

## **Risk Management Practices and Supply Chain Performance in County Governments of Western Kenya: Applications of risk identification**

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**Abstract:** Risk management has drawn attention to procurement entities globally due to continuous changes in the supply chain function. Poor risk management strategies may attract issues such as lack of risk decision-making, accountability, risk identification, risk assessment, mitigation, and monitoring. Many studies conducted on risk management practices on supply chain performance produced conflicting results, since some had positive while others had negative influence and therefore, the need for conducting the current study. The purpose of the study was to establish the influence of risk management practices on supply chain performance on County governments in western Kenya. The study specifically determined the influence of risks identification on supply chain performance in County governments of western Kenya. The study was guided by the economic theory of agency. The study used a descriptive research design. The target population was 150 employees comprising procurement officers, logistics managers, and directors of audit service, quality assurance, and finance officers from Vihiga, Kakamega, Bungoma and Busia Counties. The study used a census sample strategy, focusing on all 150 employees. Primary data were gathered for the study utilizing closed-ended questionnaires. Both descriptive and inferential statistics were used to analyze the data. Using the Pearson product moment correlation and the linear regression model, inferential statistics were examined. The correlational results showed that risk identification had a significant positive association since their p-values were less than 0.05. The regression model results of the study showed that risk identification had a coefficient of 0.191, and a p-value of 0.010, meaning that risk identification, had a significant positive influence on supply chain performance. It was recommended that county governments' managements should perform a thorough screening of suppliers before awarding tenders.

**Keywords:** Risk Management Practices: Supply Chain Performance: County Governments

### **I. Introduction:**

Risk management has drawn attention to the procurement entities globally due to continuous changes in the supply chain function. Poor risk management strategies may attract issues such as lack of risk decision-making, accountability, risk identification, risk assessment, mitigation, and monitoring (World Economic Report, 2020). Therefore, a more comprehensive approach is needed to mitigate the challenges that arise from disruption and uncertainties.

Due to the current global economic crisis, firms must maintain effective risk management procedures. Risk is present in all the organization's functions (Felea & Albastroiu, 2013). Risks have the potential to disrupt supply chains. Supply chain risk management guarantees that there are few breakdowns and that supply chains run smoothly. (Christopher, Martin, & Hau Lee, 2014).

Many institutions have adopted risk management practices such as monitoring risks by identifying risk management strategies in order to prevent fraud. However, despite these mechanisms being in place, county governments do not still have inaccurate forecasting and unreliable suppliers that has reduced the level of stock replenishment. This has made it difficult for this county government to account for Kshs. 200-500 million every financial year as per the auditor general report (The Auditor General Report, 2020). The world economic report (2020) also recorded an increasing concern regarding approaches in supply chain risk management. Supply chain performance in government agencies and county governments studies on the association between risk management and execution have produced varied results. A study done by Mburu (2015) found risk management strategies had a significant positive effect on supply chain performance, while a study done by Kisia (2017) found risk management had an insignificant negative impact on supply chain performance. A study done by Hariharan (2018) found a positive relationship between risk management and supply chain performance, while another similar study

conducted by Ganiyu (2020) found a negative relationship between risk management and supply chain performance. The variation in the above studies and the auditor reports have brought a gap in risk management that needs to be addressed and this study is addressing that gap.

## **II. Objectives of the study**

### **General Objective**

The main objective of this research was to establish the effects of risk management practices on supply chain performance in County governments of Western Kenya.

### **Specific Objective**

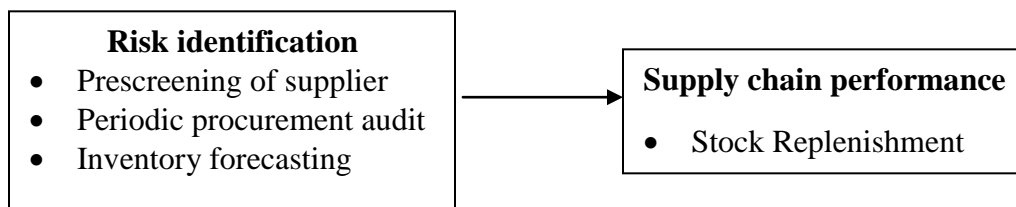
- i) To determine the effect of supply chain risk identification on supply chain performance in County governments of Western Kenya

### **Conceptual Framework**

#### **Independent Variable**

risk management practices

#### **Dependent Variable**



**Figure 1:** Conceptual Framework

## **1.1 Theoretical Review**

### **Economic Theory of Agency**

This theory was propounded by Ross (1973) and said that when two or more parties have an agency connection and one of the parties is an agent and the other the principal. This theory provides mechanisms for handling risks and sharing risks that may occur. It explains agency problems and how to solve them. This theory comes out as the main theory. It explains why supply chain risks should be identified, monitoring and reviewing risks once ascertained, and risk management responses should be involved. The assessment of risk will verify the agency's problem, while risk review, monitoring, and response is a solution-centered approach to the problem. When parties involved in a transaction have differing perspectives on risk, an issue with risk-sharing occurs (Eisenhardt, 1989).

