

Moderating Effect of ICT on Supply Chain Financial Flow Risk and Performance of Manufacturing Firms in Kenya

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Abstract

The manufacturing firms in Kenya contribute greatly to the economic development of the country. Developments in ICT are creating possibilities for moderating risks along the supply chain by creating platforms for effective decision support tools. However, the performance of the manufacturing firms has been decreasing in the past few years due to information flow risks that affect their supply chain, thereby undermining the sectors ability to contribute to the Gross Domestic Product (GDP) and attainment of Kenya's vision 2030. This study sought to investigate the moderating effect of ICT on financial flow risks and performance among manufacturing firms in Kenya. Cross-sectional survey design was adopted as the research design for this study using both qualitative and quantitative approaches. The target population was 94 firms in Kiambu County, Kenya who were both members and potential members of the Kenya Association of Manufacturers (KAM). The study used stratified random sampling to pick a sample size of 76 manufacturing firms which represented 12 industrial sectors in manufacturing firms. Data was collected using questionnaires. Descriptive statistics was used aided by Statistical Packages for Social Sciences version 21 to compute percentages of respondents' answers. Inferential statistics using linear regression and correlation analysis was applied to assist examining relationship between the research variables. It was established that ICT used moderated the relationship between financial flow risks. Therefore, the study recommends that manufacturing firms should leverage on ICT use to enhance performance of their firms.

Key words: Financial Flow Risks, Firm Performance

1.1 Introduction

In recent years however, the vulnerability of the supply chain to risks has increased (venkatesh, Rathi & Patwa, 2015). Today, the success of supply chains largely depends on managing supply chain risks effectively and efficiently. Jian (2010) points out that the revolution of information and globalizations have made supply chains to be at the centre of research. He further explains that, many firms are now involved in very complex enterprises and may engage in more than one extended enterprises to improve the bottom line. However, such a network of extended enterprises is vulnerable to disruptions. These disturbances may either be internal or external turbulences and are often referred to as risks (Jian, 2010). Supply chain risk management

implies that companies should adopt proactive approaches to effectively manage vulnerabilities along the supply chain. Strategic measures should be implemented to mitigate risk and enhance the resilience of the supply chains (venkatesh, Rathi & Patwa, 2015).

Global dangers such as terrorist attacks, financial crises, shut down of factories, supplier insolvency labor disputes, quality problems, fire and crop diseases have exposed supply chains to numerous risks and increase the chains vulnerability (Wagner & Neshat, 2012). Vulnerability increases further when companies outsource, that is, become dependent on other companies; increased market globalization, shorter product and technology life cycle. Panicker, Govindan and Diabat (2012) assert that companies are also increasingly using manufacturing, distribution as well as logistical partners, further resulting in complex supply relationships internationally leading to increased supply chain risk exposures. However, these risks can be mitigated through proper contingent planning (Wu et al, 2006).

ICT encompasses components that are integrated to assist in the collection, storage, processing and information communication. Supply chain risks management requires a large database of information as a basis for analysis and decision making on the strategies to mitigate the said risks (Elbashir, Collier & Davern, 2008; Shang et al, 2008). Therefore, ICT information system plays an important role in allowing the organizations to develop new capabilities and skills that would not be possible to accomplish (Borges, Hoppen & Luce, 2009). Information systems can help in increasing the overall capability of a firm to process information. Firms whose information systems capabilities are superior are better positioned to collect process and assimilate external information which is complex and hence formulate responses that are effective (Cadez, 2008; Stoel & Muhanna, 2009). Information systems are important because they affect the capabilities of the organizations as to process information (Bardhan, Krishnan & Lin, 2005). However, contrary to these findings, firms that utilize the most recent ICT inputs have market returns that are significantly below the mean (35) and therefore, the Information systems do not bring competitive advantage (Carr, 2003; Chae, Yen & Sheu 2005).

1.2 Problem Statement

The CEO of the KAM in an interview conducted by Mulupi (2015) confirmed that the growth in the manufacturing sector has been stagnant at 10% although the sector has the potential to perform better. This means that the Kenyan manufacturing sector is far from achieving the 20% GDP contribution as entrenched in the vision 2030 (Economic News Update, 2014). The weak performance has been attributed to high production costs, influx of counterfeits, drought incidences and volatility in international oil prices. This slow growth in the manufacturing sector can be explained by supply chain risks such as financial risks, that is, the depreciation in the Kenyan shilling against the dollar which is the widely used form of currency in the export markets. This has greatly reduced the demand for manufactured products (Soft Kenya, 2013). Financial flow risks reduces the revenues of an organization as they have a direct impact on the cost of the purchased materials. This may also affect customer satisfaction as the high cost will be passed to the end customer in term of the highly priced goods and services. There is scanty research on the moderating effect of ICT on supply chain information flow risk. Therefore this study aims to bridge the gap.

1.3 Objectives of the Study

1.3.1 General Objective

The main objective of this study is to examine the moderating effect of ICT on supply chain financial flow risks and firm performance among the manufacturing firms in Kenya

1.3.2 Specific Objectives

The specific objectives of this study are:

1. To establish the moderating effect of ICT on financial flow risk and firm performance among the manufacturing firms in Kenya.

1.4 Research Questions

1. What is the moderating effect of ICT on supply chain financial flow risk and firm performance among the manufacturing firms in Kenya?

1.5 Research Hypothesis

1. H₀₂: ICT use does not moderate supply chain financial flow risk and firm performance among the manufacturing firms in Kenya.

2.1 Literature Review

This chapter will discuss the literature review of the study. The main aim of the literature review is to explore the available and existing information which has been covered by the various researchers. The literature will be reviewed from, journals, the internet, reference books, working papers, reports and periodicals.

