2023). Good financial management depends on wise investment decisions, but because of things like market dynamics, risk assessment, and regulatory frameworks, they are also somewhat difficult. This intricacy explains why it is so crucial to grasp the special contribution of the London Stock Exchange (LSE) in financial decision analysis. The

[1] Riphah International University, Islamabad
[2] Air University School of Management Air University, Islamabad.
[3] Foundation University, Islamabad
[*] Corresponding author's E-mail: jawad.kazmi@riphah.edu.pk

London Stock Exchange has expanded to become one of the most well-known and old financial markets worldwide since its founding in 1801. Having grown over the years, it is now a central center for bonds, derivatives, equities, and ETFs exchanged under trade-through policies. The London Stock Exchange distinguishes itself from other stock markets in part by including both conventional wisdom and fresh, creative ideas. Represented in numerous worldwide indices, the LSE is a major player in the complex network of world financial markets. Before making big financial commitments, the London Stock Exchange is the only better location to finish your research. The LSE's influence on the world financial system adds even greater relevance to this institution. Given its global market, it is a consistent indication of more general trends, difficulties, and prospects. Familiarizing oneself with the London Stock Exchange as a case study in investment decision-making will help investors, analysts, and legislators in the dynamic and linked financial markets of today.

Investment decisions are heavily influenced by behavioral biases (BB), which may deviate from reasonable financial conduct. These prejudices include overconfidence, anchoring, herd behavior, loss aversion, and recency bias, which could result in less-than-ideal investing decisions (Barberis & Thaler, 2003; Kahneman & Tversky, 2013). Making wise financial selections depends on an awareness of and respect for these prejudices. Reducing these prejudices mostly depends on financial literacy (FL), that is, the capacity to grasp and apply several financial skills Lusardi and Mitchell (2007). The value of FL has increased as financial products get more complicated as it will let investors negotiate the complexity of financial markets Schwarcz (2009).

Along with improving one's capacity to make wise financial decisions, FL greatly influences risk perspective. Higher financial literacy investors see hazards more precisely, which influences their investment plans Van Rooij et al. (2011). This awareness of risk perception (RP) is essential in determining investor behavior and hence lowering irrational decision-making motivated by behavioral prejudices Ritter (2003). FL enables investors to properly balance possible risks and benefits by means of a more precise evaluation of hazards, therefore guiding more logical investment decisions.

With its lengthy legacy and a major influence on world financial markets, the LSE offers a great case study to investigate these ideas. This study intends to investigate if FL influences personal investors' prejudices and ascertain whether risk perception

moderates the link between FL and individual investor behavior. Based on LSE empirical data, the European market takes the stage. By filling in knowledge on the interaction among FL, BB, and RP in the framework of a significant financial market, this study makes significant addition to the body of knowledge. For financial institutions, legislators, and investors it will offer insightful analysis to help to promote market stability and enhance investment decisions.

2. THEORY AND LITERATURE:

2.1 Behavioral Finance Theory

Behavioral finance emphasizes the need of risk perception in investment decisions by means of which risk perception moderates the link between FL and BB. A more accurate risk assessment resulting from better financial knowledge can help to lower prejudices in investment behavior. Emphasizing their connection in decision-making, Sitkin and Pablo's (1992) Comprehensive Model of Risk Behavior combines risk propensity and risk perception in supporting this point of view. By investigating how FL affects these elements and mediates their impact on BB, the present study can extend on this model. Furthermore, Leković (2019) Behavioral Asset Pricing Model (BAPM) combines BB into conventional asset pricing models, therefore offering a structure to grasp how biases influence market results and investment decisions. Grounding the study in Behavioral Finance Theory helps the research to properly address how FL and RP affect the behavioral biases of individual investors, therefore providing insightful analysis of the decision-making procedures inside the LSE.

Figure 1: *Theoretical Framework*

2.2 Financial Literacy and Behavioral Biases of Individual Investors

Individual investors' investing decisions are highly influenced by their behavioral prejudices, which may deviate from logical conduct as expected by conventional financial theory. Among these prejudices include overconfidence, in which investors overestimate their expertise and predictive capacity; anchoring, in which people base mostly on first information when making judgments; and herd behavior, in which

investors follow the activities of a greater group instead of their analysis. Other typical biases are recency bias, in which recent events disproportionately affect investment decisions, and loss aversion, in which the fear of losses results in poor decision-making (Barberis & Thaler, 2003; Kahneman & Tversky, 2013).

By improving investors' knowledge and handling of financial goods and decisions, FL greatly helps to reduce these BB. Personal financial management, budgeting, and investing are among the several financial skills that one may grasp and apply with FL. Lusardi and Mitchell (2007) underlined the growing relevance of FL because of the increasing complexity of financial products and the crucial family financial decisions taken. Calvet et al. (2007) observed that the introduction of creative financial products has motivated individual investors to engage more actively in financial markets, therefore requiring a higher degree of FL to properly negotiate these complicated instruments.

Researchers such as Lusardi and Mitchell (2014) and Alan et al. (2017) have underlined that financial literacy covers a wide spectrum of financial services, administration of financial investments, and an awareness of financial terminologies, therefore decreasing asymmetrical information problems. By improving their capacity to understand and evaluate financial risks more precisely, FL directly influences the behavioral biases of individual investors by so lowering the effect of cognitive biases including representativeness, overconfidence, anchoring, and availability bias on their investment decisions. This suggests the following theory.

H₁: Financial literacy is significantly related to the behavioral biases of individual investors.

2.3 Mediating Role of Risk Perception

Behavioral finance has produced a lot of studies on the link between one's risk preferences and actual risk-taking behavior. Sitkin and Pablo (1992) offered a thorough theoretical framework to help explain the differences in risky behavior and choice. They contended that clusters of events affect decision-makers, a component sometimes disregarded in studies on decision-making that results in erroneous findings on the motivation of dangerous action. The three personal factors most significantly correlated with risk-taking, according to Sitkin and Pablo (1992), are risk inclination, risk perception, and risk propensity.

Sitkin and Pablo (1992) define risk propensity as the disposition to take risks; risk perception is the subjective assessment of a danger's degree and likelihood. Risk

preference captures a person's inclination toward taking chances. These elements interact subtly to affect decision-making. People with high-risk propensity and low-risk perception, for example, may participate in dangerous conduct whereas those with high-risk perception may avoid risk even if they have a high-risk propensity. Sitkin and Weingart (1995) underlined in their empirical validation of the model the mediating functions of risk attitude and risk propensity. Their results confirm the theory that these elements are very important for risk-taking behavior, but they also underlined the necessity of more thorough validation of these links by more extensive empirical study with bigger and more varied samples. While Sitkin and Pablo's (1992) emphasis on organizational contexts contrasts with this study's (similar) concentration on risk behavior in family financial decision-making.

Managing and comprehending risk depends critically on FL. Personal financial management, budgeting, and investing are among the several financial skills that one must be able to grasp and use (Lusardi & Mitchell, 2007). It helps people to make wise decisions and better evaluate the dangers connected to financial goods. Research by Calvet et al. (2007) and Lusardi and Mitchell (2014) underline the growing relevance of FL in the framework of ever-complicated financial markets. Improved risk assessment and, thus, more logical financial conduct follow from higher FL. There is clear evidence linking RP to FL. Those who are financially educated are more suited to assess the risks connected to various investment choices, thereby resulting in more accurate risk perception (Van Rooij et al., 2011). This knowledge helps to moderate excessive risk-taking behavior resulting from misunderstood risk levels, either too aggressive or too cautious. Therefore, FL is rather important in determining risk attitude and, hence, investing behavior.

Financial conduct is much influenced by RP itself. It affects a person's decision-making process by means of their evaluation of the possibility for loss in any given circumstances (Ritter, 2003). More reasonable and well-considered investment decisions follow from accurate risk perception allowing investors to more effectively weigh possible risks and benefits. Misperceptions of risk can cause behavioral biases like overconfidence and loss aversion, which greatly influences financial decisions (Kahneman & Tversky, 2013). By arming investors with the knowledge and tools required to better grasp and analyze the risks connected with different investment alternatives, thereby enabling more accurate and informed evaluations of possible financial outcomes and hence impacts risk perception. Thus, the following hypothesis is proposed.

H_2: Financial literacy is significantly negatively related to risk perception.

The interaction of RP and BB clarifies even more the difficulties of financial decision-making. BB include overconfidence, anchoring, herd behavior, and loss aversion can alter RP, therefore affecting investing decisions (Barberis & Thaler, 2003). By means of a better knowledge of financial ideas and risk management strategies, FL helps to reduce these prejudices by so promoting more logical investing behavior (Waweru et al., 2014). FL has been shown in several research to influence household financial decisions. Higher FL, for example, has been demonstrated by Bernheim et al. (2001), Lusardi and Mitchell (2007), and Disney and Gathergood (2013) to provide improved financial results and lower sensitivity to cognitive biases. More thorough data is still needed, though, to properly grasp the interactions between financial literacy, education, and financial behavior (Hung et al., 2009).

Given China's expanding financial sector and varied investment possibilities, FL is a vital topic of research in international settings (Liao et al., 2017; Niu et al., 2020). Studies conducted in several cultural and economic contexts such as those by Abreu and Mendes (2010) in Portugal, Almenberg, and Widmark (2011) in Sweden offer insightful analysis of how FL shapes financial behavior across many markets. By influencing how investor's view and react to possible hazards, RP develops behavioral prejudices that affect their decision-making process and result in biases including overconfidence or loss aversion, therefore impacting their investing behavior. This suggests the following theory.

H3: Risk perception is significantly positively associated with behavioral biases of individual investors.

Between FL and BB, RP is a vital mediator that shapes people's processing and acting upon financial information. More informed decision-making results from FL tools for investors to correctly recognize and assess financial risks (Lusardi & Mitchell, 2007). Still, this information is turned into conduct via risk perception. Higher FL investors are usually better at evaluating risks, which can either help to reduce or aggravate BB (Van Rooij et al., 2011). Accurate RP, for example, can moderate overconfidence and result in more measured and balanced investment plans (Kahneman & Tversky, 2013). On the other hand, even well-informed investors might be prone to prejudices like loss aversion or anchoring if RP distorted or false (Barberis & Thaler, 2003). Therefore, RP impacts how these tools are used in practice, therefore influencing the degree and kind of BB noticed in investment decisions even as FL offers the skills for improved financial management. RP

mediates the link between FL and BB in individual investors as better financial literacy increases the accuracy of risk assessment, which in turn affects the degree of BB effect on investing decisions. Thus, the following hypothesis is proposed.

H_4: The relation between the financial literacy and behavioral biases of individual investors is mediated by risk perception.

3. METHODOLOGY

3.1. Research Design

With an eye on RP as a mediator, this paper uses a quantitative research approach to investigate how FL affects the BB of individual investors. Data is gathered using a cross-sectional survey approach, which lets participants' snapshot information be gathered at one single moment. With hypotheses developed grounded on current theories and actual data, the deductive approach will direct the investigation. SPSS 21 is used for statistical analysis looking at the links between BB, RP, and FL.

3.2. Data Collection and Analysis

Mostly from original sources, data is gathered by means of a standardized questionnaire sent to individual investors LSE trades on. The sample was guaranteed to be representative of the target population by use of a convenient probability sampling technique. Likert scale items covering 1 (Strongly Disagree) to 5 (Strongly Agree) abound on the survey. Respondents choose answers that most accurately capture their own ideas and experiences. The researcher stays away from influencing answers during data collecting to reduce bias. 720 replies in all were requested, of which 458 were of use.

3.3. Measure of Variables

Every measuring instrument utilized in this research originates from already-existing, validated scales with minor changes to make them relevant to the present study. Using five items scored on a Likert scale from 1 (very poor knowledge) to 5 (very high knowledge), Selim and Aydemir (2014) created a FL measure.

A five-point Likert scale adapted from Ghaffar & Sharif (2016) examined RP. BB including representativeness, overconfidence, anchoring, and availability were evaluated using the Kimeu et al. (2016) scale. There are 25 items on the measure, scored on a Likert scale with choices ranging from 1 (strongly disagree) to 5 (strongly agree).

4. DATA ANALYSIS AND RESULTS

Table 1: *Descriptive Statistics*

Variables	N	Minimum	Maximum	Mean	Std. Deviation
FL	458	1.00	3.41	2.1534	.92262
RP	458	2.84	4.84	3.7731	.63966
BB	458	2.73	4.05	3.3498	.39957

Table 2 *One Way ANOVA*

Demographics	RP		BB	
	F-Statistics	P Value	F-Statistics	P Value
Gender	4.699	0.32	0.302	.585
Age	11.430	0.0000	54.576	0.0000
Qualification	26.472	0.0000	69.567	0.0000
Job Experience	12.301	0.0000	58.250	0.0000
Income	11.277	0.0000	8.128	0.0000

Table 3: *Reliability Statistics*

Items	Cronbach's Alpha
FL	.903
RP	.794
BB	.812

Consolidated in Table 4.4, the reliability analysis shows the consistency of the measuring scales applied in this investigation. For FL, RP, and BB of Individual Investors the Cronbach's Alpha values are 0.903, 0.794, and 0.812, respectively. These results show great internal consistency and dependability of the scales as they exceed the generally agreed standard of 0.70 for social scientific research.

Particularly the FL scale, with an alpha of 0.902, shows outstanding dependability and implies that the items regularly assess financial literacy. Good dependability is also shown by the RP scale, with an alpha of 0.793, and the BB scale, with an alpha of 0.811, therefore showing that the items properly reflect risk perception and behavioral biases. These excellent dependability ratings guarantee that the data gathered with these scales are consistent and fit for next investigation.

Table 4: *Correlation Matrix*

Variables	FL	RP	BB
FL	1		
RP	-.479**	1	
BB	.023	.166*	1

Note: *, **, and*** denotes significance level at 10%, 5%, and 1% respectively

Table 5: *Regression Analysis*

Variable	Coefficient (β)	SE	t-value	p-value	Remarks
IV to Mediator (a path)					
FL ⟶ RP	-.3323	.0422	-7.8716	0.000	Accepted
Mediator on DV (b path)					
RP ⟶ BB	.1438	.0484	2.9670	.0034	Accepted
Direct Effect of IV on DV (c path)					
FL ⟶ BB	.0578	.0336	1.7193	0.087	Accepted
Bootstrap results for Indirect Effect (c` path)					
	Indirect Effect	**SE**	**LLCI**	**ULCI**	
FL ⟶ RP ⟶ BB	-.0478	.0178	-.0853	-.0147	Accepted

**. Correlation is significant at the 0.01 level (2-tailed).

Level of Confidence for Confidence Interval

Number of Bootstrap Resamples: 5000

After that, the relevance of the anticipated correlations was evaluated using 5,000 samples using the bootstrapping method.

According to our hypothesis H1, the regression analysis supports "Financial literacy is significantly related to behavioral biases of individual investors" important new understanding of the interactions among FL, RP, and BB among individual

investors. The results confirm the hypothesis H1 that BB (β = 0.0578, p < 0.10) are favorably affected by FL. This is in line with other research stressing the need of FL in reducing illogical investing practices (Lusardi & Mitchell, 2014; Van Rooij, Lusardi, & Alessie, 2011). By arming investors with the required information to make wise judgments, FL helps to lower the possibility of allowing prejudices like overconfidence and representativeness to rule. By means of thorough investor education programs and interactive financial tools to address common biases such as overconfidence and herd behavior, the LSE can improve investor outcomes given the notable positive correlation between financial literacy FL and BB. Coupled with open communication about market patterns and dangers, regular seminars and workshops including behavioral finance specialists can help to further reduce these biases. Crucially also is embedding behavioral insights into financial goods, pushing for favorable laws and rules, and funding continuous study to grasp and eliminate changing prejudices. These steps will enable investors to make better judgments, therefore promoting a more steady and effective financial market on the LSE.

Furthermore, supporting our hypothesis H2: "Financial literacy is significantly negatively related to risk perception" are the regression findings showing a noteworthy negative link between FL and RP (β = -0.3323, p < 0.001). corresponds with the results of Guiso and Paiella (2008), who claim that financially savvy people are better at evaluating and controlling hazards, thus reducing the apparent dangers. Implementing many industrial implications would help the LSE boost investor confidence and decision-making considering the notable negative correlation between FL and RP. The LSE should provide thorough FL initiatives stressing risk management and evaluation, thereby enabling investors to fairly see and appraise market risks. Providing interactive tools and resources such as risk calculators and instructional courses helps investors to be educated decision makers. Frequent seminars and workshops with risk management professionals help investors to recognize and reduce risks. Furthermore, lowering unwarranted risk aversion is by including risk management insights into financial products and offering open, clear communication on possible market hazards. The LSE can build a more educated, confident, and resilient investor base by pushing for supporting laws and rules that advance FL and continuous RP research, therefore helping to contribute to market stability and efficiency.

As shown by the favorable link between RP and BB (β = 0.1438, p < 0.01), this decrease in RP subsequently influences their investment activities. The studies confirm hypothesis H3: "Risk perception is significantly positively associated with

behavioral biases of individual investors." These findings highlight how closely financial knowledge shapes RP, which shapes investing behavior in turn. The LSE can take numerous actions to reduce BB of individual investors and enhance investor decision-making considering their strong positive correlation. The LSE should create and support advanced risk education initiatives especially addressing the prevalent behavioral biases impacted by misperceived risks, like overconfidence and loss aversion. By use of interactive tools and resources such as risk simulators and bias awareness courses, investors may better control and grasp their risk impressions. Regular seminars and workshops featuring behavioral finance professionals help investors learn even more about the psychological sides of risk and decision-making. To further lower misunderstandings, the LSE may also include behavioral insights into financial products to assist investors negotiate their prejudices and provide clear, open information on market risks. The LSE can promote a more logical, educated investor base by supporting laws that support FL and continuous study on the link between RP and behavioral prejudices, hence improving market stability and efficiency.

Confirming the mediation hypothesis (H4), risk perception seems to be the mediator between BB and FL. Nonetheless, a complex knowledge of the interaction between these factors is given by the indirect effect of FL on behavioral biases through RP (β = -0.0478, p < 0.05). Although financial knowledge directly influences BB, RP mediates much of this effect. The results of Detthamrong et al. (2017), who also found RP as a crucial mediator in financial decision-making procedures, match this partial mediation. The result underlines hypothesis H4: "The relation between the financial literacy and behavioral biases of individual investors is mediated by risk perception". RP mediates the link between FL and BB of individual investors, so the LSE can carry focused actions to improve investor behavior and market results. The LSE should give thorough FL initiatives, which not only teach investors on financial ideas but also stress correct RP top priority. Interactive seminars, risk assessment instruments, and instructional courses stressing how RP shapes investing decisions and behavioral biases can all be part of these events. Through real-time market data and analytics, the LSE can enable investors to better grasp and analyze market risks, hence lowering prejudices such overconfidence and herd behavior. Including behavioral finance ideas into financial goods and services can also help consumers make more wise and well-balanced judgments. Further improving the efficacy of these programs is advocacy for laws supporting continuous financial education and investigation on the interaction between FL, RP, and BB. Through addressing the mediating function of risk perception, the LSE can build a better informed and

rational investor base, therefore supporting a more stable and efficient market. With an R-Square value of 0.2295, FLand RP taken together help to explain around 22.95% of the diversity in behavioral biases.
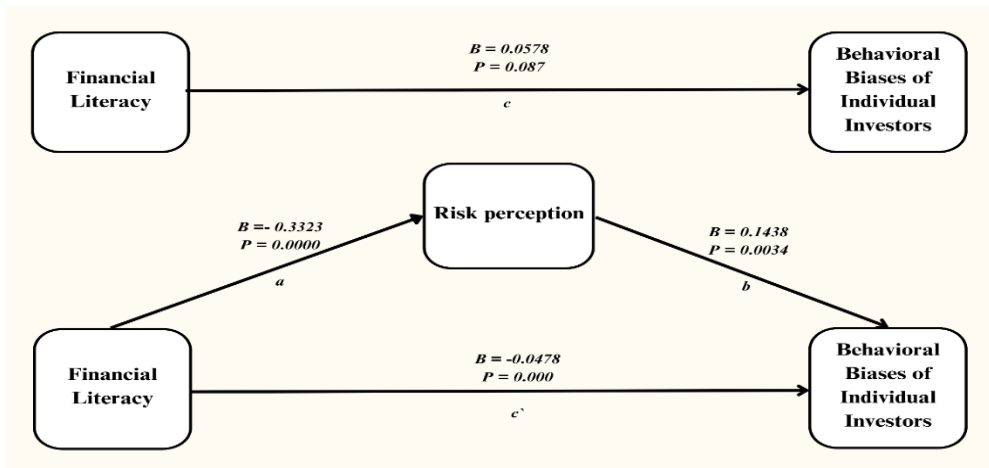
Figure 2: *Summary of Results*

Notables are also contradictions with earlier research. For example, Barber and Odean (2001) study showed that FL did not always lower the typical BB, overconfidence. various approaches of FL and RP or various sample characteristics might be the causes of this difference. Moreover, the research by Glaser and Weber (2007) shows that under some market situations, even financially intelligent people might show notable prejudices, implying that other elements could potentially be involved.

5. CONCLUSION, POLICY IMPLICATIONS AND LIMITATIONS

Behavioral finance has attracted a lot of attention in the subject of complexity of elements affecting investors' actions, especially with relation to the LSE, a well-known financial market since 1801. This study, which emphasizes the use of the LSE as a case study, has looked at the interactions of FL, BB, and RP among individual investors. The results confirm that FL greatly lowers RP, which lowers BB and promotes more logical investment choices. RP's mediation effect emphasizes its indispensable importance in converting financial information into sensible investing strategies. Improved FL helps investors to more evaluate and control risks, so lowering the frequency of prejudices like representativeness, overconfidence, anchoring, and availability.

