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Influence of Lean Warehousing Practices on Performance of Large Manufacturing Firms in Kenya

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Abstract

The study sought to establish the influence of lean warehousing practices on performance of large manufacturing firms in Kenya. The unit of analysis consisted of 138 large manufacturing firms registered with the Kenya association of manufacturing under the category of large scale manufacturing firms; the unit of observation consisted of the Heads of Supply chain, Production and Logistics. Data was collected using questionnaires. The data collected was analyzed by use of descriptive and inferential statistics aided by Statistical Package of Social Sciences (SPSS) version 22. Bivariate regression model was used to show the relationship between the variables. The study findings indicated a positive significant influence of lean warehousing on performance of large manufacturing firms. The study recommends the need by manufacturing firms in Kenya to practice lean ware housing practices such as implementing optimal storage, automated picking system and adopting integrated order receiving to a very great extent so improve their performance more. There is a need for the firms to enhance adoption of the lean production practices such as having a continuous improvement programs in terms of production, automation and use of just in time concept to a great extent so as to improve performance significantly.

Key Words: *Lean warehousing, Performance of large manufacturing firms, Kenya*

Background of the Study

Historically, the growth in manufacturing has been a key element in the successful transformation of most economies that have seen sustained rises in their per capita incomes (World Bank, 2014). The United States of America's 12% GDP is accounted for by its manufacturing sector, while it employs about 9% of the countries workforce, every dollar spent in manufacturing adds $1.37 to the U.S. economy, and every 100 jobs in a manufacturing facility creates an additional 250 jobs in other sectors, (NAM, 2015). However, as posited by Levinson (2015), it is important to note that even though the USA's manufacturing output growth has over the last decade outperformed that of most European countries and Japan, it has continued to lag behind that of China, Korea and other Asian counties. Also, the USA's share of global manufacturing activity declined from 30% in 2002 to 17.4% in 2012, while it was displaced by China as the largest manufacturing economy in the year 2010. According to Klynveld Peat Marwick Goerdeler (KPMG) International (2015), China's growth in its GDP slowed down as from the year 2013 to 2014 to stand at 74% partly due to challenging environment within the manufacturing sector. The contribution to GDP is 13.9% lower than that of the service sector which stands at 73% (Taborda, 2015).

In most of Africa, performance in manufacturing has been particularly poor over the last decades compared to the development countries (WB, 2014). Manufacturing is extremely important for the modernization of any country. It is the main activity that split the developed world from the developing one. Although there is no universal definition, nevertheless, developing countries are in general countries which have not achieved a significant degree of industrialization relative to their populations. In most cases, a developing country will have a medium to low standard of living (Mamaghani, 2010). The manufacturing sector in Kenya constitutes 70 per cent of the industrial sector contribution to Gross Domestic Product (GDP), with building, construction, mining and quarrying cumulatively contributing the remaining 30 per cent (KAM, 2016). Kenya Vision 2030 identifies the manufacturing sector as one of the key drivers for realizing a sustained annual GDP growth of 10 per cent (KER, 2013). The manufacturing sector has high, yet untapped potential to contribute to employment and GDP growth. For example, compared to the agriculture sector, which is greatly limited by land size, the manufacturing sector has high potential in employment creation and poverty alleviation since it is less affected by land size (Bigsten, Kimuyu & Sodderbom, 2010; ROK, 2013). This sector has the potential to generate foreign exchange earnings through exports and diversify the country's economy (Awino, 2011).The contribution of the manufacturing sector to GDP has continued to stagnate at. According to a recent Kenya economic report low value addition and high costs of production impede on the competitiveness of Kenya's manufactured products in the global market (RoK, 2013).

Statement of the Problem

Statistics from World Bank show that the manufacturing sector in Kenya is the third largest by sectoral contribution to GDP (10.3 per cent) (KNBS, 2016). Vision 2030 stipulates that the manufacturing sector should account for 20 per cent of GDP by 2030 (RoK, 2015; Mutindi, Namusonge & Obwogi, 2013; Achuora, Guyo, Arasa, Odhiambo, 2015). However, this fit is threatened by the poor performance of the manufacturing firms. The average annual growth rate of real GDP for the manufacturing sector declined from 10 per cent in the period 1974–79 to 4.8 per cent, 2.5 per cent and 3.8 per cent in the periods 1980–89, 1990–99 and 2000–07, respectively. Large scale manufacturing firms operating in Kenya registered stagnation and declining profits for the last five years due to a turbulent operating environment (WB, 2014).

