

Effect of Green Procurement on the Performance of Manufacturing Firms in Kenya

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Abstract

The purpose was to determine the effect of green procurement on the performance of manufacturing firms in Kenya. The study was descriptive in a positivist approach. The questionnaire was used to collect data from a random sample size of 386 in 757 manufacturing firms in Kenya registered under the Kenya Association of Manufacturers as of the year 2017. The study was informed by natural resourced based view theory. Findings from the linear regression model showed that green procurement had a significant and positive effect on the performance of manufacturing firms in Kenya. As such, adoption of flexible green procurement practices through appropriate research will help the manufacturing firm to meet diverse yet drastic changing needs as well as address challenges arising from a dynamic global business environment. Therefore, it is of utmost necessity for the firms to use inputs with relatively low environmental impacts.

Keywords: Green Procurement, Performance, Manufacturing Firms

1. Introduction

The expanding global economy has brought prosperity but also environmental degradation (World bank, 2012), such as climate change, ozone layer depletion, loss of biodiversity, pollution, degradation and the depletion of air, water, minerals and land (United Nations environment program, 2012; World bank, 2012). These issues have become essential to firms because their stakeholders, such as regulatory authorities, customers, competitors, non- governmental organizations and employees, are increasingly demanding that firms address environmental and social sustainability in business operations (Carter & Easton, 2011). GSCM has emerged one of the best innovative strategies to improved business competitiveness in a sustainable environment. On the other hand, many organizations worldwide are making an effort to purchase products and services which are less harmful to local and global environments (Nikbakhsh, 2009).

Firms wishing to minimize their environmental impacts might discover that their ability to do so is dependent on their ability to manage increasingly complex supplier relationships (Ahi & Searc 2013).green supply chain management (GSCM) is an integration of environmental thinking into supply chain management, It is aimed at planning and controlling business processes from raw material suppliers and end-customer and links together partners in a supply chain which provides an excellent starting point for improving sustainability (Seuring, 2013). This research addresses the economic and environmental dimensions of sustainability, particularly in the context of green supply chain management (GSCM). According to Brandenburg, Govindan, Sarkis & Seuring (2014), the focus of environmental management has shifted from the firm level to the supply chain level.

Green purchasing is a crucial strategy for enterprises to reduce waste and improve efficiency and enhance Green competitiveness procurement is a set of supply-side practices utilized by an organization to effectively select suppliers based on their environmental competence, technical and eco-design capability, environmental performance, ability to develop environmentally friendly goods and ability to support focal company's environmental objectives (Olson, 2009). Green procurement means purchasing products and services that cause minimal adverse environmental impacts. It incorporates human health and environmental concerns into the search for high quality products and services at competitive prices.

Furthermore, reuse, recycle and reduce in the process of green procurement in terms of paper and parts container (plastic bag/box), place purchasing orders through email (paperless) use eco-labeling of products, ensure suppliers 'environmental compliance certification and conduct auditing for suppliers' internal environmental management are also emphasized in this study (Chin, tat & Sulaiman, 2015). Manufacturing firms just like other organizations throughout the world are increasingly becoming aware of the danger posed by environmental issues such as global warming, carbon emissions, toxic substance usage, and

resource scarcity. It is this worrying realization that has made policymakers and activists advocate for going green, and many organizations, including manufacturing firms throughout the world have responded to this by adopting green supply chain practices (Xie & Breen, 2012). The manufacturing industry is the most significant contributor to the country's pollution index. Many efforts are being put into minimizing environmental footprints of the manufacturing industry to enhance environmental protection and sustainable development. It is on this basis that green supply chain management (GSCM) practices are now gaining popularity as a management approach in facilitating matters related to environmental issues and firms' performance. However, GSCM practices are still less adopted by manufacturing firms in Kenya. Notably, few studies have combined green procurement and environmental performance being moderated by existing formal governance mechanisms.

