

THE NEXUS BETWEEN RAW MATERIAL SUPPLIES AND PERFORMANCE OF SMALL AND MEDIUM SCALE MANUFACTURING FIRMS IN NIGERIA

Karibo Benaiah Bagshaw

Department of Management, Rivers State University, Port Harcourt, Nigeria.

Correspondence: Karibo B. Bagshaw, Department of Management, Rivers State University, P.M.B. 5080, Port Harcourt, Nigeria. Email: bagshaw.karibo@ust.edu.ng

Abstract: Inefficiency in raw material supplies of Small and Medium Manufacturing Enterprises in Nigeria has led to inefficient use of production time, labour and other resources due to delays or incessant short down and interruptions during production. This has become inherent part of operations in many manufacturing organizations, which has often led to inability to meet customers' order and eventual loss of market shares. Therefore, this study empirically looked at the effect of raw material supplies on the performance of Small and Medium Manufacturing Firms in Nigeria. The survey research design method was adopted with a sample size of 148 firms from the population of 283 small and medium manufacturing firms. The proportionate stratified random sampling was used to select samples from each of the manufacturing sub-sectors. Structured questionnaire were distributed to each of the selected small and medium manufacturing firms. The data from the questionnaires were analysed, using the statistical package for social sciences (SPSS). The findings showed that raw material supplies have positive and direct relationship on the performance of the studied Small and Medium Manufacturing Firms. Therefore, Small and Medium Scale manufacturing Firms in Nigeria while locating their plant must ensure that the factor of closeness to raw materials is taken as a prime consideration above personal, political and tribal considerations. Also, Small and Medium Scale Manufacturing Firms in Nigeria should establish an information pool for raw material supplies that will be distributed to individual respective firms.

Keyword: Raw Material Supplies, Performance, Profitability, On-time Delivery, Market Share



1. INTRODUCTION

Business organizations are institutions deliberately designed to achieve and accomplish certain goals. Considering that performance is a crucial objective of an organization, it is generally accepted that the structure and decision making in an organization is influenced by environmental complexity and volatility (Miles and Snow, 2010). Furthermore, it is argued that organizations which align their strategies with the requirements of their environment outperform other organizations that fail to achieve such an alignment (Chaganti, Bhanupriya, Siddhardha, 2013).

Performance measurement is critical to achieving a firm's objectives in translating strategy to action and monitoring progress. In assessing the performance of the firms, the imperative is that

performance is looked at on the basis of the objective of the firms. For instance, where the objective is to product output, having unhindered adequate raw materials supply is essential.

Meyer and Ferdows (2015) identified manufacturing performance as a cumulative focus on the firm's capabilities to ensure cost efficiency, quality, dependability and flexibility in the efficacy of lean practices. However, individual firms tend to have firm-specific performance indicators appropriate to their needs. For most firms, the main performance indicators are a combination of financial, market, competition, human resources and internal business process (Tapanya, 2004).

In contemporary Nigerian business environment, performance of Small and Medium Enterprises (SMEs) is predicated on factors, such as low sales volume, high cost of production, low capital utilization, lack of foreign exchange to source needed raw materials inputs and low quality of goods and services and poor infrastructure (Ifediora and Benjamin, 2014; Eniola and Ektebang, 2014; Malik, Kuktaite and Johnson, 2013; Oni and Daniyan, 2012).

1.1 Objectives of the Study

The objective of this study is to examine the relationship between raw materials supplies and the performance of small and medium scale manufacturing firms in Lagos State, Nigeria.

1.2 Research Questions

Is there any relationship between raw materials supplies and the performance of small and medium scale manufacturing firms in Lagos State, Nigeria?

1.3 Research Hypothesis

The hypothesis formulated from the research question was tested towards the determination of the findings of this study.

H₀: There is no significant relationship between raw material supplies and the performance of small and medium scale manufacturing firms in Lagos State, Nigeria.

1.4 Scope of the Study

The scope of this study is the cross sectional investigation of the influence of raw material supplies on the performance of small and medium scale manufacturing firms in Nigeria. For the study unit scope, the study is on small and medium scale manufacturing firms in Lagos State, Nigeria.

2. LITERATURE REVIEW

2.1 Theoretical Review of Literature

The baseline theories that underpin this study is the resource dependence theory (Ulrich and Barney, 1984; Pfeffer and Salancik, 1978).

Resource Dependence

The environment provides the source of scarce and valued resources essential to organizational survival, seen as the resource dependence perspective in the organization-environment relationship. Resource dependence means that organizations depend on the environment but strive to acquire control over the resources to minimize their dependence (Ulrich and Barney, 1984; Pfeffer and Salancik, 1978).

Manufacturing firms depend on raw material supplies but can be frustrated by suppliers, especially when there are fewer suppliers such that they dictate the price of supplies. In situations of a single supplier the supplier can create scarcity of material supplies to render the manufacturing firm helpless. Thus, manufacturing firms are eager to take control of material supplies. Firms are vulnerable if vital resources in the making of products or services are controlled by other organizations; so, they try to be as independent as possible. This is to reduce the firms' vulnerability to the suppliers because of negative effects of dependence on them for resources on performance.

When costs and risks are high, however, the manufacturing firms especially the small and medium firms may team up to reduce resource dependence and the possibility of bankruptcy. In today's volatile environment, the manufacturing firms are collaborating as never before to share scarce resources and be more competitive on a global scale. However, owners of these firms still fear the risk of association in formal relationships with other manufacturing firms. Therefore, in as much as they form umbrella associations with respect to resources and interface with the government as is the issue with the Manufacturers Association of Nigeria (MAN) and the National Association of Small and Medium Enterprise (NASME), the individual firms also like to maximize their own autonomy and independence.

Also, Aluko (2004) posited that an organization uses different types of resources, and the combination of these different resources produces synergy within an organization, which leads to the development of strength or weaknesses over a period of time. Organizational resources are

physical and human resources used as inputs by an organization to create outputs in the form of products and services through a transformation process.