It is estimated that large manufacturing firms have lost 70 per cent of their market share in East Africa (RoK, 2014). Compared to the other sectors the manufacturing sector, which is dominated by large manufacturing firm slugged behind in output growth. However the sector's contribution to the GDP has stagnated at an average of 10 per cent for more than ten years with a growth of 3.1 percent, significantly lower than the overall economic growth of 5.0 percent (WB, 2014). Although there has been a slight upswing in more recent years, the contribution of manufacturing to GDP has remained low; contributing 11.5 per cent and 12.8 per cent in the second quarters of 2009 and 2010, respectively. The manufacturing sector in Kenya has a huge untapped potential contribution to employment and GDP if the challenges facing this sector are properly addressed (Wagana & Kabare, 2015). If this problem is not addressed it will cause low economic development leading to lack of achievement of the vision 2030 with regard to the manufacturing sector, lack of competitiveness in the global market, loss of jobs consequently creating social injustice in the society. The aim of this study was to eventually help in determining what is needed to stop manufacturing firms from failing, stagnating in performance or relocating from Kenya resulting to job losses and therefore continue in operation to the foreseeable future.

Objective of the Study

To determine the influence of Lean warehousing practices on performance of large manufacturing firms in Kenya.

Literature Review

Theoretical Framework

Resource Dependence Theory

The theory of resource dependence theory was appropriate theory for this study because it helped in evaluation of the cooperation and relationship between the members in supply chain in terms of dependence on each other for the resources in order to be able to achieve optimal performance. Resource Dependence Theory (RDT) was postulated by Godfrey (1998) and he suggested that member firms in the supply chain should be dependent and cooperate with each other in seeking greater performance gains in the long run as opposed to focusing on short term gains at the expense of other members. In resource dependence theory, firms rely on the resources provided by others firms to sustain growth and competitive advantage, including organizations that depend on them (Paloviita & Luoma-aho, 2010).

RDT assumes that firms are not fully autonomous with respect to strategic critical resources for survival. In lean supply chain management, resource allocation and material recovery are key resources in the organization that require supply chain partnership to improve on performance. Organizations need to control critical resources, for example, human resources, procedures, material sources, standards, as well as distribution networks to implement lean supply chain management components. Firms that consider implementation of lean supply chain management components should take into account the supply chain members' interdependency, efficiency, effectiveness and the quality of their association that determines success in the implementation.

According Zhu (2010), RDT highlights a very important insight that organizations without the necessary resources to achieve their goals are likely to cultivate relationships with others for acquisition of the resources. This view considers supplier and customer relationship as very important connections for organizations to reduce the dynamics that surround their operating environment. In order to manage the internal and external coordination of lean supply chain management and gain in the outcomes of the performance, there is need for inter-organizational relationship (Zhu & Sarkis, 2007).

Conceptual Framework

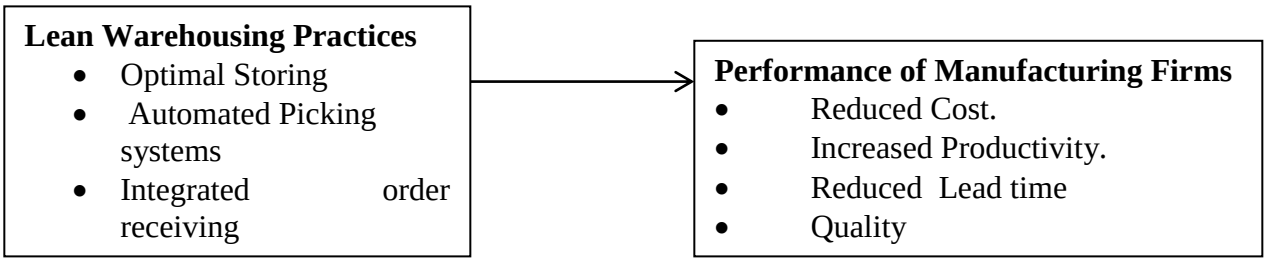

Figure 1 Conceptual Framework

Empirical Review

Lean warehousing is a very important component of LSCM which can be useful to the distribution area to reduce waste, increase the utilization of the available space, improve on productivity and meet the increasing demands of the customer. According to Ackerman and Bodegraven, (2007) warehouse in any age comes down to only two things: the management of time as well as the management of space. They further added that the warehouse was and still is used to manage the freight costs in this environment and it's also used in concert with advances in the capabilities to deliver and improve on customer service.