Encouragement of financial literacy initiatives can help investors to better grasp financial markets and risk management, hence reducing BB and strengthening decision-making. By precisely assessing the risks connected with investments, FL greatly lowers RP and helps investors to make more reasonable decisions. Financial education helps investors match their views with their financial goals by addressing the mediating function of RP, therefore promoting more educated and strong investing behavior. To guarantee easily available and successful FL programs, cooperation among financial institutions, authorities, and educational institutions is very vital. Constant assessment and program modification will help to keep these initiatives relevant and efficient in handling changing investor behavior and market problems.

Like all studies, this one has numerous restrictions. Suggesting that longitudinal studies are essential to follow these interactions over time, the cross-sectional design restricts the capacity to infer causation between FL, RP, and BB. The reliance on self-reported data exposes possible biases like social desirability and erroneous self-assessment, thereby suggesting the necessity of more objective assessments of FL and RP in further studies. The generalizability of the results is limited by the sample, maybe not completely reflecting the varied population of LSE investors. More diversity and breadth of sample would improve representation. Furthermore, the exclusive attention on the LSE implies that the results might not be immediately relevant to other financial markets with distinct architecture and investor behavior. Comparative research across several marketplaces will help to offer a more complete knowledge. Lastly, even if the study reveals important linkages and mediating effects, it does not investigate other moderating factors, including investor experience or market circumstances, which can affect these dynamics. These elements should be included in further studies to offer a more complex knowledge of the interaction among FL, RP, and BB.

REFERENCES

Abreu, M., & Mendes, V. (2010). Financial literacy and portfolio diversification. *Quantitative Finance*, *10*(5), 515–528.

Alan, S., Baydar, N., Boneva, T., Crossley, T. F., & Ertac, S. (2017). Transmission of risk preferences from mothers to daughters. *Journal of Economic Behavior & Organization*, *134*, 60–77.

Almansour, B. Y., Elkrghli, S., & Almansour, A. Y. (2023). Behavioral finance factors and investment decisions: A mediating role of risk perception. *Cogent Economics & Finance*, *11*(2), Article 2239032.

Almenberg, J., & Widmark, O. (2011). Numeracy, financial literacy and participation in asset markets. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.1756674

Barber, B. M., & Odean, T. (2001). Boys will be boys: Gender, overconfidence, and common stock investment. *The Quarterly Journal of Economics*, *116*(1), 261–292.

Barberis, N., & Thaler, R. (2003). A survey of behavioral finance. In G. M. Constantinides, M. Harris, & R. M. Stulz (Eds.), *Handbook of the Economics of Finance* (Vol. 1, pp. 1053–1128). Elsevier.

Bernheim, B. D., Garrett, D. M., & Maki, D. M. (2001). Education and saving: The long-term effects of high school financial curriculum mandates. *Journal of Public Economics*, *80*(3), 435–465.

Calvet, L. E., Campbell, J. Y., & Sodini, P. (2007). Downside risk in mutual fund returns. *The Quarterly Journal of Economics*, *122*(2), 437–489. https://doi.org/10.1162/qjec.122.2.437

Detthamrong, U., Chancharat, N., & Vithessonthi, C. (2017). Corporate governance, capital structure and firm performance: Evidence from Thailand. *Research in International Business and Finance*, *42*, 689–709.

Disney, R., & Gathergood, J. (2013). Financial literacy and consumer credit portfolios. *Journal of Banking & Finance*, *37*(7), 2246–2254.

Ghaffar, S., & Sharif, S. (2016). The level of financial literacy in Pakistan. *Journal of Education & Social Sciences*, *4*(2), 224–235.

Glaser, M., & Weber, M. (2007). Overconfidence and trading volume. *The Geneva Risk and Insurance Review*, *32*, 1–36.

Hung, A., Parker, A. M., & Yoong, J. (2009). Defining and measuring financial literacy. *RAND Working Paper Series*.

Kahneman, D., & Tversky, A. (2013). Prospect theory: An analysis of decision under risk. *In Handbook of the Fundamentals of Financial Decision Making: Part I* (pp. 99–127).

Kimeu, C. N., Anyango, W., & Rotich, G. (2016). Behavioural factors influencing investment decisions among individual investors in Nairobi Securities Exchange. *Strategic Journal of Business & Change Management*, *3*(4), 1244–1258.

Leković, M. (2019). Behavioral portfolio theory and behavioral asset pricing model as an alternative to standard finance concepts.

Liao, L., Xiao, J. J., Zhang, W., & Zhou, C. (2017). Financial literacy and risky asset holdings: Evidence from China. *Accounting & Finance*, *57*(5), 1383–1415.

Lusardi, A., & Mitchell, O. S. (2007). Baby boomer retirement security: The roles of planning, financial literacy, and housing wealth. *Journal of Monetary Economics*, *54*(1), 205–224.

Lusardi, A., & Mitchell, O. S. (2014). The economic importance of financial literacy: Theory and evidence. *American Economic Journal: Journal of Economic Literature*, *52*(1), 5–44.

Lusardi, A., & Mitchelli, O. S. (2007). Financial literacy and retirement preparedness: Evidence and implications for financial education. *Business Economics*, *42*, 35–44.

Niu, G., Zhou, Y., & Gan, H. (2020). Financial literacy and retirement preparation in China. *Pacific-Basin Finance Journal*, *59*, Article 101262.

Ritter, J. R. (2003). Behavioral finance. *Pacific-Basin Finance Journal*, *11*(4), 429–437.

Schwarcz, S. L. (2009). Regulating complexity in financial markets. *Washington University Law Review*, *87*, 211.

Selim, A. R. E. N., & Aydemir, S. D. (2014). A literature review on financial literacy. *Finansal Araştırmalar ve Çalışmalar Dergisi*, *6*(11), 33–49.

Sitkin, S. B., & Pablo, A. L. (1992). Reconceptualizing the determinants of risk behavior. *Academy of Management Review*, *17*(1), 9–38.

Sitkin, S. B., & Weingart, L. R. (1995). Determinants of risky decision-making behavior: A test of the mediating role of risk perceptions and propensity. *Academy of Management Journal*, *38*(6), 1573–1592.

Van Rooij, M., Lusardi, A., & Alessie, R. (2011). Financial literacy and stock market participation. *Journal of Financial Economics*, *101*(2), 449–472.

Waweru, N. M., Mwangi, G. G., & Parkinson, J. M. (2014). Behavioural factors influencing investment decisions in the Kenyan property market. *Afro-Asian Journal of Finance and Accounting*, *4*(1), 26–49.

Systematic Literature Review on Capital Budgeting Techniques

Wasim Abbas Shaheen[1*], Tayebba Saleem[1], Noman Shafi[1], Usman Ullah[1]

ABSTRACT

Organizations use capital budgeting to make strategic decisions affecting long-term development, sustainability, and profitability. This study identifies sustainability considerations, environmental, social, and governance (ESG) factors, governmental policies and regulations that affect capital budgeting decisions, and key performance indicators (KPIs) frequently used to evaluate the success of capital investments. This systematic literature review (SLR) synthesizes the existing research on capital budgeting techniques. The examination includes sophisticated techniques such as accurate options analysis, simulation modeling, decision trees, and a variety of capital budgeting approaches such as net present value (NPV), internal rate of return (IRR), and payback period. Researchers, experts, and politicians aim to expand their knowledge of capital budgeting procedures and guide future studies and activities within the field.

Keywords: *Capital budgeting, Net present value, Internal rate of return, Key performance indicator*

1. INTRODUCTION

According to Buchanan (1996), capital budgeting processes are a vital financial management component and have been thoroughly studied in corporate finance literature. Financial managers typically focus on three main strategic options to maximize shareholder value: capital budgeting, dividends, and financing decisions. Making informed capital budgeting choices is essential for a corporation as it aligns with the organization's core objective of wealth maximization and requires substantial resources and long-term commitment. Capital budgeting is defined by Gitman et al. (2015) as "the process of analyzing and selecting long-term investments that are consistent with the company's goal of maximizing shareholder wealth." Similarly, Leon et al. (2008) describe capital budgeting as the process of evaluating and selecting investments while factoring in risk and uncertainty to assess the projected cash flows of a project. This consideration ensures that the selection of projects optimizes long-term benefits for the organization. Capital budgeting methods can be categorized into discounted cash flow (DCF) methods and non-

[1] Quaid-i-Azam University, Islamabad
[*] Corresponding author's E-mail: waseem@qau.edu.pk

discounted cash flow (non-DCF) approaches. Non-DCF methods, such as the payback period and accounting rate of return, do not consider the time value of money. In contrast, DCF methods, including the net present value (NPV), internal rate of return (IRR), profitability index, and discounted payback period, incorporate the time value of money, providing a more accurate assessment of an investment's value. Baker and Powell (2009) outline six key steps in capital budgeting: generating project ideas, estimating project cash flows, evaluating projects, selecting projects, implementing the chosen projects, and performing a post-completion review. Each step is critical to ensure that the projects contribute positively to the firm's long-term goals and shareholder wealth.

Comparison between the previous literature review and the present study.

Frost and Rooney (2021) Elsevier Qualitative   The primary focus of this study is on efforts made by individuals to measure and "consider" the impact of sustainability on capital budget choices Majumdar and Sinha (2021).   Emerald   Case Study   This research focuses on shadow pricing of undesired outputs and shows that the NPV becomes positive, supporting the economic-environmental sustainability of effluent treatment plants.

Sisodia et al. (2021) in *Emerald* conducted a scenario-based risk analysis on the hydroponic farming technique, which holds significant promise for enhancing food security and sustainability in the Gulf area. The study evaluated the hydroponic farm using the net present value and actual alternatives approach under five distinct scenarios. Unlike conventional agricultural methods, hydroponics offers a more resource-efficient solution by reducing water consumption and dependency on arable land, key factors in regions with scarce farmland. This innovative approach aligns with broader ESG (Environmental, Social, and Governance) trends, highlighting sustainability and long-term resource management. Furthermore, integrating hydroponic systems with peatland conservation practices underscores an investment strategy that supports ecological preservation and adds value in capital budgeting, enhancing an organization's ESG profile.

Aro-Gordon and Al-Sakiti (2021) Emerald Qualitative research focused on four themes related to capital budgeting: the application of non-financial considerations, the use of more sophisticated approaches like real options, the use of traditional capital investment methods like the payback period (PB) and net present value (NPV), and how all of these factors are related to long-term manufacturing investments and success and performance.

Majid et al. (2021) Elsevier Mix method, economic analysis (NPV & benefit-cost ratio) In temperate northern India, the study aimed to determine if hydroponic

cultivation is a suitable and feasible alternative planting approach to greenhouse soil-based lettuce development.

Pertiwi et al. (2022) Elsevier Benefit-cost analysis and interviews. This study evaluated the benefits of various ecosystem services, from peatland conservation to the correct carbon price and the value of converting peatlands to rubber or palm oil crops. Net present value (NPV), internal rate of return (IRR), and annual equivalent value (AEV) are the three indicators used in this study as BCA outputs to assess the value of peatland ecosystem services in comparison to the process of converting peatland to oil palm and rubber plantations under five different economic conditions. Monteiro et al. (2021) Springer Sensitivity analysis This study looks at the effects of certified emissions reduction certificates (CERs) on the internal rates of return (IRRs) of small hydroelectric plants under the current Brazilian clean development mechanism scenario, where CER prices have dropped to historical lows. The goal is to investigate the economic aspects of sustainable management. A spreadsheet was made based on the study's findings to model a project's cash flows and determine its internal rates of return.

Frost and Rooney (2021) Elsevier's qualitative case study, as sustainability is an organizational process, focuses on views of environmental sustainability, which will be further examined. The study looks into how organizational actors are shaped by the analytical perspective of management accounting practice and sees sustainability. Capital budgeting is a management accounting technique that is essential to managerial planning and the strategic decision-making process that goes along with it. Because sustainability is strategic, decision-making managers use it to evaluate sustainability in their regular job routines.

Majumdar and Sinha (2021) Emerald Quantitative analysis. This study will examine how capital investment projects are assessed in Lebanon, whether risk is factored into the process by Lebanese enterprises, and how political risk affects capital budgeting. Lebanese businesses often employ more than one form of investment analysis, and they are progressively using sophisticated discounted cash flow approaches with payback time.

Majumdar and Sinha (2021) Taylor & Francis Qualitative analysis (case studies). The main contention of this paper is that the capital budgeting and management practices of the case of three former Soviet republics—the Russian Federation, Moldova, and Uzbekistan—are ingrained with the legacy of the Soviet planning and budgeting traditions, which include centralized control, inadequate capital planning, and strong informal powers of political elites.

Present study SLR A comprehensive search on sustainability considerations, environmental, social, and governance (ESG) factors, the role of regulatory compliance, and key performance indicators (KPIs) in capital budgeting.

Several studies in selected sources:

Source	Selective studies.
Taylor and Francis	5
Emerald	12
Elsevier	10
Springer	7

In particular, this paper answers the following research questions:

1. How are sustainability considerations integrated into capital budgeting decisions?

2. What impact do environmental, social, and governance (ESG) factors have on evaluating investment projects? How do governmental policies and regulations affect capital budgeting decisions?

3. How does regulatory compliance shape the capital budgeting landscape?

4. What key performance indicators (KPIs) are commonly used to assess capital investment success?

How are sustainability considerations integrated into capital budgeting decisions?

According to Frost, G and Rooney, J (2021), the study focuses on people's attempts to quantify and "consider" how sustainability affects capital budget decision-making processes. It specifically looks at how managers approach sustainability in their capital budgeting choices. It has expressly recognized the demand for financial outcomes to be assessed by those who are not physically present, such as the board directors of publicly listed companies or the public sector financial controllers who can see the capital budgeting processes within the organization. When seen as providing "a verified perception of accuracy in the actual measuring procedure," this emphasis on financial results and technology may also offer organizational stakeholders visibility into capital budgeting choices (Power, 2004). This can, therefore, impede personal reflection and, as noted by Miller & Rose (1990), force supervisors and administration in charge of making decisions to limit their endorsement of sustainability projects to those acts that fall under their designated scope as financial decision-makers, while also being assisted and encouraged by management accounting technology.

The comparative analysis of Majid et al. (2021) indicated that the hydroponic systems under investigation were appropriate for growing lettuce in Northern India's moderate climate. This study has successfully assessed the overall performance of the deep-water culture and nutrient film technology systems. Comparisons based on actual yield data showed that the net present value for deep water culture was higher for both crop cycles due to the larger yields per picking and comparatively lower production expenses. Compared to hydroponic techniques, factors point to conventional soil-based growing systems having lower wealth-generating potential. Compared to soil-based lettuce farming, Maestre-Valero et al. (2018) recently discovered that hydroponic cultivation had notably higher net present values. If a method's benefit-cost ratio analysis is more significant than one and its NPV value is greater than zero, it is considered economically feasible (Hanley et al., 2009). In all growing systems, the NPV values greater than zero and the BCR values above one show the economic viability of different growth strategies. Majid and colleagues (2021). Growing lettuce and other green crops is believed to be achievable using deep water cultivation technology because of its high-quality output, convenience of use, shorter crop length, and economic viability. However, the nutrient film technology has the potential to be an effective water-saving method due to its high water usage efficiency as an environment-friendly technique.

What impact do environmental, social, and governance (ESG) factors have on evaluating investment projects? How do governmental policies and regulations affect capital budgeting decisions?

Pertiwi et al. (2022) A benefit-cost analysis was performed to determine the carbon price and assess the ecosystem services of peatlands with three potential land uses: conservation, clearing for oil palm plantations, and rubber plantations. The internal rate of return for the conservation option was consistently higher than that of the planting choices. The study results by Pertiwi et al. (2022) suggest that the conservation option will be more enticing than planting choices when the discount component is high. The sensitivity analysis of the study with more significant discount rates also demonstrated that the conservation option will ultimately prove to be the most effective option for maintaining peat land because of the high degree of future uncertainties. Politicians and local governments may find it helpful to know the values of carbon pricing for various types of ecological services associated with peat fields when making decisions about conversion or conservation. Benefits from other ecosystem services must be considered if benefits from the entire ecosystem (including carbon benefits) are equal to or greater than those from the conversion of peat lands for industrial crops (Zengin & Ünal, 2019). It is critically necessary to value these ecosystem services under different land use scenarios to give decision-makers a comparable foundation for conserving or converting peat land. Gunawan (2018) suggested that government policies and initiatives to maintain peat lands for long-term sustainability can be influenced by a comprehensive cost-benefit analysis

of every ecological service. Ecosystem Services BCA has also gained popularity to encourage resource owners to conserve natural resources by offering financial incentives (Konstantinova et al., 2019; Naime et al., 2020; Pinke et al., 2018).

Mollah et al. (2021) examine the current capital budgeting procedures using data from 39 sample-listed companies in Bangladesh's DSE. The findings showed that nearly two-thirds of CFOs evaluate investment projects using the net present value (NPV) technique, with the IRR and PBP methods closely behind. According to survey results, the most crucial consideration when selecting a capital budgeting approach is the "importance of the project." The research indicates that the main obstacle to capital budgeting procedures for most respondents is Bangladesh's high fixed-cost component. Generally, risk variables were modified by either decreasing cash flows and increasing the discount rate or doing both. The dangers of unexpected inflation, commodity price risk, interest rate risk, GDP or business cycle risk, term structure risk, and foreign exchange risk were among these factors. Bangladeshi businesses primarily employ the discount rate to manage the risks associated with foreign exchange, interest rate fluctuations, and unforeseen inflation.

(Majumdar & Sinha, 2021) demonstrated in their study that centralized control over the underlying capital budgeting processes and the informal powers of political leadership significantly impact regional and local governments' goals of engaging in capital budgeting and planning along with proper maintenance, improvement, and development of public infrastructure. Political risk is high on the respondents' attention in several ways, according to Bakri's 2021 findings, as political unrest in Lebanon influences numerous capital budgeting choices. Since the conclusion of the civil war, political risk has been a defining characteristic of the Lebanese environment, and it seems to influence business investment decisions. This study discovered similar results: PB is employed instead of the NPV technique when political risk is thought to be high. Mao (1970) and Brigham (2016) propose that the PB technique can estimate a project's riskiness, making it a valuable addition to NPV.

What role does regulatory compliance play in shaping the capital budgeting landscape?

High risk, uncertainty, and complexity are hallmarks of the twenty-first-century corporate environment. Investors, policymakers, and regulators face ongoing political, technical, and financial risk and unpredictability challenges. Graham and Sathye (2017) examined how national culture affected the selection of capital planning techniques and emphasized the impact of project size, complexity, and political, legal, and social uncertainty on these processes.

Initiatives for capital budgeting can be strengthened or even complemented by societal preferences and staff. These consequences appear gradually. G. Frost & J.

Rooney (2021) In any case, significant additional expenses linked to projects deemed more sustainable in the face of budgetary constraints necessitate more internal and external organizations' support to give preference to a project that is thought to be more environmentally friendly. Put another way, valid organizational structures, shared knowledge, and social norms are necessary to foster shared cognition. To help ensure a shared vision that prioritizes sustainability, the capital budget decision-making practices adopted with this structure must consider the quantitative and qualitative rules and norms used to evaluate and contrast the attributes of knowledge made visible through shared perceptions of "flawed" accounting management narratives. Any modifications carried out with the assistance of organizational resources may be implemented to give "traces that can be mobilized and accumulated" for use by stakeholders in charge of capital budget performance "at an organizational distance" in addition to local managers Rose (1991).

Frost and Rooney's (2021) study argues that to consider sustainability, capital budgeting procedures must consider non-financial information and assessment criteria. The study also highlights the critical role that organizational norms related to sustainability and strategic leadership play and the variations in people's perspectives on incorporating sustainability factors into capital budgeting choices. These elements significantly impact organizational efforts to quantify and, when significant financial imperatives exist, "improve" the influence of sustainability in capital budget decision-making procedures.

Morales et al. (2020) study that disparities in how capital budgeting choices are approached also appear to be influenced by government support for small businesses and entrepreneurial endeavors. Certain company owners in Canada stated that they were helped, for example, in creating their business strategies by the government or nonprofit groups. The Mexican sample did not report this; instead, it supported the notion that capital budgeting decisions differ between developed and developing nations, with some interviewees complaining that they are singled out by government agencies and forced to pay exorbitant business taxes and needless registration fees (Kengatharan, 2016). The Mexican entrepreneurs in the sample rely more on family and internal finances than Canadian entrepreneurs, which has resulted in delays in capital investments in most cases (Chittenden & Derregia, 2015).

Similar scraps of evidence were discovered in the context of concentrated solar power generation by Sisodia et al. (2021). The study concluded that government assistance is essential for the new advancements in sustainability. Government assistance programs protect investors' interests and have a knock-on effect on the economy. Additionally, Souza et al. (2019) stress the significance of sound strategy and legislative backing for investments in alternative agriculture systems, which are required to draw domestic and foreign capital for the world's markets.

What key performance indicators (KPIs) are commonly used to assess capital investment success?

The results of Alles et al. (2021) study showed that various significant factors, such as the SMEs' age, ownership structure, and decision-maker experience, affect SMEs' capital budgeting techniques. These results highlight considerable policy ramifications for Sri Lanka's SME sector development. Capital budget management should be emphasized in government and regulatory bodies' policies as a necessary competence for decision-makers. It is recommended that small business owners implement policies in their establishments to improve both financial literacy and overall organizational effectiveness.

