

**INFLUENCE OF SUPPLY CHAIN MANAGEMENT
PRACTICES ON PERFORMANCE OF GOVERNMENT
MINISTRIES IN KENYA**

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**Influence of Supply Chain Management Practices on Performance of
Government Ministries in Kenya**

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DECLARATION

This thesis is my original work and has not been presented for a degree in any other University

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DEDICATION

This thesis is dedicated to my Mother Domtila Apopa, my Brothers George Apopa, Dr. Patrick Apopa PhD. Francis Apopa, my sisters Lynah Apopah and Benedette Ogot, my friends Emanuel Ngesa and Letesia Karan and most importantly my husband Paul Okeyo, Daughters Lavin Martina, Ashley Elizabeth and my son Norbert Gift.

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TABLE OF CONTENTS

DECLARATION	ii
DEDICATION	iii
ACKNOWLEDGEMENT	iv
TABLE OF CONTENTS	v
LIST OF TABLES	xiii
LIST OF FIGURES	xix
LIST OF APPENDICES	xx
LIST OF ACRONYMS AND ABBREVIATIONS.....	xxi
OPERATIONAL DEFINITION OF TERMS.....	xxv
ABSTRACT.....	xxviii
CHAPTER ONE	1
INTRODUCTION	1
1.1 Background of the study	1
1.1.1 Global Perspective on supply chain management practices	2
1.1.2 Supply chain management practices in Africa.....	3
1.1.3 Supply chain management practices in Kenya.....	4
1.1.4 Supply chain management within Government Ministries in Kenya	6

1.2 Statement of the Problem	8
1.3 Objectives of the Study	9
1.3.1 General Objectives	9
1.3.2 Specific Objective	9
1.4 Research Hypothesis	10
1.5 Significance of the study	10
1.5.1 To Government Ministries	11
1.5.2 Regulatory Authorities	11
1.5.3 The research community	11
1.5.4 The general public	11
1.6 Scope of the study	11
1.7 Study Limitations	12
CHAPTER TWO	14
LITERATURE REVIEW	14
2.1 Introduction	14
2.2 Theoretical framework	14
2.2.1 Resource-Based View Theory	14
2.2.2 Coordination theory	16

2.2.3 Systems Theory	17
2.3 Conceptual framework	19
2.4 Empirical Review	21
2.4.1 Supplier selection practices	21
2.4.2 Supply Chain Policies	27
2.4.3 Supply chain collaboration Practices	31
2.4.4 Supply Chain Risk Management.....	37
2.4.5 Organizational Culture	42
2.4.6 Performance of the Government Ministries.....	48
2.5 Critique of Existing Literature	52
2.6 Research Gaps	53
2.7 Summary	56
CHAPTER THREE.....	57
RESEARCH METHODOLOGY	57
3.1 Introduction	57
3.2 Research Design.....	57
3.2.1 Research Philosophy	58
3.3 Target Population	58

3.4 Sampling Frame	61
3.5 Sample Size and Sampling Technique	61
3.5.1 Sample size.....	61
3.5.2 Sampling Technique.....	62
3.6 Research Instruments	65
3.7 Data Collection Procedures.....	66
3.8 Pilot Study.....	66
3.8.1 Validity Test of Research Instrument	66
3.8.2 Reliability Test of Research Instrument.....	67
3.9 Data Analysis and Presentation.....	67
3.9.1 Correlation Analysis	68
3.9.2 Regression Models.....	69
3.9.3 Moderating Effect Analysis	72
3.9.4 Test of Hypothesis	76
3.10 Research Ethics	77
CHAPTER FOUR	78
RESEARCH FINDINGS AND DISCUSSION	78
4.1 Introduction.....	78

4.2 Pilot testing results	78
4.2.1 Validity of the research instrument	78
4.2.2 Reliability of the research instrument	78
4.3 Response Rate	81
4.4 Diagnostic Test.....	81
4.4.1 Normality Test	82
4.4.2 Multicollinearity Test.....	82
4.4.3 Autocorrelation Test	83
4.4.4 Heteroscedasticity Test	84
4.5 Supplier selection practices.....	84
4.5.1 Supplier Evaluation.....	85
4.5.2 Supplier Certification.....	88
4.5.3 Supplier Comparison.....	91
4.6 Supply chain policies	94
4.6.1 Disposal policy.....	94
4.6.2 Asset management policy	97
4.6.3 Risk management policy	100
4.7 Supplier Collaboration Practices.....	103

4.7.1 Information Sharing	103
4.7.2 Supply chain integration	106
4.7.3 Supplier strategic partnership.....	108
4.8 Risk Management Practices	111
4.8.1 Risk identification	111
4.8.2 Risk assessment.....	114
4.8.3 Dual sourcing	116
4.9 Organizational culture.....	119
4.9.1 Hierarchical culture.....	119
4.9.2 Role culture	122
4.9.3 Achievement culture	124
4.10 Performance of government ministries	127
4.10.1 Product quality	127
4.10.2 Compliance with statutory obligation	130
4.10.3 Service delivery.....	132
4.10.4 Cost efficiency	134
4.10.5 Budgetary compliance.....	137
4.11 Inferential Statistics.....	140

4.11.1 Supplier Selection and performance of government ministries.	140
4.11.1.1 Correlation Analysis.....	140
4.11.2 Supply chain policies and Performance of government ministries.....	143
4.11.3 Supplier Collaboration and Performance of government ministries.....	146
4.11.3.2 Univariate Regression Analysis	147
4.11.4 Risk Management and Performance of government ministries	149
4.11.5. Multivariate Regression Analysis	152
4.11.6 Organization Culture	157
CHAPTER FIVE	169
SUMMARY, CONCLUSION AND RECOMMENDATIONS	169
5.1 Introduction.....	169
5.2 Summary	169
5.2.1 Supplier Selection practices	170
5.2.2 Supply chain Policies	171
5.2.3 Supplier collaboration practices.....	172
5.2.4 Supply Chain Risk Management.....	173
5.2.5 Organizational Culture.....	174
5.3 Conclusion	175

5.4 Recommendations 176

5.4.1 Recommendations for policy 176

5.4.2 Recommendations for Management 177

5.4.3 Suggestions for Further studies 178

5.5 Contribution to the Body of Knowledge 179

REFERENCES 180

APPENDICES..... 199

LIST OF TABLES

Table 3.1: Target Population.....	60
Table 3.2: Sample Size.....	63
Table 3.3: Hypothesis Testing.....	76
Table 4.1: Reliability test for supplier selection practice.....	79
Table 4.2: Reliability test for supply chain policies.....	79
Table 4.3: Reliability test for supplier collaboration practice	79
Table 4.4: Reliability test for Supply chain risk management	80
Table 4.5: Reliability test for Organizational Culture.....	80
Table 4.6: Reliability test for Performance of government ministries.....	81
Table 4.7: Shapiro-Wilk Test.....	82
Table 4.8: Multicollinearity Test Statistics	83
Table 4.9: Durbin Watson Test for autocorrelation	84
Table 4.10: Breusch-Pagan / Cook-Weisberg test for heteroscedasticity	84
Table 4.11: Factor Analysis and Reliability for the construct supplier evaluation	86
Table 4.12: Descriptive statistics for the construct supplier evaluation.....	86
Table 4.13: Factor Analysis and Reliability for the construct supplier certification.	89
Table 4.14: Descriptive statistics for the construct supplier certification	90

Table 4.15: Factor Analysis and Reliability for the construct supplier comparison.....	92
Table 4.17: Factor Analysis and Reliability for the construct disposal policy	95
Table 4.18: Descriptive statistics for the construct disposal policy	96
Table 4.19: Factor Analysis and Reliability for the construct Asset management Policy	98
Table 4.20: Descriptive statistics for the construct Asset Management Policy	99
Table 4.21: Factor Analysis and Reliability for the construct Risk Management Policy	101
Table 4.22: Descriptive statistics for the construct Risk Management Policy.....	102
Table 4.23: Factor Analysis and Reliability for the construct Informational Sharing ..	104
Table 4.24: Descriptive statistics for the construct Information Sharing.....	105
Table 4.25: Factor Analysis and Reliability for the construct Supply Chain Integration	107
Table 4.26: Descriptive statistics for the construct Supply Chain Integration.....	107
Table 4.27: Factor Analysis and Reliability for the construct supplier strategic partnership	109
Table 4.28: Descriptive statistics for the construct Supplier Strategic Partnership	110
Table 4.29: Factor Analysis and Reliability for the construct Risk Identification.....	112
Table 4.30: Descriptive statistics for the construct Risk Identification	113
Table 4.31: Factor Analysis and Reliability for the construct Risk Identification.....	115

Table 4.32: Descriptive statistics for the construct Risk Assessment.....	115
Table 4.33: Factor Analysis and Reliability for the construct dual sourcing.....	117
Table 4.34: Descriptive statistics for the construct dual sourcing.....	118
Table 4.35: Factor Analysis and Reliability for the construct Hierarchical Culture.....	120
Table 4.36: Descriptive statistics for the construct Hierarchical Culture	121
Table 4.37: Factor Analysis and Reliability for the construct role culture	123
Table 4.38: Descriptive statistics for the Construct Role Culture.....	123
Table 4.39: Factor Analysis and Reliability for the construct Achievement Culture ...	125
Table 4.40: Descriptive statistics for the construct Achievement Culture.....	126
Table 4.43: Factor Analysis and Reliability for the construct compliance with statutory obligation	131
Table 4.44: Descriptive statistics for the construct compliance with Statutory Obligation	131
Table 4.45: Factor Analysis and Reliability for the construct Service Delivery.	133
Table 4.46: Service delivery	134
Table 4.47: Factor Analysis and Reliability for the construct cost efficiency.	135
Table 4. 48: Descriptive statistics for the construct cost efficiency.....	136
Table 4.49: Factor Analysis and Reliability for the construct budgetary compliance ..	138
Table 4.50: Descriptive statistics for the construct budgetary compliance.....	139

Table 4.51: Correlation analysis between Supplier Selection and performance of government ministries.....	141
Table 4.52: Model Summary of Supplier Selection Practices and performance	142
Table 4.53: ANOVA Supplier Selection Practices and performance	142
Table 4.54: Coefficients for Supplier Selection Practices and performance	143
Table 4.55: Correlation analysis between Supply chain policies and Performance of government ministries.....	144
Table 4.56: Model Summary for Supply Chain Policies and Performance	145
Table 4.57: Analysis of Variance for Supply Chain Policies and Performance	145
Table 4.58: Coefficients for Supply Chain Policies and Performance.....	146
Table 4.59: Correlation Analysis between Supplier Collaboration and Performance of government ministries.....	147
Table 4.60: Model Summary Supplier Collaboration Practices and Performance	148
Table 4.61: ANOVA for Supplier Collaboration and Performance.....	148
Table 4.62: Coefficients for Supplier Collaboration and Performance.....	149
Table 4.63: Correlation analysis between Risk Management and Performance of government ministries.....	150
Table 4.64: Model Summary for Risk Management and Performance.....	151
Table 4.65: ANOVA for Risk Management and Performance	151
Table 4.66: Coefficients Risk Management and Performance.....	152

Table 4.67: Model Summary for Supply Chain Management Practices and Performance	153
Table 4.68: ANOVA for Supply Chain Management Practices and Performance	154
Table 4.69: Coefficients for Supply Chain Management Practices and Performance ..	155
Table 4.70: Model Summary for the moderating effect of OC on Supplier selection practices and Performance of government ministries.....	158
Table 4.71: ANOVA for the moderating effect of OC, on supplier selection and Performance of government ministries.....	158
Table 4.72: Regression Coefficients for the moderating effect of OC, on supplier selection practices and Performance of government ministries.....	159
Table 4.73: Model Summary for the moderating effect of OC, on Supply Chain Policies and Performance of government ministries in Kenya	160
Table 4.74: ANOVA for the moderating effect of OC, on Supply Chain Policies and Performance of government ministries in Kenya	160
Table 4.75: Regression Coefficients for the moderating effect of OC, on Supply Chain Policies and Performance.....	161
Table 4.76: Model Summary for the moderating effect of OC, on Supplier Collaboration practices and Performance	162
Table 4.77: ANOVA for the moderating effect of OC on Supplier Collaboration practices and Performance	162
Table 4.78: Regression Coefficients for the moderating effect of OC on Supplier Collaboration practices and Performance	163

Table 4.79: Model Summary for the moderating effect of OC, supply chain Risk Management practices and Performance 164

Table 4.80: ANOVA for the moderating effect of OC on supply chain risk management practices and Performance. 164

Table 4.81: Regression Coefficients for the moderating effect of OC, on supply chain risk management practices and performance. 165

Table 4.82: Model Summary for overall moderated model for OC on Supply Chain Management Practices and Performance 166

Table 4.83: Analysis of Variance for the overall moderated model for OC on Supply Chain Management Practices and Performance 166

Table 4.84: Regression Coefficients for the overall moderated model for OC on Supply Chain Management Practices and Performance 168

LIST OF FIGURES

Figure 2.1: Conceptual Framework	20
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LIST OF APPENDICES

Appendix I: Questionnaire.....	199
Appendix II: Summary of the Empirical Review	217
Appendix III: Operationalization of study variables	238
Appendix IV: List of Government Ministries.....	242

LIST OF ACRONYMS AND ABBREVIATIONS

ANOVA:	Analysis of Variance
ANP:	Analytic Network Process
BSC:	Balance Scorecard
COMESA:	Common Market for Eastern and Southern Africa
CT:	Coordination Theory
CVF:	Competing Value Framework
DEA:	Data Envelopment Analysis
ECO:	Eco-innovative Practices
EFA:	Exploratory Factor Analysis
E-GP:	Electronic Government Procurement
ELECTRE:	Elimination and Et Choice Translating Reality
EMA:	Environmental Management System
EMCA:	Environmental Management and Coordination Act
EOL:	End-of Life Practices
ERP:	Enterprise Resource Planning
EU:	European Union
FMCG:	Fast Moving Consumer Goods
GDP:	Gross Domestic Product
GITS:	Green Information Technology and Systems
GP:	Goal Programming
GST:	General System Theory
IEM:	Internal Environmental Management
IISD:	International Institute of Sustainable Development

IOIS:	Inter- Organizational Information System
IS/IT:	Information System/Information Technology
IS:	Innovative Strategy
ISM:	Institute for Supply Management
ISM:	Interpretive Structural Modelling
ISO:	International Organizational Standards
KISM:	Kenya Institute of Supplies Management
KPI:	Key Performance Indicators
LSD:	Least Significant Difference
MCDM:	Multi-Criteria Decision Making
MDAs:	Ministries, Departments and Agencies
MNC:	Multinational Companies
NACOSTI:	National Council for Science and Technology
NCST:	National Council for Science and Technology
NEMA:	National Environmental Management Authority
NGEC:	National Gender and Equality Commission
OC:	Organizational culture
OECD:	Economic Co-operation and Development
OLI:	Operation and Logistic Integration
PCA:	Principal Component Analysis
PDE:	Public Procuring and Disposing Entities
PMS:	Performance Measurement System
PPDA:	Public Procurement and Disposal Act
PPRA:	Public Procurement Regulatory Authority

PS:	Proactive Strategy
PTCP:	Present Total Cost Profile
PTCP:	Present Total Cost Profile
RBV:	Resource-Based View
REBaSS:	Risk Efficiency Based Supplier Selection
RS:	Reactive Strategy
SC:	Supply Chain
SCI:	Supply Chain Integration
SCM:	Supply Chain Management
SCMP:	Supply chain management practices
SCOR:	Supply Chain Operations Reference
SCP:	Supply Chain Performance
SCRM:	Supply Chain Risk Management
SCRMP:	Supply Chain Risk Management Practices
SCS:	Supply Chain Strategy
SEM:	Structural Equation Modelling
SME:	Small and Micro Enterprises
SPSS:	Statistical Package for Social Sciences
SSP:	Strategic Supplier Partnership
TAM:	Total Asset Management
TCO:	Total Cost of Ownership
UK:	United Kingdom
USA:	United States of America
VIKOR:	Vlse Kriterijumska Optimizacija Kompromisno Resenje

YWPD: Youth Women and Persons with Disability

OPERATIONAL DEFINITION OF TERMS

Supply Chain Management: Lyson and Farrington (2006) points out that supply chain management can be summarized to mean the management of all activities, information, knowledge and financial resources associated with the flow and transformation of goods and services up from raw-materials suppliers, components suppliers, and other suppliers in such a way that the expectation of the users and the organizations are met or surpassed

A procurement policy: A procurement policy is the rules and regulations that are set in place to govern the process of acquiring goods and services needed by an organization to function efficiently. The exact process sought to minimize expenses associated with the purchase of those goods and services by using such strategies as volume purchasing, the establishment of a set roster of vendors, and establishing reorder protocols that help to keep inventories low without jeopardizing the function of the operation (Caddy & Helou, 2007).

Organizational culture: The values and behaviors that contributes to the unique social and psychological environment of an organization. It includes an organization's expectations, experiences, philosophy, and values that hold it together, and is expressed in its self-image, inner workings, interactions with the outside world, and future expectations. It is based on shared attitudes, beliefs, customs, and written

and unwritten rules that have been developed over time and are considered valid (Caddy & Helou, 2007).

Supplier Selection:

It is the process by which firms identify, evaluate, and contract with suppliers. The supplier selection process deploys a tremendous amount of a firm's financial resources. In return, firms expect significant benefits from contracting with suppliers offering high value (Bhardwaj, 2015).

Supply Chain Collaboration: Involves coordinating activities between buyer and supplier so that both parties can improve the supply chain performance such as reducing cost, increasing service level, better utilising resources, and effectively responding to changes in the market place (Tsou, 2013). Simatupang and Sridharan (2005) also defined Supply chain collaboration as two or more chain members working together to create a competitive advantage through sharing information, making joint decisions, and sharing benefits which result from greater profitability of satisfying end customer needs than acting alone

Supply Chain Risk Management: Is the implementation of strategies to manage both every day and exceptional risks along the supply chain based on continuous risk assessment with the objective of reducing vulnerability and ensuring continuity (Carter & Rodgers, 2008).

Supply Chain Management Practices: Adebayo (2012) defined supply chain management practices as a set of activities undertaken in an organization to promote effective management of its supply chain.

Supply Chain Performance: Is the total system's capability to meet end to end customer requirements through availability of product and observance of timeliness in delivery (Fawcett & Magnan, 2008).

ABSTRACT

The objective of the study was to examine the influence of supply chain management practices on performance of government ministries in Kenya. The specific objectives were; to establish the influence of supplier selection practices, supply chain policies, supplier collaboration practices and risk management practices on performance of government ministries in Kenya and to evaluate the moderating effect of organizational culture on the relationship between supply chain management practices and performance of government ministries in Kenya. The study adopted cross sectional study design. The unit of analysis for this study was 20 government ministries with a target population of 1372 staff working in the supply chain management department/units. Stratified random sampling was used, both primary and secondary data were used. The study made use of questionnaires to collect primary data. A pilot test was conducted to test the reliability and validity of the data collection instruments. SPSS software program version 22 was used to facilitate data processing and analysis. Thematic content analysis was used to analyze qualitative data while descriptive and inferential statistics were used to analyze quantitative data. Organizational culture moderating effect was tested by F- test. The study found that supplier selection practices, supply chain policies, supplier collaboration practices and risk management practices positively and significantly influence the performance of government ministries in Kenya with risk management practices being the most significant predictor, this study further established that organization culture was a moderating factor in the study. The study adopted resource based theory, coordination theory and system theory. The study found that there was a positive association between supply chain management practices and performance of government ministries. The findings also revealed that supply chain management practices can explain 96.4% of performance while the introduction of organization culture in the model increased the r- squared to 98% meaning the model is a good fit. The study recommends new policies should be formulated to ensure suppliers have compatible information system with public institutions and policy to enhance frequent identification of potential risks in supply chain and on-sight investigation of existing risk in addition to considering the provision of after sales service and also come up with training programs to help suppliers improve the quality of their products.

CHAPTER ONE

INTRODUCTION

1.1 Background of the study

This chapter presented the background information, statement of the problem, the study objectives, research hypothesis, justification and scope of the study. The study examined the influence of supply chain management practices on performance of Kenyan government ministries, specifically assessing supplier selection practices, supply chain policies, supplier collaboration, and supply chain risk management. (Mc Adam et al., 2005) argued that the public sector is under pressure from both internal and external sources to demonstrate improvements in their performance hence the need to assess the SCMPs. Harrison and New (2002) argued that the successful implementation of SCM practices provides opportunities to improve organizational performance along the supply chain Eduardo et al. (2014) argued that supply chain practices lets companies reduce costs by developing new technologies that mitigate their activities. This is particularly relevant because increasing supply chain practices benefits companies in other ways: improved efficiency, higher product quality, a lead on competitors and legislation, access to new markets, increased employee motivation and satisfaction, improved public relations, financial aid, and better organizational reputation.

Kim (2006) argued that effective construction of various SCMPs requires close integration of internal functions within the firm and external linkages with suppliers, customers and other channel members in order to be highly competitive and at the same time achieve profitability growth. Although some organizations have realized the importance of implementing supply chain management, they often do not know exactly what to implement, due to a lack of understanding of what constitutes a comprehensive set of SCMPs (Li et al., 2006a).

Although a number of studies have been done on the link between SCMPs and firm performance, there is far too little knowledge available on the role of organizational culture in moderating the influence of SCMPs and performance. SCM practitioners

need clarity about the scope of processes to include in their integration plans, the individuals and entities to involve, the practices and methodologies to follow as well as key performance areas to focus on in the measurement of performance. This opinion is supported by Lambert (2008) who states that there is a need for broadly accepted normative tools and methods for SCM practice.

Hence the current study will be based on the following supply chain management practices and how they influence performance in the government ministries: supplier selection, supplier collaboration, supply chain policy and supply chain risk management.

1.1.1 Global Perspective on supply chain management practices

Lyson and Farrington (2006) defined supply chain management as the management of all activities, information, knowledge and financial resources associated with the flow and transformation of goods and services up from raw-materials suppliers, components suppliers, and other suppliers in such a way that the expectation of the users and the organizations are met or surpassed. Adebayo (2012) defined supply chain management practices as a set of activities undertaken in an organization to promote effective management of its supply chain.

Assessing supply chain management globally, Brühlhart and Trionfetti (2004) stated that the portion of public expenditure attributable to purchases of goods and services is the subject of significant attention. As with total public expenditure, this interest arises in part from the absolute scale of public procurement with between 8% and 25% of the Gross Domestic Product (GDP) of Organization for Economic Co-operation and Development (OECD) countries and 16% of European Union (EU) GDP being attributable to government purchases of goods or services. Knowing that the role of procurement in driving forward the corporate agenda is critical, given the position and its ability to influence external organizations in the supply chain (Seuring, 2013). This calls for the need to assess supply chain management practices for improved organizational growth.

According to Solakivi (2014) Supply Chain management practices can be construed as those actions a firm engages in to further efficient management of its supply chain. Micheli (2008); Girubha et al. (2016); Mahamood et al. (2014) and Bhatti (2016); consider supplier evaluation, supplier certification, risk management policy, information sharing, supplier strategic partnership and supply chain integration to evaluate supply chain management practices. Li et al. (2005) argued that SCM practices encompass multi-faceted concept which entails strategic supplier partnerships, customer relationship, extensive sharing of information and quality of the information shared and postponement.

In Germany Khalid et al. (2012) found that technological integration emerges as the core supply chain management practices frequently identified and is contingent with a number of other practices. Further, supply chain management practices including long-term relationship development, partner development, joint development, enhanced communication, learning, stakeholder management and innovation have regularly been referred to and are considered important in improving the performance of public institutions. In China, Lin (2014) argued that although agriculture sector was regarded as a mature sector, there remained significant inefficiencies in on-farm resource management that presented opportunities for environmental improvements through supply chain management practices like collaboration, adoption of information technology and enhancement of farm-supplier relationships.

1.1.2 Supply chain management practices in Africa

Public services in many African countries are confronted with many challenges, which constrain their delivery capacities (Lienert, 2003). There is also the perennial problem of the shortage of financial and material logistics that are necessary to support effective service delivery. In South Africa, procurement is of particular significance in the public sector and is being used as a policy-making tool in view of the discriminatory and unfair practices of the past. In an effort to replace outdated procurement practices, South Africa government adopted policy to guide uniformity

in procurement reform process in conjunction with provisional treasuries in the year 2003

Adebayo (2012) carried out a study examining the level at which the Nigerian manufacturing companies are involved in SCM practices as well determine the effect of these practices on SCM performance. With a total of 31 companies forming the sample size of the study, the data collected was analyzed using both descriptive statistics (tables, mean and standard deviation) and inferential statistics (correlation and multiple regression analysis), the result showed that SCM practices definitely impacts on SCM performance.

Mensah et al. (2014) carried out a study in the manufacturing company in Ghana seeking to study examine supply chain management practice and it's effect on the performance of Kasapreko Company Limited (KCL). The objectives of the study were to examine supply chain management (SCM) practice in KCL, ascertain the influence of SCM practice on KCL performance, and to describe the trend in sale of KCL. A sample size of two-hundred (200) out of the numerous customers of KCL was administered with questionnaires in the Greater Accra Region of Ghana. The researchers also interviewed key employees of KCL using a semi-structured interview guide. A descriptive analysis with the aid of SPSS was used to quantify the relationship between the application of supply chain management practice and the performance of KCL. The result of the study indicated that KCL is applying supply chain management practice to its business activities. The study also indicated that supply chain management practice has significantly influence KCL business performance and was evidence in the sales performance of KCL over the years (2004-2010)

1.1.3 Supply chain management practices in Kenya

Supply chain management in Kenya government ministries is guided by the Public Procurement and Asset Disposal Act, 2015. According to (Koh et al., 2007) SCM practices involve a set of activities undertaken in an organization to promote effective management of its supply chain.

Kimondo et al. (2016) conducted a study on Dynamics of supply chain management in the Kenyan construction industry a case study of national irrigation board. The study established that long-term relationships, working with certified suppliers, prudent supplier selection and few supplier policies, supplier involvement in product development, good interaction and internal, trust and commitment with partners, strategic purchasing, supply network coordination, external integration, logistics integration and effective communication affect the construction project performance at National Irrigation Board.

In Kenya, Kazi (2012) conducted a study on supply chain management practices and performance at Kenya Medical Supplies Agency. The results of the study provide important insights on supply chain management practices in the health care sector and their effect on performance. The findings revealed that the major supply chain practices that highly impact on the supply chain performance include: Tracking and trace products in the supply chain, alerting customers on product availability, timely delivery and reducing the lead time. Alerting customers on status of shipment was however seen as the least practice that influences the performance of supply chain.

However the study revealed that Innovative design of a SC has a significant impact on the selection of and cooperation with best suppliers, increase of SC efficiency, and enhancement of supply chain management practice, which subsequently improves organizational performance.

Mahulo 2015 carried out a study on supply chain management practices and performance of cement companies in Kenya. According to the outcome of the Principal Component Analysis, seven principal components were extracted for supply chain management. Observation indicated that the seven supplier selection practices account for 84.55% of the total standard variances implying that the seven supply chain management practices have the greatest impact on the organizational performance of cement companies in Kenya. According to Barasa (2016) supply chain management practices that include; supply chain collaboration practice, Green supply chain management practice, information sharing practice and Customer relationship management practice statistically significantly predicted the

performance of Steel manufacturing companies in Kenya. Mwilu (2013) indicates that supply chain management practices like logistics, lean suppliers and information technology had a strong statistically significant relationship with performance. In addition, green supply chain practices, long term supplier relationships and outsourcing were found to have weak relationships which were not statistically significant.

1.1.4 Supply chain management within Government Ministries in Kenya

The term “Public Procurement” refers to the purchase by governments and state-owned enterprises of goods, services and works. The public procurement process is the sequence of activities which start with the assessment of needs, and this is followed by the award of contracts, contract management processes, and finally payment (OECD, 2015). The government, the general public and private suppliers thus all have a direct interest in public procurement.

Supply chain management within government ministries in Kenya is geared towards improved performance. Fawcett and Magnan (2008) defined performance as the total system’s capability to meet end to end customer requirements through availability of product and observance of timeliness in delivery.

The Public Procurement System in Kenya has evolved from a crude system with no regulations to a legally regulated procurement system in line with International Standards. The evolution was through a system regulated by Treasury Circulars in the 1970s, 80s and 90s and further to an orderly legally regulated procurement system under the Exchequer and Audit (Public Procurement) Regulations. Efforts made as part of the overall Public Finance Reform, a result of the implementation of this reform agenda a Public Procurement and Disposal Act was approved by parliament in 2005. In December 2015, the PPDA, 2005 was repealed and the Public Procurement and Asset Disposal Act, 2015 came into effect on 7th January, 2016.

A number of studies have been carried out in various sectors on supply chain management practices and performance in Kenya indicating the level of importance of SCMP on overall performance. The Kenyan government ministries have incurred

losses in public expenditure due to lack of implementation of good supply chain management practices and enforcement of procurement legal framework which include; Public Procurement and Asset Disposal Act, 2015 (PPADA); Public Procurement and Disposal Regulations, 2006 and the Supplies Practitioners Management Act, 2007 the Ministry of Youth kazi kwa vijana Program lost over Ksh 100millions. Kenyan government ministries loose over 5 billion annually as a result of absence of good procurement practices. During the financial year 2014/2015, a number of Ministries, Department and Commissions had funds incurred expenditure totaling Ksh 14, 435, 690, 489 of which value for money could not be established which amounts to wastages. Much of the wastages occurred in the course of procurement (Auditor General Report, Financial Year 2014/2015).

Aura (2017) conducted a study on supply chain practices, reforms and performance in the Kenya National government ministries. The study identified tendering and the use of IT as the most common supply chain practices in ministries, the study also established that ministries are yet to adopt some practices such as supplier base reduction and outsourcing due to institutional and staff capacity, the study also cited e-government as most adopted supply chain reform. In another related study Kimantira (2014) carried out a study on supply chain management practices and competitiveness in the National government of Kenya; A case study of Ruiru sub-county. The study revealed that SCMP influenced competitiveness in the national government ministries, the study also found that the most important SCMP used as; planning and control, strategic partnership reverse logistic and strategic outsourcing.

Past studies has assessed various supply chain management practices and performance both in the public and private sector and left a knowledge gap on the influence of organizational culture as a moderating factor on the SCMPs that have not been exhaustively researched like; supplier selection, supplier collaboration, supply chain policy, supplier risk management and establishing the extent to which they influence performance.

1.2 Statement of the Problem

Supply chain management is one of the key mechanisms enabling government to implement policy. Governments are the largest consumers in an economy, on average the public sector spends 45% to 65% of their budgets and 13% to 17% of their GDP on procurement (IISD, 2007). Supply chain management in Kenya government ministries, is characterized by increased costs, untimely service delivery, delay in procurement of goods, works and services, poor quality goods and there is corruption and waste. During the financial year 2014/2015, a number of Ministries, Department and Commissions had funds incurred expenditure totaling Ksh 14, 435, 690, 489 of which value for money could not be established which amounts to wastages. Much of the wastages occurred in the course of procurement (Auditor General Report, Financial Year 2014/2015).

The inefficiency in supply chain management, particularly in the procurement phase of the chain attributed to supply chain practices has contributed to inequality in the Kenyan economy. In an effort to achieve equality, the Kenyan government vide legal notice No. 114 of 2013 reserved 30% of all procurement budget to Youth Women and Persons with Disability (YWPD). Despite that, in the government ministries, there have been a low uptake of the reserved budget which led to the inclusion of sensitization for the YWPD on the 12th cycle performance contracting guidelines to increase the uptake.

In addition, the government waste a lot of man hour and finances on disposal of obsolete and unserviceable stores that are associated with poor supply chain management practices, contributing to the increase in the recurrent expenditure which led to issuance of Treasury circular No. 20/2015 on austerity measures to cut down on expenditure.

Mwale (2014) carried out a study on supply chain management practices and organizational performance of large manufacturing firms in Nairobi which was limited to private sector. In another related study, Aura (2017) conducted a study on supply chain practices, reforms and performance in the Kenyan national government ministries, The study addressed various constructs like; outsourcing, lean supplier

base reduction, inventory control and information technology with reforms as a moderating variable looking at e-government, and service delivery charter and left out a major knowledge gap on other supply chain management practices like; Supplier selection, Supply chain collaboration, supply chain policies, supply chain risk management and organizational culture as a moderating variable. In another related study, Mwilu (2013) carried out a study on supply chain management practices and performance among public research institutions, this study was also skewed to public research institutions.

It is against this background that this study was undertaken to examine the influence of supply chain management practices, on performance of government ministries in Kenya.

1.3 Objectives of the Study

1.3.1 General Objectives

The main objective of this study was to examine the influence of supply chain management practices on performance of government ministries in Kenya.

1.3.2 Specific Objective

The specific objectives were;

1. To establish the influence of supplier selection practices on performance of government ministries in Kenya.
2. To evaluate the influence of supply chain policies on performance of government ministries in Kenya.
3. To assess the influence of supplier collaboration practices on performance of government ministries in Kenya.
4. To establish the influence of risk management practices on performance of government ministries in Kenya.
5. To establish the moderating effect of organizational culture on the relationship between supply chain management practices and performance of government ministries in Kenya.

1.4 Research Hypothesis

In line with the research objectives, the following hypotheses were formulated for testing:

H₀₁: Supplier selection practices have no influence on performance of government ministries in Kenya.