Transforming the operations of an organization to a lean warehouse environment does not play a role of just another venture or program. It is a different way of doing business (Visser, 2014). According to Reichart and Holweg (2007) for organizations to maximize the value of lean warehousing they need to adopt lean distribution. Lean distribution refers to minimizing waste in the entire supply chain while ensuring that the right products are availed to the final customer according to their specification. Lean in warehousing leads to substantial improvement, better lead-times and enhanced customer value (Phogat, 2013). It is thus evident from the research that Lean has a positive impact on warehousing operations (Garcia, 2003; Bozer, 2012; Phogat, 2013). Bicheno and Holweg (2009) state that "real" Lean is behaviour-driven and it's what employees do daily without being told, that is considered Lean. In order to achieve Lean warehousing, one requires a certain mind set, where a can-do attitude is the starting point (Lean Thinking in the Warehouse, 2014). It is therefore imperative to determine what employees understand under Lean warehousing principles, in order to change their behaviour. However, the view on warehousing in today's business is changing. This is due to the awareness that warehousing can provide more value to a product than costs. Warehousing functionality is now seen as mixing and modifying a product in order to meet customer requirements (Bowersox et al, 2013).

Research Methodology

This study adopted the descriptive research design to answer the research questions using quantitative and qualitative approach. Descriptive research design was adopted in order to ascertain and describe the characteristics of the variable under study (Sekaran & Bougie, 2011). The study was anchored on the positivist research paradigm; it views the research as independent of the study they are conducting (Cooper & Schindler, 2011). The population targeted was 494 firms for this study which is classified as Large Manufacturing Firms as per Kenya Association of Manufacturers (2016). From the Firms the unit of respondents of this study was head of Production, Procurement and Logistics departments. Stratified random sampling method was applied to come up with the

sample size, since the population in different large manufacturing firms does not represent a homogeneous group, therefore the method was generally applied in order to obtain a representative sample.

The sample size was calculated according to the following formula (Kate, 2006).

$$n = \frac{t^2 \times p(1-p)}{m^2}$$

Where: n = required sample size, t = confidence level at 95% (standard value of 1.96) , p = estimated percentage prevalence of the population of interest – 10% , m = margin of error at 5% (standard value of 0.05). Therefore, the sample size (n) for this study was computed as follows:

$$n = \frac{1.96^2 \times 0.1 (1 - 0.1)}{0.05^2}$$

$N = 138.30 \sim 138$

This gives a sample size of 138 respondents. This implies that the study involved 138 large scale manufacturing firms that were selected through stratified sampling.

The research used structured questionnaire developed to capture the various variables understudy. Likert scale of 1-5 was used in formulation of the structured questions. The Likert-scale was used in this study since it is more reliable and objective and can easily indicate the presence or absence of the attitude (Mugenda & Mugenda, 2003). A pilot test was conducted on 10% of the entire sample size, which translated to 13 firms. The study used Cronbach alpha formula to test reliability which helped to find out internal consistency of the questionnaire. An alpha coefficient of 0.7 or higher indicates that the data gathered is reliable as it has a relatively high internal consistency and can be generalized to reflect opinions of all respondents in the target population. Content validity was analyzed by professionals in the field such as university supervisors while construct validity was computed using factor analysis. Data was analyzed quantitatively using descriptive statistics including frequencies, percentages, mean and standard deviation using the Statistical Package for Social Sciences (SPSS) version 24 and inferential statistics using correlation and regression analysis. A linear regression analysis was used to establish the relationship between the study variables. The research used the following bivariate regression model:

$$Y = \beta o + \beta_1 X_1 + \varepsilon$$

Where; Y represents the dependent variable (Firm Performance), X_1 is lean warehousing practices; ε is the error term of prediction.

Research Findings and Discussion

The study targeted 138 manufacturing firms in Kenya. Out of the number, 96 questionnaires were filled and returned which represented a response rate of 69.6%. For a descriptive study, a response rate of 50% and above is adequate for analysis (Kothari, 2004). Therefore 69.6% response rate is good for the study.