2.2 Concepts of Raw Material

Olusakin (2014) asserted that there are problems associated with raw material/inventory management in manufacturing organizations in Nigeria in general but the enormity of the problem in relation to small and medium enterprises (SMEs) seems catastrophic. The Manufacturers Association of Nigeria (MAN, 2005) in a similar assertion observed that inadequate local raw materials, among other reasons, caused stagnation of the industrial sector. Such is the position of raw materials in the production process that its unavailability makes the difference between a buoyant economy and a dwindling one.

The small and medium manufacturing firms, are forced to use the services of middlemen who provide them with raw materials usually at higher costs. The inaccessibility to raw materials at reasonable costs may likely induce small and medium manufacturing firms to use poor quality raw materials that are cheap as inputs in the production process. Also shortage of raw materials are likely to cause production output shortfalls in meeting demand; and in some critical cases causes stoppages of production as there are no sufficient raw materials to produce.

A NISER survey in the manufacturing sector, observed an impressive improvement on local sourcing of raw materials between 2010 - 2013, with average annual growth rate of 48%. There was however a noticeable decline in the 3 years period, on the degree of local raw materials sourcing, from 59.0% in 2010, 62.2% in 2011, 58.4% in 2013. This trend tends to suggest that quite a number of manufacturing industries are finding it difficult to maintain high level of local sourcing of their raw materials (NISER, 2014).

NISER survey further indicated the major problems encountered in local sourcing of raw materials are as follows: lack of information of potential sources of raw materials; poor quality of raw materials; periodic scarcity of local raw materials; high cost of local raw materials, and Storage problems. Despite the difficulties encountered, the large manufacturing firms have the capability of taking significant actions in providing raw materials.

According to Olusakin (2014) inefficiency in raw material or inventory management in Nigeria can be traceable to inefficient use of production time, labour and other resources due to delays or incessant short down and interruptions during production have become inherent part of operations in many manufacturing organizations in Nigeria. This often led to inability to meet

customers' order and eventual loss of market shares. Low capacity utilization and loss of revenue as consequence of these problems led to closure of many manufacturing firms in the country.

Furthermore, availability of raw materials has been acknowledged as a basic comparative advantage in the performance of small and medium scale manufacturing firms in Nigeria (Washington, Okeyo, James and Peter, 2014). The role of raw material procurement services in organizations is well documented in literature (Delmon, 2008; The World Bank, 2008; Awino, 2011). Procurement services have been described as the business function that is responsible for identification and purchase of external resources needed by an organization to fulfill its strategic objectives (Kidd, 2005).

In the manufacturing environment, an important undertaking is the purchase of raw materials and other input supplies which are crucial ingredients. Input supplies have been noted as important for an enterprise's processes since they facilitate the production of goods and services (Koksal and Ozgul, 2007). However, SMMFs have been observed not to be as strong and resistant to effects of business environment, as their larger counterparts, due to their inability to negotiate favourable procurement services terms and small scale economies for sourcing input supplies.

MAN Economic Review for the end of 2013 showed a significant improvement in local sourcing and utilization of local raw materials. However, this cannot be satisfactory, as the import dependent nature of industries in Nigeria may not propel the desired industrial growth.

2.3 Performance Measurement

There are many approaches for defining the performance of organizations. According to Mulyadi (2007), it is the successful performance of personnel, team, or organizational unit in achieving the strategic objectives that have been set previously with the expected behaviour. The successful achievement of strategic objectives needs to be measured. That is why the strategic objectives that form the basis of performance measurement are necessary to determine its size, and determine strategic initiatives to realize these goals.

According to Ahmad, Ramayah, Wilson and Kummerow (2010) measures of performance can be viewed from the financial assessment of organizations such as return on equity, return on assets and sales growth. Trkman and McCormack (2009) asserted that performance measure is very crucial for business, more especially for small firms, due to the fact that it helps the organizations to ascertain their level of organizational success or failure, and also serve as a yardstick for achieving acceptable progress in their business activities. Ukenna, Ijeoma, Anionwu and Olise

(2010) viewed firm performance in Nigeria from two different standpoints; monetary (financial) and non-monetary (non-financial) performance, respectively.

McLarty, Pichanic and Srpova (2012) viewed performance to be the results of emergent strategy from perceived integration between strategic formulation and implementation; while, market orientation seen as the deliberate attempt made to consider the needs and wants of customers as one of the construct that lead to SME performances (Aliyu and Rosli, 2014).

However, a business is considered successful if it meets its sets strategic (inclusive of tactical and operational) goals, it is advisable to harmonize measuring/indicators for performance with the strategic goals of the specific business entity. Performance measuring is usually carried out by subjective evaluation of the business entities themselves, either by evaluating their satisfaction with the achieved indicators of effectiveness and efficiency (meeting expectations, i.e. plans), or by benchmarking themselves against their competitors (Dasa, 2014).

Operational managers are increasingly demanding visible performance measures in order to assess their operational business activity with the firm's objectives. This requires analyzing and acting upon key performance indicators (KPIs) that can change from firm to firm and sometimes even in a given firm as the relationship between the firm and the external environment becomes increasingly uncertain.

Slack *et al.* (2004) identified five performance objectives that apply to all types of operation which are discussed below:

Product Quality: Quality encompasses both the quality of the design of the product in terms of aesthetics, reliability and performance and the quality of the process that delivers the product or service. Quality of delivery process impacts on costs and dependability. Flexibility is about the operation being able to change what it does quickly. How quickly can the organization change the mix of products and services it is offering to the customer? Changing consumer tastes affects demand levels and the product range desired. To stay competitive, manufacturing firms are expected to respond to customers' demand uncertainties such as increase or decrease output levels. It needs to be able to respond to these changes with flexibility. Providing flexibility in delivery options in meeting customers' demand and to remain competitive in the market requires flexibility in product delivery and product differentiation.

On-Time Delivery is all about how long customers wait before receiving their demand for a product or service. Addressing on-time delivery requires the firm to pay attention to the cycle time involved in their existing products as well as in developing new products. The manufacturing firm also has to pay attention to its scheduling and capacity planning as well as inventory management to be able to meet on-time delivery dates.

Furthermore, the firm should be dependable. Dependability is, of course, about consistency in meeting a promised delivery date for a product or service. Customers are unlikely to be satisfied by an increase in delivery time if it is not matched by consistent performance.