H₀₂: Supply chain policies have no influence on performance of government ministries in Kenya.

H₀₃: Supplier collaboration practices have no influence on performance of government ministries in Kenya.

H₀₄: Supplier risk management practices have no influence on performance of government ministries in Kenya.

H₀₅: Organizational culture do not moderate the influence of supply chain management practices on performance of government ministries in Kenya

1.5 Significance of the study

For true development to take place, strategy formulation and implementation need to extend along an organization's supply chain Green et al. (1996) for improved performance.

The study may help the Kenyan government to holistically understand the influence of supply chain management practices in all the government ministries and come up with relevant policies, laws and regulations that are based on empirical evidence. Further the government may also be able to understand the impact of various supply chain management practices on performance

1.5.1 To Government Ministries

The study is of benefit to the government ministries and departments as they can draw from the findings to understand the influence of supply chain management practices in their respective ministries for purposes of coming up with better strategies to help improve on their level of compliance hence improved performance.

1.5.2 Regulatory Authorities

The study is of great significance to the regulatory organs like National Environmental Management Authority (NEMA) and the Public Procurement Regulatory Authority (PPRA) as it will enable them understand the level of compliance in various government institutions and chart the way forward based on the research findings.

1.5.3 The research community

The study adds knowledge on supply chain management practices and open up more gaps for research hence those in the academic realm interested in conducting further research in this area will have more materials for references.

1.5.4 The general public

The study may benefit the general public since an in depth understanding of the influence of supply chain management practices may enable the government to come up with better strategies and relevant policies and laws that may improve on compliance, cost reduction and social concerns hence economic growth which may have a positive effect on the standard of living of all Kenyans.

1.6 Scope of the study

This study focused on the influence of four supply chain management practices (supplier selection practices, supply chain policies, supplier collaboration practices and risk management practices) on the performance of government ministries in Kenya. Further, moderating effect of organizational culture on perceived influence

was examined. The study was undertaken in the year 2016 and 2017 in 20 government ministries in the Republic of Kenya at their head offices located in Nairobi. The target population was drawn from the department of Directorate of Public Procurement under the National Treasury which has the mandate to regulate supply chain management activities in the country in addition to advising on personnel establishment of procurement staff and handling of inter-ministerial postings of supply chain management personnel. The National treasury circular No. 15 of 2016 states that the total population of supply chain Management officers in both the National and county government is 1372 (The National Treasury, 2016).

1.7 Study Limitations

The study has its own limitations, among them, the study adopted cross-sectional survey which could not enable examination of performance prior to and after implementation of supply chain management practices at different time periods which could provide insights into the requirement of the pertinent items. Future research could consider the use of longitudinal research design to examine the development of performance for longer period of time to show trends or changes.

The fact that the study was being carried out in the government ministries, the response of the respondents limited the study results particularly the freedom which the respondents felt in disclosing their opinions about supply chain management practices in their ministries that they may be reprimanded as thinking that they may be reprimanded as they are not allowed to divulge any government information to the public unless it's done through public relations officer.

The study used quantitative methodology much more than qualitative hence more restrictive to the respondents. To provide wider perspective to the study, future research could consider application of more qualitative methodology of data collected.

The study targeted government ministries in Kenya. With respect to this, evidence is limited to government operations and generalization may not be possible especially when accounting for applicability of the findings in other sectors of the economy. Future studies can expand their scope to test the methodology and objectives of this study within the context of other sectorial setting hence further research could enhance the generalizability of the present results. The study could also consider an extended scope to include different countries and new situations hence the results can be generalize

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter reviewed the theoretical and empirical literature from other researchers on supply chain management practices, organizational culture and performance of Kenyan government ministries. It also covered the conceptual framework assessing the relationships of the independent and dependent variables and carrying out a critical review of the literatures and finally establishing the research gaps.

2.2 Theoretical framework

A Theory is a set of statements or principles devised to explain a group of facts or phenomena especially one that has been repeatedly tested or is widely accepted and can be used to make predictions about natural phenomena. Theories are analytical tools for understanding, explaining, and making predictions about a given subject matter. A formal theory is syntactic in nature and is only meaningful when given a semantic component by applying it to some content. This study was anchored on three theories, namely; resource-based theory, coordination theory and systems theory.

2.2.1 Resource-Based View Theory

The main theoretical foundation employed to build the proposed framework following a detail review of several literatures on theoretical perspective framework is the resource-based view (RBV) of firm. The RBV of firm theorizes that unique bundle of resources owned by firms is expected to explain the variation in firm performances which includes the firm's capabilities. These resources include the SCM capability, i.e. SCMP and supply chain integration capabilities (Blome et al., 2014; Sari, 2008; Trkman et al., 2007). In this study, similar to the RBV definition of capability, SCMP are viewed as the firms' ability or potential ability to form strategic supplier partnership (SSP), establish supply chain collaboration and ability to share information, vision, goals, implement supply chain policies, manage risk and

select quality suppliers for competitive advantage. Additionally, Supply chain collaboration could be regarded as a strategic resource or a capability which is unique, valuable and hard to replicate, thereby providing competitive advantage (Fawcett et al., 2011; Hartmann & De Grahl, 2011; Gold et al., 2010).

A firm's ability to create a competitive advantage depends in part on its ability to effectively manage sourcing decisions. This in turn implies the need to select suppliers based on their ability to support value creation efforts, manage risk and implement policies. At the core of this is the ability of suppliers to not only meet buyer needs in terms of product and performance, but also alignment of the goals and objectives of both parties. Gillis, Combs and Ketchen (2014) emphasizes the distinction between capabilities and resources by defining capabilities as a special type of resource, specifically an organizationally embedded non-transferable firm-specific resource whose purpose is to improve the productivity of the other resources possessed by the firm. Resources are stocks of available factors that are owned or controlled by the organization, and capabilities are an organization's capacity to deploy resources. Essentially, it is the bundling of the resources that builds capabilities. Resource based view theory suggests that a firm's resources are the key determinants of its performance and this significantly contributes to service delivery. Resources include organizational processes, assets, information and knowledge as well as attributes that help the organization to develop and implement strategies to improve its efficiency, effectiveness, image, awareness and quality of services or products. If utilized appropriately, these resources help an organization to improve its performance.

According to Chae et al. (2014) the competitiveness of any organization is based on the resources it masters to develop core competencies through increasing the level of integration, collaboration and information sharing. Communication, and relationship management among the members of a supply chain has become a necessity for improving the effectiveness of supply chains. Such cooperative behaviors of firms provide rapid access to the required information, more sensitivity towards the needs of the customers, and faster response times than the competitors. Kotzab et al. (2015) show a relationship between supply chain management practices and performance

improvement. Kirchoff, Tate and Mollenkopf (2016) show that the impact of supply chain management practices on performance is not as visible in smaller companies as in larger ones.

This study conceptualizes SCMP as the supply chain capability to include the study constructs mentioned in the proposed framework. Furthermore, these capabilities do not only link the firm's internal operations but also the firm and its suppliers and customers that are important to utilize the resources effectively and efficiently (Blome et al., 2014). As such, organizations embarking on supply chain need to focus on the ability of organizational skills and processes in practicing those elements of SCMP. Thus, organizations that implement SCMP could improve its performance and eventually achieve competitive advantage. Recent studies using RBV in the context of SCM include (Gligor & Holcomb, 2014; Hwang & Min, 2015; Jin & Edmunds, 2015 ;). These studies, provide interesting accounts on the use of RBV in the context of supply chain practices, and performance. Therefore, the RBV is considered the main lens in this research that focusses mainly on SCMP as the main capabilities of firms.

2.2.2 Coordination theory

Coordination theory states that dependencies exist among activities and need to be managed properly. The theory has been used to analyze inter-organizational dependencies, coordination of product information in the supply chain and bundling of digitized logistics activities (Haozhe, Daugherty & Landry, 2009). Organizational practices such as supply chain risk management and collaboration are coordinated through the networks of communications and relationships that exist among organizational actors, and the strength of those networks predicts superior performance (Ossowski & Omicini, 2002). In the 1990s, supply chain management grew out of the recognition that increased reliance on improved relationships, collaborations, and information exchange with supply chain partners. Both internal and external organizational changes are required for successful supply chain management. Greater cooperation and coordination across the supply chain, both

intra- and inter-organizational, through long-term and strategic relationships have led to improved financial and organizational performance.

According to Govindan, Popiuc and Diabat (2013), inadequate investigation of internal and external coordinating mechanisms collectively amongst organizational and inter-organizational networks has been studied. External cooperation amongst organizations may not provide significant performance improvements nor be successful without proper internal cooperation. It has been found that manufacturers with well-developed internal and external interfaces perform better than their counterparts only with sound internal interfaces (Hunt & Davis, 2012). SCMP is typically an outcome of the interaction between a firm and various outside entities. Supplier and customer involvement, integration, and collaboration are important routes to performance improvements in organizations.

The government ministries employ various approaches to exploit the available resources, the government carry out inter – ministerial transfers of human resource after analyzing the core competencies of individuals within a period of three years to facilitate appropriate deployment of resources. Further, the government has a policy on direct procurement of service from various government institutions that provides services required by other government ministries. It also promotes greater cooperation and coordination across supply chain both intra and inter-organizations through long term and strategic relationships leading to improved performance.

2.2.3 Systems Theory

General System Theory (GST) was originally founded by Hungarian biologist Ludwig von Bertalanffy in 1972 (Von Bertalanffy, 1972). From a biological perspective, the theory considers an organism as an integrated system of interdependent structures and functions. From a sociological perspective, system theory is the trans-disciplinary approach of an organization. A sociological system comprises of four things, namely; objects, attributes, internal relationships among objects and environment (Kast & Rosenzweig, 2011). According to Zenko et al. (2013), objects are considered to be parts, elements, or variables within the system. Attributes are the properties, characteristics of qualities of a system and its objects.

Every system has internal relationships that exist among its objects. In addition, a system exists in an environment (Zenko et al., 2013). A system is a set of objects of things that influence one another within an environment and form a larger pattern that is different from any of the parts (Puche et al., 2016). A system can also be considered as a collection of entities that act together to perform a specific purpose. A system is separated from its environment by a boundary, which separates what is in the system and what is not.

A system can either be open or closed. An open system can interact with its environment and it is characterized by exchanges of matter and information with the external environment. In other words, organizations like government ministries are open systems that interact regularly with external forces such as other government agencies, customers and suppliers. On the contrary, in a closed system there is no exchange of information and matter with the external environment (Hongwei, Huixin & Jian-bo, 2009).

The open system theory focuses on the relationships between various departments and people in an organization as well as the relationship between the organization and its external environment. In applying the concept open system theory, Kast and Rosenzweig (2011) indicate that an organization is a system built by an energetic input-output, where the energy coming from the output reactivates the system. Another part of the open system concept focuses on the impact of changes within an organization. The changes in one part of the organization affect all other parts of the organization. The main function of an organization management is to act as a boundary-linking pin among the various subsystems within the organizational system (Kast & Rosenzweig, 2011).

Government ministries can be considered as systems that comprise of stakeholders like the general public (customers) and regulatory authorities. Each government ministry has various departments whose functions depend on each other (Caddy & Helou, 2007). Therefore, the performance of a government ministry does not depend on only one department but on the combine effort of all departments. For instance, the accounts department or the administrative department depends significantly on

the supply chain department for material and equipment's. In addition, government ministries interact significantly with suppliers and hence the importance of supplier collaboration practices. However, the acquisition of materials or service through suppliers necessitate risk management, and performance monitoring which are guided by procurement policies like the Public Procurement and Disposal Act, 2005 and Public Procurement and Asset Disposal Act, 2015 among others.

2.3 Conceptual framework

This study sought to investigate on the influence of supply chain management practices on performance of the government ministries in Kenya. The independent variables were supplier selection practices, supply chain policies, supplier collaboration practices and supply chain risk management practices. The dependent variable was the performance of the government ministries in Kenya.

The conceptual framework was adapted from; Micheli et al. (2008); Girubha et al. (2016); Mohamood et al. (2014); Tiryakioglu and yulek (2015); Bhatti (2016); Winter & Knemeyer. (2013); Li and Barnes (2008); Tummala and Schoenherr (2011); Padkil and Leonard (2015); Adams et al. (2014); Abdallah and Alnamri (2015) which assisted in the tabulation of operationalization of study variables as attached in Appendix III.

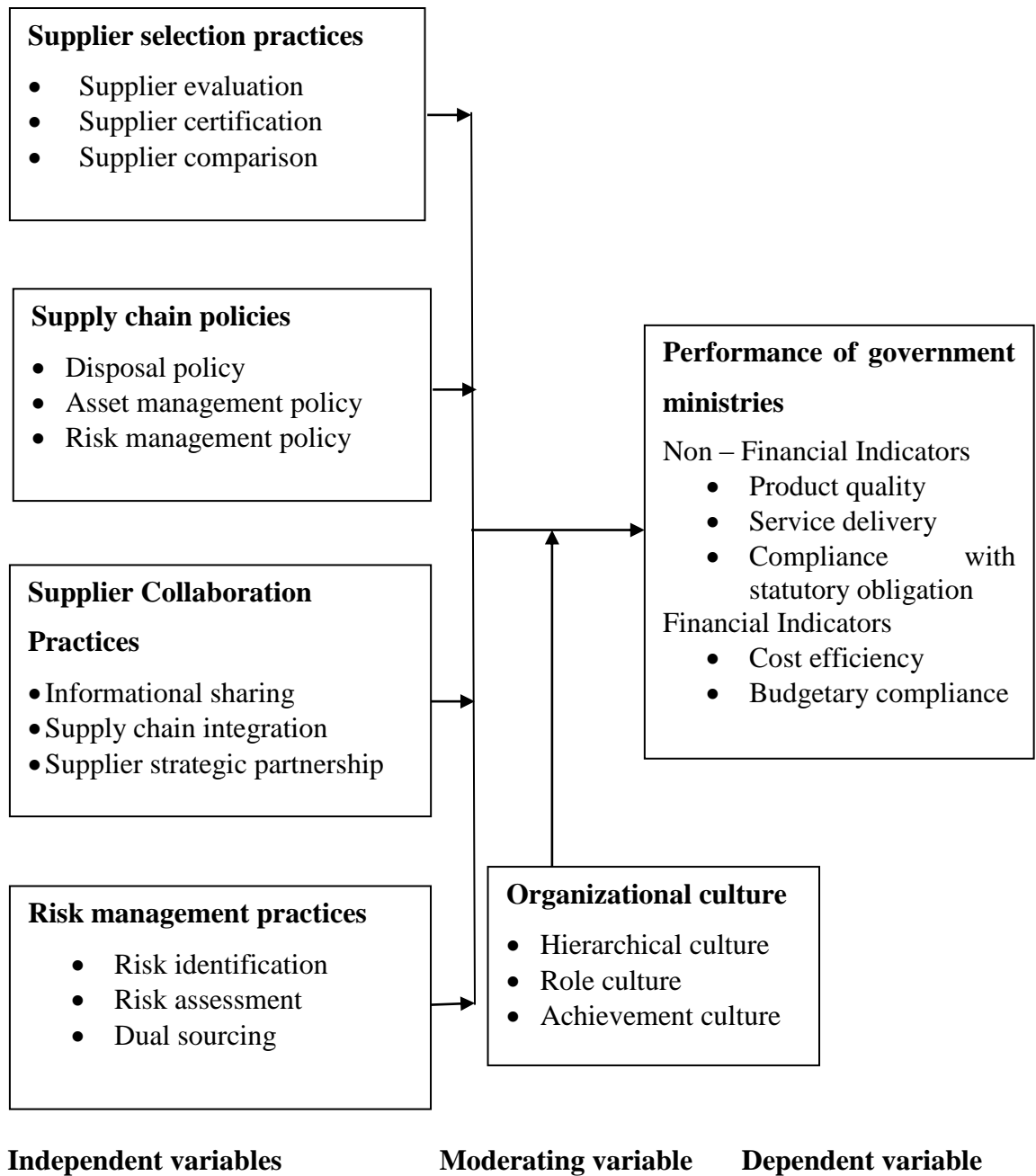


Figure 2.1: Conceptual Framework

2.4 Empirical Review

2.4.1 Supplier selection practices

Supplier selection is a crucial process that addresses how organizations select strategic suppliers to enhance their competitive advantage. Over the years, the supplier selection process has grown more complex as it not only considers price but also series of quantitative and qualitative factors considered as important for firms' survival and growth in future (Ho et al., 2010). An increasing dependence on suppliers leads companies to be even more exposed to uncertain events, which is why the supplier selection has become one of the most important issues for purchasing managers (Ronchi, 2003; Hsu et al., 2006). As management become more reliant on their strategic suppliers, it is important that supply managers select the right suppliers. The difficulty they face is that despite the extensive literature on supplier selection, there is no consensus regarding which selection criteria are the most important. According to Hsu et al. (2006) there is lack of consensus in providing definitive guidance to supply managers involved in strategic purchasing. As a result, supply managers often resort to establishing a set of criteria to evaluate and compare potential sources each time a purchase situation arises. This makes supplier selection context specific and makes it difficult to standardize selection processes. In addition, it means there is wasted effort when the process is repeated for each purchase occurrence. The lack of commonality also hinders the development of frameworks to guide practitioners, while the absence of reliable and valid measurements makes it difficult to directly compare different research studies (Kannan & Tan, 2002).

Manufacturers can effectively achieve the four dimensions of customer satisfaction like, delivery service, competitive pricing, product quality and product variety by proper and accurate evaluation and selection of suppliers and managing their involvement in the supply chain Humphreys et al. (2003) argued that to strengthen competitiveness of the purchasing company, a firm should select economically, environmentally and socially responsible suppliers.

Hsu et al. (2006) conducted a study to develop and test a reliable and valid supplier selection measurement scale that can be applied in different geographic regions, namely, the USA and Europe. The researcher developed a three-factor supplier selection measure via extensive literature review and practitioner interviews. Psychometric properties of the survey instrument were evaluated using data from the ISM-US sample via exploratory factor analysis. Based on the results, the survey instrument was modified and the revised instrument was mailed to a larger sampling group (APICS-US & APICS-Europe). Confirmatory factor analysis was used to validate the proposed three-factor supplier selection construct and to test its validity across national boundaries. The study demonstrated that underlying the documented supplier selection criteria is the need to assess a supplier's quality and service capabilities as well as its strategic and managerial alignment with the buyer.

This study theorizes that supplier quality is an important facet of supplier selection. In accordance with Micheli (2008) seven observed indicators of a supplier quality focus were identified; supplier testing capability, scope of resources, technical expertise, industry knowledge, commitment to quality, supplier's process capability, and commitment to continuous improvement in product and process. The study also highlighted the importance of a supplier being able to meet buyer needs. Moreover, in a partnership environment, the price of key materials and services are often negotiated and is only one of several factors affecting supplier selection. Total cost of ownership that considers other aspects of acquisition and service delivery is a more appropriate selection criterion. Five indicators are used to measure supplier service; supplier ability to meet delivery due dates, the price of materials, parts and services, flexible contract terms and conditions, geographical proximity, and reserve capacity or the ability to respond to unexpected demand. Given the focus of the study on strategically important suppliers, strategic/management fit is of particular relevance. Eight observed indicators were used to measure the strategic/management fit between buyer and supplier; the extent to which the supplier is open to site evaluation, supplier references and reputation, the supplier's financial stability and staying power, honest and frequent communications between buyer and supplier, the cultural match between the firms, past and current relationships with the supplier, the

strategic importance of the supplier, and the supplier's willingness to share confidential information.

Kellner and Lasch (2016) carried out a study on integrating sustainability into strategic supplier portfolio selection with a view of proposing a comprehensive methodology and a problem specific model for the configuration of the optimal strategic supplier portfolio in terms of traditional, performance-related objectives and sustainability targets. In the methodology, the study applied a hybrid model of the analytic network process (ANP) and goal programming (GP). The model meets all requirements for integrating three-dimensional sustainability into strategic supplier selection. The ANP allows for the identification of the suppliers' sustainability priorities on the basis of multiple economic, environmental, and social decision criteria and their interrelationships. GP supports the determination of the optimal supplier portfolio if dual or multiple sourcing decisions are pursued and by taking the supplier sustainability priorities, performance-related targets, resource constraints, and the corporate strategy into account. Portfolio management in the selection phase means selecting a set of suppliers that have different characteristics and competencies and that serve the purchasing company in a specific way. Supplier characteristics involve aspects such as supplier financial stability Wagner and Bode (2006) or supplier location (Rosič & Jammerneegg, 2013; Sawik, 2014). Supplier competencies are related to issues such as technological competencies (Wynstra & Pierick, 2000). From a sustainability perspective, further characteristics and competencies related to the economic, environmental, and social dimensions of sustainability should be considered and balanced.

The model reflects an innovative strategy (IS). If a Proactive Strategy (PS) is pursued, the development partnership constraint is deleted. If a Reactive Strategy (RS) is to be implemented, a focus is set on traditional targets by removing the sustainability constraints and by adapting the objective function accordingly. If an IS or a PS is pursued, all requirements are satisfied. In contrast, if an RS is implemented, none of the requirements that are directly related to sustainability (three-dimensional sustainability, qualitative criteria, interrelationships, group decision making, and time horizon) are met. For this reason, the researcher concludes

that companies should at least pursue a PS. If, nevertheless, an RS is implemented, results should be used as a basis for the improvement of the supplier sustainability values during the supplier development phase. An overview of the entire decision process is provided

By enabling the integration of sustainability targets into strategic supplier portfolio configuration, the research findings revealed that hybrid ANP-GP model contributes to research in the area of supply chain management. Results indicate that simplifying the model by omitting one or more details may lead to unfortunate actions.

Ageron et al. (2013) conducted exploratory research with a focus to examine and evaluate the importance of IS/IT criterion in the suppliers selection process. The paper attempts to assess if there is superior supply chain performance arising from the integration of this criterion and to determine difficulties companies face resulting from this deployment. In the study, the author reviewed previous literature on supplier selection and designed a structured questionnaire for their data collection. Data were collected from 90 French companies and subsequently analyzed to understand the IS/IT criterion used for supplier selection along the upstream value chain. In the findings, it was established that IT/IS is a significant supplier selection criterion within supply chain context because of the rapid proliferation of information sharing across upstream chains.

Nevertheless, the literature reviewed highlighted that traditional criteria remain the most studied: 68 articles are related to quality, 64 concerned delivery and 63 questioned the price criterion. Even if more recently, several scholars (Chan, 2003; Chan et al., 2007) suggested that other criteria, such as technology, risk, quality and flexibility have to be studied, Ho et al. (2010) highlighted that these criteria were relatively unstudied. In this regard, only 25 articles deal with technology topic whereas the use of IS/IT have been frequently associated with significant supply chain efficiency improvements (Gunasekaran & Ngai, 2004; Boone & Ganeshan, 2007). For example, Schneider or Hewlett Packard which emphasized the importance of use of intra- or inter-organizational information systems (IOIS) in their relationships with their supply chain partners, have implemented or are in the process

of implementing information technology/information systems (IT/IS) to sustain an integrative supply chain. Because improvements in SCM cannot be only achieved within the organization but also outside with upstream and downstream partners, companies have to manage their suppliers in terms of IT/IS application.

Micheli (2008) carried out a study on a decision-maker-centered supplier selection approach for critical supplies, with an aim of investigating the supplier selection issue as a way to mitigate the overall supply risk, through the proposition of a new approach which is as practical as a total cost of ownership approach and, at the same time, a real support for the supplier selection as a decision making issue, rather than an additional constraint for the decision maker. The design developed in the study was a risk efficiency-based supplier selection (REBaSS) approach for critical supplies that allows a decision maker to consider the procurement-related “risk” and “investment” for mitigation/exploitation interventions. The research finding portrayed a present total cost profile (PTCP) related to every supplier to be assessed, as a function of the possible investments that can be made to exploit the upside and to mitigate the downside supply risks. A criterion to prioritize interventions was provided, in order to unambiguously portray the PTCP. Guidelines for the PTCP comparison by a decision maker were also proposed.

According to Chapman and Ward (2003) a risk efficiency based supplier selection (REBaSS) approach starts from the TCO approach and overcomes its weaknesses. It allows the decision maker to take risks and to make, whenever possible, risk-efficient decisions, the REBaSS approach is composed of two subsequent phases: supplier evaluation, which gives as an output an assessment of every potential supplier, and comparison, which aims at comparing the assessed potential suppliers in order to rank them and to select the most appropriate one. As far as the evaluation phase is concerned, a cost profile of the potential supplier is provided instead of a single value, which clearly shows the effect of the mitigation/exploitation interventions, with regard to every potential supplier separately. As far as the comparison phase is concerned, the decision maker can compare the cost profiles that give him/her information about the variability of the total cost, besides the single value of the

TCO, related to every possible intervention that can be performed to exploit the upside and to mitigate the downside supply risks.

The expected outcome of the supplier evaluation process is a present total cost profile (PTCP) for every potential supplier, which gives guidelines about the present total cost variability due to the possible mitigation/exploitation interventions. Once the PTCPs of the potential suppliers have been portrayed, the comparison phase aims at comparing the PTCPs in order to rank them and to select the most appropriate one

Girubha et al. (2016) conducted a study on the application of interpretative structural modelling (ISM) integrated with multi-criteria decision-making (MCDM) techniques for enabling the sustainability supplier selection. The researcher adopted two approaches of hybrid MCDM methods, and the selection of supplier was based on the comparative results obtained from both the methods. The first hybrid approach is ISM – analytic network process (ANP) – Eliminations and Et Choice Translating REality (ELECTRE II) and the second hybrid approach is ISM – ANP – Vlse Kriterijumska Optimizacija Kompromisno Resenje (VIKOR). ISM was used to identify the inter relationship between the criteria. Inter-relationship of criteria obtained from ISM will serve as an input for ANP. The weights obtained from ANP were used in ELECTRE II and VIKOR. ELECTRE II as an outranking method, whereas VIKOR was a compromise ranking method; comparison of both the methods were carried out in the study. If the objective is to select a traditional supplier, criteria, namely: delivery, attitude, responsiveness, currency risk, financial capability, etc., should be considered.

Bai and Sakaris (2014) conducted a study to introduce a methodology to identify key performance indicators for supply chain (KPI) that can then be used for sustainability performance evaluation for suppliers. The researcher first discussed the complexity of supply chain performance measurement. Then, a two-stage method utilizing neighborhood rough set theory was used to identify KPI and data envelopment analysis (DEA) to benchmark and evaluate relative performance using the KPI. Additional analysis was performed to determine the sensitivity of the KPI set formation and performance results. The researcher also used the supply chain

operations reference (SCOR) model which categorizes the processes of five supply chain stages including plan, source, make, deliver and return. The research focused on the source function due to a focus on suppliers. The performance measures within SCOR are categorized on cost, time, quality, flexibility and innovation dimensions.

The results show that KPI can be determined using neighborhood rough set, and DEA performance results provided insight into relative performance of suppliers. The researcher concluded that supply chain performance results from both the neighborhood rough set and DEA can be quite sensitive parameters selected and KPI sets that were determined.

2.4.2 Supply Chain Policies

A procurement policy is the rules and regulations that are set in place to govern the process of acquiring goods and services needed by an organization to function efficiently. The exact process sought to minimize expenses associated with the purchase of those goods and services by using such strategies as volume purchasing, the establishment of a set roster of vendors, and establishing reorder protocols that help to keep inventories low without jeopardizing the function of the operation (Caddy & Helou, 2007).

Both small and large companies as well as non-profit organizations regularly design and apply procurement policies to guide on procurement matters. Procurement policies are thus a set of rules and regulations that are designed by organizations to govern on application of various procurement procedures (Bartik, 2009).

Mahmood et al. (2014) conducted a study, to explore and compare the asset management policies and practices of six Australian states – New South Wales, Victoria, Queensland, South Australia, Western Australia and Tasmania – to improve understanding of the policy context to best shape policy focus and guidelines. The study established that the Total Asset Management (TAM) guidelines cover demand management, whole-of-life asset management, risk management, value management and cross-agency coordination in service planning and delivery.

This was a comparative study based on the thematic mapping technique using the Leximancer software. In terms of asset management, key life-cycle stages, a greater focus on planning was evident in New South Wales, Victoria and South Australia and on operation and maintenance in New South Wales and Victoria. Based on the analysis, it is clear that only New South Wales has a strong focus on all life-cycle stages of asset management, except the disposal stage. The design and disposal concept was addressed in New South Wales, but the connectedness was not as strong as other life-cycle stages of assets. As integrated asset management is based on the actions and decisions across the entire asset life-cycle, it is imperative to have a set of policies and guidelines on each life-cycle stage with equal focus

The research findings concluded that Asset management policies and guidelines of New South Wales and Victoria have more interconnected themes as compared to other states in Australia. Moreover, based on the findings, New South Wales has covered most of the key concepts in relation to asset management; the remaining five states are yet to develop a comprehensive and integrated approach to asset management policies and guidelines.

The researcher established that changing and more complex operating environment also demands a shift away from managing assets in the short term through individual agencies/organizations toward a more integrated or collective and multidisciplinary approach involving the whole-of-life-cycle approach across multiple agencies/organizations. This service delivery approach is ideally achieved through a whole-of-government model, comprising policies, plans, service delivery strategies and standards and capital and recurrent budgets, in which public-, private- and community-sector organizations work together in partnership. Such an integrated approach allows for greater consistency of knowledge exchange across boundaries.

Faulkner et al. (2005) carried an updated survey of environmental policy and practice among UK organizations. To draw conclusions about the relationship between environmental concerns and organizational strategy making. The research was a survey carried out from 1999 of 911 UK Organizations, updated by interviews conducted with participant organizations in 2004. It represents an extension of a ten-

year longitudinal study of environmental policy and practice in UK organizations. In the findings, it was established that the gap between policy formulation and implementation in the environmental area continued to narrow, but environmental concerns appear not to have moved towards the Centre of the strategy making process in many firms. Organizations are still primarily influenced by short-term rather than long-term imperatives, and although recognition of opportunity offered by the environment is increasing, organizations are still liable to adopt a reactive position, increasingly so as the size of the organization decreases.

Ann et al. (2006) conducted a study to investigate the impact of EMS certification on the performance of firms, including economic and environmental aspects and perceived customer satisfaction. Montabon et al. (2000) in their survey of purchasing managers in the US, found strong evidence that certification impacts positively on performance, both environmental and economic by enhancing the reputation of the company, Improving the company's chances of selling products internationally, Waste reduction indicating that certification actually leads to environmental improvement and may eventually lead to increased profitability (Corbett & Kirsch, 2000). Increase customer satisfaction level and improving the company's competitive position. However, ISO 14001 certification has not significantly reduced lead times or reduced overall costs. The research findings revealed that ISO 14001 certification has very little impact on measures of performance. The respondents evaluated the impact of environmental management system on 14 dimensions of performance which focused on four strategic areas of competition like cost, lead time, market position, reputation and customer acceptance. Others dealt with issues of process/product design and cost/ benefit assessment.

Tiryakioğlu and Yülek (2015) carried out a selective literature survey of academic research and policy experience on public procurement policies utilized to foster technological development.

In the study, it was established that many countries are providing various forms of support to their SMEs. Some of these may be designated as public procurement policies to be taken up as instruments of industrial policy, since the traditional

coverage of industrial policy is construed as selection of sectors to be prioritized and supported. SMEs not only create new employment, but also play a role in innovation. Thus, policies supporting the SMEs can be construed as instruments of industrial policy. The policy measures in support of innovation public procurement are framework conditions, organizations and capabilities, identification specification and signaling of needs and incentivizing innovation solutions Yülek (2013) classifies the supports provided to the SMEs within the context of industrial policy into two groups as indirect and direct ones. Indirect supports includes, for instance, financial backing provided for innovation projects, while direct ones include public procurement policies. The latter would provide the SMEs direct access to the market to help facilitate the development of innovative products.

Nijaki and Warrel (2012) conducted a study, to demonstrate how local entities, such as cities and counties, can use environmentally preferable purchasing plans as a tool in developing the local green economy. First, the authors focus specifically on either the rise of economic development programs through buy-local efforts, or the focus on environmental sustainability through green procurement programs. Second, the authors discuss how locally driven, environmentally preferable purchasing could be used as a strategy to marry these goals together and utilize procurement as a tool to achieve green local economic development.

The research used qualitative methods to examine both procurement for economic development through the use of buy local campaigns, in addition to environmentally preferable procurement policies that have been used to bolster environmental quality in communities. Within a broader analytical framework, local government goals and values influence government purchasing processes through two broad goal areas: internally that is efficiency, maximum benefits, cost effectiveness and transparency or externally that is Equity, economy, and environment. Internal goals are focused on meeting the internal operational and logistical needs of the local government entities, whereas purchasing goals that consider the entities outside the local government are known as external goals

In the research findings it was established that green local economic development can be achieved by melding together procurement programs previously singularly focused on either economic development aims, or environmental preservation. It is found that procurement can be used as a viable tool in fostering both economic and environmental goals, and as a key policy and planning tool for sub-national governments in the pursuit of a green economy.

