MODERATING ROLE OF SUPPLY CHAIN FINANCE ON EMERGING TECHNOLOGIES AND SUPPY CHAIN PERFORMANCE: A STUDY OF LARGE MANUFACTURING FIRMS IN KENYA

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A RESEARCH PROPOSAL PRESENTED TO THE CARISCA RESEARCH SUMMIT FOR THE CARISCA PHD DISSERTATION COMPETITION
JUNE 28TH 2022

1.0 Introduction

Emerging technologies are accelerating digitalization and enhancing global supply chain performance across various industries.
Governments in Africa have prioritized and accelerated digital transformation through Emerging technologies across various sectors toward the achievement of Agenda 2063 and the Sustainable Development goals (e.g., ECOWAS, COMESA digital initiatives) (AU, 2022).
Locally, Emerging technologies are a key driver toward attainment of Kenya's Big 4 Agenda which include manufacturing, universal health coverage, affordable housing and food security.

The goal for the government of Kenya is to raise the manufacturing sectors contribution to gross domestic production from 8.5% to 15% by 2020 and to create a million jobs in the sector (GOK, 2017). There is therefore a need for manufacturing firms to create and sustain strong capabilities, expertise, and technologies to enhance competitiveness. Improved Supply chain performance in this sector is thus important.
Moreover, studies have indicated that supply chain finance remains a key enabler of supply chain operations. Successful supply chain financing is central to leveraging emerging technologies for improved supply chain performance.

However, weaker global demand for commodities, supply chain disruptions and necessary sanitary measures have constrained Africa's production capacity (AUC/OECD, 2022). Additionally, the recent global Covid-19 posed significant challenges and severe disruptions in the manufacturing industry (national lockdowns, acute shortages of essential supplies, staff losses and lay-offs).

General Objective

The general objective of this study is thus to investigate the moderating role of supply chain finance on emerging technologies (blockchain, robotic, automation, big data analytics) and supply chain performance. The context is large manufacturing firms in Kenya.

Keywords

Emerging technologies, digitalization, supply chain finance, blockchain, robotics, automation, big data analytics

2.0 Statement of the Problem

Ideal Situation

- Companies that aggressively employ emerging technologies in their supply chains can expect to boost annual growth of earnings before interest and taxes (EBIT) by 3.2 percent and annual revenue growth by 2.3 per cent (KNBS, 2021; Gezgin, Samal, & Silva, 2017).

Contextual/ Situational Gap

- According to (AUC/OECD, 2022), global value chain participation in East Africa declined from 3.4% in 2010 to 2.6% in 2019. Regionally, The 2020 Economic Report shows that the manufacturing sector real value added in Kenya declined by 0.1 per cent, compared to an increase of 2.5 per cent in 2019. Additionally, the number of persons in the formal manufacturing employment decreased by 10.3 per cent from 353.3 thousand in 2019 to 316.9 thousand in 2020 (KNBS, 2021, KAM, 2020).

- Additionally, despite findings on the impact of emerging technologies on manufacturing firms, there is still a need to understand how global trajectories in emerging technologies such as blockchains, robotics, automation and big data analytics can affect domestic supply chain performance in the manufacturing industry.

Therefore, the economic performance of supply chains in large manufacturing firms in Kenya and the influence of emerging technologies is worth investigating.

Literature Gap

- Previous studies (Oduma & Shale, 2019; Flechsig, Anslinger, & Lasch, 2022; Ishfaq, Sramek & Gibson, 2021; Xu, Lee, Barth & Richey, 2021, Nguema, Bi, Akenroye & Baz, 202) have shown that emerging technologies present an opportunity for manufacturing firms to increase their supply chain performance and revenue margins. Additionally, studies have identified Supply Chain Finance as an avenue for funding supply chain activities by providing liquidity and cash flows and lowering risks (Botta, Holl, Jain, Shah, & Tan, 2020; Wuttke, Foertl, Blome, & Henke, 2013).

- However there remains a gap on adoption of supply chain finance instruments to support emerging technologies in the Kenyan manufacturing sector supply chains. Moreover, there is still limited empirical research on the moderating role of supply chain finance on the relationship between emerging technologies and supply chain finance. The goal of this research is to enrich empirical studies in supply chain management, highlighting the role of emerging technologies and supply chain finance in improving supply chain performance. Therefore, this study proposes to address this gap.