General risks associated with procurements include incomplete internal needs analyses, poor vendor selection, chaotic vendor management, non-compliance, straightforward contract management procedures, labor shortages, and delays in the procurement procedure. Risk management is crucial, and it is thought that agency concerns have an impact on managers' attitudes toward risk management (Smith & Stulz 1985).

The disconnect between agent and principal expectations and how they result in hazards is explained by this theory. The economic theory of agency suggests that policies of risk hedging have influenced organizational value because county employees are the county government's agents and their actions or decisions may lead to counties taking on too much risk or working on projects that have a negative net value (Fide & Pfleiderer, 1995).

Therefore, agency theory is the main theory and is important to this study because of the risks that occur between the County Government's management and the public, who are the owners of the resources they manage, based on risk assessment, risk monitoring, and the response that results.

## **III. Literature review**

Mburu (2015) conducted study on how Kenyan manufacturing companies' supply chains performed after implementing a risk identification and management method. The study focused on 153 Kenyan manufacturing businesses and Kenya Association of Manufacturers members in the Nairobi industrial district (KAM, 2011). No sampling technique was used because the study used a census approach to gather data from all 153 respondents. The results of this study showed that supply chain performance was greatly improved by risk identification management measures.

Mburu, Ngug and Ogolla (2017) researched on supply chain performance and risk management tactics among Kenyan industrial firms. The study used a cross-section survey that was descriptive in nature, and the 412 manufacturing enterprises in Nairobi County that were registered members of KAM made up the target group. Using the formula developed by Fisher et al., the sample size was 199. The results of the study showed that supply chain performance was greatly improved by risk detection tactics

Munyuko (2015) studied on impact of supply chain risk management on organizational performance in terms of their profits. They worked as a case study in Andy Forwarders Services Limited. Questionnaires were employed to collect data. The results showed that risk identification had a significant positive effect on organization performance. This study contradicts that of Sukdeo 2017 on the impact of risk management practices on procurement performance in beverage manufacturing organizations in South Africa, revealing that supplier identification had a positive and insignificant effect on supply chain performance.

Valinejad and Rahmani (2018) conducted study on telecom companies' supply chains to identify sustainability risks. Then the study used the conventional sustainable development approach, which is a three-dimensional triangular model made up of the economic, social, and environmental elements of development. There were 14 companies chosen, both public and private. Investigative research was used. The study's findings reveal that sustainability risk identification is positively and significantly related with the supply chain of telecommunication.

### **Summary of Literature Review**

Most of the studies relating to risk management aspect were reviewed. Most of the studies used secondary data only while others used primary data only hence there was need to use both secondary and primary to complement each other. Most of the studies were carried out on manufacturing firms hence a need for a similar study in Kenyan County governments.

### **Research methodology**

#### **Research design**

The study adopted descriptive research design because it is suitable for educational fact-finding and delivers a good portion of information that is quite accurate (Mugenda & Mugenda, 2013). This design also offers a fantastic statistical data for a study. The survey's methodology was appropriate since it allowed the researcher to learn more about the county governments in western Kenya's risk management procedures and supply chain performance.

#### **Target Population**

According to Mugenda and Mugenda (2012), population targeted is a predetermined group of people or things from whom study findings can be extrapolated. The study targeted 150 respondents, as shown in Table 3.1, obtained from the four counties in the Western Kenya. The respondents were procurement practitioners, logistics managers, directors of audit service, quality assurance, and finance practitioners.

**Table 3.1: Target Population**

<b>Category</b>	<b>Number</b>	<b>Percentage</b>
Procurement	118	78.6
logistics	12	8
Director of audit services	4	2.7
Finance	12	8
Quality assurance	4	2.7
<b>Total</b>	<b>150</b>	<b>100</b>

**Source: County Government 2022**

### **Sample Size and Sampling Technique**

The study adopted the census sampling technique since a target population of 150 respondents is a small number, hence cannot be further divided. The Census sampling technique allows the collection of data from each participant of the target population (Kothari, 2014).