Flynn and Davis (2016) conducted a study to test the relationship between firms' experience of small- and medium-size enterprise (SME)-friendly policy and their participation and success in public procurement. The researcher tested the Hypothesized relationships between SME-friendly policy and three outcome variables – frequency of tendering, success rate in public contract competitions, and commercial orientation towards the public sector using survey data from 2,755 SME respondents. The SME-friendly policy was found to be significant in explaining success rates and commercial orientation towards the public sector marketplace and not significant in explaining frequency of tendering. Each of the three hypothesized relationships is tested using step-wise regression

Based on the research findings, while experience of SME-friendly policy is not linked with tendering frequency, it is linked with two other outcomes: success rates and commercial orientation towards the public sector. In respect of the first of these, the findings are consistent with the position that providing SMEs with maximum practical opportunity to compete increases their likelihood of success.

2.4.3 Supply chain collaboration Practices

Supply Chain Collaboration Involves coordinating activities between buyer and supplier so that both parties can improve the supply chain performance such as reducing cost, increasing service level, better utilising resources, and effectively responding to changes in the market place (Tsou, 2013).

Simatupang and Sridharan (2003) also defined Supply chain collaboration as two or more chain members working together to create a competitive advantage through sharing information, making joint decisions, and sharing benefits which result from greater profitability of satisfying end customer needs than acting alone.

Simatupang and Sridharan (2003) states that when two or more organizations in a supply chain work together to plan and execute supply chain activities jointly Collaboration in a supply chain occurs. Collaboration in firms occurs when the relationship is characterized by openness and trust, where risks, rewards and cost are shared (Sandberg, 2007). Trust in a supply chain is driven by perceptions of credibility and does not come into existence spontaneously. Supply chain performance is perceived to be improved through collaborative efforts of the partners, actions which lead to reduced inventory, reduced costs, improved customer service, improved forecasts and on time deliveries (Whipple & Russell 2007).

Soosay and Hyland (2015) conducted a systematic review of the literature on supply chain collaboration published over a 10-year period from 2005 to 2014. It explores the nature and extent of research undertaken to identify key themes emerging in the field and gaps that need to be addressed. The authors reviewed a sample of 207 articles from 69 journals, after using an iterative cycle of defining appropriate search keywords, searching the literature and conducting the analysis. The Key themes in the findings include the meaning of collaboration; considerations for supply chain collaboration theory; emerging areas in collaboration for sustainability, technology-enabled supply chains and humanitarian supply chains; and the need for a more holistic approach, multi-tier perspectives and research into B2C collaborations. Lehoux et al. (2010); Deakins et al. (2008); Sari (2008) stated that, the widespread developments in supply chain technologies, tools and applications such as traceability systems, Quick Response, Efficient Consumer Response, Collaborative Planning, Forecasting and Replenishment have assumed firms will engage in a collaborative approach to the implementation and use of technologies.

By taking this into consideration, Cao et al. (2010) derived a model for supply chain collaboration attributed to seven components (information sharing, goal congruence, decision synchronization, incentive alignment, resources sharing, collaborative communication and joint knowledge creation), which they term as mechanisms to reduce costs and risks. The study by Simatupang and Sridharan (2005) also proposes a model for the collaborative supply chain comprising five characteristics; collaborative performance system; information sharing; decision synchronization; incentive alignment; and integrated supply chain processes.

Vereecke and Muylle (2006) conducted a study to empirically test the relationship between supply chain (SC) collaboration and performance improvement. The researcher developed incorporating dimensions of supplier and customer collaboration and performance improvement. Factor analysis and linear statistical models for correlation and analysis of variance were used to test the hypotheses with IMSS 2001 data on 374 firms from the engineering/assembly industry across 11 European countries. In the study, weak empirical support was found for the hypothesized positive relationships between supplier (or customer) collaboration and performance improvement. There was partial empirical support for the impact of collaboration, both with suppliers and customers, on rates of improvement. For information exchange, performance improvement in respect of cost, flexibility, quality, and procurement was supported, whereas for structural collaboration, only improvement in respect of flexibility and procurement was supported. There was strong empirical support for the hypothesized higher levels of collaboration among companies showing higher performance improvement.

Barrat (2004) conducted a study on understanding the meaning of collaboration in supply chain. In the study, the author reviewed a number of literature on the elements of supply chain collaboration and their application and subsequent effect on business performance, some of the major elements supporting collaboration reviewed are; Collaborative culture where it was established that most of the corporate collaborative culture are not capable of supporting collaboration either externally or internally and according to Barrat and Geen (2001) functional thinking is rife and supported by organizational structures and performance measures that are aligned to

functional activities rather than supply chain processes; Information sharing, in the study, it was established that information, particularly the transparency and quality of information flows, plays an important part in many accounts of supply chain developments.

From both an internal and external view point, a culture of openness and honesty is needed and some of the key elements in terms of what has to happen if collaboration is to succeed are cross- functional activities, process alignment joint decision-making, true supply chain metrics, resource and commitment, intra-organizational support, corporate focus, demonstrating the business case and the role of technology.

Blome et al. (2014) carried out a study on Supply chain collaboration and sustainability analyzing the deviation from an optimal profile of supply chain collaboration and its detrimental effect on sustainability performance as well as market performance. Using data collected from 259 European manufacturing firms and advanced structural equation modeling approach, the authors empirically tested a number of direct, mediation, and moderation effects where they established that, an alignment between supply chain initiatives does pay off. Furthermore, the results show that the effects of alignment on performance measures are mediated by the firm's internal performance, the findings further indicates that it is necessary to consider supply-side and demand-side collaboration in supply chain matters as this will result in significant performance improvements.

Soita (2015) carried out a study in Kenya to establish the factors affecting supply chain collaborations in the public sector in Kenya and how the government and its citizen stands to gain if the said factors were dealt with. The author employed descriptive research design and found that there was a moderate level of collaboration among the ministries and various stakeholders with the highest being subcontracting partners, followed by that of suppliers, then outsourcing partners and finally customers. The study also found that there are 5 major extracted factors affecting supply chain collaboration in the Kenya Government Ministries which include legal framework, quality of personnel, compliance with SCM Policies, information technology and stakeholders involvement.

Winter et al. (2013) carried out a study exploring the integration of sustainability and supply chain management. The aim of the study was to provide a snapshot of the existing research and suggest potential opportunities for academic inquiry related to the concept of supply chain management. The researchers review the extant literature at the intersection of “sustainability” and “supply chain management”. The literature was categorized with the aid of a classification matrix derived from the literature in order to review the current state of thought development across three distinct disciplines (logistics/supply chain management, operations/production management and social/environmental management). The analysis suggested future research opportunities in the area. The findings indicated that the existing literature is primarily focused on individual sustainability and supply chain dimensions rather than taking a more integrated approach. In addition, the findings suggest both the emergence of a group of themes within an individual dimension, such as green logistics within the environmental dimension as well as a set of themes that are consistent across dimensions. The analysis establishes several areas of opportunity for future inquiry.

The GSCF framework identified key business processes: customer relationship management, supplier relationship management, customer service management, demand management, order fulfillment, manufacturing flow management, product development and commercialization, and returns management. Customer relationship management and supplier relationship management form the linkages in the supply chain. It is important to note, that each key business process has both strategic and operational sub-processes as well as its own objective in order to provide defined outcomes (Lambert, 2008).

Vieira and Mergulhao (2015) conducted a study to assess the effect of buyer-supplier collaboration on logistical performance. The study used descriptive research design and the use of Chi- square tests, correlational analysis, descriptive statistics, factorial analysis and regression analysis for data analysis. The research findings disclosed that elements of logistical collaboration (interpersonal tactical and strategic) exert positive influence in logistical performance (reliability transport and risk)

As Fawcett et al. (2012) advocate, the people issues are fundamental to successful collaboration but are difficult to predict and manage. Similarly, information is a critical resource to effective supply chain operations and management. However, it is unclear how far firms will go in terms of information sharing, given the trust levels, power dynamics and governance structures evident in supply chains. It is also recognised that firms very often participate in multiple supply chains. Evidently, they will have to become selective as to whom to collaborate with, and whom to cooperate with. This notion of being selective is critical in business practice, as there have been criticisms about “partnership” and “collaboration” being “one of the most inflated terms in modern business; and it is well known that you can truly partner with only a few” (Harrison et al., 2014).

Wee et al. (2016) conducted a review of supply chain collaboration practices for Small and Medium-sized Manufacturers the study assessed Information sharing as one of the constructs the study concluded that Small and medium size enterprises are encouraged to utilize information sharing on defining mutual objectives and associated performance measures and link their performance systems with incentive sharing scheme to compensate the partners fairly. The findings agreed with the concerns of Crook et al. (2008) who suggested that when independent firms collaborate and share knowledge with others, they can achieve the advantages beyond what could achieve in arm’s length exchange. However, organizations often alert of sharing sensitive information within the supply chain. They may concern about the leak of valuable information to their rivals such as demand forecasts, new technology acceptance and new products developments. Therefore, the collaborative supply chain relationship will be able to reduce the chance of information leak. In addition to information sharing the study also explored other constructs like; Joint decision making, Incentive sharing, Goal congruence and joint knowledge creation. Overall, the findings provide managerial insights for the small and medium size manufacturers in supply chain collaboration implementation owing to resource scarcity and the need to draw SCC in order to ensure a competitive advantage.

In another related study, Soita (2015) carried out a study to establish the factors affecting supply chain collaboration in the public sector in Kenya and how the government and its citizens stands to gain if the said factors were dealt with. The study found that there was a moderate level of collaboration among the ministries and various stakeholders with the highest being subcontracting partners followed by that of suppliers, then outsourcing partners and finally customers. The study was analyzed using descriptive statistics, multiple regression analysis, ANOVA and Factor analysis. Then study variables explored were; Legal framework, quality of personal, compliance with policies and information technology and stakeholder involvement.

2.4.4 Supply Chain Risk Management

Supply chain risk management (SCRM) is the implementation of strategies to manage both every day and exceptional risks along the supply chain based on continuous risk assessment with the objective of reducing vulnerability and ensuring continuity. Supply chain involve many risks, nevertheless, supply chain have proven instrumental in improving efficiency within many industries (Lucas et al., 2007). These risks can be product failure, disruption, regulatory risk, reputational risk, legal risk, supplier size, financial risk and competitive risk (Cucchiella & Gastaldi, 2006).

Wieland and Wallenburg (2012) carried out a study on dealing with supply chain risks with a view of providing clarity by empirically testing the assumption that SCRM helps supply chains to cope with vulnerabilities both proactively by supporting robustness and reactively by supporting agility. Both dimensions are assumed to have an influence on the supply chain's customer value and on business performance. The researcher collected survey data from 270 manufacturing companies for hypotheses testing via structural equation modeling. Additionally, qualitative data were collected to explore the nature of non-hypothesized findings. The study established that SCRM is important for agility and robustness of a company. The findings also revealed that both agility and robustness are important in improving performance.

Ning and Yeo (2006) argued that even though the supply risks can be reduced through improved processes and buffer strategies, organizations still need to take actions against unforeseen events because risk cannot be completely eliminated. Zsidisin and Ellram (2003) Identified a number of risk sources in order to give summary guidelines to identify and manage the uncertainty in the supply, which can be grouped into four main categories: product-related, market-related, supplier-related, and other sources. According to Zsidisin et al. (2004) a number of supply risk assessment techniques are available to prioritize the usage of resources necessary for the supply risk management process. Dual sourcing counts among the most often pursued strategies to reduce the supply risk (Zhu & Fu, 2013). However, to balance supply risks and efforts in supplier development, a dual sourcing strategy should be preferred. Methods aiming at the selection of one (the best) supplier are consequently not optimal for the present problem situation.

Roehrich et al. (2014) carried out a study with an aim of applying the logic of bounded rationality to corporate reputation management and explores how constraints posed by bounded rationality impact on firms' implementation of supply chain management practices (SCMPs). The study design was based on primary and secondary data from 12 UK based companies. The authors conducted 17 semi-structured interviews and analyzed the data through an inductive methodology. The findings revealed that, Reputational risk exposure is a central driver in a company's decision to implement SCM practices. However, managers face bounded rationality, in particular: conflicting priorities; capabilities and resources; commitment; and contextual setting, which in turn, means that companies do what they can to safeguard their reputation, but balance the extent to which they implement SCM and the cost of doing so against the likelihood of exposure. Discussion on sustainability in relation to risk management has emerged over the years. Still, risk management in regards to non-financial risk has not been properly articulated or defined and there exists a gap in academic research.

From a sustainability perspective, the main benefit in non-financial risk management is its ability to include a wider range of sustainability issues, environmental risks and social risks into the corporate boardroom than merely corporate environmental

management. Wong (2014) conducted a study highlighting the significance in developing non-financial risk management, emphasizing the need of managing environmental and social issues for enhancing corporate sustainability. Particularly, through discussing the implications of non-financial risk management, its benefits, opportunities and challenges. The researcher assessed the drawing on authoritative academic literature, reports of corporations' studies, articles and documents, by examining the development and implications of non-financial risk management.

The research finding revealed that environmental and social concerns are usually being deemed as intangible issues that need to be properly articulated and managed by an effective non-financial risk management system for enhancing corporate sustainability. Second, through different interpretations of sustainability, links could be drawn for highlighting the significance of non-financial risk management and corporate sustainability. Third, by explaining the impacts from non-financial risk management to improved development and profits, the article has illustrated corporate sustainability as a clear business case for any corporation. Fourth, challenges are also portrayed for the effective management of non-financial risk management by corporations.

Morhardt et al. (2002) further highlights the following reasons to explain the significance for corporations to engage in non-financial risk management as a vehicle to manage their environmental and social risks like compliance with regulatory requirements and proactive cost reduction of future, stricter regulations, compliance with industry environmental codes, especially in the case of sanctions for non-compliance, reduction of operating costs, promotion of stakeholder relations, the perceived environmental visibility of the firm, the notion that reporting on such issues can yield competitive advantages, The sense that with active environmental management lacking, the organizational legitimacy of the company is questionable, and the sense of the social responsibilities of doing business and desire to adhere to societal norms.

Li and Barnes (2008) carried out a study to identify proactive supply risk management methods which can be used to reduce or remove risk sources during the supplier selection process, in the context of Western based manufacturing companies that source from emerging markets. The researcher reviewed literature and conducted multiple-case study. In the research findings, it was established that, the experiences of five Western-based manufacturing companies suggested that applying the risk management process into supplier selection was particularly important and effective for supply risk reduction when sourcing from emerging markets. Supply risk sources must be identified and proactive supply risk management methods must be used to remove or reduce risk sources for effective supply risk management. The proactive risk management methods discovered in this research are: conducting a supplier questionnaire covering a wide range of business dimensions of the supplier; performing a technical review; negotiating a risk mitigation plan; employing local based procurement staff; using a total cost estimate; applying a strict part qualification process. Quality approvals, increasing dual sourcing level, developing strategic partnerships, providing technical and quality training.

Ritchie and Brindley (2007) conducted a study to examine the constructs underpinning risk management and explores its application in the supply chain context through the development of a framework. The study matched the constructs of performance and risk to provide new perspectives for researchers and practitioners. The study employed the conceptual and empirical work in the supply chain management field and other related fields to develop a conceptual framework of supply chain risk management (SCRM). Risk in the supply chain is explored in terms of risk/performance sources, drivers, consequences and management responses, including initial approaches to categorization.

The study developed a deeper understanding of the main constructs, further, development of the framework, exploring the main components in more depth providing scope for guiding organizations on the more appropriate strategies for given risk drivers emanating from different supply chain structures and contexts. Potential exists to improve the measurement of the risks and performance consequences in most settings to provide improved guidance to decision makers prior

to exercising their choices. In the research findings, a new framework is presented that helps to integrate the dimensions of risk and performance in supply chains and provide a categorization of risk drivers.

In the study literature Morhardt et al. (2002) further highlights the following reasons to explain the significance for corporations to engage in non-financial risk management as a vehicle to manage their environmental and social risks: compliance with regulatory requirements and proactive cost reduction of future, stricter regulations; compliance with industry environmental codes, especially in the case of sanctions for non-compliance; reduction of operating costs; promotion of stakeholder relations; the perceived environmental visibility of the firm; the notion that reporting on such issues can yield competitive advantages; the sense that with active environmental management lacking, the organizational legitimacy of the company is questionable; and the sense of the social responsibilities of doing business and desire to adhere to societal norms.

Tummala and Schoenherr (2011) conducted a study with an aim of proposing a comprehensive and coherent approach for managing risks in supply chains. The study developed a structured and ready-to-use approach for managers to assess and manage risks in supply chains.

In the research findings it was established that Supply chain risks can be managed more effectively when applying the Supply Chain Risk Management Process (SCRMP). The structured approach can be divided into the phases of risk identification, risk measurement and risk assessment; risk evaluation, and risk mitigation and contingency plans; and risk control and monitoring via data management systems. This impacts on the internal drivers like sourcing experience, sourcing situation, sourcing goals and external drivers such as emergence of new market changes in competitive environment, changes in regulatory framework and economic environment

2.4.5 Organizational Culture

Organizational culture is a system of shared assumptions, values, and beliefs, which governs how people behave in organizations it has a pervasive effect on an organization because it defines who its relevant employees, customers, suppliers, and competitors are, and how to interact with these key actors (Barney, 2012).

Nelson and Quick (2011) argued that cultures often function based on a structure of invisible, theoretical and emotional forms which enable workers to meet their physical and social needs. Besides increasing employee's commitment, organizational culture gives workers a sense of identity, reinforces work based values and serves as a control mechanism for work based ethics

Maina (2016) Carried out a study on Influence of Organizational culture on performance of commercial banks in Kenya and found that employees' believed that their organization had a culture that determined how things were done, employees were like-minded and held similar beliefs and values, the organizations were guided by values of consistency, adaptability and effective communication system, employees had a sense of identity which increased their commitment to work. Nelson and Quick (2011) concurred with Maina (2016) findings that besides increasing employee's commitment, organizational culture gives workers a sense of identity, reinforces work based values and serves as a control mechanism for work based ethics

Firm culture is regarded quite widely as an important factor of firm performance. It is a concept that touches many internal parts of an organization just as it interfaces with the environment outside an organization.

Adriana et al. (2009) carried out a study on organizational culture and performance in Brazil with a focus on the acquisition of a Brazilian state owned energy Distribution Company. The study aimed to verify if the performance indicators implemented by the acquiring company during the post-acquisition phase were compatible with the organizational culture dimensions (values, practices and heroes) which were obtained with ecological factorial analysis. The methodology used in this

study was based on a research design that combined quantitative research with a qualitative exploratory procedure. Research findings indicated the existence of substantial organizational culture differences, as perceived by managers and by the bulk of employees, as shown by the existence of two organizational culture clusters. The results also suggested the need of improving the coherence between performance indicators and the organizational culture dimensions.

Murphy et al. (2013) also added knowledge on effects of organizational culture on performance by carrying out a study on firm culture and performance: intensity's effects and limits", *Management Decision*. The focus of the study was to clarify distinct aspects of firm culture, delineate its effects on performance outcomes, and to examine culture intensity on theoretic grounds with attention to its effects and limits. The study analyzes a data set of 2,657 individual cases that are empirically aggregated into 302 organizational units. Its operationalization of culture intensity derives from distinct culture theory. Hypothesized relations are examined via structural equation modeling and hierarchical regression analysis. The study established that, Structural equation modeling results show culture relates positively to cooperation, coordination, and performance. Hierarchical regression analysis results show intensity influences cooperation and coordination directly and does not moderate culture's relations with those outcomes.

Prajogo and McDermott (2011) carried out a study with an aim of examining the relationship between four cultural dimensions of the competing values framework (CVF) (group, developmental, hierarchical, and rational cultures) and four types of performance: product quality, process quality, product innovation, and process innovation. The researcher collected data from 194 middle and senior managers of Australian firms who had knowledge of past and present organizational practices relating to quality and innovation-related aspects in the organization.

The eight hypotheses posed in this study were tested simultaneously using SEM. The four CVF dimensions (group, developmental, hierarchical, and rational) were considered as the independent variables and the four performance measures (product quality, process quality, product innovation, and process innovation) were considered

as dependent variables. A total of two control variables were included in the equation, namely industry sector (manufacturing versus non-manufacturing) and organization size (in terms of number of employees).

In the research findings, developmental culture was found to be the strongest predictor among the four cultural dimensions, as it shows relationships with three of the performance measures: product quality, product innovation, and process innovation. Rational culture shows a relationship with product quality, and along with group and hierarchical cultures, it also plays a role in predicting process quality.

Puni and Bosco (2016) carried out a study in Accra Ghana examining the effect of leadership style and corporate culture on perceived organizational performance. The research adopted a cross sectional correlation design and multiple regression analysis. Primary data was collected by the use of questionnaires. The results from the statistical analysis show that all leadership styles (autocratic, democratic, and laissez faire) had significant positive effect on perceived organizational performance with democratic leadership style contributing the most to performance ($\beta=.251$, $P<.01$). Consistently, all corporate culture dimensions (innovative, bureaucratic, and competitive) had significant positive effect on performance, however bureaucratic culture recorded the highest contribution ($\beta=.267$, $p<.01$). In all leadership style contributed 28% while corporate culture accounted for 40.2% of perceived organizational performance, confirming the assertion that leadership is largely responsible for the cultural formation process, but the resultant culture is principally responsible for corporate performance.

Pakdil and Leonard (2015) conducted a study on the effect of organizational culture on implementing and sustaining lean processes, where it focused on whether organizational cultural variations correlate with the success and effectiveness of lean processes and whether organizational infrastructures are required for effective lean implementation and continuation. The author reviewed the literature at the intersection of organizational culture and lean processes, particularly implementation and sustainability, using the Competing Values Framework taxonomy, the authors examine this intersection, relying on related research in the areas.

The research findings established that lean processes in relation to organizational culture leads to propositions that identify the various cultural dimensions and their purported effect on lean implementation and sustainability.

In the study, a model of interaction of those quadrants of competing values was developed including, group culture, development culture, hierarchical culture and rational culture. In the model, group culture often called clan culture is represented by high flexibility and an internal focus, including a focus on the employee (Cameron & Quinn, 1999). Shared values, participation, and collaboration were found in this culture, with teamwork, employee involvement, and corporate commitment to workers driving the firm. These researchers noted that rewards are based on team achievements, quality circles address process problems, and suggestion systems allow employees a voice – all aimed at improving company performance through empowerment. In these cultures, employees, suppliers, and customers are considered partners with management to achieve organizational goals, which are defined by the internal needs of the firm and employees (Cameron & Quinn, 1999).

In the model, development culture, also called entrepreneurial culture is represented by high flexibility and an external focus. In this organizational culture, little is static or stable, because flexibility and creativity are the primary organizational goals used to cope with uncertainty and ambiguity (Cameron & Freeman, 1991; Cameron & Quinn, 1999). There is a high emphasis on individuals, risk, and preparing for the future. Hierarchical culture also called the market or results-oriented culture is characterized by low flexibility and internal focus. There is intense specialization and uniformity, resulting in little flexibility concerning rules, which allows outputs to be consistent (Cameron & Quinn, 1999). The dominant operational approach in this culture is efficiency, that is, effectiveness, timeliness, predictability, and elimination of waste and redundancy (Cameron & Quinn, 1999). It is a formal and structured workplace.

Rational culture also termed market culture, is characterized by low flexibility and external focus. It has core values of competitiveness and productivity, focusing on

the bottom line and profitability (Cameron & Quinn, 1999). To achieve this focus, they concentrate on their customers and on improving their competitive advantage. The external environment drives activities within the company toward winning, creating leaders centered primarily on achievement. Quality strategies in rational culture are improving productivity, measuring customer preferences, creating partnership, enhancing competitiveness, and involving customers and suppliers (Cameron & Quinn, 1999).

Bititci et al. (2006) conducted a study to model the dynamic relationship between performances measurement, management styles and organizational culture, in order to develop a better understanding of the causal linkages between these three areas. The research was based around five case studies where performance measurement systems were implemented in action research programs, using identical implementation methods, the use of the performance measurement systems was then observed over a period of time in relation to the implementation lifecycle, changes to management style and organizational structure over time. The dynamic relationships were then mapped using the framework developed. Patterns were observed, which led to new insights.

In the study organizational culture like role culture where work is performed out of a respect for contractual obligations backed up by sanctions and personal loyalty towards the organization or system, power culture where work is performed out of hope of reward, fear of punishment or personal loyalty towards a powerful individual achievement culture where work is performed out of satisfaction in the excellence of work and achievement and/or personal commitment to the task or goal and support culture where work is performed out of enjoyment of the activity for its own sake and concern and respect for the needs and values of the other persons involved..

The research findings established that Organizational culture and management style seem to be interdependent throughout the lifecycle of the performance measurement system. That is, management styles need to evolve as the maturity of the performance measurement system and the organizational culture evolve. A successfully implemented and used performance measurement system, through

cultural change, leads to a more participative and consultative management style. Similarly, the correct use of performance measurement systems can encourage an achievement culture to emerge

Cadden et al. (2013) conducted a study investigating the extent to which organizational cultural fit between a buyer and supply chain participants influences performance. The study was conducted in a Fast Moving Consumer Goods (FMCG) supply chain. A cultural dimensions questionnaire was used in a focal organization (the buyer) and it identified best and poorest performing supply chain. The results were analyzed using a series of ANOVA's within the respective supply chains. The findings were then triangulated via qualitative methods. The findings demonstrate that complementarity rather than congruence between the supply chain partners achieved successful performance outcomes. Organizations in the high-performing supply chain had significantly different cultural profiles, reporting significant statistical differences across all six cultural dimensions. Organizations in the low-performing supply chain had almost identical profiles across all six cultural dimensions with significantly lower mean scores across each dimension.

The findings indicate that organizations in the high performing supply chain have significantly different cultural profiles, having significant differences across all six cultural dimensions. Organizations in the low-performing supply chain have almost identical profiles across all six cultural dimensions with significantly lower mean scores across each dimension. This is in contrast to much of the current literature espousing cultural congruence as an enabler to high performance (Pressey et al., 2007; Weber & Camerer, 2003).

Roh et al. (2008) conducted a study with an aim of linking organizational culture and Supply Chain Strategy (SCS) using competing values and an uncertainty framework. Anchored at literature review on organizational culture and SCS, the researcher presented a typology with four patterns of organizational culture with four types of corresponding Supply Chain Strategy. The research findings identified corresponding SCS efficient for hierarchical, risk-hedging for group, responsive for rational, and agile for developmental culture. These four patterns of organizational culture show

differences in terms of focus, leadership styles, criteria for effectiveness, management of employees, organizational glue and criteria of success (Cameron & Quinn, 1999). Hierarchical culture emphasizes stability or control with high level of internal focus. This orientation is characterized by uniformity, coordination, internal efficiency, and a close adherence to rules and regulations. Developmental culture would be its opposing contrast in that it underlines flexibility and external orientation toward changes. Creativity, innovation, and external growth are emphasized in response to the changing demands of the external environments (e.g., competitors and customers). Group culture is similar to hierarchical culture in that it stresses the internal aspects of an organization, but different in that an emphasis is given more on the flexibility dimension. In this culture, employees are empowered and encouraged to participate in enhancing and optimizing internal resources and business processes. Rational culture is externally oriented with a stress on control and stability. Organizations with rational culture accentuate productivity and achievement with well-defined objectives against external competitions (Stock et al., 2007).

2.4.6 Performance of the Government Ministries

Chomchaiya and Esichaikul (2016) carried out a study to develop a consolidated framework for government e-procurement (e-GP) performance measurement based on the importance internal stakeholders attach to performance measures and metrics, providing in-depth understanding of their interest in e-GP performance. The author divided the study into two main phases: internal stakeholder identification and consolidation of performance measures and metrics. The mixed-methods approach follows semi-structured expert interviews with questionnaires collected from 413 internal stakeholders. SPSS software version 16.0 was used for statistical data analysis. After the main survey, exploratory factor analysis (EFA) was conducted to extract the relevant metrics. Seven factors and 52 related itemized variables were identified. EFA was conducted using principal component analysis (PCA) to eliminate the irrelevant variables. One-way analysis of variance (one-way ANOVA) was conducted to determine the mean differences between independent variables (groups of internal stakeholders) regarding the measures and metrics. This was to determine the differences in perception of importance of each factor (measure) and

variable (metric). Least significant difference (LSD) post hoc analysis was used to study the differences in perception of importance among internal stakeholders at the metric level.

The original four measures (reliability, agility, responsiveness, cost) were adopted from SCOR. Three additional measures were developed based on the literature and in-depth interview results (transparency, efficiency, & effectiveness). These three additional measures were agreeable to all interviewed experts: transparency would address fairness and competitiveness in bidding, efficiency would mainly address time and price savings, and effectiveness would address satisfaction and budget movement. Eventually, seven primary measures and corresponding metrics were identified.

In the findings, five internal stakeholder groups were identified: management, auditors, financial officers, service users, and service support staff. Eight measures and 44 corresponding metrics were consolidated, and 21 significantly distinct performance metrics were identified from stakeholders' perceptions. As expected, financial measures were most important to financial officers, while contract management was most important to service support staff.

Ntayi et al. (2013) conducted a study with an aim of examining the prevalence and relationships between constructs of mindfulness, task autonomy, inter-functional coordination, teamwork, contract implementation and monitoring which have been largely ignored or not fully explored in previous empirical research; and attempt to use them to predict contract performance. The study uses descriptive and analytical research designs guided by multi-methods qualitative and quantitative research approaches to collect and analyze data predicting contract performance in the Common Market for Eastern and Southern Africa (COMESA) member states. Data was collected from a representative sample of ten countries and subsequent sampling was done at the government ministries. Contracts were the unit of analysis.

The study findings reveal that deontology, mindfulness procurement task performance, competence of the procurement staff, inter-functional coordination and teamwork, mindfulness, task autonomy, inter-functional coordination, teamwork,

contract implementation and monitoring for contract implementation and monitoring significantly and positively predict contract performance. Contrary to the authors' expectation, teleology ethical orientation and autonomy of procurement staff significantly and negatively predicted contract performance. These findings have both policy and managerial implications which the authors present.

Tumuhairwe and Ahimbisibwe, (2016) conducted a study with an aim of investigating the relationship between procurement records compliance, effective risk management and records management performance in Ugandan Public Procuring and Disposing Entities (PDEs). The study adopted a quantitative research design and used a cross-sectional survey. The researchers developed a questionnaire on the study constructs of procurement records compliance, effective risk management and records management performance using measurement scales derived from previous empirical studies which were modified to suit the study.

The results indicate quantitative evidence of significant positive relationships between procurement records compliance, effective risk management and records management performance. Findings also reveal that procurement records compliance and effective risk management are significant predictors of record management performance. The results also suggest that effective risk management has a stronger influence on records management performance than that on procurement records compliance.

Adams et al. (2014) carried out a study to identify current performance measurement practice within state, territory and federal government departments in Australia with a particular emphasis on the importance of sustainability performance measures. The main aim of the research was to assess the use of sustainability performance measures for supporting organizational performance improvement. The research adopted a mail survey approach within the government departments

The research findings established that the performance measures utilized by organizations to a great extent were in the areas of cost efficiency and quality measures and those utilized to least extent were for learning and growth measures and to satisfy legislative requirements and manage programs. Sustainability,

environmental or social responsibility measures are the least used performance measures, and those utilized are mainly measures of employee diversity and non-financial economic aspects that are identified.

Abdallah and Alnamri (2015) conducted a study to investigate the use of financial and non-financial performance measurement practices, including the use of the balanced scorecard (BSC) and the impact of the cultural values on the use of performance measurement systems (PMSs), in multinational companies (MNCs) operating in the Middle East with a special attention to the Saudi Arabian subsidiaries. In their research methodology, the duo collected data using a survey mailed to 180 randomly selected Saudi manufacturing subsidiaries in different industrial cities to collect data on their PMSs including the use of the BSC. In the research findings, financial measures are more widely used by most of the companies included in the sample due to the fact they are common, well known, and the most familiar performance measures in the business practice and they are more standardized measures which can be easily understood, implemented, and quantified. Moreover, the use of the non-financial measures was at a very low rate compared with the use of financial measures. The reasons were the difficulty in finding objective measures of the effect of social actors and the avoidance of any disclosure of social problems that are existed in the society.

In the research finding, the measures were classified in a descending order of the ones most widely used, as indicated by the highest mean, to the ones least widely used as indicated by the lowest mean among all measures. The financial and non-financial indicators employed in the study were, total sales 4.49 1.16, Rate of achieved budget 4.25 1.06, Unit product cost 4.21 2.19, Rate of return on investment 4.09 2.41, Number of customers' complaints 3.91 2.54, Customer response time 3.76 2.96, Rate of the growth sales 3.70 2.74, Rate of defective output to total output 3.67 2.91, Rate of market share 3.62 2.96, Actual profit margin 3.61 2.80, Measure of defective units 3.53 2.06, Number of warranty claims 2.74 2.27, Time for new product development 2.68 2.25, Customer satisfaction 2.55 2.21, Rate of new products launched 2.44 2.46, On-time delivery 2.36 2.41, Number of new employee training/hours programs 2.33 2.99 and Employees' satisfaction 1.98 2.58

2.5 Critique of Existing Literature

Adebayo (2012) defined supply chain management practices as a set of activities undertaken in an organization to promote effective management of its supply chain, the concept of supply chain management practices has been considered from different points of views in different bodies of literature. There are no specific elements that are conventionally accepted as best supply chain management practices, Ibrahim and Hamid (2012) assert that many authors who have studied supply chain management practice have used various elements and dimensions to measure the supply chain management practices.