The literature will review the following areas: the conceptual framework, review of variables research gaps and a summary of the chapter

Resource Based View of the Firm (RBV)

The RBV postulates that the firms can be seen as a collection of resources. Some of these resources can be said to be strategic resources (Wernerfelt, 1984). RBV is also referred to as the Resource Based Theory of the firm by some researchers (Barratt & Oke, 2007). The theory was developed to complement the Industrial Organization (IO) which focused on the determinants of the performance of a firm, outside the firm itself, specifically within the structure of its industry. In contrast to the IO view, the RBV focuses on the internal sources of sustainable competitive advantage and seeks to explain the reason why firms which are in the same industry differ in terms of performance (Kraaijenbrink et al., 2010).

In his work, Barney (1991) argues that sustainable competitive advantage can be derived from what the firm controls in terms of resources and capabilities. These resources have unique traits in that, they are rare, they are valuable, they cannot be substituted and also difficult to imitate. Additionally, such resources and capabilities can also be viewed as both tangible and intangible assets that include; the management skills of a firm, its organizational processes and routines as well as the information and the knowledge that it controls (Barney et al., 2001).

This theory is useful to this study because managers play a vital role in enhancing the performance of their firms. Managers in the Kenyan manufacturing sector must demonstrate a continuous commitment to invest in ICT as a resource to moderate the risks along their supply

chains and therefore enhance their sales, market share and profitability of their firms. Investing in ICT will enable the managers to have the capabilities for decision making. Managers of the Kenyan manufacturing firms should have the necessary ICT supply chain management soft wares that will enable them to foster good relationships with other partners along the supply chain since risk mitigation requires a joint consultative effort for successful risk mitigation.

Lastly, supply chain risk management can be seen as a strategic internal resource that can lead to competitive advantage and improved performance of a firm (Barney, 2012). Risk management along the supply chains has a positive effect on the profitability of a firm (Loice & Ronald 2011). Kenyan manufacturing firms need to realize that supply chains are one of the areas that they can leverage on to achieve competitive advantage. They need to adopt proactive approaches that will enable them to manage risks from both the upstream and the downstream sides of the supply chains. Risk management will be an important resource in eliminating uncertainties along their supply chains thereby creating value to the customers.

2.2 Empirical review

2.2.1 Financial Flow Risk

Financial flow refers to the cash that is received and spent by an organization (Musa, 2012). The financial position of an enterprise is disrupted when a company is unable to settle debts as well as when it engages in investments that are improper. Issues such as credit uncertainties caused ,mainly by clients who default their debts in an organization can lead to variations in the incomes of a firm (Rao & Goldsby, 2009).These can lead to delays in the payment of the suppliers and other partners along the supply chain (Musa, 2012; Rao & Goldsby, 2009).

Exchange rate risks

Njaaga (2013) defines exchange rate as the risk that the operations of a business will be affected by the changes in the rates of exchange. Musa (2013) defines exchange rate volatility as the movement of exchange rate that stems from fluctuations in currency. Rao (2006) explains that most firms manage the risk of exchange rate through hedging. Hedging involves taking a contract that will either rise or fall in value and then offsetting the fall or rise in value of an existing position (Eiteman, 2007). Hedging therefore helps in the reduction of the position risks that are caused by the movements of the exchange rates. A study by Musa (2013) shows that manufacturing firms in Kenya are more likely to be affected by the volatility in exchange rate risks since it is an import oriented country. He further explains that the fact that most manufacturing firms import raw materials, consumer goods and capital goods, there is need to manage the foreign exchange market.

The exchange rates in an economy plays a very vital role since it affects the domestic price levels, the allocation of resources and investment decisions as well as the profitability of the goods and services that are traded by a company (Musa, 2013; Njaaga, 2013). The volatility of the exchange rates affects the prices of the finished goods that are exported and also the cost of the inputs that are procured from a global perspective (Musa, 2013; Irene, 2011). The concept of globalization has encouraged international purchasing as firms seek to increase their competitive advantage and also leverage on economies of scale. Although global sourcing has

significantly reduced the cost of buying, thereby contributing to profitability, it has also led to variability in the cash flows of firms due to fluctuations in foreign exchange risks (Afza & Alam, 2014). Results of a study carried out by Irene (2011) shows that there is negative relationship between foreign exchange risk and the financial performance of a firm. Exchange rate risk affects the outsourcing decisions of a firm as volatile currency affects the budget allocation for offshore initiatives (Zonnov, 2006).

Financial Strength of the Suppliers

Kleindorfer and Saad, (2005) argue that a company that deals with suppliers who have financial hardships may results to inefficiencies along the supply chain. Supplier relationships such as partnerships with suppliers who are financially unsound increases risk of the procuring entities that enter in such relationships (Finch, 2004). When the financial strength of a supplier is vulnerable, it affects the entire supply chain participants (Tang, 2006). Suppliers who suffer from unsettled debts of their raw materials often affect the buying firms as they experience inadequate orders. A study by Achilles (2014) also shows that when suppliers suffer from financial failure, the average cost incurred by the procuring entity participating in the supply chain amounts to 73,000 pounds. Therefore, managing the financial failure risks of the suppliers should be a top priority for an organizations, sourcing, procurement and contract management (Achilles, 2014). An Article by Supply Chain Digest (2014) posits that procuring organizations can rely on the financial accounts of a company and carefully analyze them to determine their financial strength.

Procurement managers should also liaise with the other members of a supply chain to ensure that suppliers' issues that manifest themselves in delivery or quality problems are communicated to the management so as to allow follow up activity (Achilles, 2014). A study by Carter and Giunipero (2010) explains that it is important for companies to manage the risks that are associated with their suppliers. They further assert that firms should make a decision on whether such management should be carried out in-house or outsourced to a 3rd party. The establishment of supplier management programs helps in avoiding costs that may be difficult to measure or even put into a cost benefit analysis such as ROI (Return on Investment). Management should understand how the lack of key components or services in an organization impacts on the whole business and especially if the supplier goes into bankruptcy without the knowledge of the organization (Carter & Giunipero, 2010). Therefore management of the strengths of the suppliers is vital and should be prioritized by organizations regardless of a crystal clear return of such a program. There is need for proactiveness in supply risk management as opposed to reacting to problems once they arise (Carter & Giunipero, 2010).