Alles et al. (2020) state that both nonfinancial and financial considerations can impact the choice of capital budgeting approaches. The decision-makers demographics are among the nonfinancial determinants. However, Katabi and Dimoso (2016) noted that business-related factors such as industry, firm establishment, growth in sales, number of employees, and kind of business are critical when selecting capital budgeting methodologies.

Alkaraan (2020) stated that a suitable management control system is a crucial component of giving strategic investment decision-making processes sufficient strategic direction. According to the study by Alles et al. (2021), cost, time, and knowledge are the main variables linked to SMEs that neither adopted capital budgeting procedures nor used inadequate capital budgeting strategies. Government organizations might use this information to pinpoint and identify SMEs that most require advice and support to make wise investment decisions that will increase profits. Governmental organizations might create initiatives to provide support and training, focusing on needy SMEs. It was discovered that the primary factors influencing an SME's choice to give up capital budgeting procedures were cost, time, and knowledge.

2. CONCLUSION

Sustainability considerations are increasingly integrated into capital budgeting decisions as organizations recognize the role of environmental, social, and governance (ESG) considerations in creating long-term value. More and more capital budgeting choices are being made with long-term value development in mind rather than immediate profits. Sustainable investments are viewed as drivers of competitive advantage, resilience, and stakeholder trust over the long run, leading to better financial performance and shareholder returns. Assessing the economic costs and benefits of sustainability projects, including potential savings from energy efficiency improvements, waste reduction, and risk mitigation.

Integrating sustainability considerations into capital budgeting decisions is essential for organizations to create long-term value, manage risks, meet stakeholder expectations, and contribute to a more sustainable future. By integrating environmental, social, and governance (ESG) aspects into investment decisions, companies can drive positive economic, ecological and social outcomes while securing their competitive advantage in a rapidly changing business landscape.

Governmental policies and regulations play a critical role in shaping capital budgeting decisions by imposing compliance costs, providing incentives, influencing market conditions, and addressing societal and environmental concerns. Companies must carefully analyze the regulatory landscape and consider the impact of government policies on investment projects to make informed decisions that align with their strategic objectives and regulatory obligations. By incorporating regulatory considerations into capital budgeting processes, organizations can mitigate risks, capitalize on opportunities, and contribute to sustainable and compliant business practices.

3. FUTURE DIRECTION

1. Using advanced analytics and artificial intelligence (AI) techniques can enhance sustainability considerations in capital budgeting. Predictive analytics can help forecast future sustainability risks and opportunities, while AI algorithms can optimize capital allocation by considering a broader range of sustainability factors.

2. With increasing uncertainty around climate change and other sustainability challenges, scenario analysis becomes crucial in capital budgeting. Future directions involve scenario planning techniques to assess the resilience of investment projects under different future scenarios, enabling better decision-making in the face of uncertainty.

3. Future capital budgeting techniques may emphasize governance factors more, particularly with the rise of corporate governance reforms and shareholder activism. Integrating governance metrics into investment decision-making processes could become more systematic, focusing on board diversity, executive accountability, and ethical business conduct.

4. Future trade policies may address global challenges such as climate change, resource scarcity, and supply chain resilience. Capital budgeting decisions may need to account for potential changes in trade dynamics, including shifts in trade agreements, tariffs, and trade barriers.

REFERENCES

Alkaraan, F. (2020). Strategic investment decision-making practices in large manufacturing companies: A role for emergent analysis techniques? *Meditari Accountancy Research, 28*(4), 633–653.

Alles, L., Jayathilaka, R., Kumari, N., Malalathunga, T., Obeyesekera, H., & Sharmila, S. (2021). An investigation of capital budgeting techniques by small and medium enterprises. *Quality & Quantity, 55*, 993–1006.

Alleyne, P., Armstrong, S., & Chandler, M. (2018). A survey of capital budgeting practices used by firms in Barbados. *Journal of Financial Reporting and Accounting, 16*(4), 564–584.

Aro-Gordon, S., & Al-Sakiti, M. (2021). Advances in industrial capital budgeting practice: An overview of responses and discussions in Oman.

Baker, H. K., & Powell, G. (2009). *Understanding financial management: A practical guide.* John Wiley & Sons.

Bakri, A., Fifield, S. G., & Power, D. M. (2021). Capital budgeting practices and political risk: Evidence from Lebanon. *Qualitative Research in Financial Markets, 14*(3), 483–504.

Brigham, E. F. (2016). *Financial management: Theory and practice.* Cengage Learning Canada, Inc.

Bunch, B. S. (1996). Current practices and issues in capital budgeting and reporting. *Public Budgeting & Finance, 16*(2), 7–25.

Chittenden, F., & Derregia, M. (2015). Uncertainty, irreversibility, and the use of rules of thumb in capital budgeting. *The British Accounting Review, 47*(3), 225–236.

Frost, G., & Rooney, J. (2021). Considerations of sustainability in capital budgeting decision-making. *Journal of Cleaner Production, 312*, 127650.

Gitman, L. J., Juchau, R., & Flanagan, J. (2015). *Principles of managerial finance.* Pearson Higher Education (AU).

Graham, P. J., & Sathye, M. (2017). Does national culture impact capital budgeting systems? *Australasian Accounting, Business and Finance Journal, 11*(2), 43–60.

Gunawan, H. (2018). Indonesian peatland functions: Initiated peatland restoration and responsible management of peatland for the benefit of the local community; Case study in Riau and West Kalimantan Provinces. In *Environmental resources use and challenges in contemporary Southeast Asia: Tropical ecosystems in transition* (pp. 117–138).

Hanley, N., Barbier, E. B., & Barbier, E. (2009). *Pricing nature: Cost-benefit analysis and environmental policy.* Edward Elgar Publishing.

Katabi, R. J., & Dimoso, R. L. (2016). The effect of small business characteristics on the choice of investment evaluation techniques for SMEs in Tanzania. *IOSR Journal of Business and Management, 18*(4), 11–18.

Kengatharan, L. (2016). Capital budgeting theory and practice: A review and agenda for future research. *Applied Economics and Finance, 3*(2).

Konstantinova, E., Brunina, L., Persevica, A., & Zvaigzne, A. (2019, June). Economic valuation of ecosystem services: A case study for sustainable management of degraded peatlands in Latvia. In *Environment, technology, and resources: Proceedings of the International Scientific and Practical Conference* (Vol. 1, pp. 110–113).

Leon, F. M., Isa, M., & Kester, G. W. (2008). Capital budgeting practices of listed Indonesian companies. *Asian Journal of Business and Accounting, 1*(2), 175–192.

Maestre-Valero, J. F., Martin-Gorriz, B., Soto-García, M., Martinez-Mate, M. A., & Martinez-Alvarez, V. (2018). Producing lettuce in soil-based or soilless outdoor systems: Which is more economically profitable? *Agricultural Water Management, 206*, 48–55.

Majid, M., Khan, J. N., Shah, Q. M. A., Masoodi, K. Z., Afroza, B., & Parvaze, S. (2021). Evaluation of hydroponic systems for the cultivation of lettuce (*Lactuca sativa L.*, var. Longifolia) and comparison with protected soil-based cultivation. *Agricultural Water Management, 245*, 106572.

Majumdar, A., & Sinha, S. K. (2021). Economic sustainability benchmarking of environmental initiatives: A case of a wastewater treatment plant. *Benchmarking: An International Journal, 28*(6), 2008–2022.

Mao, J. C. (1970). Survey of capital budgeting: Theory and practice. *Journal of Finance, 25*(2), 349–360.

Miller, P., & Rose, N. (1990). Governing economic life. *Economy and Society, 19*(1), 1–31.

Mollah, M. A. S., Rouf, M. A., & Rana, S. S. (2021). A study on the capital budgeting practices of some selected companies in Bangladesh. *PSU Research Review.*

Monteiro, L. S., Costa, K. A., Christo, E. D. S., & Freitas, W. K. (2021). Economic feasibility analysis of small hydropower projects. *International Journal of Environmental Science and Technology, 18*, 1653–1664.

Morales Burgos, J. A., Kittler, M., & Walsh, M. (2020). Bounded rationality, capital budgeting decisions, and small business. *Qualitative Research in Accounting & Management, 17*(2), 293–318.

Naime, J., Mora, F., Sánchez-Martínez, M., Arreola, F., & Balvanera, P. (2020). Economic valuation of ecosystem services from secondary tropical forests: Trade-offs and implications for policymaking. *Forest Ecology and Management, 473*, 118294.

Pertiwi, N., Tsusaka, T. W., Nguyen, T. P. L., Abe, I., & Sasaki, N. (2022). Nature-based carbon pricing of full ecosystem services for peatland conservation: A case study in Riau Province, Indonesia. *Nature-Based Solutions, 2*, 100023.

Pinke, Z., Kiss, M., & Lövei, G. L. (2018). Developing an integrated land use planning system on the Hungarian Plain reclaimed wetlands using the economic valuation of ecosystem services. *Ecosystem Services, 30*, 299–308.

Power, M. (2004). Counting, control, and calculation: Reflections on measuring and management. *Human Relations, 57*(6), 765–783.

Rose, N. (1991). Governing by numbers: Figuring out democracy. *Accounting, Organizations, and Society, 16*(7), 673–692.

Sisodia, G. S., Alshamsi, R., & Sergi, B. S. (2021). Business valuation strategy for new hydroponic farm development—A proposal towards sustainable agriculture development in the United Arab Emirates. *British Food Journal, 123*(4), 1560–1577.

Souza, S. V., Gimenes, R. M. T., & Binotto, E. (2019). Economic viability for deploying hydroponic systems in emerging countries: A differentiated risk adjustment proposal. *Land Use Policy, 83*, 357–369.

Zengin, H., & Ünal, M. E. (2019). Analyzing the effect of carbon prices on wood production and harvest scheduling in a managed forest in Turkey. *Forest Policy and Economics, 103*, 28–35.

Ripple Reaction towards Corporate Social Responsibility and Profitability: A Sustainable Model for Emerging Economy

Hina Najam[1*]

ABSTRACT

Corporate social responsibility (CSR) plays a vital role in improving the firm performance. Much research has been done in this context, but the relationship between CSR, inflation, and performance has rarely been explored. Hence, this study aims to demonstrate how corporate social responsibility and inflation affect firm profitability in the 30 manufacturing industries of China over the period 2011 to 2023. This study checks the impact of CSR, inflation, leverage, and firm size on profitability using the bivariate regression, ordinary least square, and heterogeneous model. The study's findings indicate that CSR significantly impacts (1) firm profitability; (2) profitability is significantly impacted by inflation. Leverage and firm size also affect the firm performance. A crisis of trust can result from inflation, which seriously damages a company's relationships with its stakeholders, including employees, customers, and other parties. This is especially true at a time when a lot of people are accusing businesses of artificially boosting prices to increase profits. Companies that are interested in enhancing their profits should focus on CSR and environmental activities.

Keywords: Corporate social responsibility; Inflation; Profitability; Leverage; Size; Ordinary Least Square.

1. INTRODUCTION

Corporate Social Responsibility (CSR), from the perspective of firms in such an endeavor, has become an integral strategic tool that the firm can apply, especially in dynamic settings where the roles of society, government, and firms are consistently at odds with one another in a complex economy (Abbas, 2025). Although businesses operate on profit motives, their activities may sometimes hold environmental and social risks, especially in sectors such as mining, manufacturing, and heavy (Danilov, 2021). Environmental risks take many forms (pollution, resource depletion, and negative impact on communities). CSR initiatives should offset such negative externalities to maintain sustainable social effectiveness and health (Abbas, 2024; Hsu et al., 2022). Despite CSR being widely adopted across multiple

[1] Air University, Islamabad
[*] Corresponding author's E-mail: hinanajam786@yahoo.com
This is an open-access article.

organizations, there are still debates about how effective CSR policies are at increasing corporate profitability (Sachin & Rajesh, 2021).

Corporate financial sustainability keeps relying on corporate investment decisions that can be financed through the capital market. The stock price and investment attractiveness of a firm depend on its profitability, which investors measure using financial indicators like return on assets (ROA), return on equity (ROE), earnings per share (EPS), etc. (Goodwin et al., 2022; Ikpefan et al., 2021). The profitability of firms is generally divided into two components: current income (e.g., through dividends and interest payments) and capital gains (appreciation in stock value) (Orlov & Aaheim, 2017). Investors want high returns but need to trade off this goal against risk, so CSR disclosure is an important consideration when making investment decisions (Bhattacharyya, 2021).

CSR reporting has become vital to signal corporate transparency, impacting stakeholders' and investors' trust (Kong et al., 2022a). CSR does mean increasing profit, but in the long run, companies that do CSR will be better positioned to create value for their shareholders and other stakeholders such as employees, customers, and local communities (Ahmed et al., 2021). However, evidence on the CSR–profitability relationship is mixed. Others show a negative relationship, indicating that CSR reduces the firm value because it burdens the firm, creating a conflict between profits and social responsibility (Mukanjari & Sterner, 2020). On the contrary, some studies suggest that financial results do not always reflect in CSR spending, especially when companies are inclined towards their ethics and environmental contribution rather than short-term profits (Hsu et al., 2022).

In light of differing views on CSR, this study examines the effect of CSR on firm profit in the context of emerging economies, specifically, on the impacts of CSR, inflation, leverage, and firm size on the profitability of 30 manufacturing firms in China from 2011 to 2023. This study enriches the broader discussion regarding sustainable business choices, particularly in areas with corporate trust passivity and deficiencies in corporate governance, by providing empirical evidence on the relationship between CSR and financial success.

The rest of the paper is organized as follows: The first section discusses related literature on CSR and firm profitability. The next section describes the research methodology, outlining the data collection and analysis methods employed. The next section provides the empirical results, and the paper concludes with a discussion of the implications and recommendations for future research.

2. LITERATURE REVIEW

Economic profit is a strong predictor of the market value of a firm in capital markets; higher profitability leads to improved investor confidence and choice. Since the shareholders' primary goal is the firm's profitability, companies must create trust and security among investors and ensure maximum returns (Umar et al., 2021). Based on the stock price, which is a basic indicator of firm performance and firm fire for each financial year end, thus also profit) (Yaqoob et al., 2020). In-depth financial analyses can be used to project returns on company shares, and investors can expect the fastest returns possible. Meanwhile, a firm's profitability and an investor's decision-making appear to be strongly influenced by external factors like inflation (Lepitzki & Axsen, 2018).

Two main approaches can be used to analyze firm profitability: fundamental analysis and technical analysis (Olalere et al., 2021). Fundamental analysis is centered around internal information like revenue growth and dividend policy; technical analysis is focused on external factors such as economic, political, and financial trends (Mamun, 2021). Investors use financial and non-financial information to forecast stock returns (Obeidat et al., 2021). Non-financial information, frequently omitted from financial statements, can offer unique perspectives on corporate governance, sustainability, and strategic objectives. Empirical research indicates that the risk of investor sentiment and profitability expectations positively impact a firm's financial performance (Khan et al., 2016; Qing et al., 2024). However, risk and return cannot be unentwined since higher expected returns often require greater risk acceptance by investors (Diebold & Yilmaz, 2014; Yu et al., 2024). Standard deviation, which indicates deviations from expected financial returns, is commonly used to assess risk.

In light of the recent economic turbulence concerning 2020, this research examines the pivotal function of CSR impacting firm-respected value concerning inflationary high tide. More specifically, the article analyzes U.S. firms' stock-price responses to inflation from January 2018 to September 2022, drawing upon the theoretical framework of whether firms that have historically responded to stakeholder needs (CSR performers) sufficiently maintained stakeholder trust and financial stability during these turbulent times. In previous studies, CSR has been used as a proxy for social capital, highlighting its function in fortifying corporate resilience during economic adversity. It's worth noting that corporate attitudes toward CSR are often affected by political sentiment. Regions leaning towards the Democratic Party provide relatively higher support from its consumers and investors towards CSR-firm than the Republican side (Shang et al., 2024). Based on empirical evidence, GOP-anchored firms undergo nearly an order of magnitude weaker market price effects in reaction to CSR initiatives over periods of inflation than do firms

corporately located in more liberal voting states (Aguinis & Glavas, 2019; Fu et al., 2023).

Through this study, we further add to the literature by addressing the cross-sectional consequences of inflation on firm value. Controlled for inflation using nominalization to stock prices (Zhou et al., 2023). Inflation affects firms' profitability via higher actual return requirements and lower expected earnings. Additionally, there is considerable heterogeneity in how stocks respond to inflation. Recent literature shows inflation attaching a risk premium to firm profitability, as its mean-reverting nature signals its anticipated adverse effect on real growth. However, firms with lower debt levels face more exposure to inflationary shocks, shaping the profitability dynamics (Fan et al., 2023).

Corporate governance and investor attitudes are affected by political and cultural factors. Public discontent with big companies shapes regulatory and policy preferences and is reflected in market conduct. Similar to past economic crises, perceptions of corporate behavior are a function of historical context, suggesting that consumer expectations are not static. According to studies, inflation can create lasting shifts in attitudes toward firms in society, changing how corporate valuation is conducted for decades (Abbas et al., 2023). Firms are considered opportunistic pricing entities in this scenario, and as a result, consumers may penalize firms perceived as displaying such opportunistic behavior, causing these entities to lose revenue (Jiakui et al., 2023). Moreover, employees' perceptions of corporate fairness will influence corporate morale, productivity, and turnover, impacting a firm's human capital and operational efficiency (Tong et al., 2023). Investors are willing to pay for the reputation of companies, and CSR engagement helps to build trust with consumers and employees. As a result, the financial performance improves (Wang et al., 2022). Moreover, CSR-oriented firms may enjoy enhanced access to external financing, especially when inflationary shocks tighten credit conditions (Najam et al., 2022).

Inflation, defined as an ongoing price increase, is a persistent economic occurrence that diminishes purchasing power and impacts how businesses operate. Well, might it impact firms' profitability and investment decisions (Faridi & Malik, 2020), leading to a fall in the real value of a currency owing to inflation? Therefore, the consumer price index is an important index for analyzing the influence of inflation on corporate financial health. CSR is a strategic business practice that incorporates financial and socio-economic sustainability aims. The Global Reporting Initiative (GRI) aims to ensure transparency in corporate sustainability efforts by offering a standardized framework for measuring CSR disclosure.

The standard metric for corporate profitability is net profit margin, which assesses the net income in relation to total sales (Quyen et al., 2021). According to empirical

studies, CSR disclosure is not a direct mechanism for affecting investor decisions because many investors consider CSR initiatives an additional cost instead of a value-generating investment, which can be one of the reasons CSR disclosure increases asymmetric information (Pfajfar et al., 2022). Concerning cost, CSR can place financial pressure on firms, especially in the short term, which may limit its short-run accessibility. Firm size, which is often used as a control variable in profitability assessments, is measured using the natural logarithm of total assets. Firm size does not always correlate with higher returns against the widespread beliefs of investors. Previous studies show that firm size is not significantly related to profitability, meaning that profitability depends on strategic management decisions instead of an organization being very large.

During the 2014–2018 period, inflation has subsided, providing investors with opportunities that favor corporate strategic initiatives over macroeconomic uncertainty (Yao et al., 2018). The consistent inflation data given while firm profitability varies tells us that inflation is not a strong enough force on the market (Diebold & Yilmaz, 2012). As a result, investors usually discount inflationary changes when they make investment decisions. Based on above discussion, the following hypotheses are as follows;

H1: CSR has a significant impact on the profitability of Chinese Companies.

H2: Inflation has a significant impact on the profitability of Chinese Companies.

H3: Leverage has a significant impact on the profitability of Chinese Companies.

H4: Firm size has a significant impact on the profitability of Chinese Companies.

3. RESEARCH METHODOLOGY

This study takes the firm profitability and social capital as CSR. Inflation, leverage, and firm size also matter in a firm's performance. This study was done on 30 Chinese manufacturing companies from 2011 to 2023. According to Pham et al. (2021), businesses that include CSR in their annual reports will be recognized with awards from government agencies and environmental groups (Pollak et al., 2022). This is because the CSR report demonstrates the company's quality and corporate social responsibility attitude toward its production process (Hsu et al., 2022), and it helps the public evaluate the safety and health of customers who use the company's products. This may boost the company's confidence and product sales volume. Furthermore, having a CSR report can be considered one of a company's competitive advantages because it offers information on the financial, social, and environmental aspects of the business, as well as the strategy and operations of the business, which are factors that contribute to its profitability and can be used as a basis for decision-making. stakeholder (Mamun, 2021). Businesses that conduct business in sectors

related to natural resources or those that do so for profit are required to fulfill social and environmental obligations.

A widespread increase in prices, or a decline in the purchasing power of money, is referred to as inflation (Chowdhury et al., 2017). The value of money decreases with increasing price inflation. Inflation does not apply to price increases brought on by a lost harvest or increases in the cost of specific goods. The "cost of living index" or "consumer price index" is the most commonly used indicator of inflation. This index, which shows the trend of consumer spending, is based on the cost of a chosen package of items. According to (Cronin, 2014), price increases have a general and ongoing tendency. A price increase for one or two commodities alone does not qualify as inflation unless it is followed by an increase in the price of additional goods. (Tan, 2016) defined inflation as the widespread and persistent tendency for prices to rise. It is not considered inflation when the price of one or two goods rises. The prerequisites for an ongoing upward trend must also be emphasized. Price increases that are only momentary in nature, such as those brought on by seasonality, before holidays, natural calamities, etc., are not considered inflation. Inflation is measured by consumer price index and leverage actually measures the firm debt and size can be taken as natural log of total assets. The data is collected from world development indicator (WDI). The study investigated the theory regarding the beneficial impact of a company's social capital on its value in times of significant inflation.

$$\text{Profitability}_{i,t} = \alpha + \beta_1 \text{CSR}_{i,t} \times \beta_2 \text{Inflation}_{i,t} + \beta_3 \text{Leverage}_{i,t} + \beta_4 \text{Size}_{i,t} + \epsilon_{i,t}$$

4. DATA ANALYSES AND RESULTS

Table 1 shows the descriptive statistics. This table presents the minimum, maximum, standard deviation and mean values. Table 2 explains the results of correlation coefficients which indicated that CSR and Profitability are positively correlated with each other with beta value of 0.456**. Inflation has a negative impact on profitability with beta values of -0.123**. Leverage and profitability also negatively correlated with each other with beta values of -0.532*. Firm size and profitability are positively correlated with each other with beta values of 0.098**.