Khalid et al. (2012) in his study carried out in Germany considered long-term relationship development, partner development, joint development, enhanced communication, learning stakeholder management in his study on supply chain management practices where he found that technological integration emerges as the core supply chain management practices frequently identified and is contingent with a number of other practices. In china, Lin (2014) examined the following practices; collaboration, adoption of information technology and enhancement of firm- supplier relationship on his study assessing inefficiencies in on-firm resource management that presented opportunities for environmental improvement through supply chain management practices. Kimondo et al. (2016) contributed to the body of knowledge by examining long-term relationships, working with certified suppliers, prudent supplier selection and few supplier policies, supplier involvement in product development, good interaction and internal, trust and commitment with partners, strategic purchasing, supply network coordination, external integration, logistics integration and effective communication

In Kenya, Kazi (2012) considered Tracking and trace products in the supply chain, alerting customers on product availability, timely delivery and reducing the lead time. Alerting customers on status of shipment, Innovative design of a SC in his study on supply chain management practices and performance at Kenya Medical Supplies Agencies. Barasa (2016) in his study considered supply chain management practices that include; supply chain collaboration practice, Green supply chain

management practice, information sharing practice and Customer relationship management practice in his study on performance of steel manufacturing companies in Kenya. Mwilu (2013) indicates that supply chain management practices like logistics, lean suppliers and information technology. Aura (2017) conducted a study on supply chain practices, reforms and performance in the Kenya National government ministries and identified tendering and the use of IT as the most common supply chain practices in ministries. In a study by Kimantira (2014) on supply chain management practices and competitiveness in the National government of Kenya; a case study of Ruiru sub-county. The study found that the most important SCMP used as; planning and control, strategic partnership reverse logistic and strategic outsourcing.

According to Githui (2012) there are some impediments associated with the current procurement management. The body of literature address only the practices and their impact on performance, in addition there is need of addressing other impediments like the organizational culture that impacts on employees' performance.

The absence of a comprehensive understanding of supply chain management practices, makes it more difficult for supply chain management decision makers to claim responsibility for the right practices, it also make it difficult to benchmark with other organizations and companies on the supply chain metrics for improvement on performance and also gives more room for research on the acceptable supply chain management practices.

2.6 Research Gaps

Hsu et al. (2006) conducted a study to develop and test a reliable and valid supplier selection measurement scale that can be applied in different geographic regions, namely, the USA and Europe. The researcher developed a three-factor supplier selection measure via extensive literature review and practitioner interviews. Confirmatory factor analysis was used to validate the proposed three-factor supplier selection construct and to test its validity across national boundaries. The study demonstrated that underlying the documented supplier selection criteria is the need to assess a supplier's quality and service capabilities as well as its strategic and

managerial alignment with the buyer. The study was conducted in developed countries, USA and Europe hence its findings cannot be generalized to Kenya

Ageron et al. (2013) conducted exploratory research with a focus to examine and evaluate the importance of IS/IT criterion in the suppliers selection process. The paper attempts to assess if there is superior supply chain performance arising from the integration of this criterion and to determine difficulties companies face resulting from this deployment. In the study, the author reviewed previous literature on supplier selection and designed a structured questionnaire for their data collection. The study did not address the influence of supplier selection on performance that notwithstanding, the study was conducted in France, hence its findings cannot be generalized to Kenya

Micheli (2008) carried out a study on a decision-maker-centered supplier selection approach for critical supplies, with an aim of investigating the supplier selection issue as a way to mitigate the overall supply risk. The independent variable for the study was supplier risk which is different from organizational performance.

The study by Mahmood et al. (2014) conducted to explore and compare the asset management policies and practices of six Australian states – New South Wales, Victoria, Queensland, South Australia, Western Australia and Tasmania – to improve understanding of the policy context to best shape policy focus and guidelines. The study established that the Total Asset Management (TAM) guidelines cover demand management, whole-of-life asset management, risk management, value management and cross-agency coordination in service planning and delivery. The study mainly looked at the understanding of policy and not how the policy influence performance. Having been conducted in Australia the findings of the study cannot be generalized to Kenya

Tiryakioğlu and Yülek (2015) carried out a selective literature survey of academic research and policy experience on public procurement policies utilized to foster technological development. The study was limited to public procurement policies utilized to foster technological development.

Vereecke and Muylle (2006) conducted a study to empirically test the relationship between supply chain (SC) collaboration and performance improvement. The researcher developed incorporating dimensions of supplier and customer collaboration and performance improvement. The study was conducted in the assembly industry and hence the findings cannot be generalized to government ministries. In another study conducted by Barrat (2004) on understanding the meaning of collaboration in supply chain. In the study, the author reviewed a number of literature on the elements of supply chain collaboration and their application and subsequent effect on business performance, the study did not show the influence of supply chain collaboration on performance, notwithstanding, it was limited to USA which is developed country hence its findings cannot be generalized to Kenya.

In another related study, Soita (2015) carried out a study to establish the factors affecting supply chain collaboration in the public sector in Kenya and how the government and its citizens stands to gain if the said factors were dealt with. The study only outlined factors affecting supply chain collaborations but did not show how supply chain collaboration practices influence performance. Li and Barnes (2008) carried out a study to identify proactive supply risk management methods which can be used to reduce or remove risk sources during the supplier selection process. The study only identified supply risk management methods but did not show their influence on performance, in addition, having been conducted in the manufacturing sector, the findings of the study cannot be generalized to government ministries. Ritchie and Brindley (2007) conducted a study to examine the constructs underpinning risk management and explores its application in the supply chain context through the development of a framework. The study was limited to United Kingdom and limited to the construction sector which is different from government ministries.

Bititci et al. (2006) conducted a study to model the dynamic relationship between performances measurement, management styles and organizational culture, in order to develop a better understanding of the causal linkages between these three areas. The study looked at how organizational culture influence the relationship between performance measurement management styles.

The above studies confirm the level of interest in supply chain management practices and the stated gaps show the need to study the influence of supply chain management practices on performance of government ministries in Kenya.

2.7 Summary

Literature review looked at a number of areas that were deemed to be relevant to the study objectives. The study concurred with Ibrahim and Hamid (2012) assertion that many authors who have studied supply chain management practice have used various elements and dimensions to measure the supply chain management practices. The study reviewed relevant theories and this included; Resource based View theory, coordination theory and systems theory, based on these, the study developed conceptual framework showing the relationship between the independent variables like; Supply chain management practices, supply chain collaboration, supply chain policies and supply chain risk management in relation to the dependent variable being performance of government ministries. These discussions helped in shedding some light on the supply chain management practices since supply chain management is a multidimensional concept and there is no single theory or theories that could adequately explain the concept.

The study also reviewed the empirical literature where past studies in the field of supply chain management practices were analyzed both globally and locally on all the identified variables of supply chain management practices this was followed by a critique of the empirical review which showed that there are no specific elements that are conventionally accepted as best supply chain management practices.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

According to Adrian, Lewis and Saunders (2003) a research methodology refers to a process of following the steps, procedures and strategies for gathering and analyzing the data in a research investigation. These methods describe in detail how the study was conducted. According to Bryman (2003) methodology includes the design, setting, sample, methodological limitations and the data-collection and analysis techniques in a study. This is the know-how of the scientific methods and techniques employed to obtain valid knowledge. This chapter covers the research design, the target population, the sample size and sampling technique, data collection method, pilot testing and data analysis and presentation that were observed during the study.

3.2 Research Design

The research design refers to the overall strategy chosen by researchers to integrate the different components of the study in a coherent and logical way, thereby, ensuring that they effectively address the research problem; it constitutes the blueprint for the collection, measurement, and analysis of data (Bryman & Cramer, 2012). The study used cross-sectional design, where data was collected on the whole study population at a single point in time to examine the relationship between the variables of interest, meaning that there is no experimental procedure, so no variables was manipulated by the researcher. Cross-sectional research designs have two distinctive features: no time dimension and a reliance on existing differences rather than change following intervention. In addition, the cross-sectional design can only measure differences between or from among a variety of people, subjects, or phenomena rather than change. This study adopted a cross sectional study design because they generally use survey techniques to gather data, which are relatively inexpensive and take up little time to conduct.

3.2.1 Research Philosophy

The research philosophy adopted for the study was Positivism research philosophy which reflects the belief that reality is stable. This reality can be observed and described from an objective viewpoint without necessarily interfering with the phenomenon itself (Matta 2015). Positivists' belief that hypothesis developed from existing theories can be tested by measuring observable social realities, thus positivism is derived from natural sciences. Based on previously observed, explained realities and their interrelationships, it is then possible under positivism research philosophy to make predictions. Halfpenny (2015) asserts that positivism research philosophy can be used to investigate what truly happens in organizations through scientific measurement of people and system behaviors hence this research philosophy can be used to investigate the influence of supply chain management practices on performance of the government ministries in Kenya.

The choice of the research philosophy is based on the hypothesis that the researcher intends to test. Under positivism research philosophy, it is possible to test hypothesis and generalize the findings in addition to Halfpenny (2015) assertion that positivism research philosophy can be used to investigate what truly happens in organizations through scientific measurement of people and system behaviors. However, according to Saunders et al. (2007) to test the hypothesis, there is need to translate the underlying concepts into measurable forms.

3.3 Target Population

Population is the entire set of units for which the study data are to be used to make inferences (Kothari, 2004). According to Ngechu (2004) it's the entire set of individuals (or objects) having some common characteristics as defined by the sampling criteria established for the study. The target population according to Mugenda and Mugenda (2003) is a part of the population drawn from the entire or universe.

The target population comprised of all the ministries in the Kenya government which totals to 20. According to the Government of Kenya Executive Order No.1 (2016), there are 20 National Ministries in the Republic of Kenya (See Appendix VI). The department of Directorate of Public Procurement under the National Treasury has the mandate to advise on personnel establishment of procurement staff and handling of inter-ministerial postings of supply chain management personnel. The National treasury circular No. 15 of 2016 states that the total population of supply chain Management officers in both the National and county government is 1372 (The National Treasury, 2016). The target population of this study was therefore 1372 staff working in the supply chain management department/units in the 20 government ministries in Kenya.

The study considered the 20 Ministries since they facilitate execution of public service through their respective enterprises to the general public, in addition to being the largest consumer in the economy and the biggest spender in the public on procurement of goods and services. The study population comprised of staff in supply chain department as they are fully involved in the execution of supply chain management practices.

Table 3.1: Target Population

S/No	Ministries	Records management	Stores	Procurement	Population
1	Ministry of Interior and coordination of National Government	109	54	380	543
2	Ministry of Devolution and planning	18	9	64	92
3	Ministry of Finance and National Treasury	6	3	20	28
4	Ministry of Defense	13	7	46	66
5	Ministry of Foreign Affairs & International Trade	3	2	11	16
6	Ministry of Education	12	6	41	58
7	Ministry of Health	8	4	29	41
8	Ministry of Transport and Infrastructure	15	7	51	73
9	Ministry of Information, Communication and Technology	5	3	18	26
10	Ministry of Environment and Natural Resource	8	4	27	39
11	Ministry of Land, Housing and Urban Development	16	8	55	78
12	Ministry of Sports, Culture and the Arts	5	3	19	27
13	Ministry of Labour & East Africa Affairs	9	5	32	46
14	Ministry of Energy and Petroleum	7	3	23	33
15	Ministry of Agriculture Livestock and Fisheries	11	6	39	55
16	Ministry of Industrialization and Enterprise Development	10	5	36	52
17	Ministry of Public Service Youth and Gender Affairs	4	2	14	20
18	Ministry of Tourism	6	3	20	28
19	Ministry of Mining	4	2	13	18
20	Ministry of Water and Irrigation	7	3	23	33
	TOTAL	274	137	960	1372

Source: National Treasury Circular No. 15, 2016

3.4 Sampling Frame

A sampling frame is a listing of the accessible population from which the sample is drawn. According to Ngechu (2004) sampling frame is the actual set of units from which a sample has been drawn. The sampling frame of this study was all the 1372 staff working in records management, stores and procurement sections in the 20 government ministries in Kenya.

3.5 Sample Size and Sampling Technique

3.5.1 Sample size

According to Mugenda and Mugenda (2003) sample size must be large enough to be representative of the universe population. Kothari (2004) stresses that sample size chosen by the researcher should be capable of giving enough information about the population and one which can be analyzed with ease. The sample size was determined using Fisher et al. (2003) formula. This formula was used to obtain a representative sample of the target population. The target population is estimated at 1372 staff working in supply chain management departments in government ministries.

$$n = \frac{z^2 pq}{d^2}$$

Where,

- n = the desired sample size (if the target population is > 10,000).
- Z = is the standard normal deviate at the required confidence level.
- p = is the proportion in the target population estimated to have characteristics being studied. If unknown 50% should be used.
- q=1-p
- d = the level of statistical significance set = 0.05
- Z = Assuming 95% confidence interval Z = 1.96

$$n = \frac{1.96^2 0.5 * 0.5}{0.05^2}$$

$$n = 384 \text{ staff}$$

For a population that is less than 10000 an adjustment must be done using Cochran's correction formula (Cochran, 2011);

$$nf = n / 1 + (n/N)$$

Where;

nf = the final sample size, when population is less than 10,000

n = the sample for populations of 10,000 or more

N = the size of the total population from which the sample is drawn

$$nf = 384 / 1 + (384/1372)$$

$$= 300$$

$$nf = \frac{300 * 100}{1372}$$

$$= 20\%$$

According to Mugenda and Mugenda (2003) a sample size of between 10% and 30% is good representation of the total population.

3.5.2 Sampling Technique

The study used stratified random sampling to select 300 staff from the target population. Proportionate sampling was used to select the number of staff per category. Stratified random sampling is a probability sampling method that gives chances of selecting each unit within particular strata in a population. The strata in

this study were sections of the supply chain management department. Stratified random sampling was used as it gives representative sample of the whole population. Proportionate sampling was used in allocating samples in each of the strata.

Table 3.2: Sample Size

S/No	Ministries	Population				Sample Size			
		Records management	Stores	Procurement	Total	Records management	Stores	Procurement	Total
1	Ministry of Interior and coordination of National Government	109	54	380	543	24	12	83	119
2	Ministry of Devolution and planning	18	9	64	92	4	2	14	20
3	Ministry of Finance and National Treasury	6	3	20	28	1	1	4	6
4	Ministry of Defense	13	7	46	66	3	1	10	14
5	Ministry of Foreign Affairs & International Trade	3	2	11	16	1	0	2	3
6	Ministry of Education	12	6	41	58	3	1	9	13
7	Ministry of Health	8	4	29	41	2	1	6	9
8	Ministry of Transport and Infrastructure	15	7	51	73	3	2	11	16
9	Ministry of Information, Communication and Technology	5	3	18	26	1	1	4	6
10	Ministry of Environment and Natural Resource	8	4	27	39	2	1	6	9

S/N	Ministries	Population				Sample Size			
		Records management	Stores	Procurement	Total	Records management	Stores	Procurement	Total
11	Ministry of Land, Housing and Urban Development	16	8	55	78	3	2	12	17
12	Ministry of Sports, Culture and the Arts	5	3	19	27	1	1	4	6
13	Ministry of Labour & East Africa Affairs	9	5	32	46	2	1	7	10
14	Ministry of Energy and Petroleum	7	3	23	33	1	1	5	7
15	Ministry of Agriculture Livestock and Fisheries	11	6	39	55	2	1	8	12
16	Ministry of Industrialization and Enterprise Development	10	5	36	52	2	1	8	11
17	Ministry of Public Service Youth and Gender Affairs	4	2	14	20	1	0	3	4
18	Ministry of Tourism	6	3	20	28	1	1	4	6
19	Ministry of Mining	4	2	13	18	1	0	3	4
20	Ministry of Water and Irrigation	7	3	23	33	1	1	5	7
	TOTAL	274	137	960	1372	60	30	210	300

3.6 Research Instruments

This study used both primary and secondary data. According to Greener (2008) primary data is the data collected directly from first-hand occurrence which has not been exposed to processing or any other handling. On the other hand, secondary data refers to data that is collected by someone other than the user (Ngechu, 2004). Common sources of secondary data include censuses, information collected by government departments, organizational records and data that was originally collected for other research purposes. Secondary data was collected through review of published literature such as journals articles, published theses, textbooks, annual reports of government ministries.

Creswell (2006) contends that primary data can be collected by means of qualitative data collection instruments (focus group discussions, interview guide and observations) and quantitative data collection instruments (questionnaires). This study used primary data, which was collected by use of semi-structured questionnaires. The questionnaires encompassed both closed ended or open ended questions so as to enable the respondent to express their view without being affected by the researcher. The structured questions were used in an effort to conserve time and money as well as to facilitate an easier analysis as they are in immediate usable form. On the other hand, the open-ended questions were used as they encourage the respondent to give an in-depth and felt response without feeling held back in revealing of any information. Kothari (2004) indicates that a questionnaire is a cost efficient method to collecting information particularly from a huge group of respondents and it facilitates anonymity. Questionnaires were utilized in this research since the component of anonymity as some of the information needed is sensitive.

The questionnaire was divided into 7 sections. The first section focused on the socio-demographic information of the respondents. The second, third, fourth and fifth sections focused on the independent variables (supplier selection practices, procurement policies, supplier collaboration practices, risk management practices and organizational culture). In addition, the sixth section focused on the dependent variable (performance in the Kenyan government ministries).

3.7 Data Collection Procedures

The researcher obtained an introduction letter from the university and a research permit from the National Council for Science and Technology (NCST). Permission to collect data was also sought from the administration of the 20 government ministries. This was followed by recruitment of research assistants for each of the ministries selected. The researcher and the research assistants used drop and pick method in the data collection. The respondents were given a maximum of a week after which the questionnaires were collected. This method was appropriate considering the availability of the respondents and the geographical dispersion of the sample selected.

3.8 Pilot Study

A pilot test was conducted to test the reliability and validity of the data collection instruments. A pilot survey is meant to eliminate, in advance, some of the problems that are likely to be encountered during the final survey (Cooper & Schindler, 2006). In this study pretesting involved 30 staff (10% of the sample size). According to Hertzog (2008) 10% of the sample required for a full study should be used in a sample size.

3.8.1 Validity Test of Research Instrument

Validity can be defined as the degree to which a test measures what it is supposed to measure. There are two basic approaches to the validity of tests and measures, namely; content validity, face validity and construct validity (Bryman & Cramer, 2012). Content validity addresses how well the items developed to operationalize a construct provide an adequate and representative sample of all the items that might measure the construct of interest. Because there is no statistical test to determine whether a measure adequately covers a content area or adequately represents a construct, content validity usually depends on the judgment of experts in the field. Face validity, also known as logical validity is the extent to which a test is subjectively viewed as covering the concept it purports to measure. In this study, the researcher relied on experts in the field of project management like the supervisors to

enhance face validity and construct validity. In addition, face validity and construct validity was enhanced by developing the research instruments as per the objectives of the study. Construct validity is a judgment based on the accumulation of evidence from numerous studies using a specific measuring instrument. Evaluation of construct validity requires examining the relationship of the measure being evaluated with variables known to be related or theoretically related to the construct measured by the instrument.

3.8.2 Reliability Test of Research Instrument

Reliability in statistics and psychometrics is the overall consistency of a measure. A measure is said to have a high reliability if it produces similar results under consistent conditions. Data reliability, which is a measure of internal consistency and average correlation, was measured using Cronbach's alpha coefficient which ranges between 0 and 1. Cronbach's alpha is a measure of internal consistency, that is, how closely related a set of items are as a group. It is considered to be a measure of scale reliability (Kultar, 2007). Higher alpha coefficient values means there is consistency among the items in measuring the concept of interest. A cronbach's alpha (α) of more than 0.7 is considered acceptable while a cronbach's alpha (α) of less than 0.7 is considered questionable.

3.9 Data Analysis and Presentation

Data preparation began with instruments checking, which involved eliminating unacceptable questionnaires. These included incomplete, little variance, missing pages or respondent not qualified. This was then followed by data editing, which sought to correct illegible, incomplete, inconsistent and ambiguous answers (Ngechu, 2004). The third step in data preparation was data coding. A codebook for the different variables was prepared on the basis of the numbering structure of the questionnaires. For all quantitative data analysis, this study used Statistical Package for Social Sciences (SPSS version 22) as a tool. The fourth step was data entry. Data entry is the act of transcribing data, often into a computer program. The fifth step was data cleaning, which reviewed data for consistencies. Inconsistencies may arise from faulty logic, out of range or extreme values. The sixth step involved carrying

out diagnostic tests (Greener, 2008). The study used Shapiro-Wilk Test to determine whether the data is normally distributed. In addition, the study used Durbin Watson method to test autocorrelation of the variables.

According to Ngechu (2004) data analysis involves reduction of accumulated data to a manageable size, developing summaries, looking for patterns and applying statistical techniques. The research instrument generated both qualitative and quantitative data. Thematic analysis was used to analyze qualitative data, that is, data collected from open ended questions. The results were then presented in form of a prose.

In relation to quantitative data, nominal data from the socio-demographic information section was analyzed by use of percentages and frequencies. This included level of education, years of service and respondents departments/ unit. In addition, non-parametric data were analyzed descriptively by use of measures of central tendency and measures of dispersion as the tools of data analysis. The arithmetic mean was as a measure of central tendency while the standard deviation was used as a measure of dispersion.

3.9.1 Correlation Analysis

For the parametric data, Pearson's Product Moment Correlation analysis(r) and multivariate regression analysis were used to test the relationship between variables. The Pearson product-moment correlation coefficient (or Pearson correlation coefficient, for short) is a measure of the strength of a linear association between two variables and is denoted by r . Basically, a Pearson product-moment correlation attempts to draw a line of best fit through the data of two variables, and the Pearson correlation coefficient, r , indicates how far away all these data points are to this line of best fit. The Pearson correlation coefficient, r , can take a range of values from +1 to -1. A value of 0 indicates that there is no association between the two variables (Greener, 2008). A value greater than 0 indicates a positive association; that is, as the value of one variable increases, so does the value of the other variable. A value less than 0 indicates a negative association; that is, as the value of one variable increases, the value of the other variable decreases.

3.9.2 Regression Models

The study also used univariate and multivariate regression models to test the relationship between variables. A simple linear regression model (univariate model) has one outcome and one predictor, whereas a multivariate linear regression model has one outcome and multiple predictors. The regression analysis also provided other test statistics like Student t-Tests, adjusted R^2 and F-test. The study applied a 95% confidence interval. A 95% confidence interval indicates a significance level of 0.05. This implies that for an independent variable to have a significant influence on the dependent variable, the p-value ought to be below the significance level (0.05).

The following were regression models for testing the hypotheses:

Regression model for objective one;

H₀₁: Supplier selection practices have no influence on performance of government ministries in Kenya.

$$Y = \beta_0 + \beta_1 X_1 + \varepsilon$$

Whereby;

Y = Performance of government ministries in Kenya

B₀ = Constant

β₁ = Coefficients of determination

X₁ = Supplier selection practices

ε = Error term

Regression model for objective 2;

H02: Supply chain policies have no influence on performance of government ministries in Kenya

$$Y = \beta_0 + \beta_1 X_2 + \varepsilon$$

Whereby;

Y = Performance of government ministries in Kenya

B₀ = Constant

β₁ = Coefficients of determination

X₂ = Supply chain policies

ε = Error term

Regression model for objective 3;

H03: Supplier collaboration practices have no influence on performance of government ministries in Kenya.

$$Y = \beta_0 + \beta_1 X_3 + \varepsilon$$

Whereby;

Y = Performance of government ministries in Kenya.

B₀ = Constant

β₁ = Coefficients of determination

X₃ = Supplier collaboration practices

ε = Error term

Regression model for objective 4;

H₀₄: Supplier risk management practices have no influence on performance of government ministries in Kenya.

$$Y = \beta_0 + \beta_1 X_4 + \varepsilon$$

Whereby;

Y = Performance of government ministries in Kenya.

B₀ = Constant

β₁ = Coefficients of determination

X₄ = Supplier risk management practices

ε = Error term

The statistical overall model used for analysis was as follows

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon$$

This was used for test of significance for B_i, the t- test and test of significance for the overall model the F-test

Where:-

Y is the dependent variable, Performance of government ministries in Kenya

β₀ Is the constant

β_i is the coefficient of X_i for i=1,2,3,4

X₁ = Supplier selection practices

X2 = Supply chain policies

X3 = Supplier collaboration practices

X4 = Supplier risk management practices

ε is the error term

3.9.3 Moderating Effect Analysis

A moderator is a variable that affects the direction and the strength of the relationship between an independent or predictor variable and a dependent criterion variable. This variable may reduce or enhance the direction of the relationship between a predictor variable and a dependent variable, or it may change the direction of the relationship between the two variables from positive to negative. A moderator is supported if the interaction of predictor and moderator on the outcome of the dependent variable is significant. The study used multiple regressions analysis (stepwise method) to establish the moderating effect of organizational culture (z) on relationship between independent variable and dependent variable.

H₀₅: Organizational culture do not moderate the influence of supply chain management practices on performance of government ministries in Kenya

The statistical overall model used for analysis was as follows:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_z X + \beta_{1z} X_1 Z + \beta_{2z} X_2 Z + \beta_{3z} X_3 Z + \beta_{4z} X_4 Z + \varepsilon$$

Where:-

Y is the dependent variable, Performance of government ministries in Kenya

β_0 is the constant

β_i is the coefficient of X_i for $i=1,2,3,4$

X1 = Supplier selection practices

X2 = Procurement policies

X3 = Supplier collaboration practices

X4 = Risk management practices

Z is the hypothesized moderator (organizational culture)

β_x is the coefficient of $X_i * Z$ the interaction term between organizational culture and each of the independent variables for $i=1,2,3,4$

ε is the error term

Moderating effect for objective one

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_1 Z + \varepsilon$$

Where;

Y is the dependent variable, Performance of government ministries in Kenya

β_0 is the constant

β_1 is the coefficient of X_1

X_1 = Supplier selection practices

Z is the hypothesized moderator (organizational culture)

β_x is the coefficient of $X_1 * Z$ the interaction term between organizational culture and each of the independent variables

ε is the error term

Moderating effect for objective two

$$Y = \beta_0 + \beta_1 X_2 + \beta_2 X_2 Z + \varepsilon$$

Where;

Y is the dependent variable, Performance in government ministries in Kenya.

β_0 is the constant

β_1 is the coefficient of X_1

X_2 = Supply chain policies

Z is the hypothesized moderator (organizational culture)

β_2 is the coefficient of $X_1 * Z$ the interaction term between organizational culture and each of the independent variables

ε is the error term

Moderating effect for objective three

$$Y = \beta_0 + \beta_1 X_3 + \beta_2 X_3 Z + \varepsilon$$

Where; Y is the dependent variable, Performance of government ministries in Kenya.

β_0 is the constant

β_1 is the coefficient of X_1

X_3 = Supplier collaboration practices

Z is the hypothesized moderator (organizational culture)

β_z is the coefficient of $X_1 * Z$ the interaction term between organizational culture and each of the independent variables

ε is the error term

Moderating effect for objective four

$$Y = \beta_0 + \beta_1 X_4 + \beta_2 X_4 Z + \varepsilon$$

Where; Y is the dependent variable, Performance in the government ministries in Kenya.

β_0 is the constant

B_1 is the coefficient of X_1

X_4 = Supplier risk management practices

Z is the hypothesized moderator (organizational culture)

β_z is the coefficient of $X_1 * Z$ the interaction term between organizational culture and each of the independent variables

ε is the error term

Moderating effect was presented if and only if the coefficient for $X_i Z$ where $i = 1, 2, 3, 4$ is significant

3.9.4 Test of Hypothesis

Table 3.3: Hypothesis Testing

Hypothesis	Type of Analysis
H₀₁: Supplier selection practices have no influence on performance of government ministries in Kenya.	Correlation analysis Regression analysis
H₀₂: Supply chain policies have no influence on performance of government ministries in Kenya	Correlation analysis Regression analysis
H₀₃: Supplier collaboration practices have no influence on performance of government ministries in Kenya	Correlation analysis Regression analysis
H₀₄: Supply chain risk management practices have no influence on performance of government ministries in Kenya	Correlation analysis Regression analysis
H₀₅: Organizational culture do not moderate the influence of supply chain management practices on performance of government ministries in Kenya.	Correlation analysis Regression analysis

3.10 Research Ethics

The key ethical issues that were addressed in this study were: anonymity of the participants, confidentiality of information, voluntary consents of the respondents, the disclosure of the research objectives and non-disclosure of sensitive information about the ministries,

The research ensured that all the data collected was treated with confidentiality. The questionnaires were delivered to the respondents in envelopes, and collected within the agreed period. The data was only handled by the research assistant and the researcher. No other person had access to the data. Once the questionnaires were recorded, they were safely kept in custody of the researcher. On the other hand, individual responses were not disclosed. In the same vein, the privacy of the participant is a crucial ethical consideration. In this regard, no information about the participants was made public. The aim of the research and the use of the information collected was fully explained to the participants. The data collected was strictly used only for the purpose of this study.

CHAPTER FOUR

RESEARCH FINDINGS AND DISCUSSION

4.1 Introduction

This chapter presents both qualitative and quantitative results and discussion of the findings. Qualitative results comprise of descriptive statistics and inferential statistics. The chapter contains response rate, followed demographic information of the respondents, descriptive statistics and inferential statistics. The study findings were presented as per the objectives of the study, namely; to establish the influence of supplier selection practices, supply chain policies, supplier collaboration practices and risk management practices on performance of the government ministries in Kenya; and to evaluate the moderating effect of organizational culture on the relationship between supply chain management practices and performance of government ministries in Kenya.

4.2 Pilot testing results

4.2.1 Validity of the research instrument

According to Cooper and Schindler (2003) validity can be achieved by pre-testing the instrument to be used through the identification and changing of any irrelevant, ambiguous, awkward, or offensive questions and technique. Some inconsistencies were evident in some questions and necessary adjustments were made.

4.2.2 Reliability of the research instrument

A reliability analysis was carried out. An internal consistency technique was applied using Cronbach's Alpha. The alpha value ranges between 0 and 1 with reliability increasing with the increase in value. According to Kothari (2004) Cronbach's Alpha coefficient of 0.6-0.7 is a commonly accepted rule of thumb that indicates acceptable reliability and 0.8 or higher indicates good reliability. In this study, 0.7 Cronbach's Alpha was considered acceptable.

Table 4.1: Reliability test for supplier selection practice

Indicator	Cronbach's Alpha	Number of items
Supplier evaluation	0.762	5
Supplier certification	0.932	4
Supplier comparison	0.852	6
Average	0.848	

From the findings in table 4.1 the construct supplier selection practice had an average Cronbach's reliability alpha of 0.848. This indicated that the question met the reliability criteria ($\alpha < 0.7$).

Table 4.2: Reliability test for supply chain policies

Indicator	Cronbach's Alpha	Number of items
Disposal policy	0.892	6
Asset management policy	0.787	4
Risk management policy	0.905	4
Average	0.861	

According to the findings in table 4.2 the construct supply chain policies had a Cronbach's reliability alpha of 0.861. This indicated that the question met the reliability criteria ($\alpha < 0.7$).

Table 4.3: Reliability test for supplier collaboration practice

Indicator	Cronbach's Alpha	Number of items
Information sharing	0.945	6
Supply chain integration	0.860	3
Supplier strategic partnership	0.872	6
Average	0.892	

From the findings in table 4.3 the construct supplier collaboration had an average Cronbach's reliability alpha of 0.892. This indicated that the question met the reliability criteria ($\alpha < 0.7$).

Table 4.4: Reliability test for Supply chain risk management

Indicator	Cronbach's Alpha	Number of items
Risk identification	0.818	5
Risk assessment	0.804	5
Dual sourcing	0.756	5
Average	0.792	

According to the findings in table 4.4 the construct risk management had a Cronbach's reliability alpha of 0.792. This indicated that the question met the reliability criteria ($\alpha < 0.7$).

Table 4.5: Reliability test for Organizational Culture

Indicator	Cronbach's Alpha	Number of items
Hierarchical culture	0.685	5
Role culture	0.853	4
Achievement culture	0.938	4
Average	0.825	

From the findings in table 4.5 the construct organizational culture had an average Cronbach's reliability alpha of 0.825. This indicated that the question met the reliability criteria ($\alpha < 0.7$).

Table 4.6: Reliability test for Performance of government ministries

	Indicator	Cronbach's Alpha	Number of items
No financial indicators	Product quality	0.763	4
	Compliance with statutory obligations	0.725	3
	Service delivery	0.758	4
Financial indicators	Cost efficiency	0.872	3
	Budgetary compliance	0.827	3
Average		0.789	

From the finding in table 4.6 the construct performance of government ministries had a Cronbach's reliability alpha of 0.789. This indicated that the question met the reliability criteria ($\alpha < 0.7$).

The results on reliability indicate that the Cronbach reliability alpha of all the questions was greater than 0.7 and hence there was no need to change the measures and indicators in the questions.

4.3 Response Rate

The sample size of this study was 300 staff working in the supply chain department that comprises of records management, stores and procurement. Out of the three hundred staff, 273 responses were obtained, which gives a response rate of 91%. According to Kothari (2004) a response rate of 50% or more is adequate for analysis.

4.4 Diagnostic Test

The diagnostic tests that were performed include Shapiro-wilk test for normality, multicollinearity test and Breusch-Pagan / Cook-Weisberg test for heteroscedasticity.