Financial Management

ACCA (2014) defines supply chain finance as the use of financial instruments, technologies and practices that are aimed at enabling optimal management of the working capital and the liquidity that is tied up in the processes of the supply chain. When purchasing goods and services, the supply chain participants should be concerned about the total cost of buying and not just the price of a product (ACCA, 2014). The findings of a research carried out by Hausman,

(2004) shows that financial flows in a supply chain have not been matched with the improvements that have been made in supply chain management. The new innovative solutions are intended to increase the financial flows, make them faster, more predictable, reliable and less costly (ACCA, 2014).

Today, more companies are adopting innovative technologies and payment solutions that are geared towards ensuring that the supply chains are faster and cost efficient (Bottom Line Technologies, 2011). Hausman (2004) further points out that automated supply chain payment systems have especially improved the performance of the supply chain. Poor management of finances along the supply chain can impact on the performance of the firm in terms of lost sales due to product unavailability (Hausman, 2004). Today, financial flows are manifested in terms of delays in processing and reconciling invoices and holding up capital in terms of inventory to dealing with uncertainties of being out of stock (Mertinez, 2014).

Purchasing employees should also be empowered to avoid inappropriate spending in goods and services that the organization does not require thereby undermining the initiatives of companies to control expenses and engage in strategic sourcing (Mertinez, 2014). Strategic sourcing requires the organizations to know how much they are purchasing from the various suppliers for the specific categories of items used in the company (Bottom Line Technologies, 2004). These can best be done using automated systems since periodically analyzing purchasing spends and negotiating with suppliers can be time consuming and costly (Hausman, 2014). Proper supply chain financial management improves the performance of an enterprise through reduction of supply chain risks such as improved cycle times, reduced carrying costs, predictability of cash flow improvements, reduced risk of non supply (through reduced safety stocks) and reduced currency risks (through hedging) (ACCA, 2014).

3.1 Research Methodology

The study applied a cross-sectional survey design was adopted as the research design for this study using both qualitative and quantitative approaches. The target population was 94 firms in Kiambu County who were both members and potential members of the Kenya Association of Manufacturers (KAM). The study used stratified random sampling to pick a sample size of 76 manufacturing firms which represented 12 industrial sectors in manufacturing firms. Data was collected using questionnaires. Descriptive statistics was used aided by Statistical Packages for Social Sciences version 21 to compute percentages of respondents' answers.

4.1 Study Results

4.2 Descriptive Analysis of Financial Flow Risk

The study sought to determine the moderating effect of ICT on Financial flow risk and firm performance among the manufacturing firms in Kenya. Exchange rate risks, financial strength of the suppliers and financial management were the parameters that were used to measure this objective in the opinion statements that were given by the respondents. The respondents were asked to indicate the extent to which they agreed with reduced performance as a result of better financial flow risk in their manufacturing firms. This was based on a likert scale of strongly disagree, disagree, neutral, agree and strongly agree as shown in table 4.9.

Table 4. 1: Measurement of Financial flow risk

	SD %	D %	N %	A %	SA %	M	SD
a) We only buy goods and services that are important to the firm	1.4	5.7	1.4	34.3	57.1	4.40	.891
b) We are not able to timely pay our suppliers	33.3	27.5	13.0	17.4	8.7	2.41	1.343

The research observed that majority of the respondents (57.1%) strongly agreed that their firms only buy goods and services that are important to the firm, 34.3% agreed, 5.7% disagreed while the minority 1.4% strongly disagreed and also neutral. (Mean = 4.40, SD =0.891). A large number of the firms (33.3%) strongly disagreed that they were not able to pay their suppliers on time, 27.5% disagreed, 17.4% agreed, 13.0% were neutral while a small number 8.7% strongly agreed (Mean = 2.41, SD =1.343).

This means that manufacturing firms in Kenya are able to pay their suppliers on time. These research findings are in agreement with the findings of a research carried out by Musa (2012) that the financial position of a firm is disrupted when a firm is unable to settle its debts. The findings also add that buying goods and services that are not required by the firm also affects the firm performance.

a) Exchange Rate Risk

Majority of the respondents (35.4%) were neutral about the effectiveness of the strategies that their firms had put in place to prevent the effect of currency volatility, 29.2% disagreed that the strategies they had to prevent the effect of currency volatility were rarely effective, 18.5% agreed, 9.2% strongly disagreed while the minority 7.7% strongly agreed (Mean = 2.86, SD =1.074). A large number (37.7) agreed that their firms buy goods from outside the country, 21.7% strongly agreed, 15.9% were neutral, 14.5% disagreed while a small number 10.1% strongly disagreed (Mean = 3.46, SD =1.267). Most firms (30.4%) also disagreed that they frequently change their sources of supply when the currency exchange rate increases, 30.4% of the firms were neutral, 18.8% strongly disagreed, 17.4% agreed while few firms (2.9%) strongly agreed (Mean = 2.55, SD =1.078). In terms of local sourcing, 31.9% strongly agreed that they source locally, 33.3% agreed, 14.5% disagreed, 13.0% were neutral while 7.2% strongly disagreed (Mean = 3.68, SD =1.266) as shown in table 4.10.

Table 4. 2: Measurement of exchange rate risk

	SD %	D %	N %	A %	SA %	M	SD
c) The strategies we have to prevent the effect of currency volatility are rarely effective	9.2	29.2	35.4	18.5	7.7	2.86	1.074
d) We buy most of our materials from outside the country	10.1	14.5	15.9	37.7	21.7	3.46	1.267
e) We frequently change our sources of supply when the currency exchange rate increases	18.8	30.4	30.4	17.4	2.9	2.55	1.078
f) Most of our firms materials are sourced locally	7.2	14.5	13.0	33.3	31.9	3.68	1.266

From the findings, it was clear that most strategies that the firms implemented to prevent the effect of currency volatility were effective. This is consistent with the research carried out by Eiteman (2007) that strategies such as hedging of currency helps in the prevention of position risks that are caused by the movement of the currency. The findings also indicate that most of the materials used by the manufacturing firms are sourced locally. This is in line with the findings of Musa (2013) and Jaaga (2013) that local sourcing helps to shield the firms from the volatility of the exchange rate which affects the prices of the finished goods if they were imported and therefore affect the profitability and performance of the firm.