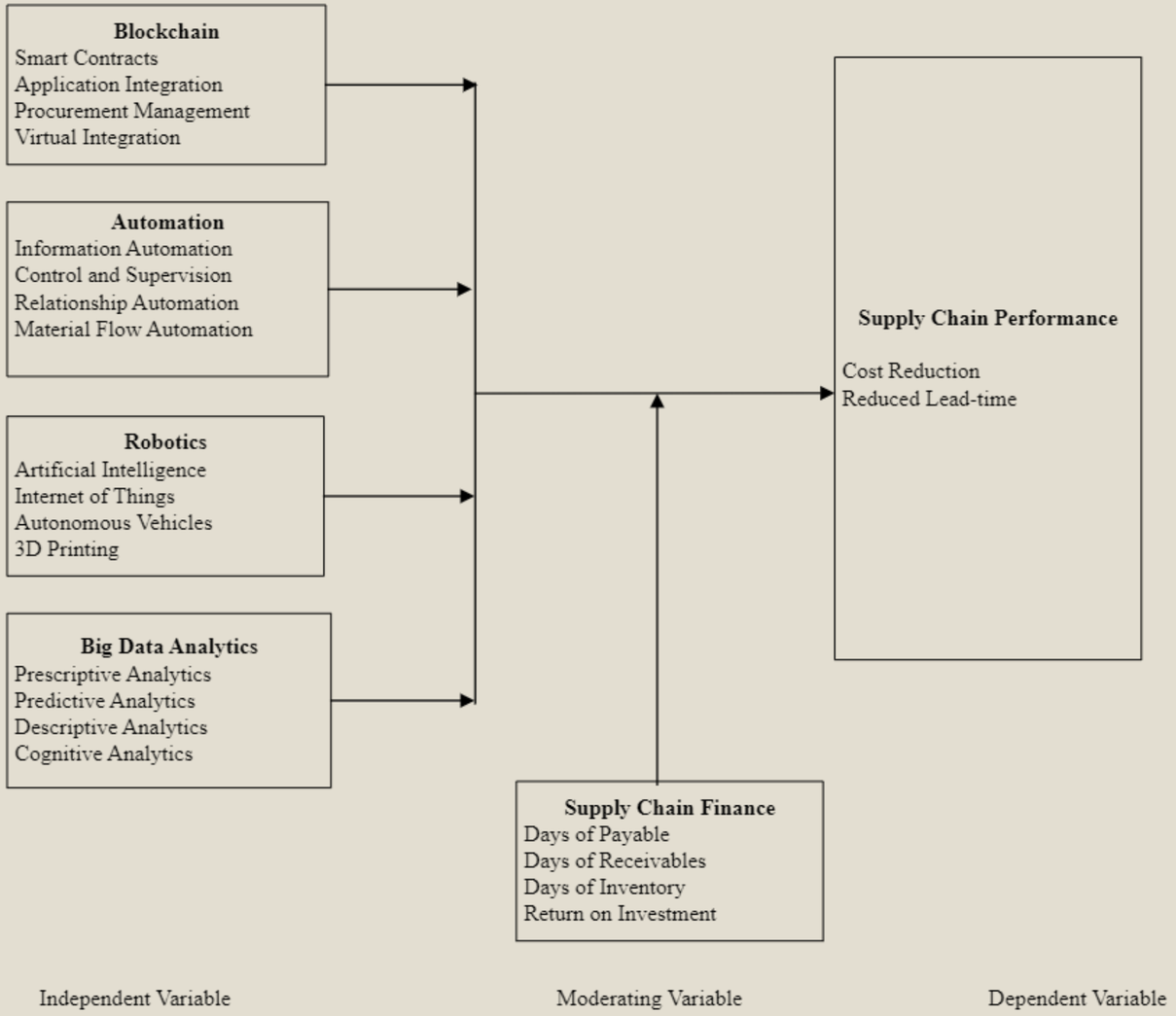
3.0 Theoretical Framework

This study conceptualizes how manufacturing firms can integrated emerging technologies within their supply chains to fosters improved supply chain performance