Table 1: *Descriptive Statistics*

	N	min	p25	Mean	p50	p75	max	sd
Profitability	274,472	-72.74	-7.47	0.42	-0.40	7.47	267.44	26.88
CSR	277,867	0.00	6.70	27.44	24.87	44.44	226.70	26.28
Inflation	277,867	-86.64	-24.70	2.42	7.77	44.48	86.27	44.66
Leverage	277,247	0.07	4.28	26.24	24.26	40.27	87.26	27.78
Firm size	276,704	-0.82	0.72	2.26	2.27	2.70	4.77	0.76

Table 2: *Correlation Coefficient*

	Profitability	**CSR**	**Inflation**	**Leverage**	**Firm size**
Profitability	1				
CSR	0.456**	1			
Inflation	-0.123**	0.443	1		
Leverage	-0.532*	0.441	0.921	1	
Firm size	0.098**	0.221	0.431	0.231	1
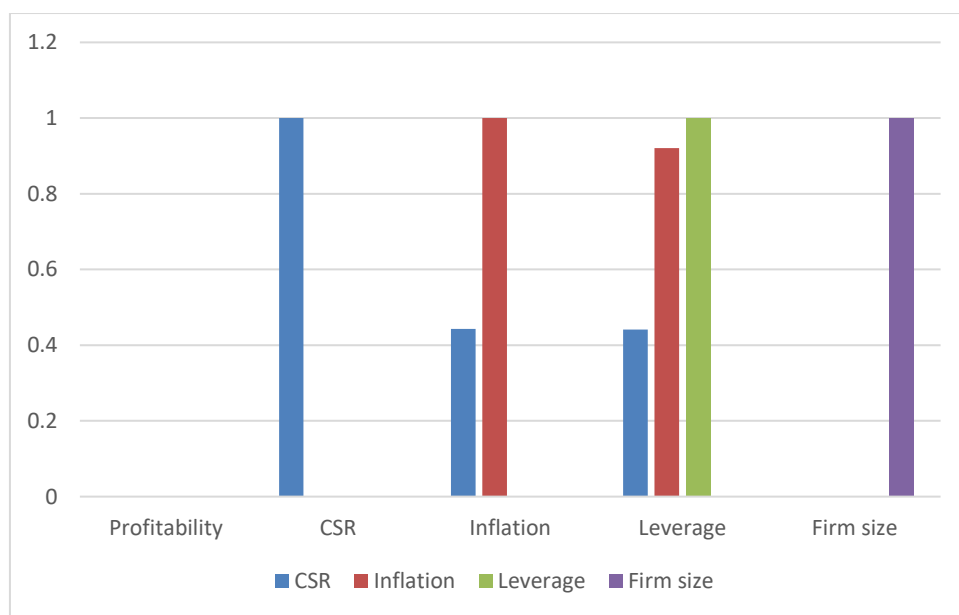
Figure 1: *Graphical Representation of the results*

Table 3 shows the results of Johansen bivariate co-integration test. This indicated that profitability and CSR have significant relationship with each other. If means if companies want to enhance their performance, they should focus on environmental activities and social performance. The significant relationship of inflation, leverage and size has been found with profitability of Chinese firms. The beta values are presented first after that test-statistics values are given.

Table 3: Johansen Bivariate Co integration test results

Λi	H0	H1	λ-max statistic	H0	H1	λ-trace statistic
(a) Profitability and CSR						
0.507	r = 0	r = 1	33.525**	r = 0	r = 1	12.221**
	r ≤ 1	r = 2		r ≤ 1	r = 2	
0.048			1.334			1.334
(b) Profitability and Inflation						
0.359	r = 0	r = 1	21.332	r = 0	r = 1	15.456**
0.11	r ≤ 1	r = 2	1.221	r ≤ 1	r = 2	1.221
(c) Profitability and leverage						
0.38	r = 0	r = 1	12.312**	r = 0	r = 1	17.554**
0.091	r ≤ 1	r = 2	2.554	r ≤ 1	r = 2	2.554
(d) Profitability and size						
0.325	r = 0	r = 1	11.321	r = 0	r = 1	14.321
0.076	r ≤ 1	r = 2	3.123	r ≤ 1	r = 2	3.123

Table 4: *OLS regression*

Dependent variable:	(1)	Profitability	(3)
CSR	1.35***	1.63***	1.36**
	(13.19)	(13.59)	(3.65)
Inflation			-1.11***
			(3.66)
Leverage	-6.56***		
	(-33.66)		
Size	1.19***	1.31***	-1.21*
	(3.36)	(3.56)	(1.65)
Observations	19,565	19,565	19,565
R-squared	0.13	0.36	0.35
Firm controls	Yes	Yes	Yes
Month FE	No	Yes	Yes
Industry FE	Yes	Yes	Yes
Firm-clustered SE	Yes	Yes	Yes

Table 4 shows the findings of OLS regression. CSR has a positive significant impact on the profitability of Chinese firms in all three models with beta values of 1.35***, 1.63***, and 1.36**. Inflation has a negative impact on profitability, with a beta value of -1.11*** in model 3. Leverage negatively impacts profitability with a beta value of -6.56*** in model 1. Firm size has a positive significant relation with profitability in the first 2 models (1.19***, 1.31***), while in the last model, the relationship is negatively significant (-1.21*).

The findings imply that inflation has a significant impact on firm profitability. Firm profitability will fall in areas where inflation rises and vice versa. Investors will receive a higher return on their investments if inflation declines. This study's results demonstrate that corporate social responsibility significantly impacts firm profitability. This indicates that a company's firm profitability is positively impacted by the amount of information it provides about its corporate social responsibility (CSR). According to the report's results, investors should consider corporate social responsibility (CSR) details when making investment decisions (Umar et al., 2021). We present the findings of a series of robustness tests in this subsection. Our primary conclusion is that high CSR enterprises outperform and remain unchanged even when alternate inflation measurements and inflation awareness are considered (Kong et al., 2022b). We take into account company price responses to realized inflation rates in our primary study.

Table 5 shows the robustness findings in three different models. The change (delta) element is taken into different explanatory variables and then checked out the impact of all these factors on firm profitability of Chinese firms over the period 2011 to 2023. CSR and size are positively linked while inflation and leverage are negatively associated with firm profitability indicating from their beta values.

Table 5: Robustness test

Dependent variable:		Profitability	
	(1)		(2)
ΔCSR	0.49***	0.49***	0.07
	-(4.47)	-(4.24)	(0.45)
ΔInflation			-0.04*
			(-4.79)
ΔLeverage			-0.13
			(-0.40)
Δsize	0.25***	0.24***	0.24***
	(4.59)	(4.95)	(4.94)
Observations	409,547	409,547	409,547
R-squared	0.04	0.24	0.24
Firm controls	Yes	Yes	Yes
Month FE	No	Yes	Yes
Industry FE	Yes	Yes	Yes
Firm-clustered SE	Yes	Yes	Yes

Table 6 shows the heterogeneous test results, which indicated that CSR and profitability are positively affected by each other with a beta value of 0.44***. On the other side, inflation and profitability are negatively linked, with each showing a value of 0.43*** in model 2. The same is the case with leverage, which is negatively linked with profitability, carrying a value of 0.28***. Firm size is positively associated with profitability, and the beta value is 0.23***.

Table 6: *Heterogeneous Test*

	(1)	(2)	(3)	(4)	(5)	(6)
CSR	0.44***					
	(9.48)					
Inflation		-0.43***				
		(9.20)				
Leverage			-0.28***			
			(9.94)			
Size				0.23***		
				(9.24)		
Observations	409,648	99,944	409,648	99,944	409,648	409,342
R-squared	0.21	0.22	0.24	0.25	0.26	0.27
Firm controls	Yes	Yes	Yes	Yes	Yes	Yes
Month FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm-clustered SE	Yes	Yes	Yes	Yes	Yes	Yes

Table 7 shows the findings of CSR and inflation dynamic situation. The insignificant findings have been found in low inflation rate while in high inflation rate, the relationship between CSR and inflation is significant. It shows the R-squared fact.
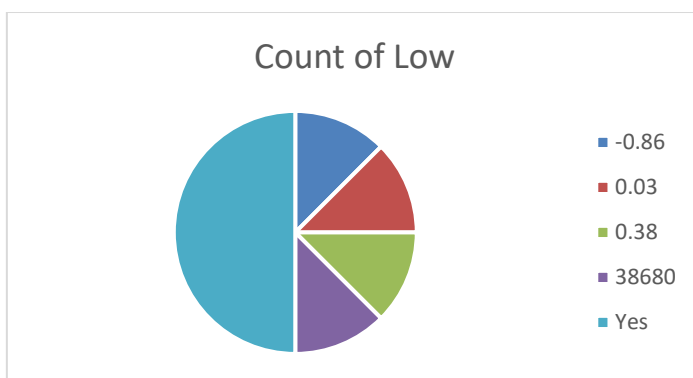

Figure 2: Count of Low Visualization

Table 7: CSR and Inflation relationship

	Low	High	Low	High	Low	High
CSR	0.38	4.08***	3.33*	3.73***	0.68*	0.64**
	(0.86)	(3.68)	(3.88)	(8.08)	(3.64)	(4.36)
Observations	38,680	38,806	36,046	36,833	36,347	36,860
R-squared	0.03	0.03	0.04	0.04	0.04	0.04
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Month FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm-clustered SE	Yes	Yes	Yes	Yes	Yes	Yes

Investors believe that the more corporate social responsibility (CSR) a company reveals, the more pressure it will face in the near and medium terms. Businesses only have to spend money on CSR when it comes to achieving the very minimum requirements of the relevant laws; in other words, information is not included in CSR that is released (Gond et al., 2017). A company's total number of CSR disclosures may not always translate into an improvement in investors' ideal firm profitability.

5. CONCLUSION AND POLICY IMPLICATIONS

CSR and inflation plays a significant role in firm's performance. The aim of this study is to examine the impact of CSR, inflation, leverage and size on firm's profitability of 30 Chinese manufacturing firms over the period 2011 to 2023 using the bivariate and OLS regression. The findings indicated that all three models find that corporate social responsibility has a positive and considerable impact on the profitability of Chinese businesses, with beta values of 1.35***, 1.63***, and 1.36**. In model 3, inflation has a beta value of -1.11***, which indicates that it has a negative impact on profitability. In model 1, leverage has a beta value of -6.56***, which indicates that it has a strong negative influence on profitability. In the first two models, the link between firm size and profitability is found to be significantly positive (1.19*** and 1.31***), whereas in the third model, the relationship is significantly negative (-1.21*).

According to the data, inflation and leverage has a negative impact on performance of the firms. When inflation rates grow, it will be detrimental to a company's capacity to turn a profit, and vice versa (Chowdhury et al., 2017). If there is less inflation, investors will get a greater return on the money they put into their

assets. According to the findings of this study, a company's level of corporate social responsibility has a considerable effect on the profitability of the business. This suggests that the quantity of information a company discloses about its CSR has a favorable impact on the firm's profitability (Dangelico & Pujari, 2010). When deciding how to allocate their capital, investors should, according to the findings of the analysis, take into account the specifics of their companies' corporate social responsibility (CSR) programs. The study discussed the results of a number of robustness tests that were conducted. Even after taking into account alternative inflation metrics and heightened awareness of inflation, our core finding that businesses with high levels of CSR have better financial performance has not altered. In the core research that we conducted, we took into account how corporate prices responded to actual rates of inflation.

The Chinese government is continuing its efforts to increase the country's overall economic growth by preserving economic stability. Challenges involving private sector investment in the public sector, as well as efforts aimed at consolidating regional and international standards particularly in matters of environmental matters (Minh et al., 2021; Sun et al., 2021), reducing pollution and dangerous chemical emissions continue to constitute focal points, and whilst progress is being made in certain jurisdictions, evidence exists to support the fact that many developing economies still suffer from environmental consequences resulting from unsustainable economic practices. This study is limited to Chinese government while the further study can be done taking the other developed and developing countries along with more different variables.

REFERENCES

Abbas, J. (2024). Does the nexus of corporate social responsibility and green dynamic capabilities drive firms toward green technological innovation? The moderating role of green transformational leadership. *Technological Forecasting and Social Change*, *208*, 123698. https://doi.org/10.1016/j.techfore.2024.123698

Abbas, J. (2025). From corporate social responsibility to human social responsibility: A pathway for a sustainable society. *Journal of Cleaner Production*, *494*, 144979. https://doi.org/10.1016/j.jclepro.2025.144979

Abbas, J., He, C., Belgacem, S. ben, Pawar, P. S., Najam, H., & Abbas, J. (2023). Investment in renewable energy and electricity output: Role of green finance, environmental tax, and geopolitical risk: Empirical evidence from China. *Energy*, *269*, 126683. https://doi.org/10.1016/j.energy.2023.126683

Aguinis, H., & Glavas, A. (2019). On Corporate Social Responsibility, Sensemaking, and the Search for Meaningfulness Through Work. *Journal of Management*, *45*(3), 1057–1086. https://doi.org/10.1177/0149206317691575

Ahmed, Z., Nathaniel, S. P., & Shahbaz, M. (2021). The criticality of information and communication technology and human capital in environmental sustainability: Evidence from Latin American and Caribbean countries. *Journal of Cleaner Production*, *2*(2), Article 2. https://doi.org/10.1016/j.jclepro.2020.125529

Bhattacharyya, R. (2021). Green finance for energy transition, climate action and sustainable development: Overview of concepts, applications, implementation and challenges. *Green Finance*, *4*(1), 1–35. https://doi.org/10.3934/gf.2022001

Chowdhury, M. A. F., Haque, M. M., & Masih, M. (2017). Re-Examining the Determinants of Islamic Bank Performance: New Evidence from Dynamic GMM, Quantile Regression, and Wavelet Coherence Approaches. *Emerging Markets Finance and Trade*, *53*(7), 1519–1534. https://doi.org/10.1080/1540496X.2016.1250076

Cronin, D. (2014). The interaction between money and asset markets: A spillover index approach. *Journal of Macroeconomics*, *39*(PA), 185–202. https://doi.org/10.1016/j.jmacro.2013.09.006

Dangelico, R. M., & Pujari, D. (2010). Mainstreaming green product innovation: Why and how companies integrate environmental sustainability. *Journal of Business Ethics*, *95*(3), 471–486. https://doi.org/10.1007/s10551-010-0434-0

Danilov, Y. A. (2021). The concept of sustainable finance and the prospects for its implementation in Russia. *Voprosy Ekonomiki*, *2021*(5), 5–25. https://doi.org/10.32609/0042-8736-2021-5-5-25

Diebold, F. X., & Yilmaz, K. (2014). On the network topology of variance decompositions: Measuring the connectedness of financial firms. *Journal of Econometrics*, *182*(1), 119–134. https://doi.org/10.1016/j.jeconom.2014.04.012

Fan, Q., Abbas, J., Zhong, Y., Pawar, P. S., Adam, N. A., & Alarif, G. B. (2023). Role of organizational and environmental factors in firm green innovation and sustainable development: Moderating role of knowledge absorptive capacity. *Journal of Cleaner Production*, *411*, 137262. https://doi.org/10.1016/j.jclepro.2023.137262

Faridi, M. R., & Malik, A. (2020). Digital transformation in supply chain, challenges and opportunities in SMEs: A case study of Al-Rumman Pharma. *Emerald Emerging Markets Case Studies*, *10*(1), 1–16. https://doi.org/10.1108/EEMCS-05-2019-0122

Fu, Q., Abbas, J., Alarif, G. B., Sial, M. S., Brugni, T. V., & Adamwal, N. (2023). I act in an environmentally responsible fashion since my firm is socially responsible: A pathway for transition to a responsible society. *Journal of Cleaner Production*, *414*, 137523. https://doi.org/10.1016/j.jclepro.2023.137523

Gond, J. P., El Akremi, A., Swaen, V., & Babu, N. (2017). The psychological microfoundations of corporate social responsibility: A person-centric systematic review. In *Journal of Organizational Behavior* (Vol. 38, Issue 2, pp. 225–246). John Wiley and Sons Ltd. https://doi.org/10.1002/job.2170

Goodwin, D., Holman, I., Pardthaisong, L., Visessri, S., Ekkawatpanit, C., & Rey Vicario, D. (2022). What is the evidence linking financial assistance for drought-affected agriculture and resilience in tropical Asia? A systematic review. In *Regional Environmental Change* (Vol. 22, Issue 1, p. 12). https://doi.org/10.1007/s10113-021-01867-y

Hsu, B. X., Chen, Y. M., & Chen, L. A. (Leann). (2022). Corporate social responsibility and value added in the supply chain: Model and mechanism. *Technological Forecasting and Social Change*, *174*. https://doi.org/10.1016/j.techfore.2021.121302

Ikpefan, O. A., Osuma, G. O., Ahire, T., Evbuomwan, G., Kazeem, B. O., & Chimezie, P. (2021). Working capital management and performance of six deposit money banks in Nigeria. *Asian Economic and Financial Review*, *11*(6), 418–428. https://doi.org/10.18488/JOURNAL.AEFR.2021.116.418.428

Jiakui, C., Abbas, J., Najam, H., Liu, J., & Abbas, J. (2023). Green technological innovation, green finance, and financial development and their role in green total factor productivity: Empirical insights from China. *Journal of Cleaner Production*, *382*(1), 135131. https://doi.org/10.1016/j.jclepro.2022.135131

Khan, A., Bibi, M., & Tanveer, S. (2016). The Impact of Corporate Governance on Cash Holdings: A Comparative Study of the Manufacturing and Service Industry. *Financial Studies*, *20*(3), 40–79.