On the flipside, it is evident from the study findings that a significant amount of the firms' material is also bought from outside the country. These results can concur with a study carried out by Musa (2013) that manufacturing firms in Kenya are likely to be affected by the volatility of the exchange rate since it is an import oriented country. He further explains that, the fact that most manufacturing firms in Kenya import their raw materials, consumer goods and capital goods there is need to manage the exchange rate market. It also confirms the findings of Afza & Alam, (2014) that although international sourcing significantly reduces the cost of buying, thereby increasing profitability, it also leads to variability in the cash flows of the firm due to variations in the foreign exchange risks.

Manufacturing firms in Kenya also fail to change their sources of supply when the exchange rate increases in their current source market. This is likely to expose the firms to high risk of exchange rate and consequently increase the prices of the goods and services bought. These study findings also agreed with Irene (2011) that there a negative relationship between exchange rate risks and the financial position of a firm. This as evidenced by Zannov (2006) could also affect the budget allocation by the firms especially for offshore initiatives especially

outsourcing decisions since outsourcing from outside the country could prove costly for the firm.

b) Financial Strength of Suppliers

A large number of the firms (21.7%) strongly disagreed and also disagreed that their firms do not evaluate their suppliers financially to determine their financial status before engaging them in their organization, 22.9% agreed, 12.9% were neutral while a small number (10.0%) strongly agreed (Mean = 2.61, SD =1.365). In terms of monitoring the financial status of their suppliers throughout the contract, the majority (24.3%) disagreed that they rarely monitor, 21.4% strongly agreed, 21.4% also agreed, 18.6% were neutral while the minority (14.3%) strongly agreed (Mean = 2.83, SD =1.372). A large number of the firms (34.8%) disagreed that they engage 3rd parties to manage the financial status of the suppliers regularly, 20.3% strongly disagreed, 17.4% agreed, 15.9% were neutral while a small number (11.6%) strongly agreed (Mean = 2.65, SD =1.304). A large number (38.8%) of the respondents agreed that they were monitoring the strength of their suppliers, 25.4 strongly agreed, 19.4% were neutral, 9.0% disagreed while a small number (7.5%) strongly disagreed (Mean = 2.78, SD =1.291) as shown in table 4.11.

Table 4. 3: Measurement of financial strength of suppliers

	SD %	D %	N %	A %	S A %	M	SD
g) We do not evaluate our suppliers financially to determine their financial status before engaging them in the organization	27.1	27.1	12.9	22.9	10.0	2.61	1.365
h) We rarely monitor the financial status of the suppliers throughout the contract	21.4	24.3	18.6	21.4	14.3	2.83	1.372
i) We engage 3rd parties to manage the financial status of our supplier regularly	20.3	34.8	15.9	17.4	11.6	2.65	1.304
j) We are monitoring the strength of our suppliers	7.5	9.0	19.4	38.8	25.4	3.66	1.175
k) We have consistently performed well at the NSE	23.4	15.6	29.7	21.9	9.4	2.78	1.291

Based on the study findings, it is clear that the manufacturing firms in Kenya evaluate their suppliers financially to determine their financial status before engaging them in their organization. These findings are consistent with Kleinddorfer and Saad (2005) who argue that a company that deals with suppliers who have financial hardships may result to inefficiencies along the supply chain. Supplier relationships such as partnerships with suppliers who are financially unsound increase the risks of firms which enter into such relationships (finch, 2004).

Also, when the financial strength of a supplier is vulnerable, it affects the entire supply chain participants (tang, 2006).

Manufacturing firms in Kenya also monitored the financial status of their suppliers throughout the contract. These findings are in agreement with Achilles, (2004) that managing financial failure risk of the suppliers should be a top priority for an organization, sourcing, procurement and contract management. The study also concurs with the results of a study by Achilles (2014) that when suppliers suffer from financial failure, the average cost incurred by the procuring entity participating in the supply chain amounts to 73, 000 pounds. Manufacturing firms in Kenya also monitor the financial status of their suppliers.

c) Financial Management

A large number of the respondents (29.4%) agreed that their firms are concerned with the price and not the total cost when buying products from the suppliers, 26.5% agreed, 23.5% strongly agreed, 11.5% were neutral while a small number (8.8%) strongly agreed (Mean = 2.74, SD =1.345). Majority of the respondents (47.1%) also agreed that they used technology to enhance the firms' cash flow, 20.6% were neutral, 19.1% strongly agreed, 7.4% disagreed, while the minority 5.9% strongly disagreed (Mean = 3.66, SD =1.060). Most firms (49.2%) also agreed that the finances of the firm are managed through strategic sourcing, 22.2% were neutral, 19.0% strongly agreed, 6.3% disagreed while few firms (3.2%) strongly disagreed (Mean = 3.75, SD =0.950). Majority of the manufacturing firms in Kenya (39.7%) disagreed that there are many complaints about nonpayment of suppliers, 32.4% strongly disagreed, 14.7% agreed, 10.3% were neutral while the minority (2.9%) strongly agreed (Mean = 2.16, SD =1.128). A large number of manufacturing firms in Kenya (39.7%) agreed that they had a procurement schedule that is strictly adhered to, 23.5% were neutral, 19.1% strongly agreed, 11.8% disagreed while a small number (5.9%) strongly disagreed (Mean = 3.54, SD =1.112). When they were asked whether they have a procurement schedule that frequently overlap, majority of the manufacturing firms (35.8%) disagreed, 23.9% agreed, 20.9% were neutral, 16.4% while the minority (3.0%) strongly agreed (Mean = 2.61, SD =1.114) as shown in table 4.12.