Instrument Reliability

The study conducted a pilot test to test for the instrument reliability. The thirteen participants in the pilot test were not included in the final study. Reliability of this instrument was evaluated through Cronbach Alpha which measures the internal consistency. Cronbach Alpha value is widely used to verify the reliability of the construct.

The results are presented in Table 1.

Table 1 Reliability Coefficient

Variables	Cronbach's Alpha	Number of Questionnaire Items	Comment
Lean warehousing Practices	0.756	6	Reliable

The findings in Table 1 indicate that the variable in the study was reliable since the value of Cronbach Alpha was above the minimum accepted value of 0.7 as argued by Al-Tit and Hunitie (2015) that a value of 0.70 or more is enough for a scale to be reliable. This represented high level of reliability and on this basis it was supposed that scales used in this study was reliable to capture the variables. Ngechu (2009) explains that the higher the coefficient, the more reliable the data is. Performance was measured by secondary information and hence it was not included.

Sample Adequacy Test

The study sought to establish the construct validity of the data collected before using it for further analysis. However, the reliability of factor analysis is dependent on sample size; therefore it was necessary to determine the adequacy of the sample size before proceeding to conduct factor analysis. To do that, the study adopted the Kaiser-Meyer-Olkin (KMO) test of sampling adequacy. According to Magd (2008) KMO is an index used to examine and justify the appropriateness of application of Factor Analysis. The KMO statistic is a measure of the proportion of variance among variables that might be common variance. The lower the proportion, the more suited the data is to Factor Analysis. A value greater than 0.5 is recommended for factor analysis (Field, 2009) and this is the threshold adopted in this study. The findings are presented in Table 2.

Table 2 Kaiser-Meyer-Olkin (KMO) Test of Sample Adequacy

	Approx. Chi-Square	216.651
	Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	0.547
Lean Warehousing Practices	Approx. Chi-Square	97.147

The findings presented in Table 2 indicate that the KMO test on all the factors in the study generated values greater than 0.5, implying that the sample size was adequate for further confirmatory factor analysis.

Confirmatory Factor Analysis

Communalities were used to indicate the substantive importance of variable factors where a loading value of 0.7 as a rule of thumb is believed to be satisfactory but due to the seemingly difficulties of meeting the 0.7 criterion a loading of up to 0.4 level is acceptable (Cooper & Schindler, 2011). Table 3 shows how much of the variance in the variables accounted for by the extracted factor; in other words, it shows the variations from the expected initial value which is one. The findings indicated that all the factors used to measure the study variables exceeded the criterion of 0.4 and thus no question was removed in line with Mugenda and Mugenda (2003).

Table 3 Confirmatory Factor Analysis

Confirmatory Factor Analysis of Lean Warehousing		
	Initial	**Extraction**
The company has implemented optimal storage	1.000	0.762
The company has automated picking system	1.000	0.892
The company has adopted integrated order receiving	1.000	0.87
The company has optimized packing	1.000	0.633
The company has automated its shipping systems	1.000	0.492
The company has implemented integrated replenishment system	1.000	0.408
Extraction Method: Principal Component Analysis.		

Descriptive Findings

Lean Warehousing

The study sought to establish the respondents agreement extent with statements related to influence of Lean warehousing practices on performance of large manufacturing firms in Kenya. According to the results displayed in table 4.8, 28.1% of respondents agreed to a very great extent that the company has implemented optimal storage, 36.5% agreed to a great extent, 30.2% moderately agreed while a small percentage of 3.1% and 2.1% agrees to a small extent and the statement does not affect at all respectively.

On whether the company has automated packing system, majority of the respondents 33.3% agreed to a great extent while those who agreed to a very great extent were 13.5%. Similarly, 9.4% agreed to a moderate extent with the statement, 16.7% agreed to a small extent while 27.1% agreed that automation of packing system does not affect lean warehousing at all. The respondents agreed to a very great extent on the statement that the company had adopted integrated order receiving, 21.9% agreed to a great extent, 31.2% agreed to a moderate extent, 14.7% agreed to a small extent while those who agreed that the statement does not affect lean warehousing at all were 27.7%. Moreover, majority of respondents 46.9% agreed that optimization of packing by the company does not affect at all warehousing process. Those who agreed to a small extent on the statement were 41.7% while 4.2% agreed to moderate extent. 5.2% and 2.15% agreed to a great extent and to very great extent respectively on the statement. On whether the company had automated its shipping systems, 14.6% of respondents agreed to a very great extent, 25% agreed to great extent, 11.5% agreed to a moderate extent, 24% agreed to a small extent while 25% agreed that the statement does not affect lean warehousing at all.