Kong, D., Ji, M., & Zhang, F. (2022a). Individual investors' dividend tax reform and corporate social responsibility. *Journal of International Financial Markets, Institutions and Money*, *78*. https://doi.org/10.1016/j.intfin.2022.101542

Kong, D., Ji, M., & Zhang, F. (2022b). Individual investors' dividend tax reform and corporate social responsibility. *Journal of International Financial Markets, Institutions and Money*, *78*. https://doi.org/10.1016/j.intfin.2022.101542

Lepitzki, J., & Axsen, J. (2018). The role of a low carbon fuel standard in achieving long-term GHG reduction targets. *Energy Policy*, *119*, 423–440. https://doi.org/10.1016/j.enpol.2018.03.067

Mamun, A. Al. (2021). Materiality of Disclosure of Non-financial Sustainability Information and Company Financial Performance: Evidence from Australian Listed Companies. *American Journal of Trade and Policy*, *8*(2), 199–214. https://doi.org/10.18034/ajtp.v8i2.565

Minh, H., Quang, T., Chien, F., Ananzeh, M., Mirza, F., Bakar, A., Minh Vu, H., Quang Ngo, T., Khac Nhu, N., Chi Minh City, H., & Nam, V. (2021). The effects of green growth, environmental-related tax, and eco-innovation

towards carbon neutrality target in the US economy. *Elsevier*, *12*, 49. https://doi.org/10.1016/j.jenvman.2021.113633

Mukanjari, S., & Sterner, T. (2020). Charting a "Green Path" for Recovery from COVID-19. *Environmental and Resource Economics*, *76*(4), 825–853. https://doi.org/10.1007/s10640-020-00479-0

Najam, H., Abbas, J., Álvarez-Otero, S., Dogan, E., & Sial, M. S. (2022). Towards green recovery: Can banks achieve financial sustainability through income diversification in ASEAN countries? *Economic Analysis and Policy*, *76*, 522–533. https://doi.org/10.1016/j.eap.2022.09.004

Obeidat, M., Khataibeh, M., Omet, G., & Tarawneh, A. (2021). The performance of banks in a developing country: Has Covid-19 made any difference. *Pressacademia*, *8*(2), 102–108. https://doi.org/10.17261/pressacademia.2021.1395

Olalere, O. E., Islam, M. A., Yusof, W. S., Ariffin, K. H. K., & Kamruzzaman, M. (2021). The moderating role of financial innovation on financial risks, business risk and firm value nexus: Empirical evidence from Nigeria. *AIP Conference Proceedings*, *2339*. https://doi.org/10.1063/5.0045082

Orlov, A., & Aaheim, A. (2017). Economy-wide effects of international and Russia's climate policies. *Energy Economics*, *68*, 466–477. https://doi.org/10.1016/j.eneco.2017.09.019

Pfajfar, G., Shoham, A., Małecka, A., & Zalaznik, M. (2022). Value of corporate social responsibility for multiple stakeholders and social impact – Relationship marketing perspective. *Journal of Business Research*, *143*, 46–61. https://doi.org/10.1016/j.jbusres.2022.01.051

Pham, D. C., Do, T. N. A., Doan, T. N., Nguyen, T. X. H., & Pham, T. K. Y. (2021). The impact of sustainability practices on financial performance: Empirical evidence from Sweden. *Cogent Business and Management*, *8*(1). https://doi.org/10.1080/23311975.2021.1912526

Pollak, F., Markovic, P., Vachal, J., & Vavrek, R. (2022). Analysis of E-Consumer Behavior During the COVID-19 Pandemic. In *EAI/Springer Innovations in Communication and Computing* (pp. 95–114). Springer Science and Business Media Deutschland GmbH. https://doi.org/10.1007/978-3-030-78303-7_6

Qing, L., Abbas, J., Najam, H., Ma, X., & Dagestani, A. A. (2024). Investment in renewable energy and green financing and their role in achieving carbon-neutrality and economic sustainability: Insights from Asian region. *Renewable Energy*, 119830. https://doi.org/10.1016/j.renene.2023.119830

Quyen, P. G., Ha, N. T. T., Darsono, S. N. A. C., & Minh, T. D. T. (2021). Income Diversification and Financial Performance: The Mediating Effect of Banks' Size, Ownership Structure and the Financial Crisis in Vietnam. *Journal of Accounting and Investment*, *22*(2). https://doi.org/10.18196/jai.v22i2.10775

Sachin, N., & Rajesh, R. (2021). An empirical study of supply chain sustainability with financial performances of Indian firms. *Environment, Development and Sustainability*. https://doi.org/10.1007/s10668-021-01717-1

Shang, T., Samour, A., Abbas, J., Ali, M., & Tursoy, T. (2024). Impact of financial inclusion, economic growth, natural resource rents, and natural energy use on carbon emissions: The MMQR approach. *Environment, Development and Sustainability*. https://doi.org/10.1007/s10668-024-04513-9

Sun, H., Awan, R. U., Nawaz, M. A., Mohsin, M., Rasheed, A. K., & Iqbal, N. (2021). Assessing the socio-economic viability of solar commercialization and electrification in south Asian countries. *Environment, Development and Sustainability*, *23*(7), 9875–9897. https://doi.org/10.1007/s10668-020-01038-9

Tan, Y. (2016). The impacts of risk and competition on bank profitability in China. *Journal of International Financial Markets, Institutions and Money*, *40*, 85–110. https://doi.org/10.1016/j.intfin.2015.09.003

Tong, L., Chiappetta Jabbour, C. J., belgacem, S. ben, Najam, H., & Abbas, J. (2023). Role of environmental regulations, green finance, and investment in green technologies in green total factor productivity: Empirical evidence from Asian region. *Journal of Cleaner Production*, *380*, 134930. https://doi.org/10.1016/j.jclepro.2022.134930

Umar, Z., Gubareva, M., & Teplova, T. (2021). The impact of Covid-19 on commodity markets volatility: Analyzing time-frequency relations between commodity prices and coronavirus panic levels. *Resources Policy*, *73*. https://doi.org/10.1016/j.resourpol.2021.102164

Wang, S., Abbas, J., Sial, M. S., Álvarez-Otero, S., & Cioca, L.-I. (2022). Achieving Green Innovation and Sustainable Development Goals through Green Knowledge Management: Moderating Role of Organizational Green Culture. *Journal of Innovation & Knowledge*, *7*(4), 100272. https://doi.org/10.1016/j.jik.2022.100272

Yao, H., Haris, M., & Tariq, G. (2018). Profitability determinants of financial institutions: Evidence from banks in pakistan. *International Journal of Financial Studies*, *6*(2), 53. https://doi.org/10.3390/ijfs6020053

Yaqoob, M. S., U Din, S., Ashraf, Y., Nazir, M. S., & Shahzad, A. (2020). What Determines Income Diversification of Banking Firms in Pakistan. *International Journal of Business Excellence*, *1*(1), 1. https://doi.org/10.1504/ijbex.2020.10031434

Yu, T., Abbas, J., Rizvi, R. A., & Najam, H. (2024). Role of environment-driven CSR, green servant leadership, and green dynamic capabilities in firm green innovation: Evidence from manufacturing industry. *Environment, Development and Sustainability*. https://doi.org/10.1007/s10668-024-05201-4

Zhou, P., Abbas, J., Najam, H., & Alvarez-Otero, S. (2023). Nexus of renewable energy output, green technological innovation, and financial development for carbon neutrality of Asian emerging economies. *Sustainable Energy Technologies and Assessments*, *58*, 103371. https://doi.org/10.1016/j.seta.2023.103371

Comparative Study of Customer Perceived Value in Pre and Post-Purchase Stage: A Case of University Students

Usman Ehsan[1*]

ABSTRACT

The study aims to determine the role of customer-perceived value and identify comparisons between university students in the pre- and post-purchase stages. A self-administered questionnaire was used to obtain the responses from university students. The responses were acquired about different dimensions of Customer perceived value, including functional, epistemic, social, emotional, conditional, and image value. The data is analyzed using the software package of Statistical Package for the Social Sciences (SPSS). The results revealed that the empirical significance of perceived value is multidimensional. Notably, social, emotional, and conditional values differ at the pre-admission stage compared to the post-admission stage. In addition, epistemic, functional, and perceived image values are similar in the pre-admission and post-admission stages. The findings imply that universities should improve social, emotional, and conditional support during pre-admission to lure learners. Likewise, creating and maintaining epistemic, functional, and image value to the extent of admission guarantees student satisfaction. Students should use these dimensions to match expectations with what institutions have to offer for great experiences. This paper presents the multifaceted construct of perceived value in HE and provides implications of the findings for managing value at various stages. The study guides the stakeholders in improving their students' experiences and successfully matching institution initiatives with students' expectations.

Keywords: Customer Perceived Value, Purchase Intention, Social Value, Emotional Value, Conditional Value, Students

1. INTRODUCTION

The concept of customer-perceived value is still complex to understand even though an enormous amount of research has been carried out on this concept (Blut et al., 2024). It is vital for the company to know about the customers' definition of perceived value so that firms can utilize their resources and formulate a strategy that delivers superior value for the customers (Arias et al., 2024). Indeed, the core of marketing is value. Right from the beginning, value is integral even in the definition

[1] University of Management & Technology
[*] Corresponding author's E-mail: usman.ehsan@skt.umt.edu.pk

of marketing, where "value is created for the customers," mostly referred to as customers' perceived value (Nguyen et al., 2024).

Background: Although there has been an enormous amount of work done on the definition, measurement, and improvement of customer-perceived value in different service environments, debate is still ongoing on to answer the fundamental/basic questions raised earlier by (Yan et al., 2024) that what is perceived as value; developing a comprehensive construct for its measurement and how these dimensions of customer perceived value are different in three stages of (pre-purchase, purchase, and post-purchase) purchase process. The same question was endorsed by (Baidoun & Salem, 2024) that the value assessment criteria may change across these scenarios and this needs to be studied. In the case of services it becomes more important to study the customer perceived value in the pre, purchase, and post-purchase stages because once a service is purchased the nature of the relationship changes as compared to products it becomes more connected (Cankül, Kaya, & Kızıltaş, 2024). After purchasing the product the interaction between product manufacturer reduces whereas in services it becomes more interactive as students interact more with teachers after getting admission, patients interact more with doctors after being hospitalized, internet users interact more with internet service providers after subscription, customers interact more with banks after opening accounts – so in services, the nature of customer perceived value will be difficult to measure in absolute manner in different stages of purchase process of services (Vieira, Araujo, & de Almeida, 2024).

There has been extensive research on this topic in different industries (Bansal & Sharma, 2024) developed for value in services (behavioral, monetary, emotional response, quality, reputation); (Liu & Liu, 2024) in Public Park and Recreation Agencies (enhancing real estate value, preventing youth crime, environmental stewardship and others relevant to public parks); Seo and Yun (2015) in destination food image (functional and emotional value); El-Adly and Eid (2017) in value of malls especially from the Muslim shoppers; Jiang and Kim (2015) for assessing green value (functional, emotional, social & epistemic, and monetary including explicit & implicit); even more recent work also followed the same routine like Gheorghe, (So et al., 2024) developed a scale for ophthalmology services; (Yilmaz, Sagfossen, & Velasco, 2023) for large-scale stores and many other scholars have developed the industry-specific scales for measuring perceived value. Kim and Tang (2020) also studied how customers perceive the value in restaurants by using a multi-layer method. They included different aspects of customers like participation behavior, citizenship behavior, and three dimensions of customer perceived value but also suggested that it will be interesting to see the change in the model – which is the customers' understanding of customer perceived value in prior purchase and post-purchase stages.

Problem Statement: As students are usually interacting with different university services or aspect of overall service (Hossain et al., 2010) so their expectations are different in pre-admission and post-admission stages (Kotler & Fox, 1995; Bhattacherjee, 2001) so this should be studied that how differently prospective and current students perceive value in higher education services.

Significance of the Study: Kim and Tang (2020) highlighted the need to study customer perceived value in pre & post-purchase in other industries similarly it is important in higher education services. In the field of higher education, many researchers studied the perceived value including (Yan et al., 2024). Baidoun & Salem (2024) proposed the information system continuance model that customers' expectations will be different after experiencing and before experiencing the services. Similarly, as students go through the pre-purchase, purchase, and post-purchase stages; their perceptions of value will be different in all those stages. Higher education services are complex because of the high level of student involvement, high importance (Alves, 2011) and career goals whether pursuing undergraduate, graduate or post-graduation studies. As the nature of perceived value is not static it changes once the context of consumer changes like prior purchase and post-purchase stages Kotler and Fox (1995) also highlighted the question of whether measurement components of student value perceived in higher education should be different from other industries because students will assess value in university education differently in different stages before admission, during the study, after graduation and also career advancement. Aycock, Cho, and Kim (2023), supported the current proposition that the value perceptions keep on changing and make it dynamic. In another research by Yilmaz, Sagfossen, and Velasco (2023) they studied the factors that have an impact on the student's participation in higher education. They find out that as students are usually unaware of certain university services/aspects of overall service so they have different issues before and after admission. Building on the work of Yan et al. (2024); Cankül, Kaya, and Kızıltaş (2024); Vieira, Araujo, and de Almeida (2024); Liu and Liu (2024); Woodruff (1997); Parasuraman (1997) and Kim and Tang (2020) this research will explore the dimensions of customer perceived value in higher education before and after getting admission in the university? The following are the research questions of this research:

RQ1: Do customers consider different dimensions of perceived value in higher education before and after getting admission to the university?

Contribution of Study: This work is unique in its attempt to examine customer perceived value of its multi-dimensionality in pre- and post-admission university students. As distinguished from prior research, that mainly investigates consumer behavior on traditional markets; the present study addresses the concept of perceived value in the context of the higher education market. Notably, the study differentiates

the social, emotional, and conditional values during various stages to help understand how expectations of students change throughout their decision-making and university experience. In addition, the study identifies congruent dimensions including epistemic, functional, and perceived image values that can provide a clear map for institutions to enhance student satisfaction and interest. This research also expands the existing theory of customer perceived value by using it in an educational context, thus encouraging universities to purposefully build more value propositions. All these contributions have policy implications for enhancing student-oriented policies and enhancing the competitiveness of the institutions.

The structure of the study covers the five sections. Section one presents the introduction, section two discusses the literature review, section three elaborates the methodology, and section four discusses the results and discussion. While, section five presents the conclusion, implications, and future research.

2. LITERATURE REVIEW

Customer perceived value is difficult to understand as it is linked with product/service evaluation; which has many aspects and is certainly not a simple task to do. One of much-cited works of Vieira, Araujo, and de Almeida (2024), in which they see that which one is more important whether perceived instrumentally (brand is serving the purpose of usage motives) or value importance (relative importance of these motives) in determining the attitude of the buyer. They got the results but with some of the conceptual questions few of which were raised by them. One was the factor of duality of the scale which they tried to explore in one of their later projects. There was another conceptual inconsistency in that they studied these concepts of value towards the brand, not the products which is not the concept of perceived value; it is more like buying/consumption patterns. This is also justified by how a firm can include the value of the brand once it is not in the market – new product development. Later on, Sheth, Newman, and Gross (1991) explored the influence of five dimensions of value on choice which is mostly known as "consumption values" Based on their work Cankül, Kaya, and Kızıltaş (2024) theory identifies five consumption values influencing consumer choice behavior. These are *functional value*, *social* value, *emotional* value, *epistemic value*, and *conditional value*. A decision may be influenced by any or all of the five consumption values (Yilmaz, Sagfossen, and Velasco (2023). Various disciplines (including economics, sociology, several branches of psychology, and marketing and consumer behavior) have links with these fields of subject. They applied this concept as a theory of choice and have applied theory using terms like use/do not use or some other terms like buy and don't buy. Blut et al. (2024) included the following dimensions of customer perceived value, which are discussed in the context of higher education services.

In general, the functional value refers to the utility and needs fulfillment of a product/service and derives from the utilitarian or functional performance (Nguyen et al., 2024). In other terms, it relates to the ability to serve the purpose of being a service offered or product used. Functional value aligns with the means–end approach to value in which consumers' consumption goals and the consequences of use are salient in the value judgment (So et al., 2024). In the context of business education, functional value accounts for the perceived benefits of the chosen course of study in terms of accelerating or enhancing students' employment or career advancement objectives, i.e. the development of knowledge and skills that help to achieve career goals (So et al., 2024). In contrast to functional, emotional value is associated with extrinsic aspects of value in terms of the offering's ability to ascertain the feelings of the customers certain foods can stimulate feelings of comfort while some consumers are said to have emotional relationships with their possessions (Fournier, 1998). Emotional perception of value keeps an equally important position in customer perception in both uni-dimensional and multi-dimensional value research. In the education context, emotional value is realized through the affective states that are aroused in the student while studying for their degree, for example, their sense of pride and self-achievement in taking their course (LeBlanc & Nguyen, 1999).

Image Value is quite different from emotional value and it refers to the design, physical, and likability of the physical environment it is highly important in the domain of services Bansal and Sharma (2024) where the tangibility aspect is limited. In university education, this sort of value is considered important as well as it refers to student's preferences towards the classroom environment, labs, grounds, and university's overall infrastructure that affects students' perception before and after taking admission in university. Among all the dimensions of customer perceived value; conditional value refers to the situational value and it is different from all other aspects of customer perceived value in detailing the capacity of a product or service to provide novelty or satisfy a desire for knowledge; finally, conditional value that derives from the specific contexts of each situation. Conditional value (CV) represents the benefits derived in a specific situational context, for example in the education context CV can be related to the value perceived by students in terms of teaching materials such as textbooks (Baidoun & Salem, 2024). The following are the hypotheses of this research study. Functional Values have two main aspects one with quality and the other one is performance.

In the context of higher education, functional value is mostly related to the quality of education and the program chosen.

Hypothesis 1: *There is a difference in the importance of functional value (dimension of perceived value) in Higher Education before and after getting admission to a university*

Epistemic Value refers to the ability of education services to arouse curiosity, provide novelty, or satisfy the need for education – which is the core of the higher education industry.

Hypothesis 2: *There is a difference in the importance of Epistemic value (dimension of perceived value) in Higher Education before and after getting admission in the university*

Social Value is related to the group interactions that most students experience with friends and colleagues. Some of the researchers also included images of the university considering as well that how people perceive or have an image in society.

Hypothesis 3: *There is a difference in the importance of Social value (dimension of perceived value) in Higher Education before and after getting admission in the university*

Emotional Value refers to the emotional attachment with friends, colleagues, and the university itself during their studies at the university.

Hypothesis 4: *There is a difference in the importance of Emotional value (dimension of perceived value) in Higher Education before and after getting admission to the university*

Conditional Value Conditional value (CV) represents the benefits derived in a specific situational context, for example in the education context CV can be related to the value perceived by students in terms of teaching materials such as textbooks (Unni, 2005)

Hypothesis 5: *There is a difference in the importance of Conditional value (dimension of perceived value) in Higher Education before and after getting admission to the university*

Image Value refers to the design, physicality, and likability of the physical environment. It is highly important in the domain of services (Chahal and Kumari, 2012), where the tangibility aspect is limited.

Hypothesis 6: *There is a difference in the importance of Image value (dimension of perceived value) in Higher Education before and after getting admission to the university*

3. THEORETICAL SUPPORT

This research is underpinned by the Theory of Consumption Values (TCV), developed by Sheth, Newman, and Gross in 1991 TCV reveals consumption values that are functional, social, emotional, epistemic, and conditional in the buying decision process of consumers. This theory is highly relevant to the present study as it reflects on the study's objective which was to identify and analyze the differences in perceived values of university students during the pre-choice/conversion (the purchase decision) and post-choice/conversion (the post-purchase experience) stages. The main research strategy in this study is the analysis of the development of value perceptions in TCV, which is facilitated by TCV's multidimensional framework. This paper extends TCV by comparing the social, emotional, and conditional values in the three stages while functional, epistemic, and perceived image values remain invariant. This application expands the theory's applicability in the higher education setting. In the field of higher education, students interact with different service providers at different stages of service in the pre-experience stage students interact with only administrative staff and in the experience stage students interact with faculty which highly influences the perceptions of value in those situations.
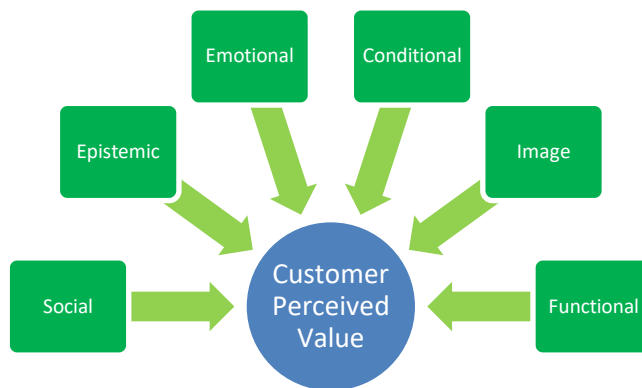
Figure 1 *Research Framework*

As discussed earlier students interact with different university services or aspects of overall service (Hossain et al., 2010) so their expectations are different in the pre-admission and post-admission stages (Kotler & Fox, 1995; Bhattacherjee, 2001) ultimately their will be different in the dimensions of perceived value among prospective and current students of higher education. From the research of Ledden, Kalafatis, and Samuel (2007) the dimensions of customer perceived value will be explored in the context of higher education before and after admission in the university only to the get dimensions not given as this research was only limited to

see the difference amongst get dimensions. Following is the theoretical model for this research:

4. METHODOLOGY

Population and Sample: In this research, the target population was students currently enrolled in business programs (undergraduate and graduate) using a self-administered questionnaire using a simple random sampling technique via a database provided by the university. A total of 125 respondents from three universities were reached against the target of 200 but due to time constraints appropriate number was not achieved.

Questionnaire: In this study survey method was used. A self-administered questionnaire was used for data collection. The questionnaire had three main sections. The first section was related to demographics; the second section was related to dimensions before admission and the third was related to dimensions after admission in the higher education institution.

Process of Sample Recruitment: Before admission (pre-purchase stage) students are more interested in getting information about the university pathway, tuition & other expenses, scholarships, and admission, and a few other aspects. Whereas after admission (purchase stage) they want more information about academic support, range of courses, connectedness, and other aspects that were completely different from before admission. Supporting the argument of this research that students perceive value differently before admission (pre-purchase) and after admission (purchase stage). Lai et al. (2012) suggested that future research should be conducted on how student's undergraduate purchase and their future postgraduate purchase affect their evaluation of perceived value. Toledo, Martínez, and García (2017) studied the factors affecting perceived value and outcome of perceived value among university graduates. They collected quantitative data using a unidimensional scale and they acknowledged as a limitation. They also suggested that research should be undertaken by considering the time at which research is undertaken (right after graduation) because of the diversity and complexity of the concept (perceived value).

Data Analysis: Data analysis will be done using SPSS. Instrument reliability measure was ensured but validity measures were not required in this context of research so there were not tested. The difference in the importance of dimensions of perceived value was tested using a paired sample t-test.

5. STUDY FINDINGS

First of all the demographics data is presented where the distribution of gender and age wise is presented. In gender-wise classification Male percentage is higher as its value is 58% and female representation is 42%. Age-wise classification and representation is below 20 has 13% participation, 20-22 have 38%, 23-25 have 40%, and above 25 has 9% participation.

Table 1 *Demographic Information*

Demographics	Options	Percentage
Gender	Male	58%
	Female	42%
Age	Below 20	13%
	20-22	38%
	23-25	40%
	Above 25	9%

Scale reliability was ensured as its value is higher than 0.80 in both sages as results are as follows:

Table 2 *Reliability of Construct*

Constructs	Items	Pre-CA	Post-CA
Functional Value	PreF1, PreF2, PreF3, PreF4, PreF5, PreF6	0.936	0.959
Epistemic Value	PReEp1, PreEp2, PreEp3, PreEp4	0.913	0.904
Social Value	PreS1, PreS2, PreS3, PreS4, PreS5, PreS6	0.826	0.914
Emotional Value	PreEm1, PreEm2, PreEm3, PreEm4, PreEm5, PreEm6	0.905	0.907
Conditional Value	PreC1, PreC2, PreC3, PreC4	0.877	0.941
Image Value	PreI1, PreI2, PreI3, PreI4, PreI5	0.946	0.969

Following are the paired sample t-tests to reflect the difference in the importance of dimensions of perceived value amongst university students in the preadmission and post-admission stage. Hypothesis 1-Functional Value, 2-Epistemic Value & 6-Image Value are rejected as the difference in the importance of dimension is not significant (Sig-Value is above 0.05). On the other hand Hypothesis 3, Social Value,

4-Emotional Value & 5-Conditional Value are accepted as the difference in the importance is significant with a significant value of below 0.05.