Profitability is the last objective to be discussed but clearly not the least. For organizations that have adopted a low cost strategy it is the most important objective. The lower the cost of production, the lower will be the price that the product can be offered to customers, which in turn will boost sales and profit. Even manufacturing firms that seek to gain their competitive advantage through differentiation are keen to lower their cost because that will lead to improvements in profit levels.

To be able to deliver a cost advantage, the firm has to analyse where operation costs are incurred. The major cost categories are staffing, facilities that include technology and equipment costs, and materials. The proportions vary between these categories but generally a firm spends around 55% of its costs on materials, 30% on facilities and 15% on staffing (Greasley, 2006). So focusing on reducing the cost of materials will have the biggest impact on profitability.

Generally the level of costs depends on the volume and variety of output and how variable is the demand. Variety of outputs leads to greater levels of complexity and therefore increased costs. Consumer segments that are looking for low-priced products or services will lead the firm to respond flexibly to meet wide range of its product or services in meeting different consumer segments, thereby increasing profit margin.

It is important that the profit performance should accommodate the other performance factors such as innovative products and services, a wide range of products and services, low price, reliable delivery, fast delivery, high quality and the ability to be flexible and change the timing or quantity of output (Greasley, 2006).

Market Share

Market share is the percentage of a market (defined in terms of either units or revenue) accounted for by a specific entity. Market share is closely monitored as it is a key indicator of market competitiveness (Slack *et.al*, 2004).

Identifying appropriate measure of the market share, Slack *et al.* (2004) argued that it helps managers evaluate both primary and selective demand in their market. That is, it enables them to judge not only total market growth or decline but also trends in customers' selections among competitors. Generally, sales growth resulting from primary demand (total market growth) is less costly and more profitable than that achieved by capturing share from competitors. Conversely, losses in market share can signal serious long-term problems that require strategic adjustments. Firms with market shares below a certain level may not be viable. Similarly, within a firm's product line, market share trends for individual products are considered early indicators of future opportunities or threats.

Scanning activities help managers to be market oriented or externally focused. In many cases, because of the range of resources and expertise available to them, large firms are often better than smaller firms at environmental scanning activities such as market research. Although large firms can dominate a market or an industry because of economies of scale, small firms tend to be more flexible, which often means they can respond to changes in the external environment more quickly than their larger counterparts.

3. METHODOLOGY

There are two dimensions of methodology guiding the pattern of social research: the nomothetic method and the ideographic method. The nomothetic method derives its philosophical assumptions from positivism that uses the quantitative research methods; while, the ideographic method holds to the assumptions on idealism anchored on qualitative research methods (Ahiauzu and Asawo, 2016).

This study adopts the quantitative research methodology to empirically assess the influence of raw materials supplies on the performance of small and medium scale manufacturing firms in Nigeria. The survey research design was adopted with a given sample size selected from the population of small and medium manufacturing firms because of its requirements to collect data from a wide range of subjects to elicit acceptable generalization.

In order to test the formulated hypothesis in this study, a research questionnaire was designed to elicit information from managers of small and medium scale manufacturing firms (SMMFs)

to determine whether or not raw materials supplies have an influence on the performance of their firms.

The study area is Lagos State, Nigeria. Lagos State was selected because it was considered to have the largest concentration of small and medium sized enterprises in Nigeria, which would facilitate the data distribution and collection process (Okpara and Wynn, 2007). Another justification for this population of study was the report of the Nigerian Association of Small-Scale Industrialists (NASSI) that the enrolment of its membership across the Federation of Nigeria was about 20,000 members and more than 50 of these number operated in Lagos State (LASEED, 2005). Lagos is thereby, seen as the commercial nerve centre of Nigeria.

The target population for this study comprises small and medium manufacturing firms operating within Lagos State. However, for the purpose of this study and in order to determine the sampling frame, small and medium manufacturing firm is defined as any enterprise with revenue ranging from ₦1 million - ₦40 million for small firms; and above ₦40 million to ₦200 million for medium firms (Lawal, Kio, Sulaimon, and Adebayo, 2000). The fact remains that there is no complete list of existing small and medium manufacturing firms in Lagos State. However, the study population consists of 283 small and medium manufacturing firms, listed with the Manufacturers' Association of Nigeria (MAN) in Lagos State, Nigeria.

From the population of 283 firms, a sample size of 148 firms was selected, using the simplified model of sample size for a given population, developed by Krejcie and Morgan (1970) and as used in Sekaran (2003). The listing of the manufacturing firms was first divided into mutually exclusive groupings, depending on the manufacturing sector of the firm. After separating the sample frame according to the groupings or strata, the proportionate stratified random sampling procedure was used in selecting firms from each of the groupings as samples for the survey since firms within the groups are relatively homogenous with respect to the measurement of interest (Saunders, Lewis and Thornhill, 2007).

Table 3.1 shows sectoral group profile of the sampled small- and medium-scale manufacturing firms. A total of 148 questionnaires were distributed. One Hundred and Twenty Seven (127) which represent 85.8% of the distributed questionnaires were retrieved, while 21, representing 14.2%, were not retrieved. 5 (3.9%) of the retrieved questionnaires were discarded because they were not completely filled. Thus, 122 (96.1%) of the retrieved questionnaires were useful. This

value (122) is therefore used as the sample size of the study in the presentation and analysis of the data collected.

Table 1: Sampled Small and Medium Manufacturing firms

Manufacturing sector	Population	Sample size (Distributed Questionnaires)	Percentage (%)	Distributed Questionnaires Retrieved (Respondents)	Percentage (%)
Food, beverages and tobacco	50	26	17.6	21	17.2
Chemicals and Pharmaceuticals	34	18	12.2	16	13.1
Domestic and Industrial Rubber and Foam	33	17	11.5	13	10.7
Basic Metals, Iron, Steel and Fabricated Metals	44	23	15.5	16	13.1
Pulp, Paper and Paper Product	31	16	10.8	12	9.8
Electricals and Electronics	15	8	5.4	6	4.9
Textiles and Wearing Apparels Carpets, Leather and Footwear	40	21	14.2	30	24.6
Wood and Wood Product	36	19	12.8	8	6.6
Total	283	148	100	122	100

Source: Field Survey, 2017.