Lastly, majority of the respondents 26% agreed to a very great extent that the company had implemented integrated replenishment system, 14.6% agreed to a great extent while 22.9% agreed to a moderate extent on the statement. Those who agreed to a small extent on the implementation of integrated replenishment system were 16.7% while only 19.8% agreed that the statement does not affect lean warehousing at all. The findings concurs with Ackerman and Bodegraven, (2007) findings that Lean warehousing forms an important component of LSCM which can be useful to the distribution area to reduce waste, increase the utilization of the available space, improve on productivity and meet the increasing demands of the customer.

Table 4: Descriptive Analysis of Lean Warehousing

Statement	5	4	3	2	1
The company has implemented optimal storage	28.10%	36.50%	30.20%	3.10%	2.10%
The company has automated picking system	13.50%	33.30%	9.40%	16.70%	27.10%
The company has adopted integrated order receiving	15.60%	21.90%	31.20%	14.60%	16.70%
The company has optimized packing	2.10%	5.20%	4.20%	41.70%	46.90%
The company has automated its shipping systems	14.60%	25.00%	11.50%	24.00%	25.00%
The company has implemented integrated replenishment system	26.00%	14.60%	22.90%	16.70%	19.80%

Performance of Manufacturing Firms

The performance of manufacturing firms was measured as costs, lead time and production levels. The quality of products was also measured as the defects units returned to the firm. Since the firms are not listed, the data was filled by the firms. The subsection discusses the findings. The findings in figure 2 indicates that on average, the number of days taken to completely accomplish a supply chain process has been decreasing in the five years investigated from an average of 45.6 days to 24.4 days in the year 2017. The findings are consistent with Phogat (2013) who argued that application of lean practices leads to substantial improvement, better lead-times and enhanced customer value.

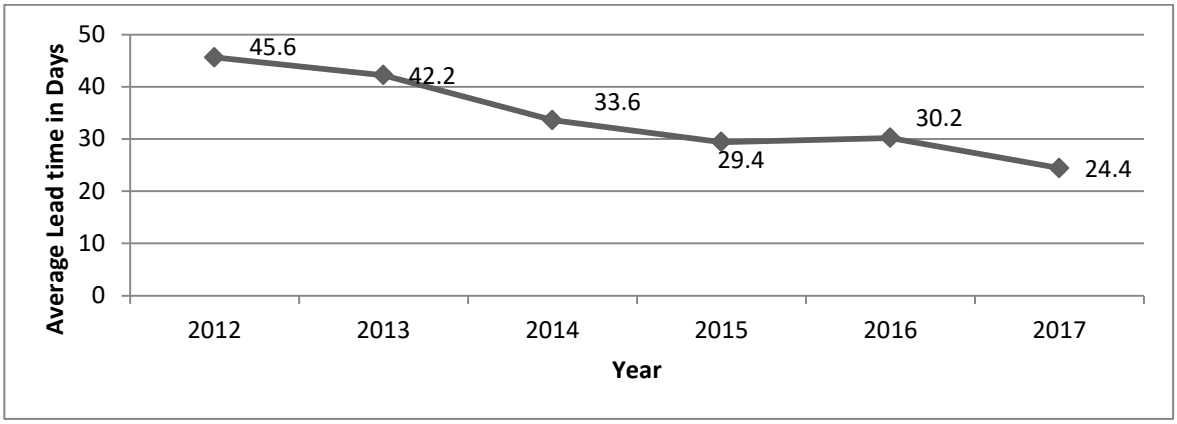

Figure 2 Average Lead time in Days

The study also sought to establish the total production of the manufacturing firms for the last five years as shown in Figure 3. It was established that on average, the total production has indicated unsteady trends although it stands between 4.8 and 6.2 Trillion. The findings however agree with the KAM report that the sector has had unsteady trends. The findings are consistent with the argument by Argus and Iteng (2013) who indicated that lean practices led to an improvement in business performance in terms of increased production and sales.