Table 3 *Paired T-Sample Results*

Pre-admission Vs Post-admission	Pre-Post	t-test	Sig.	Results
Functional Value	0.092	1.535	0.140	Rejected
Epistemic Value	0.033	0.434	0.594	Rejected
Social Value	0.174	2.456	0.011	Accepted
Emotional Value	0.283	2.958	0.000	Accepted
Conditional Value	0.336	-2.305	0.002	Accepted
Image Value	0.133	1.301	0.128	Rejected

Table 3 shows the results of the paired t-test of specific dimensions of the perceived value of university students in the pre-admission and post-admission stages. Social value, emotional value, and conditional value are significantly different from each other, which means that students' perceptions of these aspects change remarkably during their university years. The results revealed that post-admission, the value gained by students through their membership in the community has risen significantly in terms of social value (t = 2.456, p = 0.011) and emotional value (t = 2.958, p < 0.001). Notably, conditional value is significantly reduced (t = -2.305, p = 0.002) meaning that students might consider other situational factors such as promos or availability of certain materials upon joining less of importance. On the other hand, functional value (t = 1.535, p = 0.140), epistemic value (t = 0.434, p = 0.594) and image value (t = 1.301, p = 0.128) values are also statistically insignificant; this means the perceived values under these dimensions are similar between the two stages. Such consistency reflects stable expectations of students in terms of the type of knowledge that the university provides, its practical relevance, and the university's reputation. Conclusively, these results suggest that universities need to foster epistemic, functional, and image-related aspects, while dynamic aspects, such as social, emotional, and situational support, should be enhanced in the context of the transition to post-admission.

6. DISCUSSION

Functional value is considered important equally in the pre-admission and post-admission stages as they are always considered about the quality of education. It reflects that the students/customers are concerned about the functionality; the performance of the university on academic grounds matters. So universities should keep in consideration this aspect whether dealing with prospective students or existing customers – the quality of education prevails. Also goes for the same for Epistemic value where students have concerned for the knowledge and content of teaching matters in both stages. Similarly with the image value of the university student in the pre-admission and post-admission stages always expect to be part of a

university with a good brand image. Social value is important for the students as some have a good social circle even before university admission and they value this aspect in the later stage means after getting enrolled. Emotional Value refers to the emotional attachment with friends, colleagues, and the university itself during their studies at the university. It got quite similar results as for the social value. From the results, it can be concluded that it is important in both stages but it is related to their social circle in that particular university. After getting enrolled students consider this as one of the important aspects and they don't get attached just to friends they also get an association with the faculty and overall university like they like to visit the university on and off. They miss the university if they don't visit for some time as happened in this pandemic situation. Lastly, the conditional value which as per nature reflects change as a student's condition of knowledge and economic changes so does the perception about perceived value; which is reflected in the results.

7. CONCLUSION, POLICY IMPLICATION AND FUTURE RESEARCH

7.1 Conclusion

This research work is important in understanding the complexity of the customer perceived value within the context of university students before and after their admission. The study shows that there are variations of perceived value as students move from high school to university enriching these dimensions of the values. Post-admission, the stress is on the social and emotional values that require the university to encourage students to be able to engage in communities and offer their emotional support too. On the other hand, conditional value reduces, thus implying that situational factors are more influential at this stage, the decision-making stage. However, functional, epistemic, and image values are static across the two stages, and, as such, play a key role in students' broader perceptions of their university experience. These results provide empirical support for universities to implement a stage-specific approach to improving students' satisfaction and loyalty. When institutions meet new and continuous requirements and retain value dimensions, they can enhance competitive advantage and positive student experience.

7.2 Practical & Theoretical Implications

The implication of the findings of this study for policy in the context of universities is therefore consequential in view of the current efforts by institutions to increase student satisfaction and organizational performance. Understanding that customer perceived value is a changing construct, it is crucial for universities to implement a conceptual, level-based model to respond to a continuous change in customers' expectations during the pre-and post-admission periods. First, it was seen

that social and emotional values have increased significantly after admission, and therefore, these aspects of students' lives should be emphasized more. Supportive measures include social identity enhancement through policies that foster the formation of active student' associations, colorful students activities, and services that promote student's mental health. Another area that universities should encourage are those that help support issues with diversity and inclusion to ensure all students feel welcome. Secondly, the decrease in value that is conditional on attendance post-admission implies that the promotional factors and the grant of temporary incentives are less important to students once admitted. However, institutions have to ensure that these situational benefits are capitalized during the pre-admission stages to attract the right clientele base. There are always misconceptions especially concerning resources, scholarships, and facilities that can be cleared before enrollment. Finally, the stability of functional, epistemic, and image value supports the proposition that values high academic standards, solid learning experience, and a sound institutional image. The four dimensions can be improved by policies addressing the curriculum, quality of faculty, and international collaboration. Also, clarity of the brand and accurate marketing mix messages consistent with the institutional capabilities can maintain perceived image value across both stages. Through these policies, universities can be able to control the dynamic aspects of perceived value to provide a balanced and satisfying total student experience. That is why, the efforts aimed at increasing student retention and satisfaction rates will help to strengthen long-term institutional competitiveness and, therefore, stability in the international market of educational services.

7.3 Limitations and Future Research

In terms of limitations, there are three sorts of limitations that are discussed here. In terms of theory, the pre-established scale was used with a minor adaptation, but in the future, different scales should be developed for each stage so as to have appropriate responses from respondents. In terms of methodological limitations, the transactional was used where, in such circumstances, the longitudinal data can provide better insights in future studies. Lastly, the contextual limitation that the participants from undergraduate degree programs were involved with can be addressed in future studies by having multiple-level participants.

REFERENCES

Alhallaq, H., Younas, M., Kamal, S., & Champion, B. (2019). Understanding the perceived value of mobile payments: a qualitative study. *24th UK Academy for Information Systems Conference Proceedings.*

Alves, H., (2011). The measurement of perceived value in higher education: a unidimensional approach, *The Service Industries Journal*, *31*(12), 1943-1960.

Arias, C., Cadena Lozano, J. B., & Bello Bernal, M. A. (2024). The Role of Value in Extending the Lifetime of Products: An Analysis of Perceived Value and Green Consumption Values on Pro-Circular Behaviors of Repair and Reuse. *Sustainability*, *16*(4), 1567.

Aycock, M., Cho, E., & Kim, K. (2023). "I like to buy pre-owned luxury fashion products": Understanding online second-hand luxury fashion shopping motivations and perceived value of young adult consumers. *Journal of Global Fashion Marketing*, *14*(3), 327-349.

Baidoun, S. D., & Salem, M. Z. (2024). The moderating role of perceived trust and perceived value on online shopping behavioral intention of Palestinian millennials during COVID-19. *Competitiveness Review: An International Business Journal*, *34*(1), 125-143.

Bansal, N., & Sharma, S. (2024). Post-purchase online customer experience with apparel retailing: a structural equation modelling approach. *International Journal of Fashion Design, Technology and Education*, *17*(1), 13-24.

Bhattacherjee, A. (2001a), "Understanding Information Systems Continuance: An Expectation-Confirmation Model." *MIS Quarterly*, *25*(3), pp. 251-370

Blut, M., Chaney, D., Lunardo, R., Mencarelli, R., & Grewal, D. (2024). Customer perceived value: a comprehensive meta-analysis. *Journal of Service Research*, *27*(4), 501-524.

Brown, R.M., & Mazzarol, T.W. (2009). The importance of institutional image to student satisfaction and loyalty within higher education. *Journal of Higher Education*, *57*(1), 81–95.

Cankül, D., Kaya, S., & Kızıltaş, M. Ç. (2024). The effect of gastronomic experience on restaurant image, customer perceived value, customer satisfaction and customer loyalty. *International Journal of Gastronomy and Food Science*, *36*, 100908.

Chahal, H. and Kumari, N. (2012), "Consumer perceived value: The development of a multiple item scale in hospitals in the Indian context", *International Journal of Pharmaceutical and Healthcare Marketing*, Vol. 6 No. 2, pp. 167-190.

Charlebois, S., & Haratifar, S., (2015), The perceived value of dairy product traceability in modern society: An exploratory study, *Journal of Dairy Science,* *98*(5), 3514-3525,ISSN 0022-0302, https://doi.org/10.3168/jds.2014-9247.

El-Adly, M. I., & Eid, R. (2017). Dimensions of the perceived value of malls: Muslim shoppers' perspective. *International Journal of Retail & Distribution Management*.

Fontaine, R., & Letaifa, S. B. (2012). The reasons clients change audit firms and the client's perceived value of the audit service: a qualitative study in Canada. *Cahier de recherche*, *08*.

Gheorghe, C. M., Purcărea, V. L., & Gheorghe, I. R. (2019). The development of a multidimensional Consumer Perceived Value scale in ophthalmology services. *Romanian Journal of Ophthalmology*, *63*(4), 339.

Hossain, D., Burton, L. J., Lawrence, J., & Gorman, D. (2010). Identifying the key factors that impact on rural and remote students' participation in higher education at USQ *(Doctoral dissertation, University of Southern Queensland)*. Available at https://eprints.usq.edu.au/8581

Ida. E., (2011). Perceived Value in the Cultural Services. *International Journal of Management Cases*, *13*. https://doi.org/10.5848/APBJ.2011.00140.

Jiang, Y., & Kim, Y. (2015). Developing multi-dimensional green value. *International Journal of Contemporary Hospitality Management*.

Jiménez-Castillo, D., Sánchez-Fernández, R., & Iniesta-Bonillo, M. Á. (2013). Segmenting university graduates on the basis of perceived value, image and identification. *International Review on Public and Nonprofit Marketing*, *10*(3), 235-252.

Jones, P., Pickernell, D., Fisher, R., & Netana, C. (2017). A tale of two universities: graduates perceived value of entrepreneurship education. *Education + Training*, *59*(7/8), pp. 689-705

Kaczynski, A. T., & Crompton, J. L. (2004). Development of A Multi-Dimensional Scale for Implementing Positioning in Public Park and Recreation Agencies. *Journal of Park & Recreation Administration*, *22*(2).

Kim, E., & Tang, L. R. (2020). The role of customer behavior in forming perceived value at restaurants: A multidimensional approach. *International Journal of Hospitality Management*, *87*, 102511.

Lai, L. S., To, W. M., Lung, J. W., & Lai, T. M. (2012). The perceived value of higher education: the voice of Chinese students. *Higher education*, *63*(3), 271-287.

LeBlanc, G., & Nguyen, N. (1999). Listening to the customer's voice: Examining perceived service value among business college students. *International Journal of Education*, *13*(4), 187–198.

Ledden, L., Kalafatis, S.P., & Samouel, P. (2007). The relationship between personal values and perceived value of education. *Journal of Business Research*, *60*, 965–974.

Liu, M., & Liu, H. (2024). Farmers' adoption of agriculture green production technologies: perceived value or policy-driven?. *Heliyon*, *10*(1).

Martensen, A., Grønholdt, L., Eskildsen, J., & Kristensen, K. (1999). Measuring student oriented quality in higher education: Application of the ECSI methodology. *Proceedings from the TQM for Higher Education conference 'Higher Education institutions and the issue of total quality'*, Verona, 371–383.

Nguyen, N. X., Nguyen, D. T., Suseno, Y., & Bui Quang, T. (2024). The flipped side of customer perceived value and digital technology in B2B professional service context. *Journal of Strategic Marketing*, *32*(8), 1001-1021.

Parasuraman, A. (1997). Reflections on gaining competitive advantage through customer value. *Journal of the Academy of marketing Science*, *25*(2), 154.

Petrick, J. F. (2002). Development of a multi-dimensional scale for measuring the perceived value of a service. *Journal of leisure research*, *34*(2), 119-134.

Seo, S., & Yun, N. (2015). Multi-dimensional scale to measure destination food image: case of Korean food. *British Food Journal*.

So, K. K. F., Li, J., King, C., & Hollebeek, L. D. (2024). Social media marketing activities, customer engagement, and customer stickiness: A longitudinal investigation. *Psychology & Marketing*.

Sweeney, J. C., & Soutar, G. N. (2001). Consumer perceived value: The development of a multiple item scale. *Journal of Retailing*, *77*(2), 203-220.

Toledo, L.D., Martínez, T.L., & García, S.D.B., (2017). Antecedents and consequences of university perceived value, according to graduates: The moderating role of Higher Education involvement. *International Review on Public and Nonprofit Marketing*, *14*(4), 535-565.

Vieira, V. A., Araujo, C. F., & de Almeida, M. I. S. (2024). Customer relational benefit: A second-order meta-analysis and an alternative framework. *International Journal of Consumer Studies*, *48*(1), e12987.

Webb, D., & Jagun, A. (1997). Customer care, customer satisfaction, value, loyalty and complaining behavior: Validation in a UK university setting. *Journal of Consumer Satisfaction, Dissatisfaction and Complaining Behavior*, *10*, 139–151.

Woodruff. B. (1997). "Customer Value: The Next Source for Competitive Advantage*," Journal of the Academy of Marketing Science*, *25*(2). 139-153.

Yan, D., Wang, C., Sun, T., & Wen, D. (2024). The impact of service experience on sustainable customer engagement: The mediation of green perceived value and customer satisfaction. *Corporate Social Responsibility and Environmental Management*, *31*(3), 2175-2194.

Yilmaz, T., Sagfossen, S., & Velasco, C. (2023). What makes NFTs valuable to consumers? Perceived value drivers associated with NFTs liking, purchasing, and holding. *Journal of Business Research*, *165*, 114056.

Blockchain-Enabled Supply Chain Financing, Firm Performance and Financial Capital Availability: A Tri-Variate Interaction Analysis for Small and Medium Family Enterprises

Elijah Asante Boakye[1,2*], Bright Nana Kwame Ahia[1,3], Millicent Adu-Damoah[1]

ABSTRACT

This study investigates the influence of blockchain-enabled supply chain financing (BcTSCF) on the performance and financial capital availability of small- and medium-sized family enterprises (SMFEs) in Ghana. Utilizing the purposive sampling method, data were collected from 215 SMFEs across Ghana's agribusiness, construction, catering and hospitality, fashion and design, and wholesale and retail sectors. Drawing implicitly on resource-based theory and employing a quantitative correlational approach and PLS-SEM, we find that financial capital availability is positively influenced by BcTSCF, enhancing firm performance, especially innovation performance. Specifically, BcTSCF is positively related with availability of financial capital. Furthermore, firm performance was positively influenced by the availability of financial capital for SMFEs (β= 0.652; t-value = 20.287; CI [0.587, 0.713]; p < 0.001). Between innovation and financial performance, the availability of financial capital has a greater impact on the former than the latter (β=0.574; t-value = 19.443; CI [0.516, 0.632]; p-value < 0.01). This study contributes significantly to the sparse academic discourse in sub-Saharan Africa by addressing the gap in research on BcTSCF and SMFEs in developing countries. Again, it provides important information for industry practitioners and regulators to encourage blockchain usage and to enhance SMFEs' financial health of SMFEs.

Keywords: blockchain-enabled supply chain financing (BcTSCF), firm performance, financial capital availability, small and medium family enterprises (SMFEs), Partial least squares structural equation modeling (PLS-SEM)

INTRODUCTION

Access to financial capital is widely recognized as a primary challenge hindering small business growth (Kamble et al., 2019). Small- and medium-sized family

[1] University of Electronic Science and Technology of China (School of Management and Economics), Chengdu, China
[2] Center for West African Studies, University of Electronic Science and Technology of China, Chengdu, China.
[3] C.K. Tedam University of Technology and Applied Sciences (Department of Business and Computing), Navrongo, Ghana.
*Corresponding author's E-mail: el.asante2@yahoo.com

enterprises (SMFEs) are integral to economic development, yet they often struggle with funding obstacles due to factors such as information asymmetry, heightened default risks, and limited collateral (Begnini et al., 2024; Gupta & Gregoriou, 2018). Blockchain technology-enabled supply chain finance (BcTSCF) presents a groundbreaking solution that facilitates business financing by expanding access to capital and offering alternative fundraising channels (Gao et al., 2018). Research indicates that BcTSCF can reduce knowledge asymmetry and streamline transactions, resulting in more efficient and cost-effective funding processes (Karltorp et al., 2017). The implementation of BcTSCF offers multiple advantages, including ensuring the smooth flow of capital, enhancing funding services, building trust, fostering peer-to-peer collaboration, and promoting transparency (Beck & Cull, 2014). Financial capital is essential for businesses to operate effectively, allowing them to expand into new markets and strengthen their competitive positions (Xu & Hitt, 2020). It is a critical driver of sustainable competitive advantage, firm performance, and overall business growth (Choi, 2019; Du et al., 2020). According to Ruggiero and Cupertino (2018), adequate financial resources, such as working capital and cash flow, play a vital role in promoting innovation and enabling firms to invest in research and development, which is essential for performance. Despite the many benefits blockchain technology offers, limited research exists on how BcTSCF impacts the fundraising efforts of small businesses, especially in emerging markets. In Ghana, the development of BcTSCF has been supported by advances in ICT and increased funding (World Bank Group, 2019), with ICT4AD policy further promoting technological innovation (Coffie et al., 2021). Platforms like AgriXchain, Kudigo, and Pezesha have emerged, backed by support from Ghana's Ministry of Communication and Digitalization (MoCD), Ghana Enterprises Agency (GEA), and the Association of Ghana Industries (AGI) (Startup Facility, 2020). While blockchain adoption is gaining traction in developed countries, its implementation remains in the early stages in developing nations, with most studies being theoretical (Kshetri, 2018). This highlights the need for more research into the real-world application of BcTSCF (Schuetz & Venkatesh, 2020). Ghana presents a unique opportunity to explore the impact of blockchain technology in a developing country context. This study aims to fill the existing research gaps by taking an empirical approach to investigate how BcTSCF influences the availability of financial capital. Furthermore, it examines the relationship between financial capital availability and firm performance within SMFEs. The novelty of this research lies in its empirical exploration of the three-way relationship between BcTSCF, financial capital availability, and firm performance, specifically for SMFEs in Ghana. The findings of this study offer important insights into the potential of emerging technologies like BcTSCF in Ghana and will assist policymakers and stakeholders in formulating strategies to foster the successful integration of BcTSCF into the country's economic framework.

LITERATURE REVIEW

Blockchain-enabled SCF

BcTSCF is the application of blockchain technology (BcT) to oversee the supply financing activities of businesses (Gao et al., 2018). BcTSCF accelerates supply chain finance by concurrently exchanging information among stakeholders to minimize communication and transfer errors (Kamble et al., 2019). According to Ta et al. (2018), business funding activities are increased by BcTSCF's facilitation of improved costs, information exchange, and financial accessibility. Wang et al. (2019) examine how the decentralized consensus processes of blockchains can minimize information asymmetry and improve the efficiency of lending and borrowing. Saberi et al. (2019) assert that because BcT promotes decentralization, security, audibility, and smart execution, small businesses may find themselves in need to use it extensively for their fundraising efforts. Previous research indicates the potential utilization of BcT across supply chain financing operations (Kshetri, 2021). However, most of these investigations have been conceptual and across developed countries (Wang et al., 2019). In Ghana, supply chain finance (SCF) is an important mechanism for enterprises, offering a range of financial solutions that maximize working capital management and supply chain liquidity (Collins et al., 2015). With solutions such as supplier finance, invoice financing, and reverse factoring, the full potential has not been exploited because of challenges, such as information asymmetry, adverse selection, moral hazards, and defaults (Boakye et al., 2022). Consequently, there is a need to adopt the BcTSCF, which provides a system to improve cash flow management and enhance trust among suppliers, buyers, and financial institutions. This study addresses the necessity for empirical evidence to contribute to existing discussions, as previous research has largely been dominated by case studies, literature reviews, and qualitative studies (Queiroz & Wamba, 2020; Queiroz & Wamba, 2019).

Financial capital availability

In a study on small enterprises in Pakistan, Memon et al. (2020) asserted that capital plays a crucial role in environmental, financial, and innovative performance. Financial capital facilitates smooth business operations. Strong funding encourages firms to expand into new markets and solidify their positions. Low cash availability, on the other hand, can discourage businesses from carrying out their present operating activity (Xu & Hitt, 2020). According to Khan et al. (2019), adequate financing can promote viable growth, act as a buffer against unforeseen shocks, and provide a durable competitive edge for SMEs in Pakistan. Ruggiero and Cupertino (2018) posit that financial capital **is** essential, helping firms to invest in creative ventures, social, scientific, and developmental endeavours. According to Davari and Farokhmanesh (2017), available funding has a significant impact on finding and

developing new opportunities for business expansion. Based on Knight et al. (2019), SMFEs' insufficient finances hinder them from actively participating in sustainable and environmental initiatives. However, little is known about how technological advancements affect financial capital availability. The BcTSCF serves as the conceptual framework for this study's understanding of the availability of finance. From enhancing accessibility and availability to cutting expenses, it resides on the BcTSCF's initiatives to address the innate features of business financing.