Model Specification

The models below were specified in line with the objectives and hypotheses with the view to guide the study. Each specified model is expressing relationship between the criterion variable and the predictor variable.

Model 1:

$$Y = a_0 + a_1RM + u_1 \dots\dots (1)$$

Model 2:

$$P = b_0 + b_2RM + u_2 \dots\dots (2)$$

Model 3:

$$PQ = c_0 + c_3RM + u_3 \dots\dots (3)$$

Model 4:

$$MS = d_0 + d_4RM + u_4 \dots\dots (4)$$

Model 5:

$$OD = e_0 + e_5RM + u_5 \dots\dots (5b)$$

where

- Y = Firm Performance
- P = Profitability
- PQ = Product Quality
- MS = Market Share
- OD = On-Time Delivery



4. DATA ANALYSIS AND DISCUSSION OF FINDINGS

The observations in the research questionnaire were measured, using the statistical tool of SPSS (Statistical Package for Social Sciences) with a significance level of 0.05. The analysis and interpretation of data in this study were presented, using frequencies, percentages, mean, standard deviation; and regression analysis to ascertain the association between each pair of variables and also product moment correlation coefficient (r) to define the level of relationship of the study variables.

The level of relationship between the raw material supplies and performance of the firm was examined on one hand and on each of the measures of firm performance on the other.

Table 2: Correlation Analysis Showing the Measure of Relationship between Raw Material Supplies and Firm Performance

Correlations

Variables1	Statistics	Raw Material Supplies	Firm Performance
Raw Material Supplies	Correlation Coefficient	1.000	.873 **
	Sig. (2-tailed)	.	.000
	N	122	122
Firm Performance	Correlation Coefficient	.873 **	1.000
	Sig. (2-tailed)	.000	.
	N	122	122

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

The relationship between raw material supplies and firm performance as shown in Table 2 that the correlation co-efficient (r) = 0.873 and PV = 0.000 < 0.05 (level of significance), indicating that a strong positive relationship exists between adequate raw materials supplies and firm performance. The scatter plot illustrating this relationship is shown in Appendix 1.



Table 3: Correlation Analysis Showing the Measure of Relationship between Raw Material Supplies and Profitability

Correlations

Variables1	Statistics	Raw Material Supplies	Profitability
Raw Material Supplies	Correlation Coefficient	1.000	.894 **
	Sig. (2-tailed)	.	.000
	N	122	122
Profitability	Correlation Coefficient	.894 **	1.000
	Sig. (2-tailed)	.000	.
	N	122	122

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

Table 3 above presents the relationship between raw material supplies and profitability that the correlation co-efficient (r) = 0.894 and the PV = 0.000 < 0.05 (level of significance). This

indicates that a strong positive significant relationship exists between adequate raw material supplies and profitability, where increase in raw material supplies should result in increase in profitability. The scatter plot illustrating this relationship is shown in Appendix 2.

Table 4: Correlation Analysis showing the Measure of Relationship between Raw Material Supplies and Product Quality

Correlations				
Variables1	Statistics	Raw Material Supplies	Product Quality	
Raw Material Supplies	Correlation Coefficient	1.000	.891 **	
	Sig. (2-tailed)	.	.000	
	N	122	122	
Product Quality	Correlation Coefficient	.891 **	1.000	
	Sig. (2-tailed)	.000	.	
	N	122	122	

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

The relationship between raw material supplies and product quality as shown in Table 4 above reveal that the correlation co-efficient (r) = 0.891. The raw material supplies as the basic input resource significantly determines the quality of the product output. This is understandable in that the quality of the raw materials supplied will determine the quality of the product manufactured. The scatter plot illustrating this relationship is shown in Appendix 3.

Table 5: Correlation Analysis showing the Measure of Relationship between Raw Material Supplies and Market Share

Correlations				
Variables1	Statistics	Raw Material Supplies	Market Share	
Raw Material Supplies	Correlation Coefficient	1.000	.814 **	
	Sig. (2-tailed)	.	.000	
	N	122	122	
Market Share	Correlation Coefficient	.814 **	1.000	
	Sig. (2-tailed)	.000	.	
	N	122	122	

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

The relationship between raw material supplies and market share as shown in Table 5 above shows that the correlation co-efficient (r) = 0.814. The quality of raw materials supplied affects

the product quality which in turn affects sales, thus affect the market share. The PV = 0.000 < 0.05 (level of significance) also show the relationship is significant. The scatter plot illustrating this relationship is shown in Appendix 4.

Table 6: Correlation Analysis showing the Measure of Relationship between Raw Material Supplies and On-Time Delivery

		Correlations		
Variables1	Statistics	Raw Material Supplies	On-Time Delivery	
Raw Material Supplies	Correlation Coefficient	1.000	.836**	
	Sig. (2-tailed)	.	.000	
	N	122	122	
On-Time delivery	Correlation Coefficient	.836**	1.000	
	Sig. (2-tailed)	.000	.	
	N	122	122	

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

The relationship between raw material supplies and on-time delivery as shown in Table 6 above shows that the correlation coefficient (r) = 0.836, indicating that a strong relationship exists between raw material supplies and on-time delivery. The positive sign of the correlation value implies that raw material supplies are positively related to on-time delivery in that the timeliness of raw materials supplied affect the ability to deliver on time. The PV = 0.000 < 0.05 (level of significance) also indicate a significant relationship between raw material supplies and on-time delivery. The scatter plot illustrating this relationship is shown in Appendix 5.

Test of Hypotheses

This section presents the findings from the hypotheses test for the study. The hypotheses test on level of relationship between raw material supplies and performance of the firm was examined on one hand and on each of the measures of firm performance on the other.

Raw Material Supplies on Firm Performance

The regression analysis on the level of association of raw material supplies on profitability as a single dependent variable is shown in Table 7.