### **Data Collection**

Both primary and secondary data were employed in the investigation. Primary data was gathered through questionnaires that were handed out in person to respondents in each of the four chosen county governments by the research assistants. The respondents were given two weeks to complete the questionnaires. The study assistants collected the questionnaires back after the allotted time. Analysis of the county governments' auditor general report for the years 2020–2021 provided secondary data.

### **Pilot Test**

This was conducted in Kisumu County to prelude to the main study. Kisumu County was adopted for piloting since it has similar characteristics to the targeted counties. Hence, the respondents used for pretesting were similar to the sample under study using procedures identical to those of the actual study. The aim of the pilot project is to evaluate the efficiency of the data gathering methods and the viability of conducting the survey. The researcher received more guidance from the pilot study on how to conduct a larger examination later on (Sampson, 2014). The pilot study's findings were used to identify anomalies that could occur during the actual study.

### 3.7.1 Validity

This describes how an item measures what it is supposed or intended to measure. It also shows the degree to which tools used to gather data measure what it purports (Hair and Lukas, 2014). Data from the pilot study was tested for both contents and validity construct. Content validity was ascertained using research experts assigned to the researcher in the form of research supervisors who guided the researcher in conducting the research and ensure the study's content was at par with existing scholarly trends and knowledge. Further, the study used the KMO and Bartlett's test to ascertain construct validity. The test evaluated the data for sufficiency of data for generalization by estimating identity matrices and partial correlations between variables under study.

**Table 3.2: KMO and Bartlett's Test**

Variable	No of Items	AVE	KMO	Bartlett's test		
				$\chi^2$	df	P-value
Risk Identification	6	0.530	0.915	43.186	15	0.000

The Average Variance Extract and the KMO value extracted indicated that the strength of partial correlations between the variables was adequate to collect reliable data. This is because the AVE values was more than 0.5 and the KMO values were closer to 1, deemed satisfactory. For the Bartlett's test showed that the variable had a probability value of 0.000 that is significant at 5% significance level hence the correlational matrices present were not identity matrices. Given the results, the questionnaires were an appropriate instrument for collecting primary data since all the values met the required criteria.

### 3.7.2 Reliability

This is defined by the precision and relevance of inferences (Mugenda & Mugenda, 2003). The information from the 15 respondents (or 10% of the sample size) in Kisumu County was collected to assess the reliability of the results. Cronbach's alpha, the most reliable technique to test internal consistency, was employed. Contacted to assist in checking whether the research questions to ascertain the consistency of the questionnaires. The yard stick for the test is alpha value of 0.7 with a value above 0.7 seen as satisfactory (Bardhoshi & Erford, 2017).

**Table 3.3: Reliability Test**

Construct	Number of Items	Cronbach alpha
Risk Identification	6	0.801
Supply Chain Performance	3	0.941

The test shows that the alpha values for Risk Identification, Risk Assessment, and supply chain performance were 0.801 and 0.941, respectively. Thus, the questionnaire was deemed reliable and could give consistent results even after repeated trials.

## IV. Data Analysis and Presentation

The data collected was edited, cleaned, and evaluated to ensure they are accurate, comprehensive, consistent, and valuable. Data analysis procedures were used to arrange the data in order to draw conclusions and make assumptions about the data in order to come up with the best answers possible (Barasa, 2015). Data were statistically examined in this study using a linear regression model. The study's findings were presented using percentages and tables since they are simple to understand. Since the variables are continuous, a binary logistic regression model was employed to determine the relationship between risk management techniques and supply chain performance in County governments of Western Kenya.

$$Y = \alpha + \beta_1 RI_1 + \varepsilon$$

Where:

$Y$  = supply chain performance

$\alpha$  = Constant Term

$\varepsilon$  = error term

$\beta_i, i = 1$  Beta coefficient

$RI_1$  = Risk identification

### Response Rate

The questionnaires were issued by the researcher to 150 respondents and 121 questionnaires were successfully responded, leading to a response rate of 80.70% as shown table 4.1. This response is adequate as it is above 60% rate recommended for the generalization of the findings to a larger population as stated by Kothari, (2014).

**Table 4.1: Response Rate**

Targeted Respondents	Returned Questionnaires	Response rate
121	92	76.03%

### Demographic information Number of Years Served in the County Government

Majority of the respondents at 57.3% had served at the county government for a period of more than three years as shown in table 6. This implied that majority of the employees had adequate knowledge and experience on county government meaning that the responses obtained from them were very objective and reliable.