H₀₁ Green procurement does not significantly influence the performance of manufacturing firms in Kenya

2. Theoretical Review

The theoretical perspective relevant to this study is based on green supply chain practices that are presumed to influence the effectiveness of a business value chain consequently affecting the environmental performance of large manufacturing firms in Kenya. This study was informed by natural resource based view theory.

The resource-based view (RBV) was first developed by Wernerfelt (1984) who perceived a firm as a broader set of resources compared to the traditional view, which accounts only for categories such as labor, capital and land. The extension of the RBV to the natural-resource-based view (NRBV) is widely used in explaining why firms adopt GSCM. The NRBV posits that strategy and competitive advantage can be created from capabilities facilitating environmentally sustainable economic activities (Hart 1995). Hart argues that for a resource to be valuable, rare, inimitable and non-substitutable, it must possess three characteristics: it must be causally ambiguous, socially complex and firm-specific. Thus, the theory is relevant to the study as NRBV theory is often used to explain more strategic motivations of GSCM adoption, such as why firms operating within the same context (market or industry) pursue different GSCM strategies despite experiencing similar institutional pressures (Testa & Iraldo 2010). According to the theory, environmental management in the supply chain can create a competitive advantage for those practicing it. It highlights the whole concept of adopting this practice. The availability of the necessary infrastructure will make adoption of green practices easier hence the theory links to the independent variable of the study which is performance.

2.1 Empirical Review

Yang and Zhang (2012), pointed out the potential aim of green procurement is to eliminate waste, and purchasing department will focus on value by comprehensively considering the total cost in the process of eliminating waste, which should focus on the business of waste disposal activities. Green procurement can also be construed as sustainable procurement; it means purchasing products and services that cause minimal adverse environmental impacts. It focuses on the practice of procuring products and services that are less harmful to the environment (land, air and water). Green products purchased should be those that are made with less harmful materials or which when produced or used or consumed would have a minimal impact on the environment. This includes buying local and reducing your carbon footprint (Yang et.al, 2012). The kinds of materials from which a product is manufactured may substantially affect the environmental footprint of the product. For example, mining or logging may have low to high impact, depending on the practices of the companies involved, through energy and water use, waste production, and effects on health and ecosystems.

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A descriptive study by Eltayeb, Zailani and Jayaraman (2010) examined the enablers of green procurement among firms with environmental certification in Malaysia, specifically, the study focused on the impact of four drivers namely; legislations, client demands, societal expectations, and the desired gains from Green procurement in the Malaysian manufacturing sector. Using a random sampling research technique, they held vital informant guided interviews with leaders of the corporations in the sample size. The results of the research revealed that green practices are influenced by legislations, client demands, societal expectations, the desired gains, and firm ownership. The study also indicated that despite firms adopting corporate social responsibility, it is not a convincing enabler for green procurement.

A study conducted by Blomea, Hollosby and Paulrajac (2013) to establish the effect of green procurement and green supplier development on supply chain performance of western European firms within the manufacturing and service sector used a target population comprising of senior corporate leaders from supply chain consulting companies in Europe. Data was collected using questionnaires. The findings of the study indicated that green supplier development has a direct impact on supply chain performance.

Nasiche et al. (2014) conducted a case study on the determinants of green procurement in the public sector. The study evaluated factors that affect the implementation of green practices in the public sector with a biased on Kenya pipeline company (KPC). The research discovered that internal capacities to implement green strategies and external motivators including demands from stakeholders and government legislation affecting the adoption of green practices to a great extent. The issue of the cost of implementation was not a significant concern. The study showed that the institutional governance set up might be a success factor in going green. The major limitation is that the study only focused on one company, KPC. This makes the results inconclusive.