Table 7: Regression Analysis Result showing the Influence of Raw Material Supplies on Firm Performance

Variables	Coef.	t-cal	t-tab	sig. t	r	r ²	F-cal	F-tab	sig f
Constant	0.343	2.260	1.96	0.026	0.929	0.836	184.1	2.37	0.000
RMS	0.451	5.459		0.000					

Dependent Variable: Firm Performance

Source: SPSS 17.0 Output.

From Model 1 in the methodology:

$$Y = a_0 + a_1RM + u_1 \dots\dots (1)$$

$$Y = 0.311 + 0.451RM$$

$$T\text{-value} = 5.459$$

Table 7 shows that the correlation co-efficient (r) of raw material supplies on firm performance is 0.929. This implies a very strong positive relationship between raw material supplies and firm performance of manufacturing firms. The $F\text{-cal} = 184.1 > F\text{-tab}_{(0.05, 4, 117)} = 2.37$ with a corresponding significant f-value of 0.000.

Decision rule in the test of hypotheses is to accept the null hypothesis where the t-calculated is < the t value from the statistical table under 0.05 significance level. Thus, where the t-calculated is > the t-tabulated, then the null hypothesis is rejected and the alternate or research hypothesis accepted.

Hypothesis Testing 1

H₀₁: There is no significant influence of raw material supplies on the performance of small and medium scale manufacturing firms.

The relationship between raw material supplies and firm performance, as shown in Table 7, indicates that the correlation co-efficient, (r) = 0.929. This correlation value is high, indicating that a strong positive relationship exists between raw material supplies and firm performance. The PV = 0.000 < 0.05 (level of significance) shows a significant relationship between the raw material supplies and firm performance.

Also, Table 7 above indicates that raw material supplies had a t-calculated value of 5.459. Using the decision criterion, the t-calculated = 5.459 > t-tabulated $(_{0.05, 121}) = 1.96$, thus the null hypothesis is rejected; and that raw material supplies significantly influence the performance of small-and medium-scale manufacturing firms.

Raw Material Supplies on Profitability as a Single Dependent Variable

The regression analysis on the level of association of raw material supplies on profitability as a single dependent variable is shown in the Table 8.

Table 8: Regression Analysis Result showing the influence of Raw Material Supplies on Profitability

Variables	Coef.	t-cal	t-tab	sig. t	r	r ²	F-cal	F-tab	sig f
Constant	0.311	2.032	1.96	0.044	0.930	0.864	186.2	2.37	0.000
RMS	0.510	6.128		0.000					

Dependent Variable: Profitability

Source: SPSS 17.0 Output.

From model 2 in the methodology:

$$P = b_0 + b_2RM + u_2 \dots\dots (2)$$

$$P = 0.311 + 0.510RM$$

$$T\text{-value} = 6.128$$

Table 8 shows that the correlation co-efficient (r) of raw material supplies on profitability is 0.930. This implies a very strong positive relationship between raw material supplies and profitability of manufacturing firms. The $F\text{-cal} = 186.2 > F\text{-tab}_{(0.05, 4, 117)} = 2.37$ with a corresponding significant f-value of 0.000.

Test of Hypothesis 1A

There is no significant influence of Raw Material on the Profitability of small and medium scale manufacturing firms.

From Table 8 raw material supplies had a t-calculated value of 6.128. From the Decision rule, the $t\text{-calculated} = 6.128 > t\text{-tabulated}_{(0.05, 121)} = 1.96$; therefore the null hypothesis was rejected, hence raw material supplies has positive significant influence on profitability of small and medium scale manufacturing firms.

Raw Material Supplies on Product Quality as a Single Dependent Variable

The regression analysis on the level of association of raw material supplies on product quality as a single dependent variable is shown in the Table 9.

Table 9: Regression Analysis Result showing the Influence of Raw Material Supplies on Product Quality

Variables	Coef.	t-cal	t-tab	sig. t	r	r ²	F-cal	F-tab	sig f
Constant	0.203	1.537	1.96	0.127	0.947	0.897	253.89	2.37	0.000
RM	0.418	5.832		0.000					

Dependent Variable: Product Quality

Source: SPSS 17.0 Output.

From model 3 in the methodology:

$$PQ = c_0 + c_3RM + u_3 \dots\dots (3)$$

$$PQ = 0.203 + 0.418RM$$

$$T\text{-value} = 5.832$$

Table 9 shows that the correlation co-efficient (r) of raw material supplies on product quality is 0.947. This implies a very strong positive relationship between raw material supplies and product quality. The $F\text{-cal} = 253.89 > F\text{-tab}_{(0.05, 4, 117)} = 2.37$ with a corresponding significant f-value of 0.000.



Test of Hypothesis 1B

There is no significant influence of Raw Material Supplies on the Product Quality of small and medium scale manufacturing firms.

Also, Table 9 above indicates that raw material supplies had a t-calculated value of 5.832. From the Decision rule, the $t\text{-calculated} = 5.832 > t\text{-tabulated}_{(0.05, 121)} = 1.96$; therefore the null hypothesis was rejected and that raw material supplies has a significant influence on the product quality of small and medium scale manufacturing firms.

Raw Material Supplies on Market Share as a Single Dependent Variable

The regression analysis on the level of association of raw material supplies on market share as a single dependent variable is shown in Table 10.

Table 10: Regression Analysis Result showing the Influence of Raw Material Supplies on Market Share

Variables	Coef.	t-cal	t-tab	sig. t	r	r ²	F-cal	F-tab	sig f
Constant	0.465	2.091	1.96	0.039	0.736	0.727	81.638	2.37	0.000
RMS	0.430	3.557		0.001					

Dependent Variable: Market Share

Source: SPSS 17.0 Output.

From model 4 in the methodology:

$$MS = d_0 + d_4RM + u_4 \dots\dots (4)$$

$$MS = 0.465 + 0.430RM$$

$$T\text{-value} = 3.557$$

Table 10 shows that the correlation co-efficient (r) of raw material supplies on market share is 0.727. This implies a strong positive relationship between raw material supplies and market share of manufacturing firms. The $F\text{-cal} = 81.638 > F\text{-tab}_{(0.05, 4, 117)} = 2.37$ with a corresponding significant f-value of 0.000.

Test of Hypothesis 1C

There is no significant influence of Raw Material Supplies on the Market Share of Small and Medium Scale manufacturing firms.