Table 4. 4: Measurement of financial management

	SD %	D %	N %	A %	SA %	M	SD
l) We are concerned with the price and not the total cost when buying products from suppliers	23.5	26.5	11.8	29.4	8.8	2.74	1.345
m) We always use technology to enhance the firm cash flow	5.9	7.4	20.6	47.1	19.1	3.66	1.060
n) We manage the finances of the firm through strategic sourcing	3.2	6.3	22.2	49.2	19.0	3.75	.950
o) There are many complaint about nonpayment of suppliers	32.4	39.7	10.3	14.7	2.9	2.16	1.128
p) We have a procurement schedule that is strictly adhered to	5.9	11.8	23.5	39.7	19.1	3.54	1.112
q) We have procurement schedule that frequently overlap	16.4	35.8	20.9	23.9	3.0	2.61	1.114

From the study findings, it is clear that manufacturing firms in Kenya use technology to enhance their firms’ cash flow. This is in agreement with bottom Line Technologies (2011) who argue that when companies adopt information technology, they ensure that their supply chains are faster and cost efficient. Hausman (2004) also agrees by arguing that when supply chain payment systems are automated, the performance of the firm is improved. Manufacturing firms in Kenya also manage their finances through strategic sources. This is in line with a study carried out by Mertinez (2014) that firms can reduce their financial flow risk by avoiding inappropriate spending in goods and services that the company does not require. This improves the performance of the firm through the reduction of supply chain risks such as reduced risk of non-supply and reduced currency risk (ACCEA, 2014). Manufacturing firms in Kenya also have few complaints about nonpayment from the suppliers. This is in tandem with Mertinez (2014) that financial flows are manifested terms of delays in processing and reconciling of invoices. Manufacturing firms in Kenya also have a procurement schedule that is strictly adhered to and that does not frequently overlap. This helps in preventing the firms from spending on purchases that are not required by the firm (Mertinez, 2014).

However, manufacturing firms in Kenya are concerned about the price and not the total cost when buying goods from the suppliers. This is in agreement with a research carried out by ACCA (2014) which argues that when purchasing goods and services, the supply chain participants should be concerned with the total cost of buying and not just the price of the product. Therefore, to improve performance of their firms, manufacturing firms should first analyze the total cost from purchase price, maintainace, to disposal in order to better manage the finances of the firms and avoid financial flow risks.

d) ICT use on Financial Flow Risk

The respondents were asked to indicate how they use ICT to improve financial flow. Most of the respondents (89.4%) agreed that they used ICT in payment of the suppliers, 83.5% used ICT in analyzing purchasing spend, 68.2% in supplier relationship management, 78.8% in sourcing for goods while 53% used intranet to send payment information to suppliers.

However, majority of the respondents did not use ICT in; Exchange rates management (51.5%), analyzing the suppliers' financial performance (51.5%), use text messages to post notices of supplier payment (64.6%), use of whats app to post payment documents to suppliers (70.8%) while (66.7%) of the respondents did not use wi-fi to send payment information to suppliers. The results were shown in the table 4.13.

Table 4. 5: ICT use on information flow risk

	Frequency	%
Payment to suppliers		
No	7	10.6
Yes	59	89.4
Analyzing purchasing spend		
No	11	16.7
Yes	55	83.5
Exchange rates management		
No	34	51.5
Yes	32	48.5
Supplier relationship management		
No	21	31.8
Yes	45	68.2
Sourcing goods		
No	14	21.2
Yes	52	78.8
Analysis of supplier financial performance		
No	34	51.5
Yes	32	48.5
We use text messages to post notices of supplier payment		
No	42	64.6
Yes	23	35.4
We use whatsApp to post payment documents to suppliers		
No	46	70.8
Yes	19	29.2
We use intranet to send payment information to suppliers		
No	31	47.0
Yes	35	53.0
Wifi is used to transmit payment information		
No	44	66.7
Yes	22	33.3

4.7 Relationship between financial flow risk and firm performance

Objective 1: To establish the moderating effect of ICT on financial flow risk and firm performance among manufacturing firms in Kenya

Regression analysis was conducted to determine the extent to which firm performance (dependent variable) can be influenced by financial flow risk (independent variable). The linear regression model for financial flow risk was found to be statistically insignificant (F=1, 67= 1.159, p= 0.286). Therefore, financial flow risk is not a significant predictor of the performance of the manufacturing firms in Kenya as shown in table 4.37.

Table 4. 7: Regression results on financial flow risk and firm performance

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.130 ^a	.017	.002	.538

ANOVA

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	.335	1	.335	1.159	.286 ^b
	Residual	19.377	67	.289		
	Total	19.712	68			

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error			
1	(Constant)	3.733	.261		14.328	.000
	Financial flow risk	-.095	.089	-.130	-1.077	.286

a. Dependent Variable: Performance of the manufacturing firms in Kenya

Although the regression model indicated that there was no relationship between information flow risk and firm performance, the researcher did a triangulation to support the regression model. The researcher had asked the firm to give their perceived effect of financial flow risk on the performance of manufacturing firms in Kenya. Table 4.37 illustrates their perceived effect of financial flow risk and performance of manufacturing firms in Kenya.

4. 3 Moderating effect of ICT use on the relationship between financial flow risk and firm performance

The second specific objective of this study was to establish the moderating effect of ICT on information flow risk and firm performance among the manufacturing firms in Kenya

The hypothesis to test for this specific objective was:

H₀₂ – ICT use does not moderate the relationship between financial flow risk and firm performance among the manufacturing firms in Kenya

To determine if ICT use moderates the relationship between financial flow risk and firm performance among the manufacturing firms in Kenya, three models were fitted hierarchically with;

- 1) Model 1 having X_2 as the predictor.
- 2) Model 2 having X_2 and the moderation variable as a predictor.
- 3) Model 3 is model 2 with interaction term between X_2 and the moderating variable

The 3 models were found to be statistically insignificant, that is, in all cases p was bigger than 0.05 (see table 4.38).