Also from the literature it shows that there is limited implementation of green procurement in developing countries as compared to developed countries. Lack of theory may also have limited our ability to understand the relationship between green procurement and firms 'performance. It also makes the generalization of research findings from one context to another difficult. It is therefore essential that green procurement research makes greater use of theory to improve our understanding of the phenomenon (Benjamin *et al.*, 2015). This study therefore seeks to establish whether the implementation of green procurement influences the performance of manufacturing industries in any way. From literature most studies focused on the effect of a single green supply chain practice on performance and not particularly on manufacturing firms 'performance hence presenting a conceptual gap. In the Kenyan context, the influence of Green procurement on the Kenya manufacturing firms remains unexplored and there is a lack of a guiding framework on how manufacturing firms should embrace Green procurement. Hence this creates significant gaps this study is going to fulfill.

3. Material and methods.

This study adopted an exploratory research design using both quantitative and qualitative approaches. The target population for this study was the 757 manufacturing industry from Nairobi and Kiambu counties where over 80% of the industries are located. Magenta (2008) indicates that a sample of between 10% to 30% is appropriate for a study. A sample size of 40% of the total population in this study is hence excellent. Hence, the sample size for this study was 386 manufacturing industry from Nairobi county where over 80% of the industries are located, and from each industry the researcher administered questionnaires to procurement managers and operational managers to be respondents in the study. The study collected primary data using structured questionnaires and capture information through a 5-point Likert scale type. Reliability was measured using Cronbach alpha. The measurement scale for reliability was tested using Cronbach alpha

coefficient for every independent variable and for an alpha (α) of 0.7 and above the instrument was interpreted as reliable (Cronbach, 1951). In addition, This study tested for criterion, content and construct validity of the research instrument. Factor analysis was carried out on the measurement of variables. In general, the extraction method was principal component analysis and the rotation method was varimax with Kaiser Normalization and the findings were presented in Table 1. From the findings, all the items related to variables were significantly loaded on their respective factors thus all were retained for analysis.

Table 1 Reliability and Validity Analysis

	Mean	loadings	Bartlett's Test Approx. Chi-Square	Eigenvalues	% of CV
green procurement (KMO =.83, Cronbach Alpha=0.88)			934.399*	3.124	57.299
Selection of suppliers is based on their ability to develop environmentally friendly goods	2.12	0.56			
The company effectively select suppliers based on their ability to support the company's environmental objectives	2.13	0.71			
The company purchases products with biodegradable packaging	2.50	0.57			
The use of toxic and hazardous material is minimized in the ordering process	2.25	0.78			
Materials Purchased for manufacturing are of recyclable nature	2.04	0.86			
Green specifications are considered during inspection	2.79	0.62			
Purchase orders are placed through the mail (paperless)	2.54	0.83			
Order follow up is electronically done	2.45	0.86			
There is the use of ecobelling practices	2.32	0.54			
firm performance(KMO=.82, Cronbach Alpha = 0.90)			2345.481*	3.932	57.453
Profitability has changed after the introduction of green supply chain management	2.24	0.71			
percentage change in profits after the introduction of green supply chain management	1.40	0.66			
percentage change in market share after the introduction of green supply chain management	2.13	0.63			
percentage change in average return on an investment after the introduction of green supply chain management	1.41	0.87			
percentage change in average sales volume after the introduction of green supply chain management	2.21	0.90			
The direction of change of earnings per share after the introduction of green supply chain management	1.17	0.66			
percentage change in earnings per share after the introduction of green supply chain management	2.29	0.70			
The direction of change of market share after the introduction of green supply chain management	1.24	0.92			
The direction of change of average sales volume after the introduction of green supply chain management	2.13	0.83			
The direction of change of average return on an investment after the introduction of green supply chain management	1.24	0.77			
The direction of change of the company's usage of energy ..	1.80	0.73			

Extraction Method: Principal Component Analysis.