Also, Table 10 above indicates that raw material supplies had a t-calculated value of 3.557. From the Decision rule, the $t\text{-calculated} = 3.557 > t\text{-tabulated}_{(0.05, 121)} = 1.96$; therefore the null hypothesis was rejected and that raw material supplies has significant influence on market share of small and medium scale manufacturing firms.

Raw Material Supplies on On-Time Delivery as a Single Dependent Variable

The regression analysis on the level of association of raw material supplies on on-time delivery as a single dependent variable is shown in Table 11.

Table 11: Regression Analysis Result showing the Influence of Raw Material Supplies on On-Time Delivery

Variables	Coef.	t-cal	t-tab	sig. t	r	r ²	F-cal	F-tab	sig f
Constant	0.395	2.108	1.96	0.037	0.806	0.799	121.45	2.37	0.000

RMS	0.446	4.379		0.000					
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Dependent Variable: On-Time Delivery

Source: SPSS 17.0 Output.

From model 5 in the methodology:

$$OD = e_0 + e_5RM + u_5 \dots\dots (5)$$

$$OD = 0.395 + 0.446RM$$

$$T\text{-value} = 4.379$$

Table 11 shows that the correlation co-efficient (r) of raw material supplies on on-time delivery is 0.806. This implies a strong positive relationship between raw material supplies and on-time delivery. The $F\text{-cal} = 121.45 > F\text{-tab}_{(0.05, 4, 117)} = 2.37$ with a corresponding significant f-value of 0.000.

Test of Hypothesis 1D

There is no significant influence of Raw Material Supplies on the On-Time Delivery of products of Small and Medium Scale manufacturing firms..

Also, Table 11 above indicates that Raw material supplies had a t-calculated value of 4.379. From the Decision rule, the $t\text{-calculated} = 4.379 > t\text{-tabulated}_{(0.05, 121)} = 1.96$; therefore the null hypothesis was rejected and that Raw material supplies significantly influence on On-Time Delivery of products of small and medium scale manufacturing firms.

Summary: From the t-calculated and hypotheses, Raw material supplies all have very strong significant influence on product quality and on-time delivery of products as compared to market share which has the least outcome of the influence on raw material supplies.

5. CONCLUSION

Improving the performance of small and medium scale manufacturing firms and securing profit margins require effective raw material sourcing strategies. Raw material sourcing decisions such as price, inventory availability, capacity and predicting future demand can affect firms' performance for example, profit margins in maximizing returns on investment, minimizing inventory levels of finished products, product quality and prompt delivery.

The main role of production is to turn inputs (raw materials) into outputs (finished goods). Defective raw material inputs will lead to defective product quality output therefore the firm must source raw materials that have the potentials of producing high quality outputs. The nearness or availability of raw materials is a factor in choosing the location of manufacturing plants. Manufacturing firms not sited close to the needed raw materials, are expected to incur higher sourcing and transportation costs that will reduce profit margin. Inadequate supplies of raw materials affect the firms operations. It leads to reduced product output and low capacity utilization, and this may affect the firm's profit, product quality, and market share and on-time delivery and as evident in the study, therefore, have significant impact on the performance of the small and medium manufacturing firms.

These actions seem out of reach of small and medium manufacturing firms that lack the capability to undertake most of the above actions in providing or sourcing for local raw materials. This may be due to the disadvantage of size of small and medium manufacturing firms that are unable to take advantage of economies of scale in purchasing quality raw materials.

Hence, small and medium manufacturing firms buy their raw materials individually and therefore purchase only small amounts. The cost per unit is higher than for bulk purchase and results in a minimal return to the supplier, who relies on a reasonably high turnover. The small and medium manufacturing firms might pool their resources, buy raw materials from suppliers in bulk, and split them amongst themselves at lower cost.

Another possibility would be for the National Association of Small and Medium Enterprises to buy in bulk by eliminating middlemen and store the raw materials in order to sell them piecemeal to their members at subsidized costs. Wholesalers have the advantage of buying in bulk, thereby reducing handling costs for the suppliers.

6. RECOMMENDATIONS

Based on the findings of the study, the following recommendations are made.

Small and medium scale manufacturing firms in Nigeria should constantly improve the quality of their operations and products in such a way that would secure the loyalty of their customers' when compared to the loyalty of consumers for foreign products. This will give an edge to the products of small and medium scale manufacturing firms in Nigeria in the market place and improve competitiveness.

Following the quality improvement of products, small and medium scale manufacturing firms in Nigeria should establish an information pool for raw material supplies that will be distributed to individual respective firms.

Small and medium scale manufacturing firms in Nigeria while locating their plant must ensure that the factor of closeness to raw materials is taken as a prime consideration above personal, political and tribal considerations in order to cut cost and invariably increase profits. It has also provided empirical evidence for the existence of positive and statistically significant relationship between power supply infrastructure, government policy inconsistency, competitive market and raw materials on the performance of small and medium scale manufacturing firms in the Nigerian context.