Theoretical Perspective	Author(s)	SCF and DSC
Modular System Theory	Yoram, Boykin, Xue, 2014, Doran, 2003	Blockchains and Robotics. Alternate modules may be easily substituted and integrated due to independence of modules.
Business Ecosystem Model	Laudon & Laudon, 2020; Iansiti & Levien, 2004, Ma, 2019	Automation. Network infrastructure and their relation within interdependent networks of various actors.
Resource Based View (RBV)	Barney 1991, Prahalad, K., & Hamel, G. (1990), Kamasak	SC Big Data Analytics Competitive advantage and improved through innovation.
Economic Theories (TOC & I/O)	Grabher 1993, Waldam, DiMaggio 1983; Ogaga, 2017; Goldratt 1984; Simsit, Hilton 2008; Dubey et al., 2019	Supply chain performance and Supply chain finance in the manufacturing sector. Identifying constrains and systematically improving. Strategies within industrial structures.
Innovation Theories	Schumpeter, 1976; Danneels and Kleinschmidtb, 2001, Cohen & Roussel, 2013; Manners & Lyon, 2019	Exploitation of technological and financial innovation to earn economic profit.

4.0 Conceptual Framework

The independent variables in this study are emerging technologies, while supply chain performance of large manufacturing firms (Supply Chain performance metrics) which include Cost reduction, Reduced Lead time, is the dependent variable. SCF will have the moderating variable.



5.0 Methodology

Positivism Philosophy → Survey Research Design → Statistical Analysis

- This study intends to use mixed research designs, that is, descriptive and correlational research designs.
- In this study, the unit of analysis will be 712 large manufacturing firms in Kenya listed by KAM.
- The main reason for this choice was that these firms are likely to exhibit an intricate supply chain management approach and the display of adoption of emerging technologies in supply chain management.

Stratum	Population	Sample Size	Percentage %
Building, Mining & Construction	21	6	3
Chemical & Allied	71	22	10
Energy & Electrical	43	13	6
Food and Beverages	180	55	25
Leather and Footwear	7	2	1
Metal & Allied	71	22	10
Automotive	50	15	7
Paper & Board	71	22	10
Pharmaceutical & Medical Equipment	21	6	3
Plastics & Rubber	28	9	4
Textile & Apparels	71	22	10
Timber, Wood & Furniture	28	9	4
Agriculture/Fresh Produce	50	15	7
Total	712	217	100

5.0 Methodology Cont…

Data Collection

- Study will rely on both primary data. Questionnaire will be adopted to collect primary data.

Pilot Study

- At least 20 firms. Content Validity and Reliability test using Cronbach's alpha will be applied

Data Analysis &

- Major statistics will be Descriptive and Inferential Statistics.
- Descriptive analysis (mean and standard deviation scores for the independent and dependent variables will be used
- Inferential analysis (hypothesis testing, normal distribution, correlation and multiple regression analysis and factor analysis will be generated and analyzed. Diagnostic tests will be performed to test correlation. The moderating regression model is as below

$$\gamma = \beta_0 + \beta_1 X + \beta_2 \not{Z} + \beta_3 X.\not{Z} + \varepsilon \quad \text{..... Equation 1}$$

$$\gamma = \beta_0 + \beta_1 X_1 \not{Z} + \beta_1 X_2 \not{Z} + \beta_1, X_3 \not{Z} + \beta_1 X_4 \not{Z} + \quad \varepsilon \quad \text{..... Equation 2}$$

Where: -

Y = Dependent variable (Supply chain performance)

β_0 = Y Intercept

X = The Independent variables (X_1, X_2, X_3, X_4)

Z = The Moderating variable (Supply chain finance)

$X.\not{Z}$= Product Term

$\beta_1 X + \beta_2 \not{Z} + \beta_3 X.\not{Z}$ = Independent variable interacting the moderating variable

ε = Error Term

Presentation

- Data will be presented in using frequency distribution tables, bar charts and pie charts to facilitate comparison and give clear information

6.0 Implications for Africa

- *Academia and Researchers*

Adds to the expanse of empirical research on digitalized supply chain management for further academic inquiry

- *Government and Policy Markers*

Formulation of policies and regulations in implementing digital initiatives in manufacturing and other sectors

- *Regulatory Bodies*

Study will highlight contributions and effect of emerging technologies such us on human capital that may need to be addressed by regulatory bodies

- *Managers of Manufacturing firms*

Provides insights to supply chain, operations and logistics managers on how adoption of emerging technologies can lead to operational cost reductions and increased revenues