Table 4. 38: Moderated Multiple Regression for financial flow risk

Model Summary									
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics of R Square Change	F Change	Change Statistics df1	Change Statistics df2	Sig. F Change
1	.143 ^a	.020	.006	.535	.020	1.376	1	66	.245
2	.253 ^b	.064	.035	.527	.044	3.031	1	65	.086
3	.331 ^c	.110	.068	.518	.046	3.288	1	64	.074

ANOVA^a						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	.394	1	.394	1.376	.245 ^b
	Residual	18.918	66	.287		
	Total	19.312	67			
2	Regression	1.237	2	.619	2.224	.116 ^c
	Residual	18.075	65	.278		
	Total	19.312	67			
3	Regression	2.120	3	.707	2.631	.058 ^d
	Residual	17.192	64	.269		
	Total	19.312	67			

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	3.474	.065		53.460	.000		
	Financial flow risk	-.104	.088	-.143	-1.173	.245	1.000	1.000
2	(Constant)	3.315	.111		29.840	.000		
	Financial flow risk	-.060	.091	-.083	-.663	.510	.924	1.083
	ICT use	.242	.139	.217	1.741	.086	.924	1.083
3	(Constant)	3.368	.113		29.800	.000		
	Financial flow risk	-.234	.131	-.323	-1.788	.078	.427	2.342
	ICT use	.208	.138	.186	1.502	.138	.906	1.104
	Financial flow risk*ICT use	.324	.179	.316	1.813	.074	.457	2.190

However, looking at the reduction (from 0.245 to 0.086 to 0.074) in p-values (sig. F change), one can conclude moderation maybe detected with a larger sample size. This means there is a significant reduction in financial flow risk when ICT use is present though not statistically significant since it is not below 5%. The potential moderation of ICT use on the relationship between financial flow risk and firm performance is further depicted in the scatter plot shown in Figure 4.8.

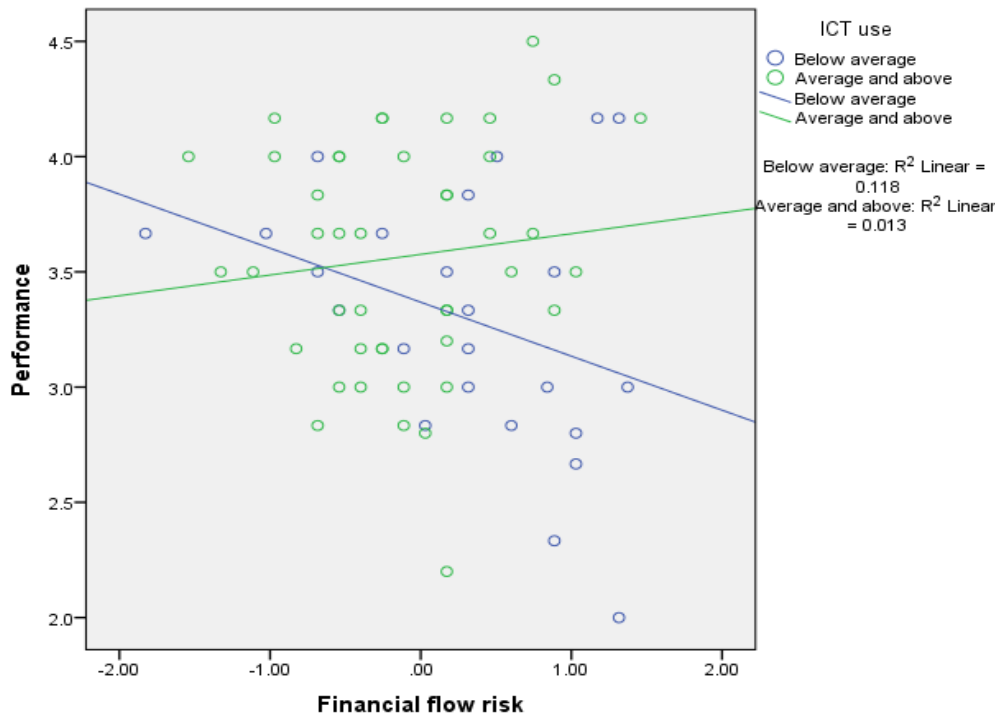


Figure 4. 1: Slope of moderated financial flow risk

The scatter plot above suggests some form of moderating effect that was not statistically significant because the p value was not less than 5%. This means that as financial flow risk increases, manufacturing firms in Kenya that have leveraged on ICT use have increased firm performance. This is because ICT use hedges them against the negative effect of the financial flow risk on their performance. On the other hand, the manufacturing firms which have not leveraged on the usage of ICT, when financial flow risk increases, their performance is affected negatively (decreases). This is in agreement with a study carried out by Hausman (2014) which revealed that firms that failed to leverage on ICT to improve their financial management and analyze the purchasing spend were more prone to financial flow risks due to high carrying costs and non-predictability of cash flow improvements.

When an open ended question was asked on how the firms can manage finances in order to improve the performance of their firms, the respondents indicated; budgeting and strictly sticking to the budget, ensuring value for money is achieved in all stages of procurement, managing skills and terms of payment.