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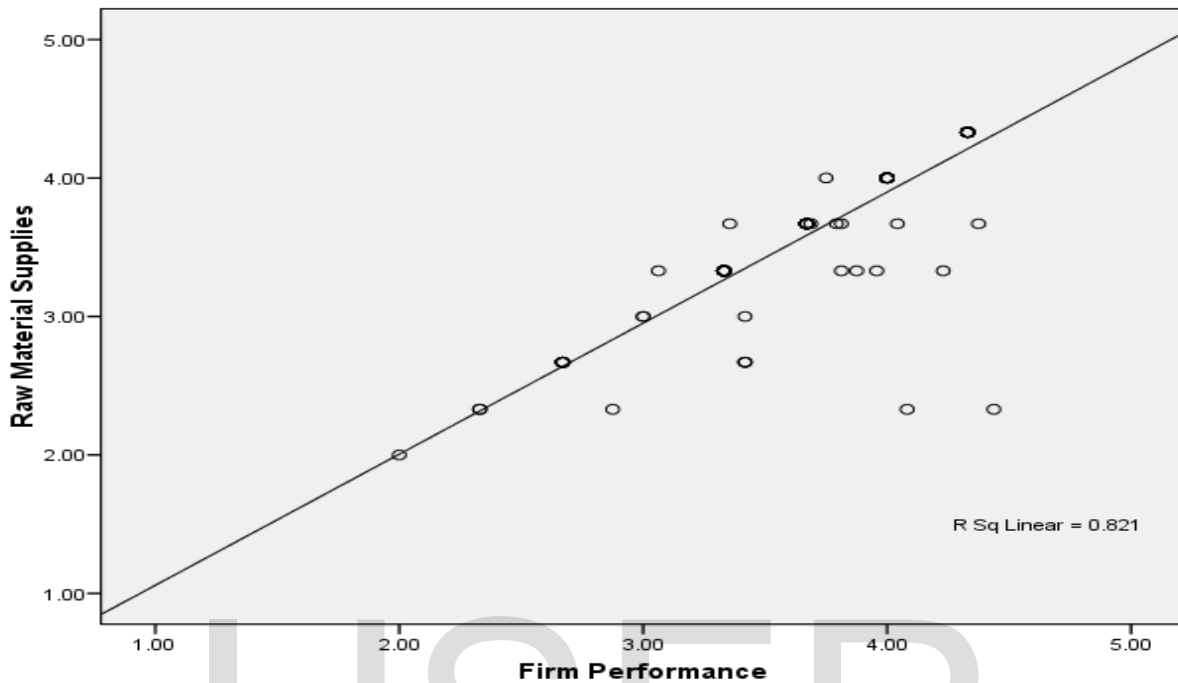
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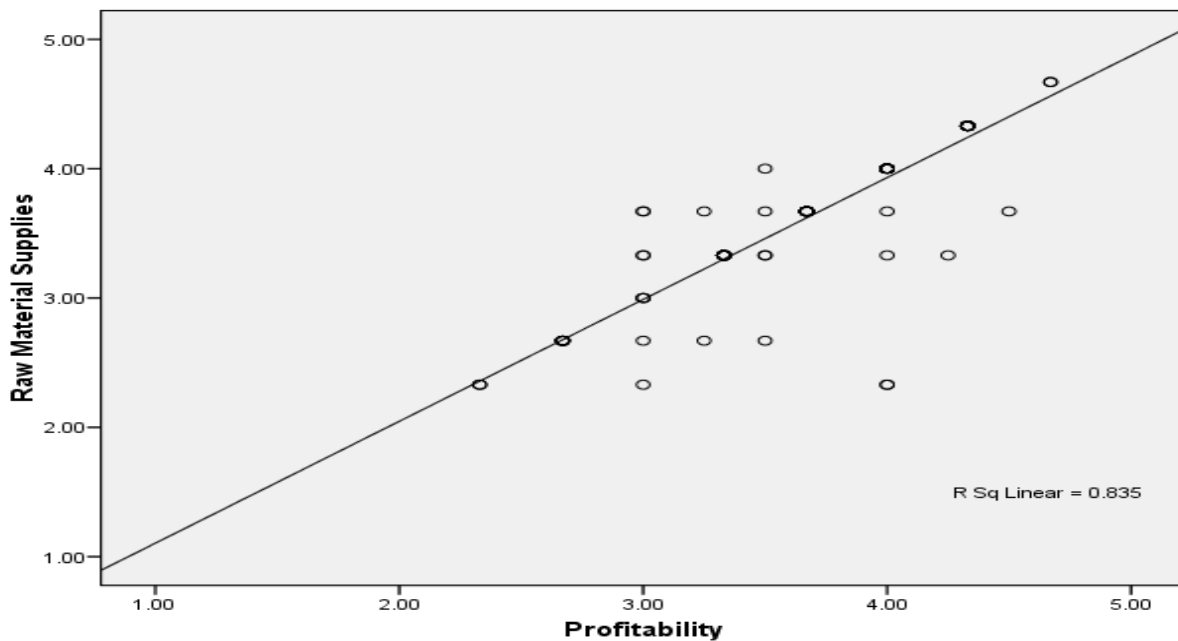
Appendix 1

Scatter Plot establishing the Relationship between Raw Material Supplies and Firm performance



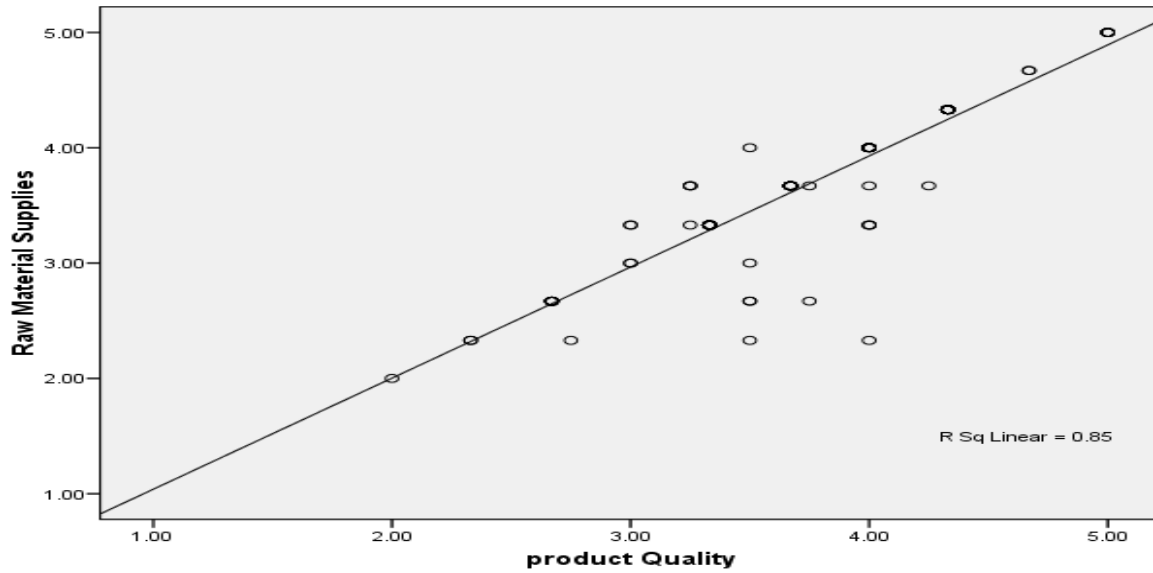
Appendix 2

Scatter Plot establishing the Relationship between Raw Material Supplies and Profitability