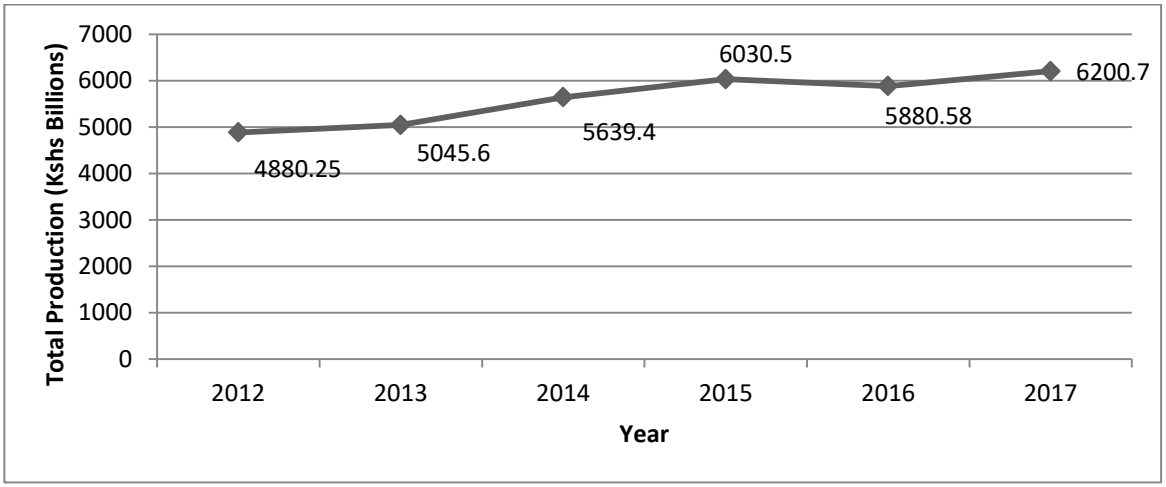

Figure 3 Total Production

The study also established the total inventory costs and presented the trends as shown in Figure 4. It was revealed that the inventory costs have been increasing before a decrease in the year 2016. On average, the inventory costs have increased from 2.9 Trillion in the year 2012 to 3.7 Trillion in the year 2017. The findings indicate the performance of the large manufacturing firms in terms of production costs is high and need to be managed by methods among them lean practices. The findings are consistent with Achuora, Guyo, Arasa and Odhiambo (2015) who agreed that the manufacturing firms in Kenya have had turbulent performance with high costs.

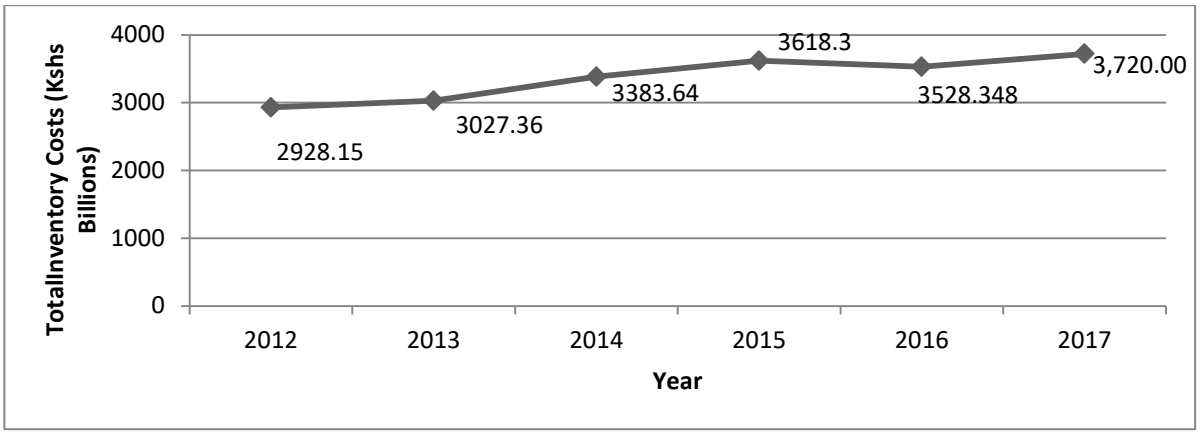

Figure 4 Total Inventory Costs

The performance of the manufacturing firms was also captured in terms of the quality of products measured as the number of defects recorded by the companies. The findings presented in Figure 5 indicate that the number of defects have decreased from an average number of 1240.6 return inwards due to defects to an average of 341.3 units. The findings indicate that adoption of lean practices has led to management of defects. The findings are consistent with Alukal and Manons (2002) who indicated that a planned implementation of lean practices leads to improved quality, better cash flow, increased sales, better productivity, improved morale and higher profits