3.1 Analytic model

To test the effect of green procurement on environmental performance, inferential statistics regarding correlation and multivariate regression modeling was adopted. Linear regression was conducted to determine which among the green procurement affects the dependent variable most and determine the direction and magnitude of the effect. To derive the composite index for the variables under study, the harmonic mean formula was used (Barlett, Kotrlik & Higgins, 2011)

$$C_i = \frac{\sum f_i w_i}{\sum f_i} \text{ Where}$$

C_i = composite index for variable F = total number of respondents

W_i = the relative weight given to each component in a particular variable.

The following regression models were used in the determination of coefficients of the independent variables (green supply chain practices) in relation to the dependent variable (environmental performance). The multivariate models were as follows: Correlation Matrix

$$y_i = \beta_0 + \beta_1 X_1 + e$$

Where

Y = performance indicators.

X = Green procurement.

Findings and Discussions

This section presents data analysis, presentation and interpretation of the findings. The section highlights the fundamental results of the examination based on which further investigations was attempted to test the hypotheses.

Univariate analysis

Firm performance is on the premise that an organization is in possession of productive assets such as human, physical, and capital assets required to accomplish a common purpose (Hayes, 2013). Firm performance realized a mean of 1.71, a standard deviation of 0.21. The results suggest that not much change has been elicited in the performance of the manufacturing firms after the introduction of green supply chain management. Large and Thomsen (2011) defined green procurement as the integration of environmental considerations into purchasing policies, programmes, and actions. Green procurement summed up to a mean of 2.37, the standard deviation of 0.31, skewness of 0.69 and kurtosis of 0.04. The implication is that the manufacturing firms in Kenya have made minimal efforts towards the adoption of green procurement. From the findings in the table, green procurement has a positive and significant relationship with firm performance ($r = 0.692$, p -value = 0.000) at 0.01 level of significance.

Table 2 Correlation results

	Mean	Std. Dev	Firm performance	Green procurement
Firm performance	1.71	0.21	1	
Green procurement	2.37	0.31	.692**	1

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

Hypothesis testing (regression results)

H_{01} *Green procurement does not significantly influence the performance of manufacturing firms in Kenya*

The first hypothesis (H_{01}) stated that green procurement does not significantly influence the performance of manufacturing firms in Kenya. However, the findings in table 3 showed that green procurement has a positive and significant effect on the performance of manufacturing firms ($\beta_1 = 1.026$, $p < 0.05$). Thus, the hypothesis was rejected and this can be explained further by assessing the value of the t-test which indicates that green procurement would be attributed to the regression model 14 times more compared to the effect of the standard error associated with the estimated coefficient ($t = 14.264$). More findings in Table 4.23 indicated that the variation in performance of manufacturing firms was attributed by 47.8% change in green procurement. The findings on green procurement indicated that the selection of suppliers is not based on their ability to develop environmentally friendly goods. Also, the company has not made sufficient efforts towards ensuring that there is a valid selection of suppliers based on their ability to support the firm's environmental objectives. Further, it is undefined if the company purchases products with biodegradable packaging. Moreover, it is not clear if the use of toxic and hazardous is minimized in the ordering process.

Further, it is unclear whether purchase orders are placed through the mail and if order follow is done electronically. Similarly, there is uncertainty as to whether materials purchased for manufacturing are of recyclable nature. Also, there are no considerations on green specifications during an inspection on delivery. Moreover, there is a doubt if there is a use of ecolabeling practices. In line with the findings, Blomea, Hollosby and Paulrajac (2013) established that green procurement and green supplier development directly impacted on the supply chain performance of western European firms within the manufacturing and service sector. In addition, the findings are in tally with that of Pembere (2016), which indicated that the adoption of green procurement practices improves the supply chain performance.