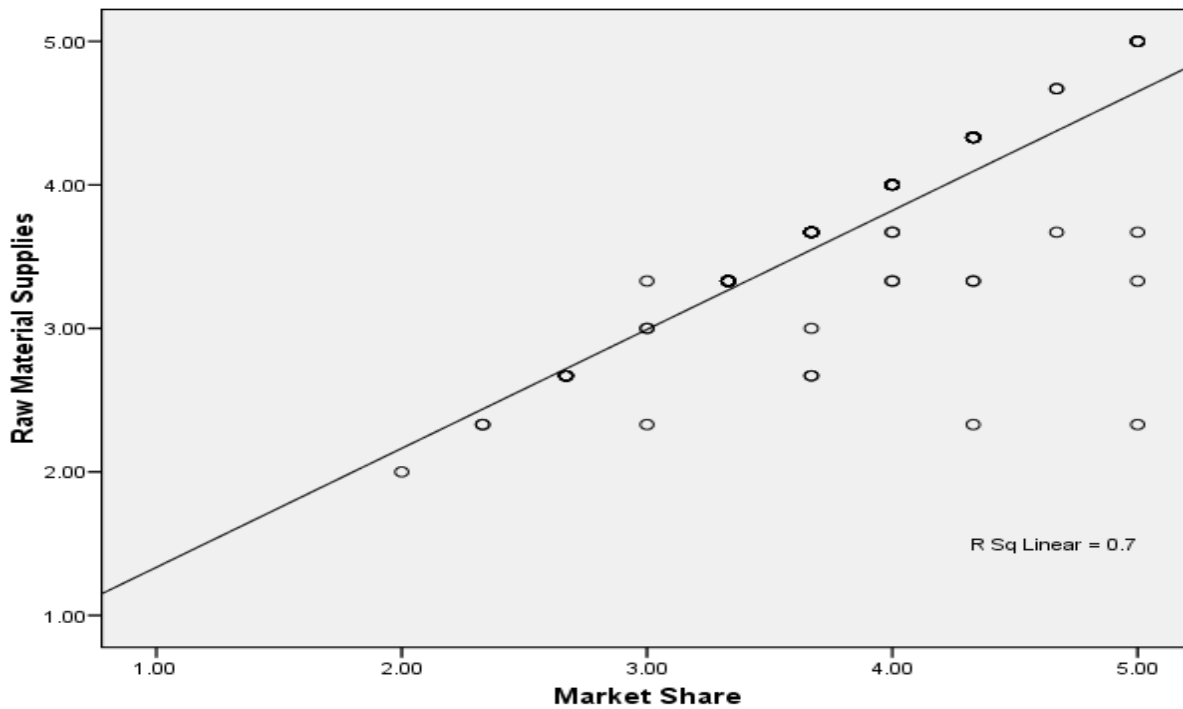
Appendix 3

Scatter Plot establishing the Relationship between Raw Material Supplies and Product Quality



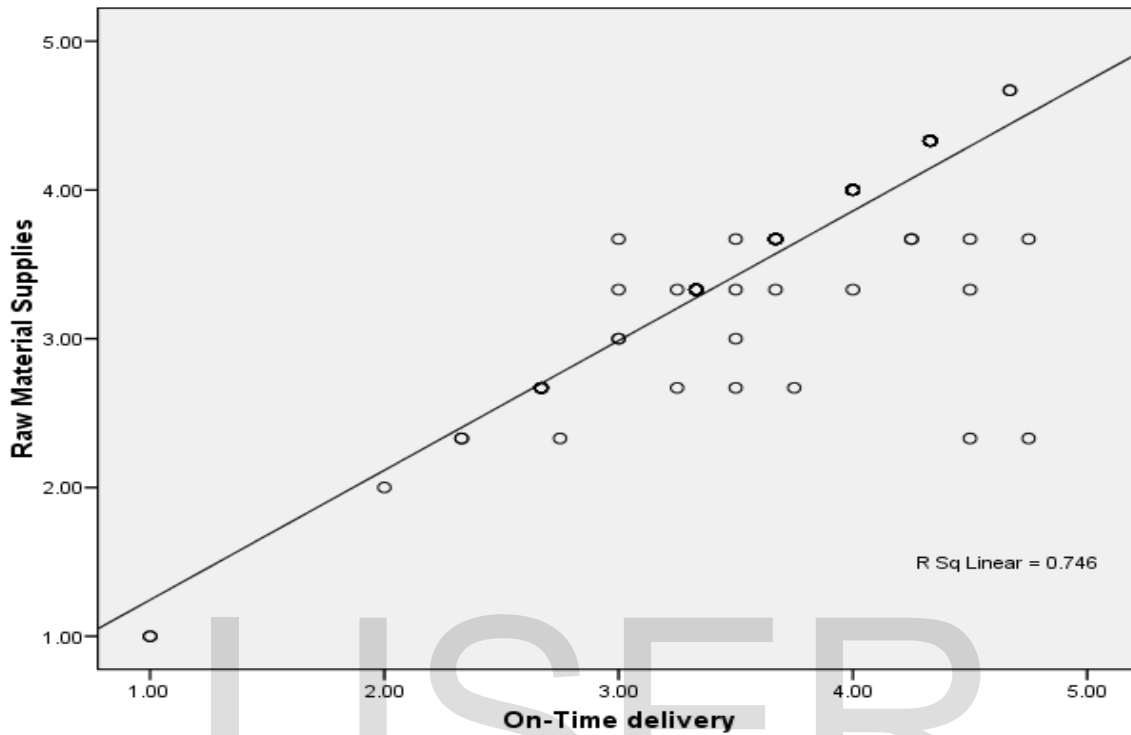
Appendix 4

Scatter Plot establishing the Relationship between Raw Material Supplies and Market Share



Appendix 5

Scatter Plot establishing the Relationship between Raw Material Supplies and On-Time Delivery



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