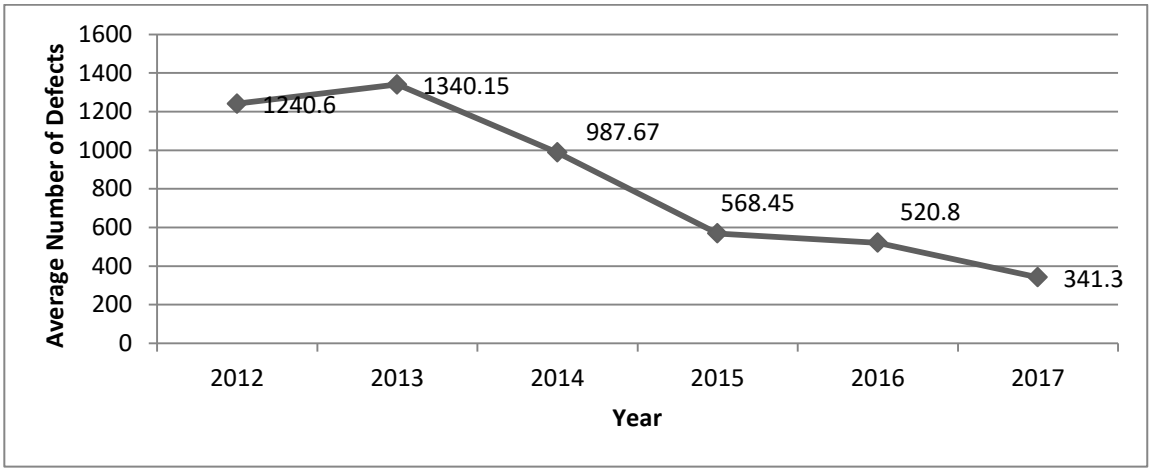

Figure 5 Number of Defects

Correlation Analysis

The study used correlation analysis to establish the association among the variables used in the study. The findings indicated that there is a positive and significant association between lean warehousing practices and performance of large manufacturing firms in Kenya (Pearson correlation value is 0.436 and level of significance of 0.000 which is less than 0.05). The results imply that a positive change in lean warehousing practices such as implementing optimal storage, automated picking system, adopting integrated order receiving, optimized packing, automated shipping systems and implementing integrated replenishment system results to a positive and significant change in performance of large manufacturing firms in Kenya. The findings are consistent with Phogat (2013) who

argued that lean in warehousing leads to substantial improvement, better lead-times and enhanced customer value. The findings also support the argument by Garcia (2003); Bozer (2012); Phogat (2013); Bicheno and Holweg (2009) that lean has a positive impact on warehousing operations.

Table 5 Correlation Matrix

Correlations		**Lean Warehousing Practices**	**Performance**
Lean Warehousing Practices	Pearson Correlation	1	
	Sig. (2-tailed)		
Performance	Pearson Correlation	.436**	1
	Sig. (2-tailed)	0.000	
	N	96	96

Diagnostic tests

Before running the regression model, the assumptions of Ordinary Least Square regression were observed. Normality of the dependent variable was established using Smirnov Kolmogorov and Shapiro Wilk test. The study also tested for homogeneity of variance (Heteroscedasticity) and Linearity using Levene's test as well as scatter plot. The findings are presented and discussed in the subsections that follow.

Normality Test

In order to make inferences from an analysis, assumption of normally distributed dependent variable is very important. The study used both kolmogorov-Sminorv and Shapiro- Wilk normality tests. However, the Shapirao Wilk results were interpreted since the data set is less than 2000. In both tests, if the test of normality yields a figure of less than 0.05 it means that the data is not normally distributed. The findings are presented in Table 6 below. The findings indicate that all the variables had insignificant Shapiro Wilk values and Kolmogorov Smirnova values (greater than 0.05) implying that the variables were normally distributed.

Table 6 Test of Normality

Tests of Normality	**Kolmogorov-Smirnova**			**Shapiro-Wilk**		
Variable	Statistic	df	Sig.	Statistic	df	Sig.
Lean Warehousing	0.088	288	0.067	0.971	96	0.058
Performance	0.142	288	0.052	0.96	96	0.058
Lilliefors Significance Correction						

Heteroscedasticity

Heteroscedasticity means a situation in which the variance of the dependent variable varies across the data, as opposed to a situation where Ordinary Least Squares (OLS) make the assumption that variance of the error term is constant (Nordgaard *et al*., 2010; Field, 2013). To test heteroscedasticity, the study adopted Breusch Pagan test (Tabachnick & Fidell, 2013).