4.4.1 Normality Test

Multiple regression analysis assumes that variables have normal distributions. Non-normally distributed variables can distort relationships and significance tests. In this study normal distribution of data was tested by use of Shapiro Wilk Test. The Shapiro–Wilk test is a test of normality in frequentist statistics. The null-hypothesis of this test is that the population is normally distributed. Thus if the p-value is less than the chosen alpha level, then the null hypothesis is rejected and there is evidence that the data tested are not from a normally distributed population. In other words, the data are not normal. On the contrary, if the p-value is greater than the chosen alpha level, then the null hypothesis that the data came from a normally distributed population cannot be rejected.

Table 4.7: Shapiro-Wilk Test

				Df	Sig.
			Statistic		
Performance of government ministries			.927	117	.389

From findings in table 4.7 the performance of government ministries (p-value=0.389) was normally distributed. This shows that the dependent variable was normally distributed and hence the data meets the regression analysis assumption of normality of data.

4.4.2 Multicollinearity Test

Multicollinearity is a statistical phenomenon in which two or more independent variables in a multiple regression model are highly correlated Kothari (2004) meaning that one can be linearly predicted from the others with a non-trivial degree of accuracy. It is an undesirable situation where the correlations among the independent variables are strong, and this increases the standard errors of the coefficients. To help assess multicollinearity, Variance Inflation Factor (VIF) was

used, which measures multicollinearity in the regression model. The general rule of thumb is that VIF exceeding 4 warrant further investigations, if there are two or more variables that will have a VIF around or greater than 5, one of these variables must be removed from the regression model (Bryman & Cramer, 2012). The VIF values found in table 4.8 show that, there was no multicollinearity among the independent variables, since all the values are below 5. This implies that the results of the multiple regression equation are not misleading, since the independent variables in the multiple regression equation are not highly correlated among themselves.

Table 4.8: Multicollinearity Test Statistics

	Tolerance	VIF
supplier selection	.552	1.813
supply chain policies	.439	2.277
supplier collaboration	.537	1.863
risk management	.544	1.840

4.4.3 Autocorrelation Test

Durbin–Watson statistic is a test statistic used to detect the presence of autocorrelation (a relationship between values separated from each other by a given time lag) in the residuals (prediction errors) from a regression analysis. The Durbin-Watson (d) was 2.071. The acceptable Durbin Watson range is between 1.5 and 2.5 (Field, 2009). A rule of thumb is that test statistic values in the range of 1.5 and 2.5 are relatively normal. Field (2009) suggests that values under 1 or more than 3 are a definite cause of concern. In this data analysis Durbin Watson value is 2.071, which is between the acceptable ranges, it shows that there were no auto correlation problems.

Table 4.9: Durbin Watson Test for autocorrelation

R	R Square	Adjusted R Square	Std. Error Watson of the Estimate	Durbin-
.507	.257	.246	.41514	2.071

4.4.4 Heteroscedasticity Test

Heteroscedasticity is a situation where the variability of a variable is unequal across the range of values of a second variable that predicts it (Vinod, 2008). In this study Heteroscedasticity was tested by performing the Breusch-pagan / cook-weisberg test. Breusch-Pagan / Cook-Weisberg test the null hypothesis that the error variances are all equal versus the alternative that the error variances are a multiplicative function of one or more variables (Vinod, 2008). Homoscedasticity will be evident when the value of “Prob > Chi-squared” is greater than 0.05 Table 4.9 shows that the constant variance ($\text{Chi}^2 = 3.549809$) is insignificant ($P = 0.470$).

Table 4.10: Breusch-Pagan / Cook-Weisberg test for heteroscedasticity

Ho: Constant variance			
Statistics	df	Stat value	p-value
Chi-squared	4	3.549809	0.470345

4.5 Supplier selection practices

The first objective of the study was to establish the influence of supplier selection practices on performance of government ministries in Kenya. Issues given attention under supplier selection practices included supplier evaluation, supplier certification and supplier comparison. A five point Likert scale was used to measure the indicators Where 1 was strongly disagree, 2 was disagree 3 was neither agree or disagree, 4 was agree and 5 was strongly Agree.

4.5.1 Supplier Evaluation

4.5.1.1 Factor Analysis and Reliability for the construct Supplier evaluation

The Supplier evaluation construct was reviewed for reliability and factor analysis as indicated in table 4.10, it was posited as a one-dimensional construct measured by the five items; We use technical capability criteria when evaluating suppliers (SE1), We use technical expertise criteria when evaluating suppliers (SE2), We use financial capability criteria when evaluating suppliers (SE3), We consider provision of after sales service when evaluating suppliers (SE4) and We consider suppliers past performance and current relationship when evaluating suppliers (SE5).. Supplier evaluation had a Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy of 0.686, which was above the threshold of 0.6 (Kaiser, 1974). Barlett's test of sphericity was significant (chi-square= 236.89, $p < 0.005$), showing that there were sufficient relationships among the variables to investigate. Exploratory factor analysis using Principal Component Analysis (PCA) with promax rotation revealed that the factor loadings of four out of five items were above the acceptable threshold of 0.5 Hair et al. (2006) therefore SE4 was dropped since its factor loading was 0.457 which is below the acceptable threshold of 0.5. Item total correlations of SE1, SE2, SE3 and SE5 were 0.598, 0.542, 0.419 and 0.423 respectively, which was above the 0.3 threshold. SE1, SE2, SE3 and SE5 were therefore maintained for measurement model estimation as they achieved the required thresholds for reliability and validity. Additionally, the items of measure SE1, SE2, SE3 and SE5 had factor loadings of 0.833, 0.801, 0.645 and 0.65 respectively, which accounted for 54.38% of the variability in Supplier evaluation. A Cronbach's coefficient alpha of 0.700 for Supplier evaluation indicated that the measuring scale was reliable.

Table 4.11: Factor Analysis and Reliability for the construct supplier evaluation

First order constructs	Cronbach's alpha	Reliability		Factor analysis			variance extracted	Items deleted
		Item	total correlation	KMO	Bartlett's (p value)	PCA component loading		
Supplier evaluation	0.701	SE1	0.598	0.686	236.89 (0.000)	0.833	54.38%	SE4
		SE2	0.542			0.801		0.457<0.5
		SE3	0.419			0.645		
		SE5	0.423			0.65		

4.5.1.2 Descriptive statistics for the construct Supplier evaluation

Respondents were requested to indicate their level of agreement with various statements on aspects of supplier evaluation. From the findings in table 4.11, majority of the respondents agreed that they use technical capability, criteria when evaluating suppliers (M=4.406, SD=0.894), they use technical expertise criteria when evaluating suppliers (M=4.285, SD=0.946) and they use financial capability criteria when evaluating suppliers (M=4.087, SD=1.050). In addition, the respondents agreed that they consider suppliers past performance and current relationship when evaluating suppliers (M=3.765, SD=1.211). However, the respondents were neutral on the statement that they consider provision of after sales service when evaluating suppliers (M=3.007, SD=1.333).

Table 4.12: Descriptive statistics for the construct supplier evaluation

	Strongly disagree	Disagree	Neither agree or disagree	Agree	Strongly Agree	Mean	Std. Deviation
SE1	0.0	2.2	21.2	10.3	66.3	4.406	.894
SE2	0.0	4.8	20.1	16.8	58.2	4.285	.946
SE3	1.1	7.0	23.4	19.0	49.5	4.087	1.050
SE4	11.0	36.3	12.8	20.9	19.0	3.007	1.333
SE5	4.4	12.5	23.8	20.9	38.5	3.765	1.211

These findings imply that government ministries in Kenya were using technical capability, technical expertise criteria, financial capability and suppliers past performance during the selection process. However, the ministries were moderately using the criteria of considering the provision of after sales service when evaluating suppliers. These findings agree with Hsu et al. (2006) argument that underlying the documented supplier selection criteria is the need to assess a supplier's quality and service capabilities as well as its strategic and managerial alignment with the buyer. These findings also concur with Churchill (1979) argument that scope of resources, technical expertise, industry knowledge, commitment to quality, supplier's process capability, and commitment to continuous improvement in product and process are used in supplier evaluation. Suppliers' evaluation in government ministries was found to be very free, fair, thorough and detailed and suppliers must have necessary qualifications, capacity, experience, financial capability, resources and equipment to be able to deliver.

The respondents were also asked to comment on supplier evaluation in their ministry. From the findings, they indicated that supplier's evaluation is very free, fair, thorough and detailed and suppliers must have necessary qualifications, capacity, experience, financial capability, resources and equipment to be able to deliver. The respondents also indicated that suppliers should be provided with clear information regarding the tender they are applying for to enable them provide necessary documentation correctly. They further indicated that evaluation enables the ministry to have assurance of supplier's ability to meet the contractual obligations that leads to timely delivery of quality goods and services.

The respondents were further asked to suggest any other criteria that their ministries used to evaluate suppliers. According to the findings, they indicated that during the evaluation it should be verified that suppliers is neither debarred from participating in procurement nor has been involved in corrupt practices. In addition, the ministry should at all times verify that the suppliers that they are procuring goods from are permitted by relevant agencies authorities who deal with quality measures to supply the items or services. They further indicated that Suppliers are also evaluated based on frequency of rejection of goods and services.

4.5.2 Supplier Certification

4.5.2.1 Factor Analysis and Reliability for the construct Supplier Certification.

The Supplier certification construct was reviewed for reliability and factor analysis as indicated in table 4.12, it was posited as a one-dimensional construct measured by the four items; we include requirement for Environmental Certification ISO 14001 in our evaluation criteria (SC1), we include requirement for quality certification in ISO 19001 in our evaluation criteria (SC2), we include requirement for life cycle certification ISO 14044:2006 (SC3) and we have knowledge on ISO 26000:2010 on social responsibility (SC4).. Supplier certification had a KMO measure of sampling adequacy of 0.8, which was above the threshold of 0.6 (Kaiser, 1974). Barlett's test of sphericity was significant (chi-square= 1074.225, $p < 0.05$), showing that there were sufficient relationships among the variables to investigate. Exploratory factor analysis using PCA with promax rotation revealed that the factor loadings of all the four items were above the acceptable threshold of 0.5 (Hair et al., 2006). Item total correlations of SC1, SC2, SC3 and SC4 were 0.872, 0.857, 0.900 and 0.792 respectively, which was above the 0.3 threshold. SC1, SC2, SC3 and SC4 were therefore maintained for measurement model estimation as they achieved the required thresholds for reliability and validity. Additionally, the items of measure SC1, SC2, SC3 and SC4 had factor loadings of 0.929, 0.923, 0.946 and 0.881 respectively, which accounted for 84.65% of the variability in Supplier certification. A Cronbach's coefficient alpha of 0.938 for Supplier certification indicated that the measuring scale was reliable.

Table 4.13: Factor Analysis and Reliability for the construct supplier certification.

First order constructs	Cronbach's alpha	Reliability		Factor analysis				
		Item	total correlation	KMO	Bartlett's (p value)	PCA component loading	variance extracted	Items deleted
Supplier Certification	0.938	SC1	0.872	0.8	1074.225 (0.000)	0.929	84.65%	None
		SC2	0.857			0.923		
		SC3	0.900			0.946		
		SC4	0.792			0.881		

4.5.2.2 Descriptive statistics for the construct Supplier certification

The respondents were also requested to indicate their level of agreement with various statements on aspects of supplier certification. The results were as shown in table 4.13. According to the findings, the respondents disagreed with the statement that they include requirement for Quality Certification in ISO 19001 in their evaluation criteria (M=2.498, SD=1.492). The respondents also disagreed with the statement that they had knowledge on ISO 26000:2010 on Social Responsibility (M=2.355, SD=1.370). In addition, the respondents disagreed with the statement that they include requirement for Environmental Certification ISO 14001 in their evaluation criteria (M=2.278, SD=1.301). Further, the respondents disagreed with the statement that they include requirement for Life Cycle Certification ISO 14044:2006 (M=2.183, SD=1.329).

Table 4.14: Descriptive statistics for the construct supplier certification

	Strongly disagree	Disagree	Neither agree or disagree	Agree	Strongly Agree	Mean	Std. Deviation
SC1	38.1	25.6	13.2	16.5	6.6	2.278	1.301
SC2	34.8	26.7	9.9	11.0	17.6	2.498	1.492
SC3	42.5	26.0	11.0	11.7	8.8	2.183	1.329
SC4	34.8	30.0	12.1	11.0	12.1	2.355	1.370

These findings imply that government ministries do not include requirement for Quality Certification (ISO 19001) in their evaluation criteria. In addition, most of the staff have no knowledge on ISO 26000:2010 on Social Responsibility. In addition, government ministries do not include requirement for Environmental Certification ISO 14001 and requirement for Life Cycle Certification ISO 14044:2006 in their evaluations. According to Corbett and Kirsch (2000) ISO 14001 certification has not significantly reduced lead times or reduced overall costs. In addition, ISO 14001 certification has very little impact on measures of performance. Further, the study found that government ministries do not include requirement for Environmental Certification ISO 14001 and requirement for Life Cycle Certification ISO 14044:2006 in their evaluations. These findings agree with Girubha et al. (2016) argument that ISO 140001 certification, ISO 26000 (social responsibility), ISO 14041 and 14044 (lifecycle assessment) are used in supplier selection. Government ministries in Kenya do not certify suppliers nor do they evaluate whether they are ISO certified. In addition, the ministries do not insist on ISO certified suppliers.

The respondents were also asked to comment on supplier certification in their ministry. According to the findings, they indicated that they do not certify suppliers nor do they insist on ISO certification when evaluating suppliers. The respondents indicated that there is need of sensitizing procurement professionals on International

standards to build their capacity to facilitate proper evaluation of suppliers when certification requirements are included in the evaluation criteria

4.5.3 Supplier Comparison

4.5.3.1 Factor Analysis and Reliability for the construct Supplier Comparison.

The Supplier comparison construct was reviewed for reliability and factor analysis as indicated in table 4.14, It was posited as a one-dimensional construct measured by the six items; we rank suppliers on product quality (SCO1), we rank suppliers on service quality (SCO2), we rank suppliers on lead time (SCO3), we rank suppliers on reputation (SCO4), we rank suppliers on responsiveness (SCO5) and we rank suppliers on price (SCO6). Supplier comparison had a KMO measure of sampling adequacy of 0.740, which was above the threshold of 0.6 (Kaiser, 1974). Barlett's test of sphericity was significant (chi-square= 919.734, $p < 0.05$), showing that there were sufficient relationships among the variables to investigate. Exploratory factor analysis using PCA with promax rotation revealed that the factor loadings of five out of six items were above the acceptable threshold of 0.5 (Hair et al., 2006) therefore SCO6 was dropped since its factor loading was 0.458 which is below the acceptable threshold of 0.5. Item total correlations of SCO1, SCO2, SCO3, SCO4 and SCO5, were 0.745, 0.782, 0.789, 0.637 and 0.383 respectively, which was above the 0.3 threshold. SCO1, SCO2, SCO3, SCO4 and SCO5 were therefore maintained for measurement model estimation as they achieved the required thresholds for reliability and validity. Additionally, the items of measure SCO1, SCO2, SCO3, SCO4 and SCO5 had factor loadings of 0.869, 0.891, 0.881, 0.767 and 0.513 respectively, which accounted for 63.58% of the variability in Supplier comparison. A Cronbach's coefficient alpha of 0.853 for Supplier comparison indicated that the measuring scale was reliable.

Table 4.15: Factor Analysis and Reliability for the construct supplier comparison.

First order constructs	Cronbach's alpha	Reliability		Factor analysis			variance extracted	Items deleted
		Item	total correlation	KMO	Bartlett's (p value)	PCA component loading		
Supplier Comparison	0.853	SCO 1	0.745	0.740	919.734 (0.000)	0.869	63.58%	SCO6 0.458<0.5
		SCO 2	0.782			0.891		
		SCO 3	0.789			0.881		
		SCO 4	0.637			0.767		
		SCO 5	0.383			0.513		

4.5.3.2 Descriptive statistics for the construct Supplier Comparison

The study sought to find out the respondents level of agreement with various statements on aspects of supplier comparison. The results were as shown in table 4.15. According to the findings, the respondents agreed that they rank suppliers on responsiveness and price (M=4.219, SD=1.058), they rank suppliers on product quality and service quality (M=3.985, SD=1.297). In addition, the respondents agreed that they rank suppliers on lead time (M=3.809, SD=1.297). However, the respondents disagreed with the statement that they rank suppliers on reputation (M=3.498, SD=1.312).

Table 4.16: Descriptive statistics for the construct supplier comparison

	Strongly disagree	Disagree	Neither agree or disagree	Agree	Strongly Agree	Mean	Std. Deviation
SCO1	8.1	6.2	18.7	13.2	53.8	3.985	1.306
SCO2	8.1	4.0	24.2	8.8	54.9	3.985	1.297
SCO3	5.5	13.2	22.7	12.1	46.5	3.809	1.297
SCO4	8.8	14.3	27.8	16.5	32.6	3.498	1.312
SCO5	1.1	6.6	20.9	12.1	59.3	4.219	1.058
SCO6	3.3	3.3	23.1	8.8	61.5	4.219	1.109

The findings imply that government ministries rank suppliers on responsiveness and price, product quality and service quality as well as lead time. However, most government ministries rarely rank suppliers based on their reputation. These findings concur with Churchill (1979) argument that supplier service/product quality is an important facet of supplier selection. These findings also agree with Kellner and Lasch (2016) argument that the indicators used to measure supplier service include supplier ability to meet delivery due dates, the price of materials, parts and services, flexible contract terms and conditions, geographical proximity, and reserve capacity and the ability to respond to unexpected demand are used in supplier selection. In government ministries in Kenya, suppliers' comparison is carried out to determine whether there is responsiveness to the set criteria. Most government ministries used responsiveness, better prices and quality in comparison with the market prices. Other criteria used include quality of service, technical capability, financial capability, proximity to supply point and number of years in business, experience of suppliers, consistency of virtues and values and total cost assessment. These findings are in agreement with Amindoust et al. (2012) argument that supplier selection criteria in most government institutions include quality of service, technical capability, financial capability and experience.

The respondents were asked to comment on supplier comparison in their ministry. The respondents indicated that suppliers are ranked or rated the best in terms of the awarded tenders. Suppliers' comparison is carried out to determine whether there is responsiveness to the set criteria. Most government ministries used responsiveness, better prices and quality in comparison with the market prices.

The respondents were asked to indicate other criteria that their ministries use to rank suppliers. From the findings, they indicated that suppliers are ranked based on the criteria set out in the bid document the lowest evaluated bidder becomes the successful bidder. Other criteria used include quality of service, technical capability, financial capability, proximity to supply point and number of years in business, experience of suppliers, consistency of virtues and values and total cost assessment.

4.6 Supply chain policies

The second objective of the study was to evaluate the influence of supply chain policies on performance of government ministries in Kenya. Issues given attention under supply chain policies included Disposal policy, Asset management policy and Risk management policy. A five point Likert scale was used to measure the indicators Where 1 was strongly disagree, 2 was disagree 3 was neither agree or disagree, 4 was agree and 5 was strongly Agree.

4.6.1 Disposal policy

The second objective of the study was to evaluate the influence of supply chain policies on performance of the government ministries in Kenya. Supply chain policies included disposal policy, asset management policy and risk management policy.

4.6.1.1 Factor Analysis and Reliability for the construct disposal policy

The Disposal policy construct was reviewed for reliability and factor analysis as indicated in table 4.16. It was posited as a one-dimensional construct measured by the six items; we use our disposal policy (DP1), We carry out identification and reporting of items before disposal (DP2), we prepare a disposal plan (DP3), we carry

out assessment of items earmarked for disposal (DP4), we carry out evaluation of items earmarked for disposal (DP5) and we prepare a disposal report (DP6).. Disposal policy had a KMO measure of sampling adequacy of 0.899, which was above the threshold of 0.6 (Kaiser, 1974). Barlett’s test of sphericity was significant (chi-square= 1221.738, $p < 0.05$), showing that there were sufficient relationships among the variables to investigate. Exploratory factor analysis using PCA with promax rotation revealed that the factor loadings of all the six items were above the acceptable threshold of 0.5 (Hair et al., 2006). Item total correlations of DP1, DP2, DP3, DP4, DP5 and DP6 were 0.645, 0.837, 0.781, 0.866, 0.75 and 0.775 respectively, which was above the 0.3 threshold. DP1, DP2, DP3, DP4, DP5 and DP6 were therefore maintained for measurement model estimation as they achieved the required thresholds for reliability and validity. Additionally, the items of measure DP1, DP2, DP3, DP4, DP5 and DP6 had factor loadings of 0.737, 0.895, 0.859, 0.919, 0.832 and 0.856 respectively, which accounted for 72.52% of the variability in Disposal policy, A Cronbach’s coefficient alpha of 0.915 for Disposal policy indicated that the measuring scale was reliable.

Table 4.17: Factor Analysis and Reliability for the construct disposal policy

First order constructs	Cronbach’s alpha	Reliability		Factor analysis				
		Item	Item total correlation	KMO	Bartlett’s (p value)	PCA component loading	variance extracted	Items deleted
Disposal policy	0.915	DP1	0.645	0.899	1221.738 (0.000)	0.737	72.52%	None
		DP2	0.837			0.895		
		DP3	0.781			0.859		
		DP4	0.866			0.919		
		DP5	0.750			0.832		
		DP6	0.775			0.856		

4.6.1.2 Descriptive statistics for the construct disposal policy

The respondents were requested to indicate their level of agreement with various statements on disposal policy. The results were as shown in 4.17. From the findings, the respondents strongly agreed that they prepare a disposal report (M=4.648, SD=0.791), they carry out assessment of items earmarked for disposal (M=4.461, SD=0.907), they carry out identification and reporting of items before disposal (M=4.450, SD=0.954) and prepare a disposal plan (M=4.329, SD=1.040). The respondents also agreed that they carry out evaluation of items earmarked for disposal (M=4.274, SD=1.071) and they have a disposal policy (M=4.175, SD=1.202).

Table 4.18: Descriptive statistics for the construct disposal policy

	Strongly disagree	Disagree	Neither agree or disagree	Agree	Strongly Agree	Mean	Std. Deviation
DP1	6.6	2.2	18.7	12.1	60.4	4.175	1.202
DP2	1.1	3.3	16.5	7.7	71.4	4.450	.954
DP3	1.1	7.7	13.2	13.2	64.8	4.329	1.040
DP4	1.1	2.2	15.4	12.1	69.2	4.461	.907
DP5	2.2	5.5	17.6	12.1	62.6	4.274	1.071
DP6	1.1	1.1	9.9	7.7	80.2	4.648	.791

These findings imply that supply chain departments in government ministries prepare a disposal report, they carry out assessment of items earmarked for disposal, they carry out identification and reporting of items before disposal, prepare a disposal plan, carry out evaluation of items earmarked for disposal and they use the disposal policy.

The respondents were asked to comment on disposal policy in their ministry. According to the findings, they indicated that the disposal policy is guided by the public procurement and Asset disposal act 2015. They also indicated that when the disposal is done by contracted Auctioneer, it's advantageous to the ministry as it gets

value for money. Disposal exercise is as vigorous as procurement and follows strict predetermined procedures. Items are disposed annually and the items earmarked for disposal are put in the annual disposal plan. During the disposal process, they identify the goods and services for disposal then constitute a committee with a chairman to undertake the task. Disposal policy enhances transparency, efficiency, effective and economical disposal of assets.

The respondents were requested to indicate any other disposal procedure that their ministry uses for disposal of Asset. According to the findings, the respondents indicated that the disposal procedure in use is adequate and is in accordance with the regulation. In addition, the provisions in the current procurement law are sufficient for the ministry's disposal needs. They further indicated that the annual disposal plan is prepared and the disposal exercise is carried out once in a year.

4.6.2 Asset management policy

4.6.2.1 Factor Analysis and Reliability for the construct Asset management Policy

The Asset management policy construct was reviewed for reliability and factor analysis as indicated in table 4.18. Asset management policy was posited as a one-dimensional construct measured by the four items, we have asset management policy (AMP1), we maintain fixed asset register (AMP2), we insure our assets (AMP3) and we update our asset register (AMP4).. Asset management policy had a KMO measure of sampling adequacy of 0.7, which was above the threshold of 0.6 (Kaiser, 1974). Barlett's test of sphericity was significant (chi-square= 592.374, $p < 0.05$), showing that there were sufficient relationships among the variables to investigate. Exploratory factor analysis using PCA with promax rotation revealed that the factor loadings of all the four were above the acceptable threshold of 0.5 (Hair et al., 2006). Item total correlations of AMP1, AMP2, AMP3 and AMP4 were 0.534, 0.741, 0.409 and 0.758 respectively, which was above the 0.3 threshold. AMP1, AMP2, AMP3 and AMP4 were therefore maintained for measurement model estimation as they achieved the required thresholds for reliability and validity. Additionally, the items of measure AMP1, AMP2, AMP3 and AMP4 had factor loadings of 0.754, 0.918,

0.598 and 0.922 respectively, which accounted for 65.49% of the variability in Asset management policy. A Cronbach's coefficient alpha of 0.767 for Asset management policy indicated that the measuring scale was reliable.

Table 4.19: Factor Analysis and Reliability for the construct Asset management Policy

First order constructs	Cronbach's alpha	Reliability		Factor analysis				
		Item	Item total correlation	KMO	Bartlett's (p value)	PCA component loading	variance extracted	Items deleted
Asset management policy	0.767	AMP 1	0.534	0.7	592.374 (0.000)	0.754	65.49%	None
		AMP 2	0.741			0.918		
		AMP 3	0.409			0.598		
		AMP 4	0.758			0.922		

4.6.2.2 Descriptive statistics for the construct Asset management policy

The respondents were further requested to indicate their level of agreement with various statements on asset management policy. The results were as presented in table 4.19. According to the findings, the respondents agreed that they maintain and update fixed asset register as shown by means of 4.439 (SD=0.976) and 4.395 (SD=0.994) respectively. The respondents also agreed with a mean of 3.871 (SD=1.345) that they have asset management policy and they insure their ministries' assets (M=3.527, SD=1.601).

Table 4.20: Descriptive statistics for the construct Asset Management Policy

	Strongly disagree	Disagree	Neither agree or disagree	Agree	Strongly Agree	Mean	Std. Deviation
AMP1	8.8	9.9	15.0	17.9	48.4	3.871	1.345
AMP2	2.2	2.6	14.3	11.0	70.0	4.439	.976
AMP3	17.6	15.8	9.9	9.9	46.9	3.527	1.601
AMP4	2.2	2.6	16.5	11.0	67.8	4.395	.994

These findings imply that supply chain departments in government ministries in Kenya maintain and up to date fixed asset register, have asset management policy and they insure their ministries' assets. According to Mahmood et al. (2014) total asset management policies cover demand management, whole-of-life asset management, risk management, value management and cross-agency coordination in service planning and delivery.

The respondents were asked to comment on asset management policy in their ministry. According to the findings, they indicated that their ministries had an asset management policy and maintained assets register. However, they indicated that some assets are not in the asset register and the ministries need to have the items insured. Insurance of assets is a continuous process because new assets are insured as soon as they are procured.

The respondents were also asked to indicate any other asset management strategy that their ministry implements. According to the findings, they indicated that assets which becomes obsolete are disposed as per the regulations. Some ministries had computerized the management of asset register. The ministries were also using asset tagging or digital bar coding and the adoption of ISO 55000 to create an effective strategic asset management plan.

4.6.3 Risk management policy

4.6.3.1 Factor Analysis and Reliability for the construct Risk management policy

The Risk management policy construct was reviewed for reliability and factor analysis as indicated in table 4.20, it was posited as a one-dimensional construct measured by the four items; we have a risk management policy (RMP1), we identify risk in procurement (RMP2), we maintain a risk register (RMP3) and we update procurement risk register (RMP4). Risk management policy had a KMO measure of sampling adequacy of 0.817, which was above the threshold of 0.6 (Kaiser, 1974). Barlett's test of sphericity was significant (chi-square= 1148.006, $p < 0.05$), showing that there were sufficient relationships among the variables to investigate. Exploratory factor analysis using PCA with promax rotation revealed that the factor loadings of four were above the acceptable threshold of 0.5 (Hair et al., 2006) therefore none was dropped. Item total correlations of RMP1, RMP2, RMP3 and RMP4 were 0.848, 0.863, 0.91 and 0.88 respectively, which was above the 0.3 threshold. RMP1, RMP2, RMP3 and RMP4 were therefore maintained for measurement model estimation as they achieved the required thresholds for reliability and validity. Additionally, the items of measure RMP1, RMP2, RMP3 and RMP4 had factor loadings of 0.915, 0.923, 0.95 and 0.933 respectively, which accounted for 86.56% of the variability in Risk management policy. A Cronbach's coefficient alpha of 0.948 for Risk management policy indicated that the measuring scale was reliable.

Table 4.21: Factor Analysis and Reliability for the construct Risk Management Policy

First order constructs	Cronbach's alpha	Reliability		Factor analysis					
		Item	Item total correlation	KMO	Bartlett's (p value)	PCA component loading	variance extracted	Items deleted	
Risk management policy	0.948	RMP1	0.848	0.817	1148.006 (0.000)	0.915	86.56%	None	
		RMP2	0.863			0.923			
		RMP3	0.910			0.950			
		RMP4	0.880			0.933			

4.6.3.2 Descriptive statistics for the construct Risk management policy

The respondents were requested to indicate their level of agreement with statements on risk management policy in relation to their ministries supply chain department. The results were as presented in table 4.21. From the findings, the respondents indicated that they identify risk in procurement in their ministries (M=3.542, SD=1.434). The respondents were neutral on the statements that they have a risk management policy and they maintain a risk register in their ministries as shown by means of 3.391 (SD=1.511) and 2.956, (SD=1.580) respectively. Further, the respondents were neutral on the statement that they update procurement risk register as shown by a mean of 2.930 (SD=1.594).

Table 4.22: Descriptive statistics for the construct Risk Management Policy

	Strongly disagree	Disagree	Neither agree or disagree	Agree	Strongly Agree	Mean	Std. Deviation
RMP1	16.5	16.1	15.4	15.8	36.3	3.391	1.511
RMP2	15.4	6.6	23.8	16.8	37.4	3.542	1.434
RMP3	27.5	17.6	13.6	14.7	26.7	2.956	1.580
RMP4	29.7	14.3	16.5	12.5	27.1	2.930	1.594

These findings show that government ministries in Kenya identify risk in procurement, have a risk management policy and they maintain risks register. However, while some ministries were updating procurement risk register others were not. These findings are in agreement with Bhatti (2016) findings that public institutions have risk management policies and maintain a risk register. However, while some ministries were updating procurement risk register others were not

The respondents were required to comment on risk management policy in their ministry. From the findings, they indicated that risk management was not very active but the policy entails risk identification, risk analysis, risk response and risk monitoring and control. They also indicated that risk management policy in the ministry affects all departments and not necessary procurement alone. Risk management also balances the cost of managing risk with anticipated benefits and undertaken contingency planning in the event that critical risks are realized. Therefore, it should be a continuous process linked to achievement of the organization.

The respondents were also requested to indicate any other risk management strategy that their ministries implement. From the findings, they indicated that the management should come up with risk management policy. In addition, the ministry does not implement its own policy strategy the policy is from the central government for implementation by every ministry or department.

4.7 Supplier Collaboration Practices

The third objective of the study was to assess the influence of supplier collaboration practices on performance of the government ministries in Kenya. The indicators of supplier collaboration include information sharing, supply chain integration and supplier strategic partnership. A five point Likert scale was used to measure the indicators Where 1 was strongly disagree, 2 was disagree 3 was neither agree or disagree, 4 was agree and 5 was strongly Agree

4.7.1 Information Sharing

4.7.1.1 Factor Analysis and Reliability for the construct Informational sharing

The Informational sharing construct was reviewed for reliability and factor analysis as indicated in table 4.22. It was posited as a one-dimensional construct measured by the six items; we share proprietary information with suppliers (IS1), we share business knowledge of core business process (IS2), we provide advance information of changing need to suppliers (IS3), we provide full information to suppliers about issues that affect business (IS4), we exchange information that help establish business planning (IS5) and we keep each other informed about the changes that may affect the other (IS6). Informational sharing had a KMO measure of sampling adequacy of 0.912, which was above the threshold of 0.6 (Kaiser, 1974). Barlett's test of sphericity was significant (chi-square= 1771.621, $p < 0.05$), showing that there were sufficient relationships among the variables to investigate. Exploratory factor analysis using PCA with promax rotation revealed that the factor loadings of six items were above the acceptable threshold of 0.5 (Hair et al., 2006) therefore none was dropped. Item total correlations of IS1, IS2, IS3, IS4, IS5 and IS6 were 0.813, 0.839, 0.852, 0.91, 0.852 and 0.905 respectively, which was above the 0.3 threshold. IS1, IS2, IS3, IS4, IS5 and IS6 were therefore maintained for measurement model estimation as they achieved the required thresholds for reliability and validity. Additionally, the items of measure IS1, IS2, IS3, IS4, IS5 and IS6 had factor loadings of 0.868, 0.888, 0.898, 0.941, 0.899 and 0.937 respectively, which accounted for 81.97% of the variability in Informational sharing. A Cronbach's

coefficient alpha of 0.956 for Informational sharing indicated that the measuring scale was reliable.