**Table 6: Number of Years Served in the County Government**

	Frequency	Percent	Cumulative percent
Above 6 years	22	20.0	20.0
3-5 years	41	37.3	57.3
1-2 years	27	24.5	81.8
Below one year	20	18.2	100.0
Total	110	100.0	

### Descriptive statistics

#### Risk Identification and Supply Chain performance

The study required to identify the risks which influenced the supply chain performance. Five questions were asked to the respondents, which included prescreening of suppliers by county government, prescreening of supplier effects, periodic audit and inventory turnout.

The results were in table 4.4 show that County governments conduct pre-screening of suppliers, pre-screening of suppliers affects supply chain performance, county governments conduct a periodic audit of the Supply chain, periodic audits of the supply chain affect performance, county government do not conduct inventory forecasting and inventory forecasting affects supply chain performance.

**Table 4. 2: Risk Identification and Supply Chain Performance**

Statements	SA	A	N	D	SD
County governments conduct pre-screening of suppliers	9 7.4%	44 36.4%	27 22.3%	23 19.00%	18 14.9%
Pre-screening of suppliers affects supply chain performance	25 20.7%	53 43.8%	22 18.2%	14 11.1%	7 5.8%
County governments conduct a periodic audit of the Supply chain	20 16.5%	54 44.6%	20 16.5%	10 8.3%	15 12.4%
Periodic audits of the supply chain affect performance	18 14.9%	58 47.9%	15 12.4%	19 15.7%	11 9.1%
The county government conducts inventory forecasting	21 17.4%	36 29.8%	20 16.5%	25 20.7%	19 15.6%
Inventory forecasting affects supply chain performance	30 24.8%	50 41.3%	21 17.4%	12 9.9%	8 6.7%

### Inferential Statistics

This section covers the correlational analysis, model summary and the regression model.

#### Correlation Analysis

Correlation analysis is a statistical method that identifies the relationships between variables and assess how strongly they are linearly related. Correlation analysis, to put it simply, assesses how much a change in one variable influences a change in another. The study used the Pearson product moment to ascertain the level of association between the model variables. The technique derives the correlation coefficients together with p values which are used to show the significance of the association between variables. The association between risk identification (RI) on supply chain performance (stock replenishment) was presented as shown below.

**Table 4. 3: Pearson Correlation**

	RI
<b>RI</b>	1
<b>Stock replenishment</b>	0.640* (0.028)

From the findings in Table 4.8, Risk identification and supply chain performance are positively correlated. Risk identification and performance of supply chain were significantly associated at 5% significance level as shown by the variable's coefficient of  $r = 0.640$  and p-value of 0.028, which is less than the 0.05. This means that, an increase risk identification by one unit increases supplier chain performance (Stock replenishment) by 0.640.



### Model Summary<sup>b</sup>

The model summary proportionates the aggregate relationship strength between an independent and dependent variable. It gives the multiple correlations (R), coefficient of determination (R square) and standard error of the estimate. Table 4. 13 contains R, R square and adjusted R square results.

**Table 4. 4: Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.784 <sup>a</sup>	.615	.046	.656	.612

**a. Predictors: (Constant), RI**

**b. Dependent Variable: Procurement Performance**

R denotes the multiple correlations or overall association between the independent and dependent variables while R square summarizes the change or variations in the overall model. Table 4.9 shows that the multiple regression analysis results indicate an R of .784 and an R<sup>2</sup> of .615. This indicates that risk management practices and performance of supply chain were positively associated hence enhanced risk management practices improve the performance of supply chain. An R<sup>2</sup> of 0.615 denotes that 61.5% of variations in performance of supply chain are explained by changes in risk management practices.

### ANOVA<sup>a</sup>

ANOVA stands for the Analysis of Variance and gives the joint effect of the study variables in the model. It derives the f statistic and the significance level which gives the significance of the overall relationship between the variables as shown in table 4.10.

**Table 4. 5: ANOVA**

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	13.371	4	3.343	3.123	.011 <sup>b</sup>
	Residual	124.188	116	1.0706		
	<b>Total</b>	<b>137.559</b>	<b>120</b>			

**a. Predictors: (Constant), RI, RA, RM, RT**

**b. Dependent Variable: Procurement Performance**

As seen in table 4.10 the regression analysis gave an F statistic of 3.123 and a p-value of 0.011. The results portray that risk identification significantly influenced supply chain performance at 95% confidence interval given the probability value of 0.011 which is smaller than the significance level of 0.05. Further, the f statistics is more than the calculated f value of 2.46, affirming the significance of the influence of risk identification on performance of supply chain.

### Regression Coefficients Analysis

Coefficient of regression was conducted whereby the influence of the risk management practices variables, which include risk identification (RI) on performance of supply chain variable (stock replenishment) was determined. The results were shown below.