The findings indicated in Table 7 indicate that the Prob > Chi2 value which represents significance is greater than 0.05 which indicates that the null hypothesis of constant variance is not rejected. This shows presence of homogeneity hence a regression model was suitable in this study.

Table 7 Breusch-Pagan / Cook-Weisberg test for Homoscedasticity

Breusch-Pagan / Cook-Weisberg test for Homoscedasticity
Ho: Constant variance
chi2(3) = 8.57
Prob > chi2 = 0.134

Homogeneity and Linearity

The study also tested for homogeneity and linearity using Levene's test. The findings are presented in Table 8 below. The test for linearity has a significance value of 0.000 which is smaller than 0.05, indicating that there is a linear relationship between lean supply chain management and performance of manufacturing firms. The test for deviation from linearity has a significance value of 0.45 which is greater than the significance value of 0.05, which means that there doesn't exist a nonlinear relationship in addition to the linear component.

Table 8 : Levene's Test of Homogeneity and Linearity

ANOVA Table			**Sum of Squares**	**Mean Square**	**F**	**Sig.**
Performance * Independent	Between Groups	(Combined)	8.295	0.094	1.736	0.226
		Linearity	2.735	2.735	50.376	0.000
		Deviation from Linearity	5.56	0.064	1.177	0.45
	Within Groups		0.38	0.054		
	Total		**8.675**			

Regression Analysis

In order to establish the Influence of Lean Warehousing Practices on Performance of Large Manufacturing Firms in Kenya, keeping other independent variables constant, a bivariate regression model of the form below $Y= \beta_0+ \beta_1X_1 + e$ was established where, Y = performance of large manufacturing firms in Kenya and X_1 = Lean

Warehousing Practices. The findings for the model summary presented in Table 9 reveal that other factors held constant, Lean Warehousing Practices accounts for up to 19% of the variations in performance of large manufacturing firms in Kenya as indicated by an R-square value of 0.19. The findings also showed that the correlation between Lean Warehousing Practices and performance of large manufacturing firms in Kenya was positive at a value of 0.436. The model significance findings indicated that the model linking Lean Warehousing Practices and Performance of large manufacturing firms in Kenya was significant as shown by a significant F statistic vale of 0.000 (Sig <0.05) at 5% level of significance. This implies that a model linking Lean Warehousing Practices to performance can be used to predict performance of large manufacturing firms in Kenya.

The regression results of the study also showed Lean Warehousing Practices positively and significantly influence the performance of large manufacturing firms in Kenya. This is shown by a positive beta coefficient of 0.218 and significance value of 0.000 (Sig < 0.05) at 5% level of significance. The results therefore imply that other factors held constant, a one unit increase in Lean Warehousing Practices leads to a 0.218 units increase in performance of large manufacturing firms in Kenya. The findings are consistent with the findings of a study by Bowersox *et al* (2013) that lean warehousing can provide more value to a product than costs thus improving performance.

Table 9: Regression analysis of Lean Warehousing Practices and Performance

Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate
.436[a]	0.19	0.182	0.27335

ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Regression	1.651	1	1.651	22.098	.000
Residual	7.024	94	0.075		
Total	8.675	95			

Model Coefficients

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	1.867	0.146		12.755	0.000
Lean Warehousing Practices	0.218	0.046	0.436	4.701	0.000

Dependent Variable : Firm Performance

Predictor Variables : (Constant), Lean Warehousing Practices

Conclusions

Based on the study findings, the study concluded that that a positive change in lean warehousing practices such as implementing optimal storage, automated picking system, adopting integrated order receiving, optimized packing, automated shipping systems and implementing integrated replenishment system results to a positive and significant change in performance of large manufacturing firms in Kenya.

Recommendations

Since the findings indicated that lean ware housing practices significantly improves performance, the study

recommends that large manufacturing firms should aim to practice lean ware housing practices such as implementing optimal storage, automated picking system, adopting integrated order receiving, optimized packing, automated shipping systems and implementing integrated replenishment system to a very great extent so improve their performance more.

Conflict of Interest

No potential Conflict of Interest was recorded by the authors

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