4.4 Discussion

Findings from the qualitative results indicate that financial flow risk does not affect the performance of the manufacturing firms in Kenya. This is contrary to the findings of Musa, 2012; Rao and Goldsby (2009) that financial flow risk affects the performance of a firm as failure by debtors to settle their debts may affect the ability of the manufacturing firms to pay their suppliers therefore disrupting the supply chain. The lack of relationship between financial flow risk and firm performance among the manufacturing firms in Kenya could be explained by the fact that majority (37.7%) of the manufacturing firms in Kenya buy goods and services from

outside the country. The manufacturing firms are also not aware that there is need to change their sources of supply when the source countries are affected by the threat of exchange rates. It is therefore evident that most of these firms are not aware of the potential financial flow risks that may greatly affect their supply chain such as exchange rate risks. Exchange rate risk according to Njaaga, (2013) and Irene, (2011) increases the cost of raw materials and these may affect the financial performance and customer service due to increased prices of the final products. Total costing is an important supply chain determinant of the price of the product. However, manufacturing firms in Kenya only consider the price of the products only. These firms are also not aware that the lack of the total costing can significantly affect the performance of their firms. A study carried out by ACCA (2014) advises manufacturing firms to consider the total cost of a product as this may have an impact on the performance of the firms in terms of high maintenance and disposal costs during the life cycle of products.

ICT was seen to moderate the relationship between financial flow risk and performance of the manufacturing firms in Kenya based on the results from the scatter plot. Manufacturing firms that had leveraged on ICT use had a higher performance compared to those which had not. This means that ICT use reduces the impact of financial flow risk on the performance of the firm. This study findings are in agreement with the study carried out by Hausman (2014) that ICT use helps in the management of finances and analyses the firms purchasing spend thereby reducing carrying costs and enabling firms to predict cash flows more effectively.

5.1 Summary, Conclusion and Recommendations

5.2 Moderating effect of ICT on financial flow risk and firm performance among the manufacturing firms in Kenya

Financial flow risk is defined as the inability by the suppliers to settle payment as a result of improper investments and the failure by customers to pay their debt. In this study, financial flow risk was operationalized using exchange rate, financial strength of the supplier and financial management. The study found out that manufacturing firms in Kenya buy goods that are only important to the firm and are also able to pay their suppliers on time. Most of the strategies that the firms implemented to prevent the effect of currency volatility were effective. Also, most of the materials used by the manufacturing firms were sourced locally but also a significant amount is sourced from outside the country. Manufacturing firms in Kenya also fail to change their sources of supply when the exchange rate increases in their current source market. From the study findings, manufacturing firms in Kenya evaluate their suppliers financially to determine their financial status before engaging them in their organization. Manufacturing firms in Kenya also monitored the financial status of their suppliers throughout the contract.

In addition, manufacturing firms in Kenya use technology to enhance their firms' cash flow. These firms also manage their finances through strategic sources. Manufacturing firms in Kenya also have few complaints about nonpayment from the suppliers. They also have a procurement schedule that is strictly adhered to and that does not frequently overlap. However, manufacturing firms in Kenya are concerned about the price and not the total cost when buying

goods from the suppliers. The firms also pointed out budgeting and strictly sticking to the budget, ensuring value for money is achieved in all stages of procurement, managing skills and terms of payment as some of the strategies that firms can adopt in order to reduce financial flow risk and improve the performance of their firms.

Kenyan manufacturing firms also in order to improve their financial flow use ICT in payment of the suppliers, in analyzing purchasing spend, in supplier relationship management, in sourcing for goods and use the intranet to send payment information to suppliers. However, they do not use ICT in exchange rates management, analyzing the suppliers' financial performance, do not use text messages to post notices of supplier payment, they did not use whats app to post payment documents to suppliers and also did not use wi-fi to send payment information to suppliers.

The study also found out financial flow risk is not a significant predictor of firm performance. ICT use was also not a significant moderator of the relationship between financial flow risk and firm performance. However, further investigation using the scatter plot revealed that ICT use moderated the relationship between financial flow risk and firm performance, although the moderation was not significant. Also looking at the decrease in the p values, one would conclude that with a larger sample size, the moderation would have been evident. Therefore, manufacturing firms in Kenya that have better ICT infrastructure and training are able to hedge themselves against financial flow risk and therefore record a high performance. Firms that are not able to leverage on ICT use on the other hand are affected more by financial flow risk and this decreases their performance. This findings were in agreement with Hausman (2014) that, firms that use ICT in managing their financial flows are able to manage carrying costs which significantly reduces their revenues and also able to manage their cash flows. This enables them to only purchase products based on total spend therefore managing the finances of a firm.

Conclusion

5.3 Moderating effect of ICT use on the relationship between financial flow risk and performance among manufacturing firms in Kenya.

The study concluded that there was an insignificant relationship between financial flow risk and performance of manufacturing firms in Kenya. Therefore, financial flow risk does not significantly predict the performance of manufacturing firms in Kenya (financial flow risk does not affect performance). This is explained by the descriptive results which revealed that manufacturing firms in Kenya are concerned about the price but not the total cost when buying goods and services. In their study, ACCA (2014) argue that manufacturing firms should be concerned with the total price (purchase price, maintenance and disposal costs) as this will help them to analyze risk over the entire life of a product prior to purchase.

ICT use was also not a significant moderator of the relationship between financial flow risk and performance of the manufacturing firms in Kenya. The study can therefore conclude that when firms leverage on proper ICT use along the supply chains, they can experience a reduction in financial flow risk. That is, they will be able manage their exchange rates, analyze the financial strength of their suppliers online and consequently manage the financial flows of a firm. These will have a significant impact in terms of hedging the firms form increased prices of imported

goods and services (Eitman, 2007). Firms will also leverage on ICT to analyze the financial strengths of the suppliers and also manage their total spend to prevent spending the firms money on purchases that are not necessary. Unnecessary purchases increases storage costs which affects the performance of a firm.

Recommendations

5.4 Moderating effect of ICT use on the relationship between financial flow risk and firm performance among the manufacturing firms in Kenya

When the sources of supply of the manufacturing firms in Kenya are affected by exchange rate risks, they should be able to switch to alternative sources where the risks of exchange rate is not high. This can be achieved by diversifying sources of supply. Diversification of supply sources will be informed through proactive market research which will help in identifying and monitoring the currency exchange rates in the different countries. This is because exchange rates impacts negatively to the performance of a firms as it increases the cost of the raw materials. High cost of raw materials means that the firms will pass the same to the end customers making their products less competitive and consequently affecting their performance (Musa, 2013; Njaaga, 2013).