Firm performance

Diverse explanations of firm performance and measurement have been provided. Due to the multiple interpretations given by different scholars based on their perspectives, firm performance currently has no operational definition (Taouab & Issor, 2019). For instance, Gavrea et al. (2015) recognized that management, economics, and marketing combine to produce performance, which gives the organization's procedural and structural components a competitive edge. Over time, scholars have researched business success by using financial and market performance data to ascertain firm performance (Lu et al., 2014). Ombaka et al. (2015) reported that a firm's intangible and tangible resources significantly influence the performance of SMEs in Kenya. Research has examined the impact of financial capital availability on the success of small businesses in Spain and Mexico, considering financial, innovative, and environmental performance (Ayuso & Navarrete-Báez, 2018). Martinez-Conesa et al. (2017) explored the factors that contribute to SMFEs' financial, environmental, and creative performance of SMFEs. Khan et al. (2019) proposed that high capital availability encourages businesses to enter new markets and obtain a competitive edge, ultimately encouraging growth financing. Although previous studies have examined the impact of financial capital availability on the performance of firms, they mostly utilized traditional metrics for performance, leaving room for the consideration of non-traditional metrics. This study tests how financial capital availability can influence the performance of SMFEs. In this study, firm performance entails both financial and innovation performance. Financial performance in this context involves cash flows and working capital optimization to improve liquidity. Innovative performance, on the other hand, considers expenditure on innovative products and the improved research and development activities of SMFEs. Overall, this study closes the research gap by presenting a thorough investigation of the relationship between firm performance, financial capital availability, and BcTSCF using an empirical methodology.

HYPOTHESES DEVELOPMENT

Access Improvement

Popa (2013) asserts that BcTSCF offers the potential to create an all-inclusive gain environment across the supply chain finance ecosystem by improving liquidity

and capital allocation. As per Wang et al. (2018), BcTSCF integrates sufficient flow of information to solve the challenges of information asymmetry, guaranteeing thorough communication and dependable financial partnerships. Consequently, capital movements can be streamlined digitally, enabling proper transparent sharing and financial information monitoring. According to Du et al. (2020), BcTSCF facilitates safe real-time information exchange, transaction execution, and automated validation, all of which increase the accessibility of capital for small businesses.

Availability

Ta et al. (2018) shows that BcTSCF rationalizes activities across the value chain, eliminating communication errors by exchanging information simultaneously with all parties. Omran et al. (2017) claims that BcTSCF offers more clarity by making all documents accessible and providing immutability through its distributed ledger. Consequently, opacity in supply chain financing is reduced. Furthermore, BcTSCF lessens information asymmetry and disparities, increases participant trust, and improves useful capital and financial data (Du et al., 2020). Zhu et al. (2019) emphasized that by allowing participants to communicate, track, and access pertinent information digitally, the BcTSCF may progressively rationalize the flow of funds. We argue that BcTSCF can enhance funding, thereby affecting financial capital availability.

Cost Savings

Typically, supply chain finance operations are expensive because multiple third parties act as agents to facilitate the flow of funds and information (Kamble et al., 2019). The application of distributed ledger technology (DLT) will drastically change many supply chain financing processes, bringing transparency, cutting expenses, and promoting peer-to-peer transactions, especially the latter, which minimizes expensive third-party interventions. Gurtu and Johny (2019) demonstrated how a blockchain's special features of cost savings, transparency, and trust enhance supply chain finance. We argue that the influence of the BcTSCF in funding access improvement, capital availability promotion, and cost savings are imperative to facilitating SMFEs' availability of fiannce. Thus, we propose that:

H1: The application of BcTSCF is positively related to the availability of financial capital.

Financial resources have emerged as pivotal predictors of this angle, allowing businesses to invest in viable opportunities to sustain performance. According to Xu and Hitt (2020), financial capital is necessary for the efficient operation of a firm. Therefore, high capital availability gives businesses the cash flow they need to grow into new markets and achieve a competitive edge. Karltorp et al. (2017) contend that

easy access to financial capital is key to achieving the growth of businesses in emerging markets. Thus, having access to financial capital helps them enhance their cash flow and working capital, enabling them to pursue their operational goals. According to Adomako and Danso (2014), having access to financial resources helps businesses maximize their use of working capital, while also promoting cash flows.. Therefore, this study argues that financial capital availability can promote the fruitful implementation of financial plans by enhancing businesses to acquire funding, even during tumultuous times, to satisfy their funding demands.

H2a: *SMFEs with high financial capital availability enjoy high financial performance.*

Having sufficient financial resources is essential for businesses to carry out a variety of innovative operations. Financial resources for investing in creative activities are crucial for firms, and a firm's internal and external financing might impact its innovative performance, research and development, and social initiatives (Ruggiero & Cupertino, 2018). Mulkay et al. (2001) found that financial resources greatly support R&D and innovative activities. SMFEs in developing economies compete fiercely in an age of globalization and innovation. Under these conditions, financial resources allow businesses to invest in creative products and innovative strategies (Rodríguez-Gulías et al., 2016). As a result, when firms have sufficient resources, they can undertake innovative projects to satisfy operational and market demands and gain a competitive advantage. Thus, businesses with adequate funding enjoy higher creative performance.

H2b: *SMFEs with high financial capital availability enjoy high innovative performance.*

The tri-variate linear relationship among BcTSCF, financial capital availability, and firm performance is explained. In Figure 1, there is the prediction that availability of financial capital is influenced by BcTSCF (H*1*). Our model further envisions that firm performance (innovation and financial) is affected by financial capital availability (financial and innovation) (Hypotheses *H2a-H2b*). Based on the implications of the resource-based theory (RBT), the above hypotheses are proposed. Thus, our argument stems from the implication of using the RBT to categorize BcTSCF as a technological resource that, when strategically used, enhances the financial capital for SMFEs. Correspondingly, available finance (capital resources), when efficiently utilized, could also promote business performance.
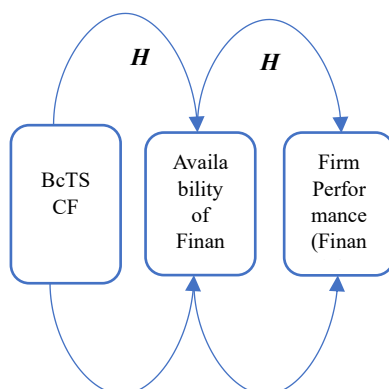
Figure 1: Study's Model

METHODOLOGY

Research Design

A quantitative correlational research approach is used to examine the tri-variate linear relationship between BcTSCF, financial capital availability, and firm performance. This approach is valuable for identifying and understanding relationships among variables and is cost-effective, insightful, time-efficient, and non-intrusive, making it applicable across various disciplines (Creswell, 2014). Data from businesses with BcTSCF ideas, experience, or potential were gathered using the purposive sampling technique. Thus, considering SMFEs with enough knowledge of BcT. With this approach, researchers become confident in determining a convenient study sample. From the total of 520 SMFEs under the Association of Ghana Industries (AGI), 360 were selected using a purposive sampling approach. Consequently, SMFEs within the agribusiness, catering & hospitality, construction, fashion & design, and wholesale & retail sectors are included. Furthermore, deploying a simple random sample approach, 215 responses from SMFEs were obtained.

Measurement Constructs and Survey Instrument

The constructs for BcTSCF were derived from Yang et al. (2017), Kamble et al. (2019), Du et al. (2020), and Ta et al. (2018) studies were used for the availability of financial capital. Elements of firm performance were based on the work of Karltorp et al. (2017) and Ruggiero and Cupertino (2018). A four-part survey was designed to gather responses on demographics, BcTSCF, firm performance, and financial capital availability. Evaluations were conducted using a seven-point Likert scale, ranging from 1 ("strongly disagree") to 7 ("strongly agree"). To ensure the reliability of the survey instrument, two pre-tests were conducted. The first pre-test involved

distributing a prototype questionnaire to nine professionals and five academics to obtain their feedback on the content of the survey items.

Collection and Analysis of Data

Participation requirement for this study was familiarity BcT, and BcTSCF platforms (AgriXchain, Pezesha and Kudigo) experience. Data was collected from managers and owners of SMFEs involved in the ICT4AD project and registered with the AGI using a purposive non-probability sampling. A hyperlink shared via email and WhatsApp facilitated participants to submit the response online, while others opted to fill it out manually. This sampling method is particularly advantageous for this study, which delves into a specific, in-depth issue, as it enables targeted participant selection. Unlike other sampling techniques (e.g., cluster, simple, or systematic sampling), it offers cost-effectiveness, greater validity of findings, flexibility, and the ability to gather rich, detailed data (Saunders et al., 2012). This is especially valuable in exploratory research, where understanding a detailed, specific perspective is essential. The sample size was calculated using the formula $n > 50 + 8m$, where "n" is the sample size and "m" is the number of variables in the research (Tabachnick et al., 2007). Since the study involved three variables, the minimum sample size needed was 74, as determined by the calculation $n > 50 + (8 * 3)$, which results in $n > 74$. The sample size of 215 respondents exceeded this threshold. Our sample size of 360 SMEs is justifiable because it is sufficiently large to ensure 95% confidence and a lower margin of error (under 5%), which is standard practice for several social science studies. Again, the probability of detecting a true effect/representation of the population) was adequate to provide a statistical power of 80%. Microsoft Excel and SPSS were used to check for outliers, unengaged responses, and missing data. Missing value analysis and multiple data imputations were conducted using SPSS version 26 software to filter and identify missing or invalid data. A descriptive statistics test was performed on the demographic data, and other statistical analyses, such as the measurement model assessment tests, hypotheses testing and structural model assessment test were performed using the Smart PLS 4. Furthermore, partial least squares structural equation modeling (PLS-SEM) was used. PLS-SEM is a highly versatile tool for understanding complex relationships among variables. Its advantages include flexibility in handling small and non-normal data samples, and both reflective and formative constructs. Furthermore, the predictive power, robustness, and ease of use of PLS-SEM make it a desirable choice in exploratory research. Its capacity to concurrently model structural and measurement components makes it a comprehensive method for studying complicated data in various research domains (Shmueli et al., 2019).

ANALYSIS OF DATA AND RESULTS

Table 1 represents respondents' demographics

Table 1: Respondents' Demographics

Demographic Variable	Item	Frequency (n = 215)	Percentage (%)
Gender	Male	157	73
	Female	58	27
Ages (years)	18-27	12	5.6
	28-37	67	31.2
	38-49	89	41.4
	50-59	45	20.9
	Above 60	2	0.9
Education	High school diploma or less	14	6.5
	High school diploma	115	53.5
	Bachelors	63	29.3
	Masters	23	10.7
SMFE Sector	Catering & Hospitality	28	13
	Agribusiness	93	43.3
	Construction	34	15.8
	Fashion & Design	29	13.5
	Wholesale & Retail	31	14.4
Size of Business	Micro (Less than 5)	22	10.2
	Small (6 – 29)	173	80.5
	Medium (30 – 99)	20	9.3
Business Age (years)	0 – 2	12	5.6
	3 – 5	67	31.2
	6 – 8	71	33
	9 – 11	39	18.1
	More than 11	26	12.1
BcTSCF level	Learning about BcTSCF	82	38.1
	Adopted BcTSCF	59	27.5
	Exploring BcTSCF	74	34.4

Measurement Model Assessment

The Cronbach's alpha and Rho_A values ranged from 0.703 to 0.792, and 0.711 to 0.793, respectively representing the Internal consistency. All values were above

the recommended level of CA > 0.7 and demonstrated indication dependability. The composite reliability examination for the constructs ranged from 0.834 to 0.878, above the CR criterion of 0.7. These findings indicate that the measuring constructs have acceptable internal consistency and reliability. The validity of the measurement model was further established by calculating the average variance extracted (AVE), which was found to be above the recommended threshold of 0.5 for all constructs, with values ranging from 0.627 to 0.711.

Table 2: Assessment of Model

Variable	Items	Loadings [a]	Cronbach's Alpha [b]	Composite reliability (rho_a)[b]	Composite reliability (rho_c)[c]	Average Variance Extracted (AVE) [d]
BcTSCF	BCA 1	0.774	0.703	0.711	0.834	0.627
	BCA 2	0.828				
	BCA 4	0.771				
Financial Capital Avail.	FCA1	0.738	0.761	0.764	0.847	0.711
	FCA2	0.740				
	FCA3	0.798				
	FCA4	0.773				
Firm Performance	FP3	0.849	0.792	0.793	0.878	0.706
	FP4	0.836				
	FP5	0.836				

Investigating potential data biases such as the common ratter effect, social desirability, consistency motif, mood state, and common scale anchoring was essential, given that this study relied on a questionnaire for data collection (Podsakoff et al., 2003). The Variable Inflation Factor (VIF) was used for the multicollinearity testing. Kock (2015) states that a variable inflation factor (VIF) greater than 3.3 indicates the potential presence of common bias in a model. Conversely, when the VIF is 3.3 or lower, the model is considered free from common bias. Table 3 shows that there are no concerns about collinearity.

Table-3: CMB Test

Constructs	Items	Outer loadings	Outer weights	VIF
BcTSCF	BCA1	0.774	0.405	1.341
	BCA2	0.828	0.470	1.409
	BCA4	0.771	0.385	1.369
Financial Capital Avail.	FCA1	0.738	0.280	1.542
	FCA2	0.740	0.347	1.351
	FCA3	0.798	0.331	1.664
	FCA4	0.773	0.353	1.440
Firm Performance	FP3	0.849	0.403	1.715
	FP3	0.836	0.386	1.679
	FP5	0.836	0.401	1.628

The discriminant validity test was conducted. The indicator loadings are the highest compared to other variables, and the square root of the AVE is displayed along the diagonal line (Fornell & Larcker, 1981). In Table 4, the diagonals show the square root of the AVE of the latent variables. These are the largest in any row or column, thus depicting discriminant validity

Table 4: Testing Discriminant Validity (Fornell-Larcker's Criterion)

	1	2	3
BcTSCF	**0.792**		
Financial Capital Availability	0.454	**0.763**	
Firm Performance	0.474	0.652	**0.841**

Hypotheses Testing

To assess the strength of impacts at different levels, the study employed a bootstrapping confidence interval of 97.5% and 2.5%. The structural model interactions were evaluated by analyzing the beta coefficients, t/p-values, and effect sizes (f2) through bootstrapping. Table 5 presents the direct effects and results from bootstrapping. Hypotheses were tested using the t-statistics test, with a benchmark level of 1.96 to determine the acceptance or rejection of hypotheses. Specifically, a t-value above 1.96 is considered significant, with higher values indicating stronger significance. The results of the analysis indicated that the hypotheses with strong support revealed a significant and positive relationship. Path coefficients (β) ranged from 0.209 to 0.652, with significance levels under 0.05 and 97.5% confidence intervals. Specifically, the adoption of BcTSCF was found to have a positive influence on the availability of financial capital (β = 0.209; t-value = 4.866; CI [0.127, 0.294]; p-value < 0.001). Moreover, financial capital availability was shown to significantly impact firm performance, with a positive and statistically significant

effect (β = 0.652; t-value = 20.287; CI [0.587, 0.713]; p-value < 0.001). The results also indicated a positive and significant effect of financial capital availability on financial performance (β = 0.618; t-value = 18.733; CI [0.552, 0.680]; p-value < 0.01), as well as on innovative performance (β = 0.574; t-value = 19.443; CI [0.516, 0.632]; p-value < 0.01). Therefore, the impact of financial capital availability on innovative performance was found to be more significant than its effect on financial performance, as measured by the t-value. In terms of effect size (f2), BcTSCF adoption had a medium-sized effect on financial capital availability, while financial capital availability had a large-sized effect on firm performance.

Table 5: Hypothesis Testing

Hypotheses.	Paths	Path-Coeff.	Std-Dev.	T-value.	P-value.	Remarks	Effect-Size (f^2)	2.5% CI LL	97.5% CI UL
H1	BcTSCF → Financial Capital Availability	0.209	0.043	4.886	0.000***	Supported	0.061	0.127	0.294
H2	Financial Capital Availability → Firm Performance	0.652	0.032	20.287	0.000***	Supported	0.739	0.587	0.713
H2a	Financial Capital Availability → Financial Performance	0.618	0.033	18.733	0.006**	Supported	0.617	0.552	0.680
H2b	Financial Capital Availability →Innovation Performance	0.574	0.038	19.443	0.009**	Supported	0.491	0.576	0.632

DISCUSSIONS

The findings indicate that the availability of financial capital is positively affected by the implementation of BcTSCF (β = 0.209; t-value = 4.866; CI [0.127, 0.294]; p-value < 0.001). This discovery is consistent with earlier research (Belleflamme et al., 2014; Du et al., 2020; Kamble et al., 2019; Omran et al., 2009; Popa, 2013; Ta et al., 2018) and has the potential to be applied universally in both advanced and emerging economies. In countries such as China and India, studies indicate that BcTSCF also

influences the availability of financial capital (Du et al., 2020; Kamble et al., 2019). The findings of the study align closely with similar results observed in a developing country such as Ghana. This study shows that, regardless of the differences in technological adoption among various economies, the influence of BcTSCF on the availability of financial capital remains consistent in both developed and developing nations.

The study categorizes availability of financial capital into access improvement, availability promotion, and saving of cost. Regarding access improvement, Wang et al. (2018) found that BcTSCF addresses information asymmetry by ensuring efficient information flow and fostering reliable financial collaboration. Blockchain's transparency—where each transaction is recorded permanently on the blockchain—reduces perceived risks for financial institutions and lenders. This enhanced transparency and real-time transaction verification make financial institutions more willing to offer capital at lower costs and faster rates, thus increasing accessibility for supply chain businesses, especially those in need of working capital. Providers who previously faced challenges obtaining financing can now secure funds more easily and at reduced rates. Similarly, Popa (2013) suggested that BcTSCF enhances liquidity and capital allocation, benefiting the entire value chain.

In terms of availability promotion, Omran et al. (2017) highlighted that BcTSCF fosters greater transparency through its distributed ledger, reducing opacity among supply chain financing participants. Tokenization further expands access to financial capital by enabling faster liquidity without relying on traditional banks or intermediaries. This particularly benefits smaller suppliers and SMEs, who would otherwise face long approval processes or high lending rates. Blockchain-based SCF enables quicker liquidity by directly connecting asset-backed tokens with capital providers.

Regarding cost savings enhancement, Cocco et al. (2017) argued that BcTSCF reduces funding costs for businesses by minimizing operational expenses tied to centralized processes, streamlining financial actions, and utilizing distributed ledgers. Transaction automation through smart contracts reduces administrative costs and operational inefficiencies, resulting in a faster and more reliable financing process. Since these smart contracts are enforceable, suppliers can access capital quickly and under favorable conditions, improving liquidity within the supply chain and enhancing capital availability for all stakeholders.

Furthermore, the study found that financial capital availability has a significant positive impact on firm performance ($\beta = 0.652$; t-value = 20.287; CI [0.587, 0.713]; p-value < 0.001), consistent with previous research (Fernandez-Feijoo et al., 2018; Memon et al., 2020). Firm performance in this study was assessed in two main

dimensions: financial and innovation performance. The results showed a significant positive influence of financial capital availability on financial performance (β = 0.618; t-value = 18.733; CI [0.552, 0.680]; p-value < 0.01). According to Xu and Hitt (2020), the availability of financial capital significantly impacts financial performance by providing businesses with the cash flows needed to expand into new markets and gain a competitive edge. Financial capital also helps create new growth opportunities for firms. Additionally, research suggests that financial capital positively affects a company's innovative performance by improving managerial decision-making and enhancing tangible outputs.

The study by Karltorp et al. (2017) also emphasized that easy access to funding is critical for business growth in emerging markets, enabling firms to achieve greater success. As noted by Adomako and Danso (2014), access to financial resources allows businesses to optimize working capital and improve cash flow, serving as both a proxy for internal financial capability and a signal of future growth potential. The research also demonstrated a significant positive effect of financial capital availability on innovation performance (β = 0.574; t-value = 19.443; CI [0.516, 0.632]; p-value < 0.01). Ruggiero and Cupertino (2018) argued that financial capital plays a key role in driving innovation by supporting investments in creative activities that are essential for firms' competitive advantage and profitability.

Moreover, Mulkay et al. (2001) highlighted that both internal and external financial resources are crucial for innovative performance, including research and development and social initiatives. Rodríguez-Gulías et al. (2016) also found that financial resources significantly impact innovation, particularly for SMFEs in developing economies, by enabling investments in creative products and innovative strategies. Therefore, SMFEs with sufficient financial capital can leverage creative projects to meet market demands, ultimately gaining a competitive edge and increasing profitability.

Theoretical Contribution

This study expands the ongoing discussions on BcTSCF by examining the tri-variate relationship among BcTSCF, financial capital availability and firm performance across Ghanaian SMFEs. Again, most research have explored the role of BcT in transforming economies globally. However, the work explores the deployment of BcTSCF (technological capability) via affecting financial capital availability, which subsequently affects firm performance. Specifically, this provided the basis for predicting BcTSCF impact on financial capital availability (improved access to financing, promoting capital availability and enhancing cost savings) and firm performance (financial and innovation) among Ghanaian SMFEs in the agribusiness, construction, catering & hospitality, fashion & design, and wholesale & retail sectors. This is a contribution to the ongoing discussions as research on

blockchain have been predominated by adoption drivers. Considering financial and innovative dimensions for firm performance provides additional insights, as several studies have used subjective performance metrics (Boso et al., 2013; Saeidi et al., 2015). Thus, making this work unique from previous research. This study's results, particularly in a developing economy that is still improving on blockchain technology adoption, generally have a strong implication for the generalization of the model in other economies' situations in the sub-Saharan region. Furthermore, the current study implicitly draws on the resource-based theory, providing the grounds to predict Blockchain as a technological resource and how BcTSCF can enhance financial capital availability as well as firm performance when exploited judiciously.

Practical Implications

First, businesses are to consider leveraging on BcTSCF to enhance their finances as well as performances (financial & innovation). Specifically, SMEs can prioritize BcTSCF due to the relative advantages over traditional SCF. Again, businesses should consider and exploit pilot programs offered by blockchain service providers and state agencies like NEIP, AGI and GEA to test BcTSCF solutions before large scale adoption since compatibility and trialability are key. Governments and other stakeholders can provide policy measures such as creating a supportive infrastructure for technology adoption and making regulatory adjustments (financial incentives, reduced compliance burdens, or specific regulations that ease adoption). Again, SME managers are expected to actively engage with available frameworks, stay informed about changes in regulations and government-backed initiatives.