Table 4.23: Factor Analysis and Reliability for the construct Informational Sharing

First order constructs	Cronbach's alpha	Reliability		Factor analysis			PCA component loading	variance extracted	Items deleted
		Item	Item total correlation	KMO	Bartlett's (p value)				
Information sharing	0.956	IS1	0.813	0.912	1771.621 (0.000)	0.868	81.9%	None	
		IS2	0.839			0.888			
		IS3	0.852			0.898			
		IS4	0.910			0.941			
		IS5	0.852			0.899			
		IS6	0.905			0.937			

4.7.1.2 Descriptive statistics for the construct Information sharing

The respondents were requested to indicate their level of agreement with various statements on information sharing. The results were as presented in table 4.23. From the findings, the respondents were neutral on the statement that they keep each other informed about the changes that may affect the other (M=3.172, SD=1.389). The respondents were also neutral on the statement that they provide full information to suppliers about issues that affect business (M=3.080, SD=1.460). The respondents were also neutral on the statements that they provide advance information of changing need to suppliers (M=3.047, SD=1.412) and share business knowledge of core business process (M=3.033, SD=1.362). In addition, the respondents were neutral on the statement that they exchange information that help establish business planning (M=2.992, SD=1.385) and sharing proprietary information with suppliers (M=2.956, SD=1.341).

Table 4.24: Descriptive statistics for the construct Information Sharing

	Strongly disagree	Disagree	Neither agree or disagree	Agree	Strongly Agree	Mean	Std. Deviation
IS1	17.6	22.0	24.9	18.3	17.2	2.956	1.341
IS2	16.5	19.8	29.3	12.8	21.6	3.033	1.362
IS3	16.5	23.1	24.2	11.7	24.5	3.047	1.412
IS4	19.8	16.5	26.4	10.6	26.7	3.080	1.460
IS5	18.7	18.7	28.6	12.8	21.2	2.992	1.385
IS6	15.4	17.6	26.7	15.0	25.3	3.172	1.389

These findings imply that some government ministries provide full information to suppliers about issues that affect business, provide advance information of changing need to suppliers and share business knowledge of core business process, exchange information that help establish business planning and sharing proprietary information with suppliers. According to Cao et al. (2010) supply chain collaboration is attributed to seven components (information sharing, goal congruence, decision synchronization, incentive alignment, resources sharing, collaborative communication and joint knowledge creation). In addition, according to Mason-Jones and Towil (1997) information enrichment like immediate sharing of market place data throughout the chain is not merely desirable but obligatory

The respondents were asked to comment on information sharing in their ministries. According to the findings, they indicated that after evaluation in the systems the awards can be seen by suppliers to see comparison of prices. In addition, information sharing between the ministry and suppliers has been key. Online transactions in the integrated financial management information system (IFMIS) alongside other means of communication have made information sharing easy and convenient. The respondents also indicated that the utilization of IFMIS is mandatory in all

government ministries. Other respondents indicated that government information is classified confidential and only relevant bits are shared. Further, any sharing of information must comply with the law relating to confidentiality, data protection, any human rights their need to establish legitimate purpose of sharing information.

The respondents were further asked to indicate the other information that their ministries shares with suppliers. According to the findings, all information pertaining to tenders should be made available to all interested suppliers. In addition, use of technology and the need to embrace better procurement practices that is devoid of corruption and wastage. The respondents also indicated that information sharing has been enhanced to facilitate coordination and cost alignment within supply chain. In government ministries the pre-qualification of supplier, contractors and consultants is also shared in the websites.

4.7.2 Supply chain integration

4.7.2.1 Factor Analysis and Reliability for the construct Supply Chain Integration

The Supply chain integration construct was reviewed for reliability and factor analysis as indicated in table 4.24, it was posited as a one-dimensional construct measured by the three items; we frequently contact our suppliers (SCI1), we have a compatible communication and information system with our suppliers (SCI2) and we participate in the marketing efforts of our suppliers (SCI3).. Supply chain integration had a KMO measure of sampling adequacy of 0.686, which was above the threshold of 0.6 (Kaiser, 1974). Barlett's test of sphericity was significant (chi-square= 334.135, $p < 0.05$), showing that there were sufficient relationships among the variables to investigate. Exploratory factor analysis using PCA with promax rotation revealed that the factor loadings of three items were above the acceptable threshold of 0.5 (Hair et al., 2006) therefore none was dropped. Item total correlations of SCI1, SCI2 and SCI3 were 0.719, 0.738 and 0.591 respectively, which was above the 0.3 threshold. SCI1, SCI2 and SCI3 were therefore maintained for measurement model estimation as they achieved the required thresholds for reliability and validity. Additionally, the items of measure SCI1, SCI2 and SCI3 had factor loadings of

0.888, 0.900 and 0.798 respectively, which accounted for 74.53% of the variability in Supply chain integration. A Cronbach's coefficient alpha of 0.822 for Supply chain integration indicated that the measuring scale was reliable.

Table 4.25: Factor Analysis and Reliability for the construct Supply Chain Integration

First order constructs	Cronbach's alpha	Reliability		Factor analysis			variance extracted	Items deleted
		Item	Item total correlation	KMO	Bartlett's (p value)	PCA component loading		
Supply chain integration	0.822	SCI1	0.719	0.686	334.135 (0.000)	0.888	74.53%	None
		SCI2	0.738			0.900		
		SCI3	0.591			0.798		

4.7.2.2 Descriptive statistics for the construct Supply Chain Integration.

The respondents were asked to indicate their level of agreement with various statements on supply chain integration in relation to their ministries' supply chain departments. The results were as shown in table 4.25. According to the findings, the respondents were neutral on the statement that they frequently contact their suppliers (M=3.454, SD=1.133). The respondents were also neutral on the statement that they have a compatible communication and information system with their suppliers (M=3.267, SD=1.259). Further, the respondents were neutral on the statement that they participate in the marketing efforts of their suppliers (M=2.586, SD=1.350).

Table 4.26: Descriptive statistics for the construct Supply Chain Integration.

	Strongly disagree	Disagree	Neither agree or disagree	Agree	Strongly Agree	Mean	Std. Deviation
SC1	4.4	15.4	33.7	23.4	23.1	3.454	1.133
SC2	7.7	20.9	33.7	12.5	25.3	3.267	1.259
SC3	25.3	30.8	17.6	12.8	13.6	2.586	1.350

These findings show that some government ministries frequently contact their suppliers, have a compatible communication and information system with their suppliers and participate in the marketing efforts of their suppliers. These findings disagree with Vieira and Mergulhao (2015) argument that in an effort to enhance supply chain integration public institutions normally contact their suppliers.

The respondents were requested to indicate any comment on supply chain integration in their ministries. From the findings, supply chain integration guarantees exchange of useful information for better service delivery gives clarity and avoids ambiguity. In addition, the respondents indicated that communication with suppliers is done only when it's necessary. Further, the respondents indicated that supplier registration and sensitization is a requirement by law hence being undertaken.

The respondents were asked to indicate any seamless coordination that exists between their ministries and suppliers. From the findings, they indicated that government ministries ensure mutual agreement and satisfaction of both suppliers and the ministry. Government ministries recommend the suppliers to other reputable clients or other procuring entity based on performance.

4.7.3 Supplier strategic partnership

4.7.3.1 Factor Analysis and Reliability for the construct supplier strategic partnership

Supplier strategic partnership was posited as a one-dimensional construct measured by the six items as indicated in table 4.26. We solve our procurement related problems jointly with suppliers (SSP1), we consider quality in supplier selection (SSP2), we help suppliers to improve their product quality (SSP3), we include our suppliers in continuous improvement programs (SSP4), we include our suppliers in planning and goal setting activities (SSP5) and we involve our suppliers in key development processes (SSP6). The Supplier strategic partnership construct was reviewed for reliability and factor analysis. Supplier strategic partnership had a KMO measure of sampling adequacy of 0.824, which was above the threshold of 0.6 (Kaiser, 1974). Barlett's test of sphericity was significant (chi-square= 987.559,

p<0.05), showing that there were sufficient relationships among the variables to investigate. Exploratory factor analysis using PCA with promax rotation revealed that the factor loadings of six items were above the acceptable threshold of 0.5 (Hair et al., 2006). Therefore none was dropped. Item total correlations of SSP1, SSP2, SSP3, SSP4, SSP5 and SSP6 were 0.672, 0.458, 0.721, 0.831, 0.78 and 0.707 respectively, which was above the 0.3 threshold. SSP1, SSP2, SSP3, SSP4, SSP5 and SSP6 were therefore maintained for measurement model estimation as they achieved the required thresholds for reliability and validity. Additionally, the items of measure SSP1, SSP2, SSP3, SSP4, SSP5 and SSP6 had factor loadings of 0.778, 0.572, 0.81, 0.898, 0.868 and 0.812 respectively, which accounted for 63.45% of the variability in Supplier strategic partnership. A Cronbach's coefficient alpha of 0.884 for Supplier strategic partnership indicated that the measuring scale was reliable.

Table 4.27: Factor Analysis and Reliability for the construct supplier strategic partnership

First order constructs	Reliability		Factor analysis					
	Cronbach's alpha	Item	Item total correlation	KMO	Bartlett's (p value)	PCA component loading	variance extracted	Items deleted
Supplier strategist partnership	0.884	SSP1	0.672	0.824	987.559 (0.000)	0.778	63.45%	None
		SSP2	0.458			0.572		
		SSP3	0.721			0.810		
		SSP4	0.831			0.898		
		SSP5	0.780			0.868		
		SSP6	0.707			0.812		

4.7.3.2 Descriptive statistics for the construct supplier strategic partnership

The respondents were further requested to indicate their level of agreement with various statements on supplier strategic partnership. The results were as presented in

table 4.27. According to the findings, the respondents agreed that they consider quality in supplier selection (M=3.978, SD=1.172). However, the respondents were neutral on the statements indicated that help suppliers to improve their product quality (M=3.256, SD=1.414) and also on solving procurement related problems jointly with suppliers (M=3.153, SD=1.244). The respondents were neutral with the statement that they include their suppliers in continuous improvement programs (M=2.948, SD=1.451). The respondents were also neutral on the statements that they involve their suppliers in key development processes (M=2.674, SD=1.355) and they include their suppliers in planning and goal setting activities (M=2.461, SD=1.442).

Table 4.28: Descriptive statistics for the construct Supplier Strategic Partnership

	Strongly disagree	Disagree	Neither agree or disagree	Agree	Strongly Agree	Mean	Std. Deviation
SSP1	9.9	22.0	30.0	19.0	19.0	3.153	1.244
SSP2	3.3	8.8	23.4	15.8	48.7	3.978	1.172
SSP3	16.5	15.4	19.4	23.4	25.3	3.256	1.414
SSP4	20.9	23.1	18.3	15.8	22.0	2.948	1.451
SSP5	38.5	17.6	15.4	16.5	12.1	2.461	1.442
SSP6	26.4	22.0	21.6	17.9	12.1	2.674	1.355

The findings show that government ministries consider quality in supplier selection. These findings concur with Wieland and Wellenburg (2012) findings that public institutions consider service quality during the selection process. However, some of the government ministries help suppliers to improve their product quality, solve procurement related problems jointly with suppliers, include their suppliers in continuous improvement programs, involve their suppliers in key development processes and they include their suppliers in planning and goal setting activities. These findings are in line with Lucas et al. (2007) argument that public institutions do not involve suppliers in key development processes as well as in planning and goal setting activities.

The respondents were asked to comment on supplier strategic partnership in their ministries. According to the findings, they indicated that when developing certain task the supplier partnership is mandatory for quality task or job. Suppliers' strategic partnership is key since parties were aware of the expectation and worked together to meet or achieve the set targets. Some respondents also indicated that they organize training and sensitization of suppliers especially under youth women and persons with disability category.

The respondents were further asked to indicate any other activity they carry out together with the suppliers. From the findings, the respondents indicated that they were carrying out improvement of quality products services together with suppliers. They also indicated that they share information about new technology, new products and the market, any challenges experienced during implementation of programs and after sale services. Also, the respondents indicated that their ministries were carrying out sensitization on the new public procurement law.

4.8 Risk Management Practices

The fourth objective of the study was to establish the influence of supply chain risk management practices on performance of the government ministries in Kenya. The indicators of s risk management include risk identification, risk assessment and dual sourcing. A five point Likert scale was used to measure the indicators Where 1 was strongly disagree, 2 was disagree 3 was neither agree or disagree, 4 was agree and 5 was strongly Agree

4.8.1 Risk identification

4.8.1.1 Factor Analysis and Reliability for the construct Risk Identification

The Risk identification construct was reviewed for reliability and factor analysis as indicated in table 4.28. It was posited as a one-dimensional construct measured by the five items; we carry out identification of potential risk in supply chain (RI1), we frequently review our ministry's records (RI2), we have a work flow chart for our ministry (RI3), we have professional expertise in our ministry (RI4) and we carry out

on-site investigation of existence of risk (RI5). Risk identification had a KMO measure of sampling adequacy of 0.857, which was above the threshold of 0.6 (Kaiser, 1974). Barlett's test of sphericity was significant (chi-square= 887.097, $p < 0.05$), showing that there were sufficient relationships among the variables to investigate. Exploratory factor analysis using PCA with promax rotation revealed that the factor loadings of five items were above the acceptable threshold of 0.5 (Hair et al., 2006). Item total correlations of RI1, RI2, RI3, RI4 and RI5 were 0.703, 0.840, 0.741, 0.779 and 0.761 respectively, which was above the 0.3 threshold. RI1, RI2, RI3, RI4 and RI5 were therefore maintained for measurement model estimation as they achieved the required thresholds for reliability and validity. Additionally, the items of measure RI1, RI2, RI3, RI4 and RI5 had factor loadings of 0.805, 0.906, 0.840, 0.865 and 0.852 respectively, which accounted for 72.94% of the variability in Risk identification. A Cronbach's coefficient alpha of 0.906 for Risk identification indicated that the measuring scale was reliable.

Table 4.29: Factor Analysis and Reliability for the construct Risk Identification

First order constructs	Cronbach's alpha	Reliability		Factor analysis			variance extracted	Items deleted
		Item	Item total correlation	KMO	Bartlett's (p value)	PCA component loading		
Risk Identification	0.906	RI1	0.703	0.857	887.097 (0.000)	0.805	72.94%	None
		RI2	0.840			0.906		
		RI3	0.741			0.840		
		RI4	0.779			0.865		
		RI5	0.761			0.852		

4.8.1.2 Descriptive statistics for the construct Risk Identification

The respondents were asked to indicate their level of agreement with various statements on risk identification in their ministries' supply chain departments. The results are presented in table 4.10 below. As indicated in table 4.29, the respondents agreed that they ministries' supply chain departments have professional expertise

(M=4.047, SD=1.213). The respondents also agreed that they frequently review their ministries' records (M=3.608, SD=1.205), have a work flow chart for their ministry (M=3.578, SD=1.320). However, they were neutral on the statements that they carry out identification of potential risk in supply chain (M=3.490, SD=1.289) and they carry out on-site investigation of existence of risk (M=3.326, SD=1.320).

Table 4.30: Descriptive statistics for the construct Risk Identification

	Strongly disagree	Disagree	Neither agree or disagree	Agree	Strongly Agree	Mean	Std. Deviation
RI1	9.9	13.2	22.3	27.1	27.5	3.490	1.289
RI2	5.5	12.1	30.4	20.1	31.9	3.608	1.205
RI3	11.0	9.9	21.2	26.0	31.9	3.578	1.320
RI4	5.5	5.5	21.6	13.6	53.8	4.047	1.213
RI5	9.9	20.9	21.2	22.7	25.3	3.326	1.320

These findings imply that government ministries' supply chain departments have professional expertise, frequently review their records and have a work flow chart. However, though some ministries carry out identification of potential risk in supply chain and on-site investigation of existence of risk others do not. These findings are contrary to Tummala and Schoenherr (2011) argument that organizations conduct identification of potential risk in supply chain

The respondents were requested to comment on risk identification in their ministries. According to the findings, they indicated that they were not conversant with risk management but usually carry out stock taking every end of a financial year, carried out by appointed members by the authorized officer. They also indicated that risk identification is done on a small extent proper programme is yet to be put in place. They also indicated that risk identification was done through regular audits and a small unit within procurement department (procurement planning and monitoring). To avoid risk in the supply chain and inventory management, the government

ministries uses a stores accounting method of first in first out to reduce the risk of obsolescence in stock that could lead to many obsolete stock.

The respondents were further asked to indicate other risk identification strategy that is used in their ministries. According to the findings, they indicated that once the policy is in place risks are identified, analysis is be done to determine response strategy what should be done to detect any new risks. They also indicated that their ministries only assess risk on theft, destruction or loss. They recommended that a risks team to explore in ways and measures to be employed when dealing with risks matters.

4.8.2 Risk assessment

4.8.2.1 Factor Analysis and Reliability for the construct Risk assessment

The Risk assessment construct was reviewed for reliability and factor analysis as indicated in table 4.30 it was posited as a one-dimensional construct measured by the five items; we carry out risk audit (RA1), we carry out regular risk check-ups (RA2), we carry out risk analysis (RA3), we carry out joint risk workshops with our suppliers (RA4) and we carry out joint training sessions with our suppliers (RA5).. Risk assessment had a KMO measure of sampling adequacy of 0.744, which was above the threshold of 0.6 (Kaiser, 1974). Barlett's test of sphericity was significant (chi-square= 1146.2, $p < 0.05$), showing that there were sufficient relationships among the variables to investigate. Exploratory factor analysis using PCA with promax rotation revealed that the factor loadings of all the five items were above the acceptable threshold of 0.5 (Hair et al., 2006). Item total correlations of RA1, RA2, RA3, RA4 and RA5 were 0.766, 0.854, 0.786, 0.693 and 0.671 respectively, which was above the 0.3 threshold. RA1, RA2, RA3, RA4 and RA5 were therefore maintained for measurement model estimation as they achieved the required thresholds for reliability and validity. Additionally, the items of measure RA1, RA2, RA3, RA4 and RA5 had factor loadings of 0.867, 0.923, 0.879, 0.789 and 0.773 respectively, which accounted for 71.93% of the variability in Risk assessment. A Cronbach's coefficient alpha of 0.900 for Risk assessment indicated that the measuring scale was reliable.

Table 4.31: Factor Analysis and Reliability for the construct Risk Identification

First order constructs	Cronbach's alpha	Reliability		Factor analysis		PCA component loading	variance extracted	Items deleted
		Item	Item total correlation	KMO	Bartlett's (p value)			
Risk assessment	0.900	RA1	0.766	0.744	1146.2 (0.000)	0.867	71.93%	None
		RA2	0.854			0.923		
		RA3	0.786			0.879		
		RA4	0.693			0.879		
		RA5	0.671			0.773		

4.8.2.2 Descriptive statistics for the construct Risk Assessment

The respondents were asked to indicate their level of agreement with various statements on risk assessment in their government ministries' supply chain departments. The results were as presented in table 4.31. According to the findings, the respondents were neutral on the statements that they carry out risk audit (M=3.274, SD=1.377), they carry out risk analysis (M=3.241, SD=1.388) and they carry out regular risk check-ups (M=3.131, SD=1.362). The respondents were also neutral on the statements that they carry out joint training sessions with their suppliers (M=2.600, SD=1.436) and they carry out joint risk workshops with their suppliers (M=2.428, SD=1.425).

Table 4.32: Descriptive statistics for the construct Risk Assessment

	Strongly disagree	Disagree	Neither agree or disagree	Agree	Strongly Agree	Mean	Std. Deviation
RA1	15.4	14.3	22.0	24.2	24.2	3.274	1.377
RA2	15.4	20.9	18.7	25.3	19.8	3.131	1.362
RA3	14.3	19.8	17.6	24.2	24.2	3.241	1.388
RA4	39.6	16.5	16.5	16.5	11.0	2.428	1.425
RA5	31.9	22.0	13.6	19.4	13.2	2.600	1.436

These findings imply that some government ministries carry out risk audit, they carry out risk analysis and regular risk check-ups. In addition, government ministries in Kenya do not carry out joint training sessions on risk with their suppliers and joint risk workshops with their suppliers.

The respondents were asked to comment on risk assessment in their ministry. According to the findings, they indicated that the ministries were yet to put risk assessment programme in place. In relation to risk assessment strategy, the respondents indicated that risk assessment should be a continuous process and hence it is important for the ministry to make a policy on this. The respondents also indicated that some ministries have set an audit team to internalize on risks matters.

4.8.3 Dual sourcing

4.8.3.1 Factor Analysis and Reliability for the construct dual sourcing

The Dual sourcing construct was reviewed for reliability and factor analysis as indicated in table 4.32. It was posited as a one-dimensional construct measured by the five items; we have a list of registered suppliers (DS1), we practice supplier rotation (DS2), we carry out supplier appraisal (DS3), we prepare a supplier appraisal report (DS4) and we implement the recommendations of supplier appraisal report (DS5). Dual sourcing had a KMO measure of sampling adequacy of 0.768, which was above the threshold of 0.6 (Kaiser, 1974). Barlett's test of sphericity was significant (chi-square= 943.658, $p < 0.05$), showing that there were sufficient relationships among the variables to investigate. Exploratory factor analysis using PCA with promax rotation revealed that the factor loadings of three out of five items were above the acceptable threshold of 0.5 Hair et al. (2006) therefore DS1 and DS2 was dropped since their individual factor loading were 0.156 and 0.282 respectively, which was below the acceptable threshold of 0.5. Item total correlations of DS1, DS2, DS3, DS4 and DS5 were 0.904, 0.938 and 0.912 respectively, which was above the 0.3 threshold. DS1, DS2, DS3, DS4 and DS5 were therefore maintained for measurement model estimation as they achieved the required thresholds for reliability and validity. Additionally, the items of measure DS1, DS2, DS3, DS4 and DS5 had factor loadings of 0.957, 0.973 and 0.961 respectively, which accounted for

92.88% of the variability in Dual sourcing. A Cronbach's coefficient alpha of 0.962 for Dual sourcing indicated that the measuring scale was reliable.

Table 4.33: Factor Analysis and Reliability for the construct dual sourcing

First order constructs	Cronbach's alpha	Reliability		Factor analysis			variance extracted	Items deleted
		Item	Item total correlation	KMO	Bartlett's (p value)	PCA component loading		
Dual sourcing	0.962	DS1	0.904	0.768	943.658 (0.000)	0.957	92.88%	DS1 0.156<0.5
		DS2	0.938			0.972		DS2 0.282<0.5
		DS3	0.912			0.961		

4.8.3.2 Descriptive statistics for the construct dual sourcing

The respondents were also requested to indicate their level of agreement with various statements on dual sourcing in their ministries' supply chain departments. The results were as presented in table 4.33. According to the findings, the respondents strongly agreed that their ministries had a list of registered suppliers (M=4.560, SD=0.864). The respondents agreed that they practice supplier rotation in their ministries (M=4.076, SD=1.110). However, the respondents were neutral on the statements that they carry out supplier appraisal (M=3.472, SD=1.440), they implement the recommendations of supplier appraisal report (M=3.329, SD=1.406) and they prepare a supplier appraisal report (M=3.243, SD=1.475).

Table 4.34: Descriptive statistics for the construct dual sourcing

	Strongly disagree	Disagree	Neither agree or disagree	Agree	Strongly Agree	Mean	Std. Deviation
DS1	1.1	1.1	15.0	6.2	76.6	4.560	.864
DS2	5.5	1.1	21.6	23.8	48.0	4.076	1.110
DS3	12.1	17.6	18.3	15.0	37.0	3.472	1.440
DS4	14.3	25.3	12.1	17.2	32.1	3.243	1.475
DS5	13.2	20.9	12.8	26.0	27.1	3.329	1.406

These findings show that government ministries in Kenya have a list of registered suppliers and practice supplier rotation in their ministries. However, only some of the ministries were carrying out supplier appraisal, prepare supplier appraisal report and implements the recommendations of supplier appraisal report. These findings are contrary to Ritchie and Brindley (2007) findings that public institutions conduct suppliers' appraisal that is used in the selection of suppliers.

The respondents were requested to comment on dual sourcing in their ministries. According to the findings, when supplier's trade on certain goods award can be done 50:50 for the items in question. It provides leveled ground for the interested parties to be accorded fair and equal opportunities to complete. To be visible in the IFMIS system, all suppliers must be registered with treasury and defined.

The respondents were further asked to indicate any other strategy that their ministries implements for dual sourcing. From the findings, the respondents indicated that dual sourcing is reasonable because each supplier gets share based on the level of responsiveness. In addition, the ministries maintain a record that ensures listed supplies are accorded opportunities on rotation. Also, disadvantaged group's like women youth people with disability are favored with common user items required. Further, tenders awarded runs through a given financial year and quotations are on a one off basis.

4.9 Organizational culture

The fifth objective was to establish the moderating effect of organizational culture on the relationship between supply chain management practices and performance of government ministries in Kenya. The moderating variable was measured in terms of hierarchical culture, role culture and achievement culture. A five point Likert scale was used to measure the indicators Where 1 was strongly disagree, 2 was disagree 3 was neither agree or disagree, 4 was agree and 5 was strongly Agree

4.9.1 Hierarchical culture

4.9.1.1 Factor Analysis and Reliability for the construct hierarchical culture

The Hierarchical culture construct was reviewed for reliability and factor analysis as indicated in table 4.34 it was posited as a one-dimensional construct measured by the five items; we adhere to procurement regulation to guide our activities and processes (HC1), we practice centralized procurement system (HC2), we adhere to laid down procurement approval system and structure (HC3), we adhere to the controls in the procurement system (HC4) and we adhere to the laid down timelines in the procurement legal framework (HC5).. Hierarchical culture had a KMO measure of sampling adequacy of 0.761, which was above the threshold of 0.6 (Kaiser, 1974). Barlett's test of sphericity was significant (chi-square= 628.368, $p < 0.05$), showing that there were sufficient relationships among the variables to investigate. Exploratory factor analysis using PCA with promax rotation revealed that the factor loadings of four out of five items were above the acceptable threshold of 0.5 Hair et al. (2006) therefore, HC2 was dropped since it had a factor loading of 0.460 which was below the acceptable threshold of 0.5. Item total correlations of HC1, HC3, HC4 and HC5 were 0.619, 0.798 0.819, and 0.455 respectively, which was above the 0.3 threshold. HC1, HC3, HC4 and HC5 were therefore maintained for measurement model estimation as they achieved the required thresholds for reliability and validity. Additionally, the items of measure HC1, HC3, HC4 and HC5 had factor loadings of 0.810, 0.927, 0.924, and 0.629 respectively, which accounted for 58.31% of the variability in Hierarchical culture. A Cronbach's coefficient alpha of 0.826 for Hierarchical culture indicated that the measuring scale was reliable.

Table 4.35: Factor Analysis and Reliability for the construct Hierarchical Culture

First order constructs	Cronbach's alpha	Reliability		Factor analysis		PCA component loading	variance extracted	Items deleted
		Item	Item total correlation	KMO	Bartlett's (p value)			
Hierarchical culture	0.826	HC1	0.619	0.738	628.368 (0.000)	0.810	58.31%	HC2, 0.460<0.5
		HC2	0.798			0.927		
		HC3	0.819			0.924		
		HC4	0.455			0.629		

4.9.1.2 Descriptive statistics for the construct hierarchical culture

The respondents were asked to indicate their level of agreement with various statements on hierarchical culture in their ministries. The results were as presented in table 4.35. According to the findings, the respondents strongly agreed that their departments adhere to procurement regulation to guide the activities and processes (M=4.699, SD=0.662). They also strongly agreed that they adhere to laid down procurement approval systems and structure (M=4.626, SD=0.722), and controls in the procurement system (M=4.637, SD=0.672). The respondents agreed that they adhere to the laid down timeliness in the procurement legal framework (M=4.329, SD=0.891) and practice centralized procurement system (M=3.945, SD=1.153).

Table 4.36: Descriptive statistics for the construct Hierarchical Culture

	Strongly disagree	Disagree	Neither agree or disagree	Agree	Strongly Agree	Mean	Std. Deviation
HC1	.4	.4	8.1	11.4	79.9	4.699	.662
HC2	4.8	5.5	24.2	21.6	44.0	3.945	1.153
HC3	.4	0.0	12.1	11.7	75.8	4.626	.722
HC4	.4	0.0	8.8	17.2	73.6	4.637	.672
HC5	1.5	0.0	19.8	21.6	57.1	4.329	.891

These results show that most government ministries adhere to procurement regulation to guide the activities and processes, laid down procurement approval systems and structure, and controls in the procurement system, laid down timeliness in the procurement legal framework and practice centralized procurement system. These findings agree with Prajogo et al. (2011) argument that supply chain departments in public institution use procurement regulation to guide their activities and processes.

The respondents were asked to make any comment on hierarchical culture in their ministries. In addition, the ministry procurement activities are guided by the public procurement and asset disposal Act and Regulations. In addition, old documents, tenders with over 6yrs, are prepared, arranged and taken to the National archives for cultural purposes. Disadvantaged groups (women, youth, people with disability) are favored with common user items required.

The respondents were asked to indicate any other supply chain system used in their ministries. According to the findings, IFMIS system is properly done, such that the hierarchical approval process is well done which makes the audit trail easy. In addition, the ministry restricts itself to the prevailing procurement law in its operations. Manual system is also used for procurement of some goods and services and replenishing of stock is based on budgetary availability.

4.9.2 Role culture

4.9.2.1 Factor Analysis and Reliability for the construct role culture

The Role culture construct was reviewed for reliability and factor analysis as indicated in table 4.36. It was posited as a one-dimensional construct measured by the four items; we adhere to contractual obligations (RC1), we exhibit loyalty towards systems in the ministry (RC2), we ensure documentation and information management (RC3) and we only do what we are authorized to do (RC4). Role culture had a KMO measure of sampling adequacy of 0.787, which was above the threshold of 0.6 (Kaiser, 1974). Barlett's test of sphericity was significant (chi-square= 484.504, $p < 0.05$), showing that there were sufficient relationships among the variables to investigate. Exploratory factor analysis using PCA with promax rotation revealed that the factor loadings of all the four items were above the acceptable threshold of 0.5 (Hair et al., 2006). Item total correlations of RC1, RC2, RC3 and RC4 were 0.640, 0.786, 0.682 and 0.665 respectively, which was above the 0.3 threshold. RC1, RC2, RC3 and RC4 were therefore maintained for measurement model estimation as they achieved the required thresholds for reliability and validity. Additionally, the items of measure RC1, RC2, RC3 and RC4 had factor loadings of 0.795, 0.92, 0.828 and 0.813 respectively, which accounted for 69.36% of the variability in Role culture. A Cronbach's coefficient alpha of 0.851 for Role culture indicated that the measuring scale was reliable.

Table 4.37: Factor Analysis and Reliability for the construct role culture

First order constructs	Cronbach's alpha	Reliability		Factor analysis			variance extracted	Items deleted
		Item	Item total correlation	KMO	Bartlett's (p value)	PCA component loading		
Role culture	0.851	RC1	0.640	0.787	484.504 (0.000)	0.795	69.36%	None
		RC2	0.786			0.892		
		RC3	0.682			0.828		
		RC4	0.665			0.813		

4.9.2.2 Descriptive statistics for the construct Role Culture

The respondents were asked to indicate their level of agreement with various statements on role culture. The results were as presented in table 4.37. According to the findings, the respondents indicated that they ensure documentation and information management (M=4.476, SD=0.809), adhere to contractual obligations (M=4.439, SD=0.793) and only do what they are authorized to do (M=4.326, SD=0.911). The respondents also agreed that they exhibit loyalty towards systems in the ministry (M=4.201, SD=0.865).

Table 4.38: Descriptive statistics for the Construct Role Culture

	Strongly disagree	Disagree	Neither agree or disagree	Agree	Strongly Agree	Mean	Std. Deviation
RC1	.4		16.8	20.9	61.9	4.439	.793
RC2	.4	0.0	27.1	24.2	48.4	4.201	.865
RC3	.4	0.0	17.9	15.0	66.7	4.476	.809
RC4	.4	3.3	18.3	19.4	58.6	4.326	.911

These findings imply that government ministries in Kenya ensure documentation and information management, adhere to contractual obligations, only do what they are authorized to do and exhibit loyalty towards systems in the ministry. These findings agree with Pakdil and Leonard (2015) argument that public institutions ensure documentation and information management and adherence to contractual obligations.

The respondents were also asked to indicate any comment on role culture in their ministries. From the findings, the respondents indicated that the ministry contractual obligations are pegged to operating laws and guidelines and all are observed. The ministries also have maintained a smooth culture in all level of departments in the management of the procurements. The respondents also indicated that they were guided by the procedure and operational manual of the department.

The respondents were requested to indicate any other requirements that their ministries use to ensure adherence to individual roles. According to the findings, the respondents indicated that there are sufficient rules and guidelines that are adhered to. In addition, they follow the laid down procurement procedure. Further, they use job description and evaluation of jobs. This has helped staff to concentrate on work to be done than roles, settings of work places and targets the officers involved are put on performances contract.