**Table 4. 6: Coefficients**

Model		Unstandardized Coefficients		T	Sig.
		B	Std. Error		
1	(Constant)	1.946	.615	3.165	.002
	RI	.191	.092	2.074	.010

**a. Predictors: (Constant), RI**

**b. Dependent Variable: Procurement Performance**

The results of the multiple regression produced the following regression equation

$$Y = 1.946 + 0.191 \text{ RI} \dots\dots\dots (4.1)$$

A regression constant of 1.946 is significant at a confidence interval of 95%, with its probability value of 0.002 that is smaller than 0.05. The constant indicates in the absence of supply risk management practices in the County Government of Western Kenya, the supply chain performance (stock replenishment) remains at 1.946. The regression analysis also produced four regression coefficients which are discussed under each objective

The study's specific objective was to determine the effect of supply chain risk identification on performance of supply chain. The objective led to the study focus on testing a null hypothesis that risk identification had no significant effect on performance of supply chain. As seen in Table 4.15, a regression analysis resulted in a coefficient regression of 0.191 with a probability value of 0.010 and a t statistic of 2.074. The coefficient shows that a unit increase in risk identification increases the stock turnover of county governments in Western Kenya by 0.191 units.

A p-value of 0.010 portrays that supply chain risk identification has a significant effect on the supply chain performance of county governments in Western Kenya at 5% significance level given that it is less than 0.05. The t statistic of 2.074 is more than a t calculated of 1.984 hence supports the significance of the effect of risk identification on performance of supply chain. The null hypothesis was ultimately rejected, and the study established that supply chain risk identification significantly affects the supply chain performance of county governments in Western Kenya. The results agree with the descriptive statistics which clearly showed that county governments carried out prescreening of suppliers, periodic audits of the supply chain, and forecasting of inventory and hence most respondents agreed that all these elements affect the supply chain performance of county governments.

The inferential statistics also reflect the findings of Mburu (2015) who found that supply chain performance was significantly influenced by risk identification in manufacturing companies in Kenya. These study findings indicated that risk identification management strategies significantly positively affected supply chain performance. Another study that found a similar result was conducted by Munyuko (2015) who established that supply chain risk management was positively related on organizational performance measured in terms of profitability. The case study on Andy Forwarders Services Limited showed that significant risk identification positively affected organization performance.

### **Summary of the Findings**

The purpose of the study was to establish the influence of risk management practices on performance of supply chain in county governments in western Kenya. The specific objective was to determine the effect of supply chain risk identification on supply chain performance in County governments of Western Kenya. The null hypothesis was that risk identification has no significant effect on supply chain performance. Descriptive and Inferential data analysis techniques were used.

From the descriptive statistics, most respondents agreed and strongly agreed that risk identification affects supply chain performance measured by stock turnover. In inferential statistics, the correlation results indicated that there was a significant association between risk identification and supply chain performance at 5% significance level as shown by the variable's coefficient of  $r = 0.640$  and probability value of 0.028, that is less than the 0.05. The regression results indicated risk identification had a coefficient regression of 0.191 and a probability value of 0.010, smaller than 0.05. This implies that a unit increase in risk identification improves supply chain performance by 0.191 units of stock turnover. Therefore, the null hypothesis was rejected at 0.05 significance level. This indicated that risk identification significantly affects supply chain performance at a 5% significance level. Risk identification and supply chain performance are positively correlated.

## **V. Conclusions**

Most of the respondents from the descriptive statistics agreed that risk identification increases supply chain performance through pre-screening of suppliers, periodic audits of the supply chain and inventory forecasting. From the inferential statistics, it was established that there is a significant relationship between risk identification and performance of supply chain ( $r=0.191$ ,  $p\text{-value}=0.010$ ). Therefore, it was concluded that risk assessment positively and significantly affects supply chain performance of western Kenya county governments.

## **VI. Recommendations**

From the inferential statistics, it was found that risk identification had a significant influence on supply chain performance in western Kenya county governments. Under the descriptive statistics, majority of the respondents were neutral that county governments do not conduct pre-screening of suppliers. Therefore, it was recommended that county governments' managements should perform a thorough screening of suppliers before awarding tenders. This will help avoid selecting unreliable suppliers who cannot consistently supply inventory to the county government warehouse, reducing the level of stock turnover.

The great number of the respondents also were neutral that county governments conduct inventory forecasting. Therefore, it was recommended that the management of county governments should conduct inventory forecasting. This will enable the procurement department to replenish the inventory before the stock out level is reached, increasing the supply chain performance.



It was also recommended that county governments to embrace risk identification practices such as supplier pre-screening to ensure prevention of the occurrence of supplier-related risk for better supply chain performance

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