Second, SMEs managers need to address the challenges of BcTSCF adoption. Thus, they can look for affordable BcTSCF solutions, explore grants, subsidies, or low-interest loans offered by governments and other stakeholders (e.g., Microfinance and Small Loans Center (MASLOC)). They can also consider user-friendly platforms that are easy to use, maintain and implement. BcTSCF platform vendors that provide comprehensive support and training should be prioritized. Third, SMEs managers are supposed to cultivate an innovative culture within the company to give staffs a favorable attitude regarding the implementation of technology. Again, observing how others successfully implement blockchain can provide valuable lessons and reduce fears or uncertainties. Finally, SMEs need to be alert on competitors adopting BcTSCF, this could spur their action to do same and stay competitive.

CONCLUSION AND FURTHER RESEARCH

This study explored the tri-variate relationship among BcTSCF, firm performance and financial capital availability. This addresses the research gap on BcTSCF and SMFEs in developing countries, and contributes significantly to the sparse academic

discourse in sub-Saharan Africa. While BcTSCF has been well researched in developed countries, it is limited in empirical evidence in the context of its utilization efforts on financial capital availability and firm performance in developing countries, particularly for small and medium family enterprises (SMFEs). By focusing on Ghana, providing insights into a developing economy's context, the research gap is addressed. On empirical validation and quantitative evidence, the study employs a robust quantitative methodology using PLS-SEM to empirically validate the interaction among BcTSCF, firm performance and available financial capital. This adds empirical weight to what has largely been a conceptual discourse in existing literature.). Again, it offers crucial insights for stakeholders to promote the adoption of BcT and enhance the financial health of SMFEs. We examined a representative sample of diverse SMFEs in Ghana (agribusiness, construction, catering & hospitality, fashion & design, and wholesale & retail) and discussed the collaborated BcTSCF influences on available financial capital, which subsequently influence both the financial and innovative performance of these focal firms. Specifically, the findings depict BcTSCF influences available financial capital of SMFEs (β= 0.209; t-value = 4.866; CI [0.127, 0.294]; p-value < 0.001) (via access improvement, availability promotion, and enhanced cost savings). Also, financial capital availability has a significantly positive influence on firm performance. In detail, the impact of financial capital availability on innovative performance (β=0.574; t-value = 19.443; CI [0.516, 0.632]; p-value < 0.01) is more significant than that on financial performance (β=0.618; t-value = 18.733; CI [0.552, 0.680]; p-value < 0.01) in reference to t-value. Thus, financial capital can enhance the investment in creative activities, which are crucial for firms' profitability and competitive advantage. Financial capital availability (internal and external resources) greatly supports innovative performance (research and development, social initiatives, and innovative activities). The transformative power of BcTSCF is further demonstrated by the long-term viability of SMEs. Small businesses can concentrate on innovation, diversification, and long-term plans by optimizing their supply chains and enhancing financial management, which will promote long-term economic success. Also, BcTSCF promotes more equitable trade interactions, which lessen exploitation and improve small enterprises' position in the global marketplace. Additionally, SMEs can invest in their communities by gaining access to more reliable funding, which will help provide better employment and assist social development projects (social sustainability) (Martin-Rios, 2024). Furthermore, BcTSCF promotes the ability to access flexible financing thus making SMEs more financially resilient to meet their goals (economic sustainability). In line with the global sustainability agenda, BcTSCF promotes sustainability and positive social impact. BcTSCF adoption supports the attainment of United Nations Sustainable Development Goals (SDGs), such as SDG 9 (Industry, Innovation, and Infrastructure), SDG 12 (Responsible Consumption and Production) and SDG 8 (Decent Work and Economic Growth) (DSDG, 2015).

Limitations and Implications for Future Studies

First, the current study is cross-sectional, thus limited in satisfactorily reflecting the understanding of BcTSCF efforts and observing the consistency of the relationship among the study's variables (BcTSCF, financial capital availability, and firm performance). Furthermore, because BcTSCF adoption is still nascent, this work was limited in its ability to evaluate the ongoing BcTSCF gains on available financial capital over a substantial period of time. Further constraint is the design of our model for Ghana (single economy). Using the model from this work might not have an impact on the results for other countries whose economies are not as big as Ghana's. The results relied solely on questionnaire replies because there was no secondary data. It is recommended for the utilization of a longitudinal approach to evaluate changes in the associations and validate findings. Further studies can explore holistically the actual application of BcTSCF and its influence on specific industries, such as agriculture or manufacturing, to identify sector-specific implications. Again, the roles of regulatory frameworks, financial institutions, and government policies in shaping the adoption and impact of BcTSCF could be examined in future studies. These can be carried out across other advanced countries across the sub region such as Kenya, South Africa and Botswana. Although the decentralized mechanisms employed under BcTSCF deals with the issues of trust, further studies can holistically seek to discuss the role of trust in adopting BcTSCF and its impact on financial capital availability. The results might then be examined for differences or consistency in a case or comparative study. Finally, due to the lack of secondary data, PLS-SEM was used. With available secondary data, future studies may consider time-series econometric analysis.

REFERENCES

Adomako, S., & Danso, A. (2014). Financial Literacy and Firm performance : The and resource flexibility. *International Journal of Management & Organizational Studies*, *3*(4), 2–15.

Alshamaila, Y., Papagiannidis, S., & Li, F. (2013). Cloud computing adoption by SMEs in the north east of England: A multi-perspective framework. *Journal of Enterprise Information Management*, *26*(3), 250–275. https://doi.org/10.1108/17410391311325225

Asante Boakye, E., Zhao, H., & Ahia, B. N. K. (2022). Blockchain technology prospects in transforming Ghana's economy: a phenomenon-based approach. *Information Technology for Development*, 1–30. https://doi.org/10.1080/02681102.2022.2073580

Ayuso, S., & Navarrete-Báez, F. E. (2018). How Does Entrepreneurial and International Orientation Influence SMEs' Commitment to Sustainable

Development? Empirical Evidence from Spain and Mexico. *Corporate Social Responsibility and Environmental Management*, *25*(1), 80–94. https://doi.org/10.1002/csr.1441

Beck, T., & Cull, R. (2014). SME finance in Africa. *Journal of African Economies*, *23*(5), 583–613. https://doi.org/10.1093/jae/eju016

Begnini, S., Oro, I. M., Tonial, G., & Dalbosco, I. B. (2024). The relationship between the use of technologies and digitalization strategies for digital transformation in family businesses. *Journal of Family Business Management*, *14*(4), 710–726. https://doi.org/10.1108/JFBM-06-2023-0087

Belleflamme, P., Lambert, T., & Schwienbacher, A. (2014). Crowdfunding: Tapping the right crowd. *Journal of Business Venturing*, *29*(5), 585–609. https://doi.org/10.1016/j.jbusvent.2013.07.003

Boso, N., Story, V. M., & Cadogan, J. W. (2013). Entrepreneurial orientation, market orientation, network ties, and performance: Study of entrepreneurial firms in a developing economy. *Journal of Business Venturing*, *28*(6), 708–727. https://doi.org/10.1016/j.jbusvent.2013.04.001

Casino, F., Dasaklis, T. K., & Patsakis, C. (2019). A systematic literature review of blockchain-based applications: Current status, classification and open issues. In *Telematics and Informatics* (Vol. 36, Issue November 2018, pp. 55–81). Elsevier. https://doi.org/10.1016/j.tele.2018.11.006

Choi, T. M. (2019). Blockchain-technology-supported platforms for diamond authentication and certification in luxury supply chains. *Transportation Research Part E: Logistics and Transportation Review*, *128*(May), 17–29. https://doi.org/10.1016/j.tre.2019.05.011

Cocco, L., Pinna, A., & Marchesi, M. (2017). Banking on blockchain: Costs savings thanks to the blockchain technology. *Future Internet*, *9*(3), 1–20. https://doi.org/10.3390/fi9030025

Coffie, C. P. K., Hongjiang, Z., Mensah, I. A., Kiconco, R., & Simon, A. E. O. (2021). Determinants of FinTech payment services diffusion by SMEs in Sub-Saharan Africa: evidence from Ghana. *Information Technology for Development*, *27*(3), 539–560. https://doi.org/10.1080/02681102.2020.1840324

Creswell, J. W. (2014). *Qualitative, quantitative and mixed methods approaches*. Sage.

Davari, A., & Farokhmanesh, T. (2017). Impact of entrepreneurship policies on opportunity to startup. *Management Science Letters*, *7*(9), 431–438. https://doi.org/10.5267/j.msl.2017.6.003

DSDG. (2015). *THE 17 GOALS | Sustainable Development*. Department of Economic and Social Affairs | Sustainable Development. https://sdgs.un.org/goals

Du, M., Chen, Q., Xiao, J., Yang, H., & Ma, X. (2020). Supply Chain Finance Innovation Using Blockchain. *IEEE Transactions on Engineering Management*, *67*(4), 1045–1058. https://doi.org/10.1109/TEM.2020.2971858

Fernandez-Feijoo, B., Romero, S., & Ruiz, S. (2018). Financial auditor and sustainability reporting: Does it matter? *Corporate Social Responsibility and Environmental Management*, *25*(3), 209–224. https://doi.org/https://doi.org/10.1002/csr.1449

Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, *18*(1), 39–50. https://doi.org/https://doi.org/10.2307/3151312

Fosso Wamba, S., Kala Kamdjoug, J. R., Epie Bawack, R., & Keogh, J. G. (2020). Bitcoin, Blockchain and Fintech: a systematic review and case studies in the supply chain. *Production Planning and Control*, *31*(2–3), 115–142. https://doi.org/10.1080/09537287.2019.1631460

Gao, G.-X. X., Fan, Z.-P. P., Fang, X., & Lim, Y. F. (2018). Optimal Stackelberg strategies for financing a supply chain through online peer-to-peer lending. *European Journal of Operational Research*, *267*(2), 585–597. https://doi.org/10.1016/j.ejor.2017.12.006

Gavrea, C., Ilies, L., & Stegerean, R. (2011). Determinants of organizational performance: The case of Romania. *Management & Marketing*, *6*(2).

Guo, H., Tang, J., Su, Z., & Katz, J. A. (2017). Opportunity recognition and SME performance: the mediating effect of business model innovation. *R&D Management*, *47*(3), 431–442. https://doi.org/https://doi.org/10.1111/radm.12219

Gupta, J., & Gregoriou, A. (2018). Impact of market-based finance on SMEs failure. *Economic Modelling*, *69*(15), 13–25. https://doi.org/https://doi.org/10.1016/j.econmod.2017.09.004

Gurtu, A., & Johny, J. (2019). Potential of blockchain technology in supply chain management: a literature review. In *International Journal of Physical Distribution and Logistics Management* (Vol. 49, Issue 9, pp. 881–900). Emerald Publishing Limited. https://doi.org/10.1108/IJPDLM-11-2018-0371

Hair, J. F., Sarstedt, M., Hopkins, L., & Kuppelwieser, V. G. (2014). Partial least

squares structural equation modeling (PLS-SEM): An emerging tool in business research. In *European Business Review* (Vol. 26, Issue 2, pp. 106–121). Emerald Group Publishing Limited. https://doi.org/10.1108/EBR-10-2013-0128

Kamble, S., Gunasekaran, A., & Arha, H. (2019). Understanding the Blockchain technology adoption in supply chains-Indian context. *International Journal of Production Research*, *57*(7), 2009–2033. https://doi.org/10.1080/00207543.2018.1518610

Karltorp, K., Guo, S., & Sandén, B. A. (2017). Handling financial resource mobilisation in technological innovation systems-The case of chinese wind power. *Journal of Cleaner Production*, *142*(4), 3872–3882. https://doi.org/10.1016/j.jclepro.2016.10.075

Khan, S. Z., Yang, Q., & Waheed, A. (2019). Investment in intangible resources and capabilities spurs sustainable competitive advantage and firm performance. *Corporate Social Responsibility and Environmental Management*, *26*(2), 285–295. https://doi.org/https://doi.org/10.1002/csr.1678

Knight, H., Megicks, P., Agarwal, S., & Leenders, M. (2019). Firm resources and the development of environmental sustainability among small and medium-sized enterprises: Evidence from the Australian wine industry. *Business Strategy and the Environment*, *28*(1), 25–39. https://doi.org/https://doi.org/10.1002/bse.2178

Kock, N. (2015). Common method bias in PLS-SEM: A full collinearity assessment approach. *International Journal of E-Collaboration (Ijec)*, *11*(4), 1–10. https://doi.org/10.4018/ijec.2015100101

Kshetri, N. (2018). Blockchain's roles in meeting key supply chain management objectives. *International Journal of Information Management*, *39*(December 2017), 80–89. https://doi.org/10.1016/j.ijinfomgt.2017.12.005

Kshetri, N. (2021). Blockchain and sustainable supply chain management in developing countries. *International Journal of Information Management*, *60*(10), 102376. https://doi.org/https://doi.org/10.1016/j.ijinfomgt.2021.102376

Lu, W., Chau, K. W., Wang, H., & Pan, W. (2014). A decade's debate on the nexus between corporate social and corporate financial performance: a critical review of empirical studies 2002–2011. *Journal of Cleaner Production*, *79*(9), 195–206. https://doi.org/https://doi.org/10.1016/j.jclepro.2014.04.072

Martin-Rios, C. (2024). Sustainability transitions in small, entrepreneurial food services through systems innovation. *Journal of the International Council for Small Business*, 1–15. https://doi.org/10.1080/26437015.2024.2396077

Martinez-Conesa, I., Soto-Acosta, P., & Palacios-Manzano, M. (2017). Corporate social responsibility and its effect on innovation and firm performance: An empirical research in SMEs. *Journal of Cleaner Production*, *142*, 2374–2383. https://doi.org/https://doi.org/10.1016/j.jclepro.2016.11.038

Memon, A., Yong An, Z., & Memon, M. Q. (2020). Does financial availability sustain financial, innovative, and environmental performance? Relation via opportunity recognition. *Corporate Social Responsibility and Environmental Management*, *27*(2), 562–575. https://doi.org/10.1002/csr.1820

Mulkay, B., Hall, B. H., & Mairesse, J. (2001). Firm level investment and R&D in France and the United States: A comparison. In *Investing today for the world of tomorrow* (Vol. 2, Issue 5, pp. 229–273). Springer. https://doi.org/https://doi.org/10.1007/978-3-642-56601-1_19

Murphy, G. B., Trailer, J. W., & Hill, R. C. (1996). Measuring performance in entrepreneurship research. *Journal of Business Research*, *36*(1), 15–23. https://doi.org/https://doi.org/10.1016/0148-2963(95)00159-X

Oliveira, T., & Martins, M. F. (2011). Literature review of information technology adoption models at firm level. *Electronic Journal of Information Systems Evaluation*, *14*(1), pp110-121.

Ombaka, B. E., Awino, Z. B., Machuki, V. N., & Wainaina, G. (2015). Exploring resources and performance relationships in commercial enterprises: An empirical perspective. *Journal of Management and Strategy*, *6*(4), 12–28. https://doi.org/doi:10.5430/jms.v6n4p12

Omran, Y., Henke, M., Heines, R., & Hofmann, E. (2009). Blockchain-driven supply chain finance: Towards a conceptual framework from a buyer perspective Yaghoob Omran. *Ipsera 2017*, *December 2018*, 15. https://www.alexandria.unisg.ch/251095/

Omran, Y., Henke, M., Heines, R., & Hofmann, E. (2017). Blockchain-driven supply chain finance: Towards a conceptual framework from a buyer perspective. 2017. - IPSERA 2017. - Budapest - Balatonfüred. *26th Annual IPSERA Conference 2017*, *2*(5), 15.

Podsakoff, P. M., MacKenzie, S. B., Lee, J.-Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: a critical review of the literature and recommended remedies. *Journal of Applied Psychology*, *88*(5), 879. https://doi.org/https://doi.org/10.1037/0021-9010.88.5.879

Popa, V. (2013). The financial supply chain management: a new solution for supply chain resilience. *Amfiteatru Economic Journal*, *15*(33), 140–153. https://doi.org/https://hdl.handle.net/10419/168782

Queiroz, M. M., & Fosso Wamba, S. (2019). Blockchain adoption challenges in supply chain: An empirical investigation of the main drivers in India and the USA. *International Journal of Information Management*, *46*, 70–82. https://doi.org/10.1016/j.ijinfomgt.2018.11.021

Ramdani, B., Kawalek, P., & Lorenzo, O. (2009). Predicting SMEs' adoption of enterprise systems. *Journal of Enterprise Information Management*, *22*(1/2), 10–24. https://doi.org/10.1108/17410390910922796

Rodríguez-Gulías, M. J., Rodeiro-Pazos, D., & Fernández-López, S. (2016). The regional effect on the innovative performance of university spin-offs: a multilevel approach. *Journal of the Knowledge Economy*, *7*(4), 869–889. https://doi.org/https://doi.org/10.1007/s13132-015-0287-y

Ruggiero, P., & Cupertino, S. (2018). CSR strategic approach, financial resources and corporate social performance: The mediating effect of innovation. *Sustainability*, *10*(10), 3611. https://doi.org/https://doi.org/10.3390/su10103611

Saberi, S., Kouhizadeh, M., Sarkis, J., & Shen, L. (2019). Blockchain technology and its relationships to sustainable supply chain management. *International Journal of Production Research*, *57*(7), 2117–2135. https://doi.org/10.1080/00207543.2018.1533261

Saeidi, S. P., Sofian, S., Saeidi, P., Saeidi, S. P., & Saaeidi, S. A. (2015). How does corporate social responsibility contribute to firm financial performance? The mediating role of competitive advantage, reputation, and customer satisfaction. *Journal of Business Research*, *68*(2), 341–350. https://doi.org/https://doi.org/10.1016/j.jbusres.2014.06.024

Saunders, M., Ph, L., & Thornhill, A. (2012). Research Methods for Business Students. *Nonprofit and Voluntary Sector Quarterly*, *35*(3), 453–476.

Schuetz, S., & Venkatesh, V. (2020). Blockchain, adoption, and financial inclusion in India: Research opportunities. *International Journal of Information Management*, *52*(6), 101936. https://doi.org/10.1016/j.ijinfomgt.2019.04.009

Shmueli, G., Sarstedt, M., Hair, J. F., Cheah, J.-H., Ting, H., Vaithilingam, S., & Ringle, C. M. (2019). Predictive model assessment in PLS-SEM: guidelines for using PLSpredict. *European Journal of Marketing*, *53*(11), 2322–2347. https://doi.org/https://doi.org/10.1108/EJM-02-2019-0189

Startup Facility. (2020). *All Blockchain Startup Companies in Ghana*. https://startupfacility.com/blockchain-startup-companies-in-ghana/

Ta, H., Esper, T. L., Ford, K., & Garcia-Dastuge, S. (2018). Trustworthiness Change

and Relationship Continuity after Contract Breach in Financial Supply Chains. *Journal of Supply Chain Management*, *54*(4), 42–61. https://doi.org/10.1111/jscm.12180

Tabachnick, B. G., Fidell, L. S., & Ullman, J. B. (2007). *Using multivariate statistics* (Vol. 5). pearson Boston, MA.

Tan, J., & Peng, M. W. (2003). Organizational slack and firm performance during economic transitions: Two studies from an emerging economy. *Strategic Management Journal*, *24*(13), 1249–1263. https://doi.org/https://doi.org/10.1002/smj.351

Taouab, O., & Issor, Z. (2019). Firm Performance: Definition and Measurement Models. *European Scientific Journal ESJ*, *15*(1), 93–106. https://doi.org/10.19044/esj.2019.v15n1p93

The World Bank Group. (2019). *Ghana Digital Economy Diagnostic: Stocktaking report*. Pubdocs.worldbank.org.

Wang, R., Lin, Z., & Luo, H. (2019). Blockchain, bank credit and SME financing. *Quality and Quantity*, *53*(3), 1127–1140. https://doi.org/10.1007/s11135-018-0806-6

Wang, X., Guo, H., Yan, R., & Wang, X. (2018). Achieving optimal performance of supply chain under cost information asymmetry. *Applied Mathematical Modelling*, *53*, 523–539. https://doi.org/10.1016/j.apm.2017.09.002

Wang, Y., Singgih, M., Wang, J., & Rit, M. (2019). Making sense of blockchain technology: How will it transform supply chains? *International Journal of Production Economics*, *211*(November 2018), 221–236. https://doi.org/10.1016/j.ijpe.2019.02.002

Xu, K., & Hitt, M. A. (2020). The international expansion of family firms: The moderating role of internal financial slack and external capital availability. *Asia Pacific Journal of Management*, *37*(1), 127–153. https://doi.org/https://doi.org/10.1007/s10490-018-9593-9

Yang, H., Lee, H., & Zo, H. (2017). User acceptance of smart home services: An extension of the theory of planned behavior. *Industrial Management and Data Systems*, *117*(1), 68–89. https://doi.org/10.1108/IMDS-01-2016-0017

Zhu, Y., Zhou, L., Xie, C., Wang, G. J., & Nguyen, T. V. (2019). Forecasting SMEs' credit risk in supply chain finance with an enhanced hybrid ensemble machine learning approach. *International Journal of Production Economics*, *211*(January), 22–33. https://doi.org/10.1016/j.ijpe.2019.01.032

Zikmund, W. G., Babin, B. J., Carr, J. C., & Griffin, M. (2013). *Business research methods*. Cengage Learning.