4.9.3 Achievement culture

4.9.3.1 Factor Analysis and Reliability for the construct Achievement culture

The Achievement culture construct was reviewed for reliability and factor analysis as indicated in table 4.38. It was posited as a one-dimensional construct measured by the four items; we recognize employee contribution and suggestions (AC1), we pursue goals and targets (AC2), we encourage employee participation (AC3) and we encourage continuous achievement (AC4). Achievement culture had a KMO measure of sampling adequacy of 0.834, which was above the threshold of 0.6 (Kaiser, 1974). Barlett's test of sphericity was significant (chi-square= 1020.193, $p < 0.05$), showing that there were sufficient relationships among the variables to

investigate. Exploratory factor analysis using PCA with promax rotation revealed that the factor loadings of four items were above the acceptable threshold of 0.5 Hair et al. (2006) therefore none was dropped. Item total correlations of AC1, AC2, AC3 and AC4 were 0.804, 0.863, 0.857 and 0.897 respectively, which was above the 0.3 threshold. AC1, AC2, AC3 and AC4 were therefore maintained for measurement model estimation as they achieved the required thresholds for reliability and validity. Additionally, the items of measure AC1, AC2, AC3 and AC4 had factor loadings of 0.887, 0.925, 0.922 and 0.945 respectively, which accounted for 84.64% of the variability in Achievement culture. A Cronbach's coefficient alpha of 0.939 for Achievement culture indicated that the measuring scale was reliable.

Table 4.39: Factor Analysis and Reliability for the construct Achievement Culture

First order constructs	Cronbach's alpha	Reliability		Factor analysis			variance extracted	Items deleted
		Item	total correlation	KMO	Bartlett's (p value)	PCA component loading		
Achievement culture	0.939	AC1	0.804	0.834	1020.193 (0.000)	0.887	84.64%	None
		AC2	0.863			0.925		
		AC3	0.857			0.922		
		AC4	0.897			0.945		

4.9.3.2 Descriptive statistics for the construct achievement culture

The respondents were asked to indicate their level of agreement with various statements on achievement culture in their ministries. The results were as presented in table 4.39. According to the findings, the respondents agreed that they pursue goals and targets (M=4.128, SD=0.936) and encourage continuous achievement (M=4.073, SD=0.948). The respondents also agreed that they encourage employee

participation (M=3.996, SD=0.979) and recognize employee’s contributions and suggestions (M=3.919, SD=1.004).

Table 4.40: Descriptive statistics for the construct Achievement Culture

	Strongly disagree	Disagree	Neither agree or disagree	Agree	Strongly Agree	Mean	Std. Deviation
AC1	1.5	6.6	26.0	30.4	35.5	3.919	1.004
AC2	1.5	1.1	26.0	26.0	45.4	4.128	.936
AC3	1.5	4.4	26.0	29.3	38.8	3.996	.979
AC4	1.5	2.2	26.0	28.2	42.1	4.073	.948

These findings imply that government ministries in Kenya pursue goals and targets, encourage continuous achievement, encourage employee participation and recognize employee’s contributions and suggestions. These findings concur with Bititci et al. (2006) findings that public institutions are structured to pursue specific goals and targets.

The respondents were requested to comment on achievement culture in their ministries. The respondents indicated that Individual employees’ contributions are highly valued in government ministries and individual employees are thus encouraged to participate positively towards goal achievements. The respondents also indicated that the best employees of the year for each department are recognized. Also, it encourages effort to attain set goals and targets.

The respondents were also asked to indicate any other activity in their ministries that recognizes individual achievement. All individuals should be commended for their hard work and compensated with honor. In addition, individual performances should be rewarded to motivate them to make continual improvement and look upon quality management. In addition, product quality is a key parameters in the ministry as it’s provide ability to fulfill the customers need and expectations. The study also found

that government ministries conduct performance review meetings in the month of December every year.

4.10 Performance of government ministries

The performance of government ministries was measured in terms of non-financial indicators and financial indicators. The non-financial indicators include product quality, compliance with statutory obligations and service delivery while the financial indicators include cost efficiency, and budgetary compliance.

4.10.1 Product quality

4.10.1.1 Factor Analysis and Reliability for the construct product quality

The Product quality construct was reviewed for reliability and factor analysis as indicated in table 4.40. It was posited as a one-dimensional construct measured by the five items; Indicate the percentage of defect free goods deliveries (PQ1), Indicate the percentage of product rejection on deliveries (PQ2), Indicate percentage of products that meet specifications (PQ3) and Indicate the percentage of product returns for repair during warranty period (PQ4).. Product quality had a KMO measure of sampling adequacy of 0.562, which was within the threshold of 0.6 (Kaiser, 1974). Barlett's test of sphericity was significant (chi-square= 80.816, $p < 0.005$), showing that there were sufficient relationships among the variables to investigate. Exploratory factor analysis using PCA with promax rotation revealed that the factor loadings of two out of four items were above the acceptable threshold of 0.5 Hair et al. (2006) therefore PQ1 and PQ3 were dropped since they had a lower factor loading of 0.233 and 0.412 respectively that is below the acceptable threshold. Item total correlations of PQ2 and PQ4 were 0.508 and 0.508 respectively, which was above the 0.3 threshold. PQ2 and PQ4 were therefore maintained for measurement model estimation as they achieved the required thresholds for reliability and validity. Additionally, the items of measure PQ2 and PQ4 had factor loadings of 0.868 and 0.868 respectively, which accounted for 75.41% of the variability in Product quality. A Cronbach's coefficient alpha of 0.701 for Product quality indicated that the measuring scale was reliable.

Table 4. 41: Factor Analysis and Reliability for the construct Product Quality

First order constructs	Cronbach's alpha	Reliability		Factor analysis			PCA component loading	variance extracted	Items deleted
		Item to total correlation	Item to total correlation	KMO	Bartlett's (p value)				
Product quality	0.701								PQ1,
									0.233<0.5
			0.508	0.562	80.816	0.868	75.41%		PQ3
					(0.000)				0.412<0.5
		PQ4	0.508			0.868			

4.10.1.2 Descriptive statistics for the construct product quality

The respondents were asked to rate product quality in their ministries. The results were as presented in table 4.41. According to the findings, the respondents indicated that the percentage of products that meet specifications was 60% to 80% (M=4.344, SD=0.973). In addition, they indicated that the percentage of defect free goods deliveries was 60% to 80% (M=3.549, SD=1.452). In addition, the percentage of product rejection on deliveries was between 20% and 40% (M=2.139, SD=1.360). Further, the percentage of product returns for repair during warranty period was between 20% and 40% (M=2.113, SD=1.360).

Table 4. 42: Descriptive statistics for the construct Product Quality

	between 20%	0- 20% 40%	- 40% 60%	- 60% 80%	- 80% 100%	– Mean	Std. Deviation
PQ1	17.9	5.9	12.5	30.8	33.0	3.549	1.452
PQ2	50.9	16.5	9.2	14.7	8.8	2.139	1.402
PQ3	2.2	2.2	16.1	17.9	61.5	4.344	.973
PQ4	51.6	14.3	11.7	15.8	6.6	2.113	1.360

These findings clearly show that the percentage of products that meets specifications in government ministries in Kenya is 60% to 80%. In addition, the percentage of defect free goods deliveries is 60% to 80%. Further, the percentage of product rejection on deliveries and product returns for repair during warranty period is between 20% and 40%.

The respondents were asked to make any comment on product quality in their ministries. According to the findings, they indicated that product supplied usually met the required standard and proper specifications are provided for all deliveries which are subjected to inspection and acceptance before being received. The respondents also indicated that supply chain is quite effective hence minimal anomalies and the organization procures goods and services of high quality standards.

The respondents were asked to indicate any other aspect of quality that has changed in their ministries. According to the findings, the respondents indicated that no major quality change because goods and services delivered already have set specifications. In addition, inspection and acceptance committee is in place and ensures that all deliveries conform to the desired specifications. Common user items that are standard are accepted so long as they meet the need of the user and the standard specification.

4.10.2 Compliance with statutory obligation

4.10.2.1 Factor Analysis and Reliability for the construct compliance with statutory obligation.

The Compliance with statutory obligation construct was reviewed for reliability and factor analysis as indicated in table 4.42. It was posited as a one-dimensional construct measured by the three items, Indicate the percentage of statutory reports submitted on time (CSO1), Indicate the percentage of audit queries on non-compliance (CSO2) and Indicate the percentage of queries from procurement regulator on non-compliance (CSO3). Compliance with statutory obligation had a KMO measure of sampling adequacy of 0.570, which was within the acceptable threshold of 0.6 (Kaiser, 1974). Barlett's test of sphericity was significant (chi-square= 221.8, $p < 0.05$), showing that there were sufficient relationships among the variables to investigate. Exploratory factor analysis using PCA with promax rotation revealed that the factor loadings of four out of five items were above the acceptable threshold of 0.5 Hair et al. (2006) therefore CSO1 was dropped. Item total correlations of CSO2 and CSO3 were 0.64 and 0.665 respectively, which was above the 0.3 threshold. CSO2 and CSO3 were therefore maintained for measurement model estimation as they achieved the required thresholds for reliability and validity. Additionally, the items of measure CSO2 and CSO3 had factor loadings of 0.935 and 0.935 respectively, which accounted for 87.40% of the variability in Compliance with statutory obligation. A Cronbach's coefficient alpha of 0.856 for Compliance with statutory obligation indicated that the measuring scale was reliable.

Table 4.43: Factor Analysis and Reliability for the construct compliance with statutory obligation

First order constructs	Cronbach's alpha	Reliability		Factor analysis			PCA component loading	variance extracted	Items deleted
		Item	Item total correlation	KMO	Bartlett's (p value)				
Compliance with statutory obligation	0.856	CSO2	0.748	0.570	221.8 (0.000)	0.927	87.40%	CSO1, 0.151<0.5	
		CSO3	0.748			0.936			

4.10.2.2 Descriptive statistics for the construct compliance with statutory obligation.

The respondents were also asked to rate compliance of their ministries with statutory obligations. The results were as shown in table 4.43. According to the findings, the respondents indicated that the percentage of statutory reports submitted on time was between 60% and 80% (M=4.128, SD=1.125). In addition, the percentage of audit queries on non-compliance was between 20% and 40% (M=2.117, SD=1.323). Also, the percentage of queries from procurement regulator on non-compliance was between 20% and 40% (M=2.029, SD=1.311).

Table 4.44: Descriptive statistics for the construct compliance with Statutory Obligation

	Between 20%	0- 20%	20% - 40%	40% - 60%	60% - 80%	80% - 100%	Mean	Std. Deviation
CSO1	7.0		15.8	27.8	49.5		4.128	1.125
CSO2	46.5	23.1	10.3	12.5	7.7		2.117	1.323
CSO3	54.2	12.1	16.8	10.3	6.6		2.029	1.311

These findings show that the percentage of statutory reports submitted on time is between 60% and 80%. In addition, however, the percentage of audit queries on non-compliance and the percentage of queries from procurement regulator on non-compliance are between 0 and 20%.

The respondents were requested for any comment on compliance with statutory obligations in their ministries. The respondents indicated that compliance is in most area except for area where documentation are required for supplier transaction. The respondents were asked to indicate the list of statutory reports that their ministries rarely submits to the regulator. The respondents indicated that they have PPRA report for supply of goods and services, treasury report for supply of goods and services and report on the presidential directive o 30% for youth, women and people with disabilities.

4.10.3 Service delivery

4.10.3.1 Factor Analysis and Reliability for the construct service delivery.

The Service delivery construct was reviewed for reliability and factor analysis as indicated in table 4.44. It was posited as a one-dimensional construct measured by the four items; we receive deliveries of goods from our suppliers on time (SD1), we get after sales service from our suppliers (SD2), we receive prompt response to our queries from our suppliers (SD3) and our suppliers are readily available for consultation (SD4). Service delivery had a KMO measure of sampling adequacy of 0.591, which was within the acceptable threshold of 0.6 (Kaiser, 1974). Barlett's test of sphericity was significant (chi-square= 203.088, $p < 0.05$), showing that there were sufficient relationships among the variables to investigate. Exploratory factor analysis using PCA with promax rotation revealed that the factor loadings of four items were above the acceptable threshold of 0.5 Hair et al. (2006) therefore none was dropped. Item total correlations of SD1, SD2, SD3 and SD4 were 0.406, 0.355, 0.457 and 0.578 respectively, which was above the 0.3 threshold. SD1, SD2, SD3 and SD4 were therefore maintained for measurement model estimation as they achieved the required thresholds for reliability and validity. Additionally, the items of measure SD1, SD2, SD3 and SD4 had factor loadings of 0.686, 0.592, 0.708 and

0.841 respectively, which accounted for 50.76% of the variability in Service delivery. A Cronbach's coefficient alpha of 0.719 for Service delivery indicated that the measuring scale was reliable.

Table 4.45: Factor Analysis and Reliability for the construct Service Delivery.

First order construct	Cronbach's alpha	Reliability		Factor analysis				
		Item	Item total correlation	KMO	Bartlett's (p value)	PCA component loading	variance extracted	Items deleted
Service delivery	0.719	SD1	0.406	0.591	203.088 (0.000)	0.686	50.76%	None
		SD2	0.355			0.592		
		SD3	0.457			0.708		
		SD4	0.578			0.841		

4.10.3.2 Descriptive statistics for the construct service delivery.

The respondents were asked to indicate their level of agreement with various statements on service delivery in their ministries. The results were as shown in table 4.45. According to the findings, the respondents agreed that they receive deliveries of goods from their suppliers on time (M=4.087, SD=0.752) and suppliers were readily available for consultation (M=3.908, SD=0.936). The respondents agreed that they receive prompt response to their queries from their supplier (M=3.758, SD=0.954). The respondents were neutral on whether they get after sales service from their suppliers (M=3.395, SD=1.110).

Table 4.46: Service delivery

	Strongly disagree	Disagree	Neither agree or disagree	Agree	Strongly Agree	Mean	Std. Deviation
SD1	1.5	1.1	12.1	57.9	27.5	4.087	.752
SD2	10.3	7.7	25.3	45.8	11.0	3.395	1.110
SD3	4.8	4.4	18.7	54.6	17.6	3.758	.954
SD4	4.8	0.0	20.1	49.8	25.3	3.908	.936

These findings imply that government ministries receive deliveries of goods from their suppliers on time, suppliers are readily available for consultation and the ministries receive prompt response to their queries from their supplier.

The respondents were asked to make any comment on service delivery in their ministries. According to the findings, the respondents indicated that the relationship with suppliers is very good and potential suppliers are always readily available for consultations. In addition, most of the suppliers are ready to make correction as and when required. The respondents were further required to list services provided by their suppliers that are not satisfactory. However, they indicated that their suppliers are good and supply goods on time. They also indicated that when a good supplier is chosen the after sales services is good.

4.10.4 Cost efficiency

4.10.4.1 Factor Analysis and Reliability for the construct cost efficiency.

Cost efficiency was posited as a one-dimensional construct measured by the three items as indicated in table 4.46; indicate the percentage of cost savings of procured goods/works/services on budgeted amount (CE1), Indicate the percentage of cost deviation of procured goods/works/services from market price (CE2) and Indicate the percentage of cost overrun of procured goods/works/services on budgeted amount (CE3). The Cost efficiency construct was reviewed for reliability and factor analysis. Cost efficiency had a KMO measure of sampling adequacy of 0.558, which

was within the acceptable threshold of 0.6 (Kaiser, 1974). Barlett’s test of sphericity was significant (chi-square= 248.39, $p < 0.05$), showing that there were sufficient relationships among the variables to investigate. Exploratory factor analysis using PCA with promax rotation revealed that the factor loadings of two out of three items were above the acceptable threshold of 0.5 (Hair et al., 2006). Item total correlations of CE2 and CE3 were 0.775 and 0.775 respectively, which was above the 0.3 threshold. CE2 and CE3 were therefore maintained for measurement model estimation as they achieved the required thresholds for reliability and validity. Additionally, the items of measure CE2 and CE3 had factor loadings of 0.942 and 0.942 respectively, which accounted for 88.76% of the variability in Cost efficiency. A Cronbach’s coefficient alpha of 0.873 for Cost efficiency indicated that the measuring scale was reliable.

Table 4.47: Factor Analysis and Reliability for the construct cost efficiency.

First order constructs	Cronbach's alpha	Reliability		Factor analysis			variance extracted	Items deleted
		Item	Item total correlation	KMO	Bartlett's (p value)	PCA component loading		
Cost efficiency	0.873	CE1	0.775	0.558	248.39 (0.000)	0.942	88.76%	CE1, 0.355 < 0.5
		CE2	0.775			0.942		

4.10.4.2 Descriptive statistics for the construct cost efficiency.

The respondents were asked to rate cost efficiency in their ministry in relation to supply chain. The results were as shown in table 4.47. According to the findings, the respondents indicated that the percentage of cost savings of procured goods/works/services on budgeted amount was 40% and 60% ($M=3.044$, $SD=1.294$).

The respondents also indicated that the percentage of cost deviation of procured goods /works/services from market price was between 20% and 40% (M=2.091, SD=1.102). The respondents also indicated that the percentage of cost overrun of procured goods/works /services on budgeted amounts was between 20% and 40% (M=2.076, SD=1.045).

Table 4. 48: Descriptive statistics for the construct cost efficiency.

	Between 20%	0- 20% 40%	- 40% 60%	- 60% 80%	- 80% 100%	– Mean	Std. Deviation
SE1	14.7	20.9	26.4	21.6	16.5	3.044	1.294
SE2	41.4	22.0	23.8	11.7	1.1	2.091	1.102
SE3	37.0	31.1	20.1	10.6	1.1	2.076	1.045

These findings imply that the percentage of cost savings of procured goods/works/services on budgeted amount is between 40% and 60% in government ministries in Kenya. However, the percentage of cost deviation of procured goods /works/services from market price and the percentage of cost overrun of procured goods/works /services on budgeted amounts is between 0% and 20%.

The respondents were asked to make comments on cost efficiency in their ministries. According to the findings, they indicated that the ministries usually do market survey to know the market value of an item and eventually avoid goods overpricing. In addition, they indicated that the procurement departments work hand in hand with suppliers to cut cost. However, sometimes the market is unfriendly and uneven due to fluctuation of prices. Others indicated that cost efficiency is low because of budget constraints digital challenges and delays of funds disbursement.

The respondents were further asked to list other aspects of costs that affect operations in their ministries. According to the findings, they indicated that their ministries restrict their operations to the budgetary allocation. However, cost efficiency is affected by the failure by the government to pay the suppliers promptly hence the

suppliers inflate the prices to accommodate the costs associated with the delayed payment, system failure which makes the procedures to be prolonged and exchange rates.

4.10.5 Budgetary compliance

4.10.5.1 Factor Analysis and Reliability for the construct budgetary compliance.

The Budgetary compliance construct was reviewed for reliability and factor analysis as indicated in table 4.48. It was posited as a one-dimensional construct measured by the four items; indicate the percentage of goods/works/services procured without budgetary allocation (BC1), Indicate the percentage of goods /works/services procured above budgetary allocation (BC2), indicate percentage of purchase orders pending due to budgetary constraints (BC3) and indicate the percentage of audit queries on budgetary compliance (BC4). Budgetary compliance had a KMO measure of sampling adequacy of 0.673, which was above the threshold of 0.6 (Kaiser, 1974). Barlett's test of sphericity was significant (chi-square= 339.114, $p < 0.05$), showing that there were sufficient relationships among the variables to investigate. Exploratory factor analysis using PCA with promax rotation revealed that the factor loadings of four items were above the acceptable threshold of 0.5 (Hair et al., 2006). Item total correlations of BC1, BC2, BC3 and BC4 were 0.549, 0.460, 0.602 and 0.681 respectively, which was above the 0.3 threshold. BC1, BC2, BC3 and BC4 were therefore maintained for measurement model estimation as they achieved the required thresholds for reliability and validity. Additionally, the items of measure BC1, BC2, BC3 and BC4 had factor loadings of 0.751, 0.666, 0.808 and 0.847 respectively, which accounted for 59.46% of the variability in budgetary compliance. A Cronbach's coefficient alpha of 0.701 for budgetary compliance indicated that the measuring scale was reliable.

Table 4.49: Factor Analysis and Reliability for the construct budgetary compliance

First order constructs	Cronbach's alpha	Reliability		Factor analysis			variance extracted	Items deleted
		Item	total correlation	KMO	Bartlett's (p value)	PCA component loading		
Budgetary compliance	0.776	BC1	0.549	0.673	339.114 (0.000)	0.751	59.46%	None
		BC2	0.460			0.666		
		BC3	0.602			0.808		
		BC4	0.681			0.847		

4.10.5.2 Descriptive statistics for the construct budgetary compliance

The respondents were also requested to rate budgetary compliance in their ministries. The results were as presented in table 4.49. From the findings, the respondents indicated that the percentage of purchase orders pending due to budgetary constraints was between 20% and 40% (M=2.065, SD=1.210). The respondents also indicated that the percentage of goods/works/services procured above the budgetary allocation was between 20% and 40% (M=1.732, SD=1.002). The respondents further indicate that the percentage of audit queries on budgetary compliance was between 20% and 40% (M=1.721, SD=0.960). The respondents also indicated that the percentage of goods/works/services procured without budgetary allocation was between 20% and 40% (M=1.512, SD=0.962).

Table 4.50: Descriptive statistics for the construct budgetary compliance

	Between 20%	0- 20% 40%	- 40% 60%	- 60% 80%	- 80% 100%	– Mean	Std. Deviation
BC1	72.9	10.3	11.7	2.9	2.2	1.512	.962
BC2	56.4	22.3	15.0	4.0	2.2	1.732	1.002
BC3	47.3	17.2	21.6	9.5	4.4	2.065	1.210
BC4	57.1	20.1	16.1	6.6	0.0	1.721	.960

These findings imply that the percentage of purchase orders pending due to budgetary constraints in government ministries in Kenya is between 0% and 20%. In addition, the percentage of goods/works/services procured above the budgetary allocation; the percentage of audit queries on budgetary compliance; and the percentage of goods/works/services procured without budgetary allocation in government ministries in Kenya are between 0% and 20%.

The respondents were also asked to make any comment on budgetary compliance in their ministries. According to the findings, the respondents indicated that they are compliant because everything is budgeted and are in the procurement plan. In addition, the consolidated annual procumbent plan is pegged to the budgetary provision of respective financial year. Further, the percentage of goods and services procured above the budgetary allocation has a lowest percentage (0-20 %). However, some respondents indicated that it is difficult to ascertain the budgetary compliance due to pending bills associated with past supplies.

The respondents were further asked to suggest budgetary concerns that affect operations in their ministries. According to the findings, the respondents indicated that operations run smoothly except where there is problem they do revise budget and plan. They also indicated that procurement plans should be submitted to the national treasury so that the treasury can allocate funds based on the plans. However, budgetary compliance was affected by inadequate funding, price increase and inflation. They also indicated that treasury should not use blanket decision on budget

allocation but should give weight to individual needs highly pressing or very core to each ministry.

4.11 Inferential Statistics

Inferential statistics were used to assess the association between independent variables, moderating variable and the dependent variable. They included correlation analysis, univariate regression analysis and multiple regression analysis.

4.11.1 Supplier Selection and performance of government ministries.

4.11.1.1 Correlation Analysis

The correlation coefficient is a measure of linear association between two variables. Values of the correlation coefficient are always between -1 and +1. A correlation coefficient of +1 indicates that two variables are perfectly related in a positive linear sense, a correlation coefficient of -1 indicates that two variables are perfectly related in a negative linear sense, and a correlation coefficient of 0 indicates that there is no linear relationship between the two variables. A correlation coefficient of between 0.0 and 0.19 is considered to be “very weak”, between 0.20 and 0.39 is considered to be “weak”, between 0.40 and 0.59 is considered to be “moderate”, between 0.60 and 0.79 is considered to be “strong” and between 0.80 and 1.0 is considered to be “very strong”.

The research carried out correlation analysis between the variables of the study using Pearson product-moment correlation coefficient. Correlation Coefficient was used to test whether there existed interdependency between independent variables and also whether the independent variables were related to the dependent variable, performance of government ministries.

Table 4.51: Correlation analysis between Supplier Selection and performance of government ministries.

		Performance of government ministries	supplier selection
Performance of government ministries	Pearson Correlation	1	
	Sig. (2-tailed)		
	N	273	
Supplier selection	Pearson Correlation	.345**	1
	Sig. (2-tailed)	.000	
	N	273	273

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

From the findings, there is a positive association between supplier selection and performance of government ministries in Kenya ($r=0.345$, $p\text{-value}=0.000$).

4.11.1.2 Univariate Regression Analysis

A univariate analysis was conducted to investigate the influence of supplier selection on the performance of Kenyan government ministries. The null hypothesis was;

H₀₁: Supplier selection practices have no influence on performance of government ministries in Kenya.

The objective was tested by regressing supplier selection practices on performance of government ministries guided by the equation $Y = \beta_0 + \beta_1 X_1 + \varepsilon$ where Y = Performance of the government ministries in Kenya, B_0 = Constant, β_1 =Coefficients of determination, X_1 = Supplier selection practices and ε = Error term. The results of the regression are presented in Table 4.51. Table 4.51 displays R (the correlation between the observed and predicted values of the dependent variable), which is 345. This is a moderate relationship between the observed and predicted values of the dependent variable. The table also displays R squared which is the proportion of variation in the dependent variable explained by the regression model, in this case, it is 0.119. This means that supplier selection practices can explain 11.9% of the

performance of the Kenyan government ministries. The value of the standard error of the estimate is shown in the output as 0.44966.

Table 4.52: Model Summary of Supplier Selection Practices and performance

R	R Square	Adjusted R Square	Std. Error of the Estimate
.345	.119	.116	.44966

Table 4.52 summarizes the results of an analysis of variance, with the sum of squares, degrees of freedom, and mean square being displayed for two sources of variation, regression and residual. For the accounted for values, the mean square (the sum of squares divided by the degrees of freedom), is 7.388, the F statistic (the regression mean square divided by the residual mean square) is 36.540 and the degree of freedom (df) is 1 whereas the output for residual which displays information about the variation that is not accounted for by the model has the following values: sum of squares as 54.794, df as 271 and a mean square of 0.202. The overall relationship was statistically significant ($F = 36.540$, $p < 0.05$) It has a significance level of 0.000 this means that the chances are zero that the result of regression model are due to random events instead of a true relationship, which implies that the linear regression model is a good fit for the data and hence can be used to predict the effect of supplier selection practices on the performance of Kenyan government ministries.

Table 4.53: ANOVA Supplier Selection Practices and performance

	Sum of Squares	Df	Mean Square	F	Sig.
Regression	7.388	1	7.388	36.540	.000
Residual	54.794	271	.202		
Total	62.182	272			

Table 4.53 represents coefficients of the independent variable and the dependent variable. These findings show that the performance of government ministries in Kenya will be having an index of 2.003 when supplier selection is held constant. In addition, the Beta coefficient was 0.218 for the relationship between supplier selection and the performance of government ministries. This shows that a unit improvement in supplier selection practices would lead to a 0.218 improvement in the performance of government ministries. The relationship is significant as the P-value (0.000) was less than the significance level (0.05). Thus yielding a regression model where $Y = 2.003 + 0.218X_1$. Therefore we can accept the alternative hypothesis that “supplier selection practices have a significant influence on performance of government ministries in Kenya”.

Table 4.54: Coefficients for Supplier Selection Practices and performance

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	2.003	.129		15.479	.000
Supplier selection	.218	.036	.345	6.045	.000

4.11.2 Supply chain policies and Performance of government ministries

4.11.2.1 Correlation Analysis

The results also show that there is a positive association between supply chain policy and the performance of government ministries in Kenya ($r=0.372$, $p\text{-value}=0.000$).

Table 4.55: Correlation analysis between Supply chain policies and Performance of government ministries

		Performance of government ministries	supply chain policy
Performance of government ministries	Pearson Correlation	1	
	Sig. (2-tailed)		
	N	273	
Supply chain policy	Pearson Correlation	.372**	1
	Sig. (2-tailed)	.000	
	N	273	273

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

4.11.2.2 Univariate Regression Analysis

A univariate analysis was conducted to investigate the influence of supply chain policies on the performance of Kenyan government ministries. The null hypothesis was;

H₀2: Supply chain policies have no influence on performance of government ministries in Kenya.

The objective was tested by regressing supply chain policies on performance of government ministries guided by the equation $Y = \beta_0 + \beta_1 X_2 + \varepsilon$ where Y = Performance of the government ministries in Kenya, B_0 = Constant, β_1 =Coefficients of determination, X_1 = supply chain policies and ε = Error term. The results of the regression are presented in Table 4.55. Table 4.55 displays R (the correlation between the observed and predicted values of the dependent variable), which is 372. This is a moderate relationship between the observed and predicted values of the dependent variable. The table also displays R squared which is the proportion of variation in the dependent variable explained by the regression model, in this case, it is 0.139. This means that supply chain policies can explain 13.9% of the performance of

Kenyan government ministries. The value of the standard error of the estimate is shown in the output as 0.44457.

Table 4.56: Model Summary for Supply Chain Policies and Performance

R	R Square	Adjusted R Square	Std. Error of the Estimate
.372	.139	.135	.44457

Table 4.56 summarizes the results of an analysis of variance, with the sum of squares, degrees of freedom, and mean square being displayed for two sources of variation, regression and residual. For the accounted for values, the mean square (the sum of squares divided by the degrees of freedom), is 8.619, the F statistic (the regression mean square divided by the residual mean square) is 43.610 and the degree of freedom (df) is 1 whereas the output for residual which displays information about the variation that is not accounted for by the model has the following values: sum of squares as 53.562, df is 271 and a mean square of 0.198. The overall relationship was statistically significant ($F = 43.610$, $p < 0.05$) It has a significance level of 0.000 this means that the chances are zero that the result of regression model are due to random events instead of a true relationship, which implies that the linear regression model is a good fit for the data and hence can be used to predict the effect of supply chain policies on the performance of Kenyan government ministries.

Table 4.57: Analysis of Variance for Supply Chain Policies and Performance

	Sum of Squares	Df	Mean Square	F	Sig.
Regression	8.619	1	8.619	43.610	.000
Residual	53.562	271	.198		
Total	62.182	272			

Table 4.57 represents coefficients of the independent variable and the dependent variable. These findings show that the performance of government ministries in Kenya will be having an index of 1.970 when supply chain policy is held constant. In addition, the Beta coefficient was 0.202 for the relationship between supply chain policies and the performance of government ministries. This shows that a unit improvement in supply chain policies would lead to a 0.218 improvement in the performance of government ministries. The relationship is significant as the P-value (0.000) was less than the significance level (0.05). Thus yielding a regression model where $Y = 1.970 + 0.202X_2$. Therefore we can accept the alternative hypothesis that “supply chain policies have a significant influence on performance of government ministries in Kenya.

Table 4.58: Coefficients for Supply Chain Policies and Performance

	Unstandardized		Standardized	T	Sig.
	Coefficients				
	B	Std. Error	Beta		
(Constant)	1.970	.124		15.921	.000
Supply chain policies	.202	.031	.372	6.604	.000

4.11.3 Supplier Collaboration and Performance of government ministries.

4.11.3.1 Correlation Analysis

In addition, the findings show that a positive association exists between supplier collaboration and the performance of government ministries in Kenya ($r=0.417$, p -value= 0.000).

Table 4.59: Correlation Analysis between Supplier Collaboration and Performance of government ministries.

		Performance of government ministries	Supplier collaboration
Performance of government ministries	Pearson Correlation	1	
	Sig. (2-tailed)		
	N	273	
Supplier collaboration	Pearson Correlation	.417**	1
	Sig. (2-tailed)	.000	
	N	273	273

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

4.11.3.2 Univariate Regression Analysis

A univariate analysis was conducted to investigate the influence of supplier collaboration practices on the performance of Kenyan government ministries. The null hypothesis was;

H₀₃: Supplier collaboration practices have no influence on performance of the government ministries in Kenya.

The objective was tested by regressing supplier collaboration practices on performance of government ministries guided by the equation $Y = \beta_0 + \beta_1 X_3 + \varepsilon$ where Y = Performance of the government ministries in Kenya, β_0 = Constant, β_1 =Coefficients of determination, X_1 = supplier collaboration practices and ε = Error term. The results of the regression are presented in Table 4.59. Table 4.59 displays R (the correlation between the observed and predicted values of the dependent variable), which is 417. This is a moderate relationship between the observed and predicted values of the dependent variable. The table also displays R squared which is the proportion of variation in the dependent variable explained by the regression model,

in this case, it is 0.174. This means that supplier collaboration practices can explain 17.4% of the performance of Kenyan government ministries. The value of the standard error of the estimate is shown in the output as 0.43531.

Table 4.60: Model Summary Supplier Collaboration Practices and Performance

R	R Square	Adjusted R Square	Std. Error of the Estimate
.417	.174	.171	.43531

Table 4.60 summarizes the results of an analysis of variance, with the sum of squares, degrees of freedom, and mean square being displayed for two sources of variation, regression and residual. For the accounted for values, the mean square (the sum of squares divided by the degrees of freedom), is 10.829, the F statistic (the regression mean square divided by the residual mean square) is 57.148 and the degree of freedom (df) is 1 whereas the output for residual which displays information about the variation that is not accounted for by the model has the following values: sum of squares as 51.353, df is 271 and a mean square of 0.189. The overall relationship was statistically significant ($F = 57.147$, $p < 0.05$) It has a significance level of 0.000 this means that the chances are zero that the result of regression model are due to random events instead of a true relationship, which implies that the linear regression model is a good fit for the data and hence can be used to predict the effect of supplier collaboration practices on the performance of Kenyan government ministries.