In order to leverage on ICT use, in reducing the impact of financial flow risk, the manufacturing firms in Kenya need to take advantage of ICT in monitoring the exchange rate risks. The employees should be properly trained on ICT use. They will equip them with adequate skills and also enhance their understanding on the various ICT platforms that are suitable for the firm to reduce the risk of exchange rate.

6.1 References

- Achilles (2014). *Supply Chain News: What are the Best ways to Estimate Supplier Financial? Risks?* Retrieved on 30th October 2014 from:
http://www.scdigest.com/assets/On_Target/09-07-28-2.php
- African Economic Outlook (2015). Principle Economic Sectors of Kenya. Retrieved on 25th April 2016 from: http://focusafrica.gov.in/Sector_Profile_Kenya.html
- Afza, M., & Alam, K. (2014). Managing foreign exchange risk among Ghanaian firms. *Journal of Risk Finance* volume, 6 (4), 306-318.
- Amimo, E. (2013). Location Decision by Food Manufacturing Firms in Kenya. Retrieved on 21st May 2016 from:
http://erepository.uonbi.ac.ke/bitstream/handle/11295/58413/Amimo_Location%20Decisions%20by%20Food%20Manufacturing%20Firms%20in%20Kenya.pdf?sequence=3&isAllowed=y
- Bradley, P. (2001). The certainty of uncertainty. *Supply Chain Management Review* 5 (2), 105-106.
- Bryman, A. (2012). *Social research methods* (4th ed.). New York: Oxford University Press.
- Butcher, T., Lawani, C., & Mangan, J. (2008). *Global Logistics and Supply Chain Management*. USA. John Wiley & Sons
- Business Daily (2016). Nairobi Ranked 8th on World Bank List of Rich, Poor Counties.

- Retrieved on 26th April 2016 from: <http://www.businessdailyafrica.com/Nairobi-ranked-8th-on-World-Bank-list-of-rich--poor-counties--/-/539546/2951310/-/l07jfl/-/index.h>
- Chaudhuri, A., Mohanty, B., & Singh, K. (2013). Supply Chain Risk assessment During New Product Development: A Group Decision Making Approach using Numeric and Linguistic Data. *International Journal of production Research*, 51(10), 2790-2804
- Chimi, C. J., & Russell, D. L. (2009). The Likert Scale: A Proposal for Improvement Using Quasi-Continuous Variables: *The Proceedings of the Information Systems Education Conference*. Washington DC: 1542-7382.
- Choi, T. Y., Dooley, K. J., & Rungtusanatham, M. (2001). Supply networks and complex adaptive systems: Control versus emergence. *Journal of Operations Management*, 19, 351–366.
- Dani, S., Chester, M., & Kalawsky, R. (2013). A Systems Approach for Modelling Supply Chain Risks. *Supply Chain Management. An International Journal*, 18(5), 523-538
- Davis, F. D., R. P. Bagozzi & P. R. Warshaw (1989). User Acceptance of Computer Technology: A Comparison of Two Theoretical Models. *Management Science Journal*, (35)8, 982–1003.
- Dehning,, B., Richardson V.J. & Zmud, , R.W. (2007). The financial performance effects of IT-based supply chain management systems in manufacturing firms. *Journal of Operations Management*, 25 (4), 806–824.
- Eiteman, D., Stonehill, A & Moffett, M. (2007). *Multinational Business Finance* (9th ed). Boston: Pearson Education.
- Finch, P. (2004). Supply chain risk management”, *Supply Chain Management. An International Journal*, 9 (2), 183-96
- Fischl. M., Scherrer-Rathje.M. & Friedli.T., (2014). Digging deeper into supply risk: a systematic literature review on price risks”, *Supply Chain Management. An International Journal*, 19 (5), 480 - 503
- Geary, S., Childerhouse, P., Towill, D., (2002). Uncertainty and the seamless supply chain. *Supply Chain Management Review*, 6 (4), 52-61.
- Global Computer Hardware, (2015). *Market Line Industry profile*. retrieved on 12th Novemeber, 2015 from: <http://web.b.ebscohost.com/ehost/pdfviewer/pdfviewer?sid=4efbbea8-acea-4a68-9462-04d713f7060c%40sessionmgr198&vid=1&hid=116>
- Global Finance, (2012). *Supply Chain Risk Management. Supply Chain Risk Management Practice*. Retrieved on 8th August 2015 from: <http://usa.marsh.com/Portals/9/Documents/SupplyChainRiskMgmtFactSheet.pdf>
- SoftKenya, (2013). Vision 2030 Economic Pillar-Manufacturing. Retrieved on 9th March 2016 from: <http://softkenya.com/vision-2030/vision-2030-economic-pillar-manufacturing/>
- Solakivi, T. (2014). *The Connection between Supply Chain Practices and Firm Performance- Evidence from Multiple Surveys and Financial Reporting Data*: Published thesis, Tuku school of Economics
- Trkman, P& Groznik, A. (2006).Measurement of supply chain integration

- benefits. Interdisciplinary. *Journal of Information, Knowledge, and Management*, 1.
- Trochim, W. M. K. (2006). *Introduction to Validity*. Retrieved on 25th November, 2015, 2010 from socialresearchmethods: [http:// www.socialresearchmethods.net/kb/introval.php](http://www.socialresearchmethods.net/kb/introval.php).
- Zibra, A. (2010). The Role of Information and Communication technology in the Management of Selected Secondary Schools in Central Uganda. Retrived on 30th May 2017 from: <https://www.researchgate.net/publication/249314748> THE ROLE OF INFORMATION AND COMMUNICATION TECHNOLOGY IN THE MANAGEMENT OF SELECTED SECONDARY SCHOOLS IN CENTRAL UGANDA