Table 3 Influence of Green Procurement on Performance of Manufacturing Firms in Kenya

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
(Constant)	-0.261	0.183		-1.428	0.155
Green procurement	1.026	0.072	0.692	14.264	0.000
Model Summary statistics					
R	0.692				
R Square	0.478				
Adjusted R Square	0.476				
Std. The error of the Estimate	0.635				
Model Fitness Statistics (ANOVA Results)					
F	203.468				
Sig.	0.000				

a Dependent Variable: firm performance

Conclusion and Recommendations

From the results of the study and the forgoing discussions, it is clear that there is a secure connection between green procurement and the performance of manufacturing firms in Kenya. This is notwithstanding the fact that there are limited efforts towards ensuring there are environmentally friendly goods and that suppliers conform with the firm's environmental objectives. The implication therefore is that the manufacturing firms have not fully optimized green procurement practices because of the inherent gaps in supplier selection and order. Also, there is a likelihood that green procurement practices have not been fully adopted by the manufacturing firms and realigned with their corporate strategies.

Green procurement needs to be embraced to help the management team appreciate the direct effect on the performance of manufacturing firms. As such, adoption of flexible green procurement practices through appropriate research will help the manufacturing firm to meet diverse yet drastic changing needs as well as address challenges arising from a dynamic global business environment. Specifically, the emphasis of the manufacturing firms needs to be on ensuring that suppliers are selected based on their ability to develop environmentally friendly goods. Also, the firms should ensure that the materials purchased for manufacturing are of recyclable nature. Also, the firms need to make considerations on green specifications during an inspection on delivery.

In connection with the findings, this study makes a number of possible implications on the influence of green supply chain practices on the performance of manufacturing firms in Kenya. First, this study has opened an insight into how green procurement, green manufacturing, green distribution and green disposal influence the performance of manufacturing firms thus expanding on the existing literature that lays emphasis on developed countries. It has opened up further research avenues to compare and contrast these results with other sectors.

REFERENCES

- i. Ahi, P. & searcy, C. (2013). *A comparative literature analysis of definitions for green and sustainable supply chain management. Journal of cleaner production*, 5(2), 329-341.
- ii. Barlett, E., Kotrlik, W. & Higgins, C. (2011). *Organizational research: determining appropriate sample size in survey research. Information technology, learning, and performance journal*, 19(1), 43-56
- iii. Blomea, C., Hollos, D. & Paulraj, A. (2013). *Gp and green supplier development: antecedents and effects on supplier performance. International journal of production research*, 52(1), 32-49.
- iv. Carter, R., & Easton, P. (2011). *Sustainable supply chain management: evolution and future directions. International journal of physical distribution & logistics management*, 41(1), 46-62.
- v. Chin, A., Tat, H., & Sulaiman, Z. (2015). *Green supply chain management, environmental collaboration and sustainability performance. Procedia cirp*, 26 (7), 695-699.
- vi. Seuring, S. (2013). *A review of modeling approaches for sustainable supply chain management. Decision support systems*, 54(4), 1513-1520.
- vii. Testa, F., & Iraldo, F. (2010). *Shadows and lights of gscm (green supply chain management): determinants and effects of these practices based on a multi-national study. Journal of cleaner production*, 18(10-11), 953-962.
- viii. Wernerfelt, B. (1984). *A resource-based view of the firm. Strategic management journal*, 5(2), 171-180.
- ix. Xie, Y., & Breen, I. (2012). *Greening community pharmaceutical supply chain in uk: a cross boundary approach. Supply chain management: an international journal*, 17(1), 40-53.
- x. Eltayeb, T., Zailani, S. and Ramayah, T. (2010), "Green supply chain initiatives among certified companies in Malaysia and environmental sustainability: investigating the outcomes", *Resources Conservation and Recycling*, Vol. 55 No. 5, pp. 495-506.
- xi. Govindan, K.; Cheng, T.C.E (2011). *Environmental supply chain management. Resour. Conserv. Recycl.* 2011, 55, 557–558.
- xii. Hart, S.L. (1995) 'A natural-resource-based view of the firm', *Academy of Management Review*, Vol. 20, No. 4, pp.986–1014.