Table 4.61: ANOVA for Supplier Collaboration and Performance

	Sum of Squares	Df	Mean Square	F	Sig.
Regression	10.829	1	10.829	57.148	.000
Residual	51.353	271	.189		
Total	62.182	272			

Table 4.61 represents coefficients of the independent variable and the dependent variable. These findings show that the performance of government ministries in Kenya will be having an index of 2.168 when supplier collaboration practices is held constant. In addition, the Beta coefficient was 0.208 for the relationship between supplier collaboration practices and the performance of government ministries. This shows that a unit improvement in supplier collaboration practices would lead to a 0.208 improvement in the performance of government ministries. The relationship is significant as the P-value (0.000) was less than the significance level (0.05). Thus yielding a regression model where $Y = 2.168 + 0.208X_3$. Therefore we can accept the alternative hypothesis that “Supplier collaboration practices have a significant influence on performance of government ministries in Kenya”.

Table 4.62: Coefficients for Supplier Collaboration and Performance

	Unstandardized		Standardized T		Sig.
	Coefficients		Coefficients		
	B	Std. Error	Beta		
(Constant)	2.168	.084		25.952	.000
Supplier collaboration	.208	.028	.417	7.560	.000

4.11.4 Risk Management and Performance of government ministries

4.11.4.1 Correlation Analysis

Further, the results show that there is a positive association between risk management and the performance of government ministries in Kenya ($r=0.503$, p -value=0.000).

Table 4.63: Correlation analysis between Risk Management and Performance of government ministries

		Performance of government ministries	Supply Chain risk management
Performance of government ministries	Pearson Correlation	1	
	Sig. (2-tailed)		
	N	273	
Supply Chain risk management	Pearson Correlation	.503**	1
	Sig. (2-tailed)	.000	
	N	271	271

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

4.11.4.2 Regression Analysis

A univariate analysis was conducted to investigate the influence of risk management practices on the performance of Kenyan government ministries. The null hypothesis was;

H₀4: Risk management practices have no influence on performance of government ministries in Kenya.

The objective was tested by regressing risk management practices on performance of government ministries guided by the equation $Y = \beta_0 + \beta_1 X_4 + \varepsilon$ where Y = Performance of government ministries in Kenya, β_0 = Constant, β_1 = Coefficients of determination, X_1 = risk management practices and ε = Error term. The results of the regression are presented in Table 4.63. Table 4.63 displays R (the correlation between the observed and predicted values of the dependent variable), which is 500. This is a moderate relationship between the observed and predicted values of the dependent variable. The table also displays R squared which is the proportion of variation in the dependent variable explained by the regression model, in this case, it is 0.250. This means that risk management practices can explain 25% of the performance of

Kenyan government ministries. The value of the standard error of the estimate is shown in the output as 0.41487.

Table 4.64: Model Summary for Risk Management and Performance

R	R Square	Adjusted R Square	Std. Error of the Estimate
.500	.250	.247	.41487

Table 4.64 summarizes the results of an analysis of variance, with the sum of squares, degrees of freedom, and mean square being displayed for two sources of variation, regression and residual. For the accounted for values, the mean square (the sum of squares divided by the degrees of freedom), is 15.537, the F statistic (the regression mean square divided by the residual mean square) is 90.268 and the degree of freedom (df) is 1 whereas the output for residual which displays information about the variation that is not accounted for by the model has the following values: sum of squares as 46.645, df is 271 and a mean square of 0.172. The overall relationship was statistically significant ($F = 90.268$, $p < 0.05$) It has a significance level of 0.000 this means that the chances are zero that the result of regression model are due to random events instead of a true relationship, which implies that the linear regression model is a good fit for the data and hence can be used to predict the effect of supplier collaboration practices on the performance of Kenyan government ministries.

Table 4.65: ANOVA for Risk Management and Performance

	Sum of Squares	Df	Mean Square	F	Sig.
Regression	15.537	1	15.537	90.268	.000
Residual	46.645	271	.172		
Total	62.182	272			

Table 4.65 represents coefficients of the independent variable and the dependent variable. These findings show that the performance of government ministries in Kenya will be having an index of 1.863 when risk management practices is held constant. In addition, the Beta coefficient was 0.264 for the relationship between supplier collaboration practices and the performance of government ministries. This shows that a unit improvement in supplier collaboration practices would lead to a 0.208 improvement in the performance of government ministries. The relationship is significant as the P-value (0.000) was less than the significance level (0.05). Thus yielding a regression model where $Y = 1.863 + 0.264X_4$. Therefore we can accept the alternative hypothesis that “risk management practices have a significant influence on performance of government ministries in Kenya”.

Table 4.66: Coefficients Risk Management and Performance

	Unstandardized		Standardized t		Sig.
	Coefficients		Coefficients		
	B	Std. Error	Beta		
(Constant)	1.863	.098		18.932	.000
Risk management	.264	.028	.500	9.501	.000

4.11.5. Multivariate Regression Analysis

After analyzing each variable’s effect on performance using simple regression, factor analysis and Pearson’s correlation, multiple linear regression analysis was used to assess the combined influence of the four independent variables (supplier selection, supply chain policies, supplier collaboration and risk management) on the dependent variable (performance of government ministries in Kenya). The statistical overall model used for analysis was as follows:

$Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \varepsilon$ Where: Y is the dependent variable, Performance of government ministries in Kenya, β_0 is the constant, β_i is the coefficient of X_i for $i=1,2,3,4$, X_1 = Supplier selection practices, X_2 = Supply Chain policies, X_3 = Supplier collaboration practices, X_4 = Supply chain risk management practices, ε is the error term

According to the findings, the R squared for the relationship between the four independent variables (supplier selection, supply chain policies, supplier collaboration and risk management) and performance of government ministries in Kenya was 0.964. This implies that the four supplier selection, supply chain policies, supplier collaboration and risk management can explain 96.4% of the performance of government ministries in Kenya. This shows that other factors not included in this study explain 3.6% of the performance of government ministries in Kenya.

Table 4.67: Model Summary for Supply Chain Management Practices and Performance

R	R Square	Adjusted R Square	Std. Error of the Estimate
0.982	.964	.964	.53394

The findings, as shown in table 4.67, show that the F-calculated (1820.976) was greater than the F-critical (4, 269) which was 2.37 and the p-value (0.000) was less than the significance level (0.05). This shows that the linear regression model is a good fit for the data and chances are zero that the result of regression model are due to random events instead of a true relationship hence can be used to assess the effect of the four independent variables (supplier selection, supply chain policy, supplier collaboration and risk management) on the performance of government ministries in Kenya.

Table 4.68: ANOVA for Supply Chain Management Practices and Performance

	Sum of Squares	Df	Mean Square	F	Sig.
Regression	2076.570	4	519.142	1820.976	.000
Residual	76.689	269	.285		
Total	2153.259	273			

The findings show that the relationship between supplier selection practices and the performance of government ministries in Kenya had a coefficient (β_1) of 0.334 (p-value=0.000). This shows that a unit improvement in supplier selection practices would lead to a 0.334 increase in the performance of government ministries in Kenya.

In addition, the association between supply chain policies and the performance of government ministries in Kenya had a regression coefficient of 0.198 (p-value=0.000). This shows that a unit improvement in supply chain policy would lead to a 0.198 increase in the performance of government ministries in Kenya.

Further, the findings show that the relationship between supplier collaboration and the performance of government ministries in Kenya had a coefficient of 0.093 (p-value=0.108), but was insignificant. This is because the p-value (0.108) was greater than the significance level (0.05).

The findings also indicate that the relationship between risk management and the performance of government ministries in Kenya had a coefficient of 0.298 (p-value=0.000). This is a clear indication that a unit improvement in risk management practices would lead to a 0.211 improvement in the performance of government ministries in Kenya. The relationship was statistically because the p-value (0.000) was less than the significance level (0.05).

The coefficients at this point revealed different trends as compared to simple regression analysis. Supplier selection had the highest effect of 0.334 on performance followed by risk management and supply chain policy with beta values of 0.298 and 0.198 respectively whereas supplier collaboration had the least beta values of 0.093 thus yielding a regression model where

$$Y = 0.334X_1 + 0.198X_2 + 0.093X_3 + 0.298X_4$$
 as shown in Table 4.68.

Table 4.69: Coefficients for Supply Chain Management Practices and Performance

	Unstandardized		Standardized t	Sig.	
	Coefficients				
	B	Std. Error	Beta		
supplier selection	.334	.059	.426	5.658	.000
supply chain policy	.198	.050	.285	3.965	.000
supplier collaboration	.093	.057	.100	1.613	.108
risk management	.298	.060	.376	4.987	.000

The first objective of this study was intended to establish the influence of supplier selection practice on the performance of government ministries in Kenya with the corresponding null hypothesis **H₀₁**: Supplier selection practices have no influence on performance of government ministries in Kenya. ($\beta_1=0$). The hypothesis test for significance of the predictor variables yields a P-value of 0.000 as per Table 4.68. This is less than the critical value of 0.05. Hence, the null hypothesis is rejected. The second objective of this study was to evaluate the influence of supply chain policies on performance of government ministries in Kenya. With the corresponding null hypothesis **H₀₂**: Supply Chain Policies have no influence on performance of government ministries in Kenya ($\beta_2=0$). The hypothesis test for significance of the predictor variables yields a P-value of 0.000 as per Table 4.73. This is less than the critical value of 0.05. Hence the null hypothesis is rejected.

The third objective of this study intended to assess the influence of supplier collaboration practices on performance of government ministries in Kenya. With the corresponding null hypothesis **H₀₃**: Supply Chain Collaboration practices have no influence on performance of government ministries in Kenya ($\beta_3=0$). The hypothesis test for significance of the predictor variables yields a P-value of 0.108 as per Table 4.68. The results shows that on its own supply chain collaboration practices have no influence on performance of government ministries in Kenya

The fourth objective of this study intended to establish the influence of risk management practices on performance of government ministries in Kenya. With the corresponding null hypothesis **H₀₄**: risk management practices have no influence on performance of government ministries in Kenya ($\beta_4=0$). The results of the hypothesis test for significance of the predictor yields a P-value of 0.000 as per Table 4.68. This is less than the critical value of 0.05. Therefore the null hypothesis is rejected. The optimal regression model is therefore

$Y = 0.334X_1 + 0.198X_2 + 0.093X_3 + 0.298X_4$ Where: Y is the dependent variable, Performance of government ministries in Kenya, β_0 is the constant, β_i is

the coefficient of X_i for $i=1, 2, 3, 4$, X_1 = Supplier selection practices, X_2 = Supply chain policies, X_3 = Supplier collaboration practices, X_4 = Risk management practices,

4.11.6 Organization Culture

The moderating variable in this study was organizational culture. The study used multiple regressions analysis (stepwise method) to establish the moderating effect of organizational culture (z) on relationship between independent variable and dependent variable.

The statistical model used for analysis was as follows:

$$Y = \beta_1 X_1 + \beta_2 Z + \beta_z X_1 Z + \varepsilon$$

where:-

Y is the dependent variable, performance of government ministries in Kenya.

β_1 - β_2 are the coefficient

X_1 = independent variable

Z is the hypothesized moderator (organizational culture)

β_z is the coefficient of $X_i * Z$ the interaction term between organizational culture and each of the dependent variables

ε is the error term

4.11.6.1 Moderating Effect of Organizational Culture (OC) on supplier selection practices and Performance of Government Ministries

The model summary for the linear regression analysis between organizational culture, supplier selection practices and performance of government ministries indicated an R-squared of 0.131. This shows that both organizational culture and

supplier selection practices can explain a variation of 13.1% of the dependent variable (Performance of Government Ministries). The r-squared increased from 11.9% to 13.1% after the introduction of the moderating variable (organizational culture).

Table 4.70: Model Summary for the moderating effect of OC on Supplier selection practices and Performance of government ministries

R	R Square	Adjusted R Square	Std. Error of the Estimate
.362	.131	.121	.44818

The F-critical (3, 269) was 2.6802 while the F-calculated was 13.525. This shows that the F-calculated was greater than the F-critical and hence a linear significant relationship exists between organizational culture, supplier selection practices and performance of government ministries. In addition, the p-value was 0.000, which was less than the significance level (0.05). This confirms goodness of fit of the model in predicting the influence of organizational culture on supplier selection and performance of government ministries.

Table 4.71: ANOVA for the moderating effect of OC, on supplier selection and Performance of government ministries

	Sum of Squares	Df	Mean Square	F	Sig.
Regression	8.150	3	2.717	13.525	.000
Residual	54.032	269	.201		
Total	62.182	272			

As shown in table 4.71, supplier selection practices has a significant influence on performance of government ministries as the beta coefficient (β_1) was 0.507 (p-

value=0.000). In addition, organizational culture has a significant influence on performance of government ministries as shown by a beta coefficient (β_2) was 0.330 (p-value=0.000). Both supplier selection practices and organizational culture combined have a lower influence on performance of government ministries as shown by a beta coefficient (β_3) was 0.173 (p-value=0.000) as compared to supplier selection on its own.

Table 4.72: Regression Coefficients for the moderating effect of OC, on supplier selection practices and Performance of government ministries

	Unstandardized Coefficients	Std. Error	Standardized Beta	t	Sig.
(Constant)	0.676	0.2424		2.789	0.000
Supplier selection	0.507	0.159	0.801	3.189	0.000
Organizational culture	0.330	0.106	0.42	3.113	0.000
supplier selection * organizational culture	0.173	0.06	0.675	2.883	0.000

Using the unstandardized coefficients the following equation applies:

$$Y = 0.507X_1 + 0.330Z + 0.173X_1 * M$$

4.11.6.2 Moderating Effect of Organizational Culture (OC) on Supply Chain Policies and Performance of Government Ministries

The model summary for the linear regression analysis between organizational culture, supply chain policies and performance of government ministries indicated an R-squared of 0.146. This shows that both organizational culture and supply chain policies can explain a variation of 14.6% of the dependent variable (performance of government ministries). The r-squared increased from 13.9% before the introduction

of the moderating factor to 14.6% after the introduction of organizational culture in the equation.

Table 4.73: Model Summary for the moderating effect of OC, on Supply Chain Policies and Performance of government ministries in Kenya

R	R Square	Adjusted R Square	Std. Error of the Estimate
.382	.146	.136	.44436

The F-critical (3, 269) was 2.6802 while the F-calculated was 15.306. This shows that the F-calculated was greater than the F-critical and hence a linear significant relationship exists between organizational culture, supply chain policies and performance of government ministries. In addition, the p-value was 0.000, which was less than the significance level (0.05). This confirms goodness of fit of the model in predicting the influence of organizational culture and supply chain policies on performance of government ministries.

Table 4.74: ANOVA for the moderating effect of OC, on Supply Chain Policies and Performance of government ministries in Kenya

	Sum of Squares	Df	Mean Square	F	Sig.
Regression	9.067	3	3.022	15.306	.000
Residual	53.115	269	.197		
Total	62.182	272			

As shown in table 4.74, supply chain policies has a significant influence on performance of government ministries as the beta coefficient (β_1) was 0.527 (p-value=0.000). In addition, organizational culture has a significant influence on performance of government ministries as shown by a beta coefficient (β_2) was 0.325

(p-value=0.000). Both organizational culture and supply chain policies combined have a lower influence on performance of government ministries as shown by a beta coefficient (β_3) was 0.129 (p-value=0.000) as compared to supply chain policies on its own.

Table 4.75: Regression Coefficients for the moderating effect of OC, on Supply Chain Policies and Performance

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	0.663	0.168		3.946	0.000
Supply chain policy	0.527	0.141	0.973	3.738	0.000
Organizational culture	0.325	0.116	0.413	2.802	0.000
supply chain Policies * organizational culture	0.129	0.055	0.871	2.345	0.000

Using the unstandardized coefficients the following equation applies:

$$Y = 0.527X_1 + 0.326Z + 0.129X_1 * M$$

4.11.6.3 Moderating Effect of Organizational Culture (OC) on Supply Chain collaboration practices and Performance of Government Ministries

The model summary for the linear regression analysis between organizational culture, supplier collaboration practices and performance of government ministries indicated an R-squared of 0.208. This shows that both organizational culture and supplier collaboration practices can explain a variation of 20.8% of the dependent variable (performance of government ministries). The r-squared increased from 17.4% before the introduction of the moderating variable to 20.8% after the introduction of the moderating variable.

Table 4.76: Model Summary for the moderating effect of OC, on Supplier Collaboration practices and Performance

R	R Square	Adjusted R Square	Std. Error of the Estimate
.456	.208	.200	.42778

The F-critical (3, 269) was 2.6802 while the F-calculated was 23.600. This shows that the F-calculated was greater than the F-critical and hence a linear significant relationship exists between organizational culture, supplier collaboration practices and performance of government ministries. In addition, the p-value was 0.000, which was less than the significance level (0.05). This confirms goodness of fit of the model in predicting the influence of organizational culture and supplier collaboration practices on performance of government ministries.

Table 4.77: ANOVA for the moderating effect of OC on Supplier Collaboration practices and Performance

	Sum of Squares	Df	Mean Square	F	Sig.
Regression	12.956	3	4.319	23.600	.000
Residual	49.226	269	.183		
Total	62.182	272			

As shown in table 4.77, supplier collaboration has a significant influence on performance of government ministries as the beta coefficient (β_1) was 0.958 (p-value=0.000). In addition, organizational culture has a significant influence on performance of government ministries as shown by a beta coefficient (β_2) was 0.503 (p-value=0.000). Both organizational culture and supplier collaboration combined have a lower influence on performance of government ministries as shown by a beta

coefficient (β_3) was 0.170 (p-value=0.000) as compared to supplier collaboration on its own.

Table 4.78: Regression Coefficients for the moderating effect of OC on Supplier Collaboration practices and Performance

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	.009	.645		.014	.989
Supplier collaboration	.958	.228	1.921	4.194	.000
Organizational culture	.503	.149	.640	3.384	.001
Supplier Collaboration * organizational culture	.170	.051	1.847	3.344	.001

Using the unstandardized coefficients the following equation applies:

$$Y = 0.958X_1 + 0.503Z + 0.170X_1 * M$$

4.11.6.4 Moderating Effect of Organizational Culture (OC) on Supply Chain risk management practices and Performance of Government Ministries in Kenya

The model summary for the linear regression analysis between organizational culture, supply chain risk management practices and performance of government ministries indicated an R-squared of 0.258. This shows that both organizational culture and supply chain risk management practices can explain a variation of 25.8% of the dependent variable (performance of government ministries). The r-squared increased from 25.3% before the introduction of the moderating variable to 25.8% after the introduction of the moderating variable.

Table 4.79: Model Summary for the moderating effect of OC, supply chain Risk Management practices and Performance

R	R Square	Adjusted R Square	Std. Error of the Estimate
.508	.258	.249	.41426

The F-critical (3, 269) was 2.6802 while the F-calculated was 31.113. This shows that the F-calculated was greater than the F-critical and hence a linear significant relationship exists between organizational culture, supply chain risk management practices and performance of government ministries. In addition, the p-value was 0.000, which was less than the significance level (0.05). This confirms goodness of fit of the model in predicting the influence of organizational culture and supply chain risk management practices on performance of government ministries.

Table 4.80: ANOVA for the moderating effect of OC on supply chain risk management practices and Performance.

	Sum of Squares	Df	Mean Square	F	Sig.
Regression	16.018	3	5.339	31.113	.000
Residual	46.163	269	.172		
Total	62.182	272			

As shown in table 4.80, supply chain risk management has a significant influence on performance of government ministries as the beta coefficient (β_1) was 0.701 (p-value=0.000). In addition, organizational culture has a significant influence on performance of government ministries as shown by a beta coefficient (β_2) was 0.191 (p-value=0.000). Both organizational culture and supply chain risk management practices combined have a lower influence on performance of government ministries

as shown by a beta coefficient (β_3) was 0.121 (p-value=0.000) as compared to supply chain risk management practices on its own.

Table 4.81: Regression Coefficients for the moderating effect of OC, on supply chain risk management practices and performance.

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	0.904	0.748		1.209	0.228
Supply chain risk management	0.701	0.243	1.32	2.885	0.004
Organizational culture	0.191	0.073	0.242	2.616	0.000
Supply chain risk management * organizational culture	0.121	0.054	0.997	2.241	0.006

Using the unstandardized coefficients the following equation applies:

$$Y = 0.701X_1 + 0.191Z + 0.121X_1 * M$$

4.11.6.5 Overall moderated model

The statistical overall moderated model for organizational culture on supply chain management practices and performance used for analysis was as follows:

$$Y = \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_z X + \beta_{1z} X_1 Z + \beta_{2z} X_2 Z + \beta_{3z} X_3 Z + \beta_{4z} X_4 Z + \varepsilon$$

The overall moderated model for the linear regression analysis between organizational culture, supply chain management practices and performance of government ministries indicated an R-squared of 0.980. This shows that both organization culture, supply chain management practices, and organizational culture can explain 98% of the performance of government ministries in Kenya. The introduction of organizational culture in the model increased the r-squared from 96.4%.

Table 4.82: Model Summary for overall moderated model for OC on Supply Chain Management Practices and Performance

Model	R	R Squared	Adjusted R Square	Std. Error of the Estimate
1	.990	.980	.979	.40611

The F-critical (9, 264) was 2.372 while the F-calculated was 1421.298. This shows that the F-calculated was greater than the F-critical and hence a linear significant relationship exists between organizational culture, supply chain management practices, supply chain management practices* organizational culture and performance of government ministries. In addition, the p-value was 0.000, which was less than the significance level (0.05). This confirms goodness of fit of the model in predicting the influence of organizational culture, supply chain management practices and supply chain management practices* organizational culture on performance of government ministries.

Table 4.83: Analysis of Variance for the overall moderated model for OC on Supply Chain Management Practices and Performance

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2109.718	9	234.413	1421.298	.000
	Residual	43.541	264	.165		
	Total	2153.259	273			

As shown in table 4.83, supplier selection has no significant influence on performance of government ministries as the beta coefficient was -0.467 and the p-value was 0.161. Both supplier selection and organizational culture combined had no

significance influence on performance of government ministries as the beta coefficient was 0.105 and the p-value was 0.171.

The results also show that on its own supply chain policy had a significant influence on performance of government ministries as indicated by a beta coefficient of 0.881 and a p-value of 0.009. However, the introduction of organizational culture led to a decrease in the beta coefficient to 0.204 and a p-value of 0.009 but the influence changed to negative.

The results indicate that supplier collaboration on its own had no significant influence on the performance of government ministries as shown by a beta coefficient of 0.594 and a p-value of 0.089. After the introduction of organizational culture, the beta coefficient reduced to 0.114 and the p-value was 0.106 and change the direction from positive to negative.

Also, risk management had no significant influence on the performance of government ministries as indicated by a beta coefficient of -0.079 and a p-value of 0.718. The introduction of organizational culture led to a decrease in the beta coefficient to 0.078 and a p-value of 0.122.

$$Y = -0.467X_1 + 0.881X_2 + 0.594X_3 - 0.079X_4 + 0.417X + 0.105X_1Z \\ - 0.204X_2Z - 0.124X_3Z + 0.078X_4Z$$

Table 4.84: Regression Coefficients for the overall moderated model for OC on Supply Chain Management Practices and Performance

	Unstandardized Coefficients		Standardized Coefficients		Sig.
	B	Std. Error	Beta	t	
Supplier selection	-.467	.332	-.597	-1.407	.161
Supply chain policy	.881	.336	1.272	2.621	.009
Supplier collaboration	.594	.348	.642	1.707	.089
Supply chain risk management	-.079	.217	-.099	-.362	.718
Organizational culture	.417	.036	.643	11.716	.000
Supplier selection * organizational culture	.105	.076	.590	1.372	.171
Supply chain Policies * organizational culture	-.204	.078	-1.307	-2.615	.009
Supplier Collaboration * organizational culture	-.124	.076	-.599	-1.623	.106
Supply chain risk management * organizational culture	.078	.050	.441	1.551	.122

Using the unstandardized coefficients the following equation applies:

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter comprises of three main sections that were guided by the specific objectives and study hypotheses. The first section is the study summary, followed by conclusions and recommendations for policy, recommendations for enhancing the performance of government ministries in Kenya and suggestions for further research.

5.2 Summary

Supply chain management practices involves the strategic, transparent integration and achievement of an organization's social, environmental, and economic goals in the systemic coordination of key inter organizational business processes for improving the long-term economic performance of the individual company and its supply chains. Socially it leads to increased equality and improved labor market through requirement on employment and social integration, economically it saves both money and resources when life cycle costing is considered and finally it results to improved service to the society hence increased quality of life.

The objective of the study was to examine the influence of supply chain management practices on performance of government ministries in Kenya. The specific objective of the study were; to establish the influence of supplier selection practices on performance of the government ministries in Kenya, to establish the influence of supply chain policies on performance of the government ministries in Kenya, to evaluate the influence of supplier collaboration practices on performance of the government ministries in Kenya, to assess the influence of risk management practices on performance of the government ministries in Kenya and to evaluate the moderating effect of organizational culture on the relationship between supply chain management practices and performance of the government ministries in Kenya.

The study adopted descriptive survey design and a cross sectional study design. The population of this study was 20 government ministries with a target population of 1372 staff working in the supply chain management department/units in the 20 government ministries in Kenya. The sample size was determined using Fishers (2003) formula. Stratified random sampling was used as it gives representative sample of the whole population. Both primary and secondary data was used. This study made use of semi-structured questionnaires to collect primary data. Secondary data was extracted from records availed by the targeted population. A pilot test was conducted to test the reliability and validity of the data collection instruments. The questionnaires were administered through a drop and pick later method. The data collected from the ministries was both qualitative and quantitative, SPSS version 22 was used to analyse quantitative data and also nominal data from the socio-demographic information section was analysed by use of percentages and frequencies. Thematic content analysis was used to analyze qualitative data, that is, data collected from open ended questions. The results were then presented in form of a prose. Both descriptive and inferential statistics were used to analyze quantitative data. In descriptive statistics, the study used frequency, mean, standard deviation and percentages. The analyzed data was then presented in tables and figures. In relation to inferential statistics the study used analysis of variance, correlation analysis and multivariate regression analysis.

5.2.1 Supplier Selection practices

Supplier selection practices included supplier selection, supplier certification and supplier comparison. From descriptive statistics, the study found that government ministries in Kenya use technical capability, technical expertise criteria, financial capability criteria, suppliers past performance and current relationship when evaluating suppliers. However, some government ministries do not consider provision of after sales service when evaluating supplier.

In relation to supplier certification the study found that government ministries in Kenya do not include requirements for Quality Certification in ISO 19001 in their evaluation criteria. In addition, staffs working in the supply chain department have

little knowledge on ISO 26000:2010 on Social Responsibility. In addition, the study found that government ministries do not include requirement for Environmental Certification ISO 14001 and requirement for Life Cycle Certification ISO 14044:2006 in their evaluation criteria.

Supplier service/product quality is an important facet of supplier selection. The study revealed that government ministries in Kenya rank suppliers on responsiveness and price, product or service quality and lead time. However, most government ministries in Kenya do not rank suppliers on reputation.

From the correlation analysis the study found that there is a positive relationship between supplier selection practices and performance of government ministries in Kenya ($r=0.345$, $p\text{-value}=0.000$). The regression analysis results also indicated that supplier selection practices positively and significantly influence the performance of government ministries in Kenya. The results indicated that a unit improvement in supplier selection practices would lead to a 0.218 improvement in the performance of government ministries in Kenya.

5.2.2 Supply chain Policies

Supply chain policies included disposal policy, asset management policy and risk management policy. From descriptive statistics, the study found that government ministries prepare a disposal report, carry out assessment of items earmarked for disposal, carry out identification and reporting of items before disposal, prepare a disposal plan, carry out evaluation of items earmarked for disposal and have a disposal policy in place. The Public Procurement and Asset Disposal Act, 2015 came into effect on 7th January, 2016 highlights disposal procedures.

The study also revealed that government ministries in Kenya maintain and update fixed asset register, have asset management policy in place and insure their assets. Total asset management policies cover demand management, whole-of-life asset management, risk management, value management and cross-agency coordination in service planning and delivery. The study revealed that government ministries identify risk in procurement, have a risk management policy and maintain a risk register in

their ministries. However, the study found that government ministries were not updating their procurement risk register.

From correlation analysis the study found that there is a positive association between supply chain policies and the performance of government ministries in Kenya ($r=0.372$, $p\text{-value}=0.000$). The regression analysis results also indicated that supply chain policies has a positive and significant effect on the performance of government ministries in Kenya. The results indicated that a unit improvement in supply chain policies would lead to a 0.202 improvement in the performance of government ministries in Kenya.

5.2.3 Supplier collaboration practices

The indicators of supplier collaboration include information sharing, supply chain integration and supplier strategic partnership. From descriptive statistics, the study found that government ministries were not keeping each other informed about the changes that may affect the other. In addition, the study found that government ministries do not provide full information to suppliers about issues that affect business. Further, the study found that government ministries do not provide advance information of changing need to suppliers and share business knowledge of core business process.

In addition, the study revealed that government ministries do not exchange information that help establish business planning and they do not share proprietary information with suppliers. Supply chain collaboration is attributed to seven components (information sharing, goal congruence, decision synchronization, incentive alignment, resources sharing, collaborative communication and joint knowledge creation).

The study established that government ministers do not contact their suppliers frequently. In addition, government ministries do not have a compatible communication and information system with their supplier and do not participate in the marketing efforts of their suppliers. The study established that government ministries consider quality in supplier selection. However, they do not help suppliers

to improve their product quality and they do not solve procurement related problems jointly with suppliers. Also, the study found that government ministries do not include their suppliers in continuous improvement programs, key development processes as well as planning and goal setting activities.

From the correlation analysis, the study revealed that there is a positive association between supplier collaboration and the performance of government ministries in Kenya ($r=0.417$, $p\text{-value}=0.000$). The regression analysis results indicate that supplier collaboration has a positive and significant influence on the performance of government ministries in Kenya. The results show that a unit improvement in supplier collaboration practices would lead to a 0.208 improvement in the performance of the government ministries in Kenya.

5.2.4 Supply Chain Risk Management

The indicators of Supply chain risk management practices include risk identification, risk assessment and dual sourcing. From descriptive statistics, the study found that ministries' supply chain departments have professional expertise, they frequently review their ministries' records and have a work flow chart for their ministry. However, they do not carry out identification of potential risk in supply chain and on-site investigation of existence of risk.

The study also established that government ministries do not carry out risk audit, risk analysis and regular risk check-ups. In addition, government ministries do not carry out joint training sessions with their suppliers and joint risk workshops with their suppliers. The study found also that government ministries in Kenya have a list of registered suppliers and practice supplier rotation. In addition, government ministries were not carrying out supplier appraisal. In addition, they rarely implemented the recommendations of supplier appraisal report.

From correlation analysis, the study found that there is a positive association between risk management and the performance of government ministries in Kenya ($r=0.503$, $p\text{-value}=0.000$). The regression analysis revealed that risk management has a positive and significant effect on the performance of government ministries in Kenya. The

results also indicated that a unit improvement in risk management practices would lead to a 0.267 improvement in the performance of government ministries in Kenya.

5.2.5 Organizational Culture

Organization culture was used as the moderating variable in this study and was measured in terms of hierarchical culture, role culture and achievement culture. From descriptive statistics, the study found that supply chain departments in government ministries in Kenya adhere to procurement regulation to guide our activities and processes. The study also found that they adhere to laid down procurement approval systems and structure, and controls in the procurement system. The study also found that they adhere to the laid down timeliness in the procurement legal framework and practice centralized procurement system.

In relation to role culture, the study revealed that government ministries ensure documentation and information management, adhere to contractual obligation and only do what they are authorized to do. Further, the study found that government ministries exhibit loyalty towards systems in the ministry. In regard to achievement culture, the study established that government ministries pursue goals and targets and encourage continuous achievement. In addition, the study found that government ministries encourage employee participation and recognize employee's contributions and suggestions.

From correlation analysis, the study found that organizational culture influence supplier selection, supply chain policy, supplier collaboration and supply chain risk management as well as the performance of government ministries in Kenya. From the regression analysis, the study found that organizational culture influence the association between the supply chain management practices (supplier selection, supply chain policy, supplier collaboration and risk management) and the performance of government ministries in Kenya.

5.3 Conclusion

The study concludes that supplier selection practices positively and significantly influence the performance of government ministries in Kenya. The study found that even though government ministries were using technical capability, technical expertise criteria, financial capability criteria and suppliers past performance in evaluating suppliers, they were not putting much consideration in supplier certification like requirements for Quality Certification in ISO 19001, ISO 26000:2010 on Social Responsibility, requirement for Environmental Certification ISO 14001 and requirement for Life Cycle Certification ISO 14044:2006. The study found that government ministries in Kenya rank suppliers on responsiveness and price, product or service quality and lead time.

The study also concludes supply chain policies has a positive and significant effect on the performance of government ministries in Kenya. The study found that government ministries prepare a disposal report, carry out assessment of items earmarked for disposal, carry out identification and reporting of items before disposal, prepare a disposal plan, carry out evaluation of items earmarked for disposal and have a disposal policy in place. The study found that although government ministries in Kenya maintain and update fixed asset register, have asset management policy in place and insure their assets they rarely update their procurement risk register.

The study further concludes that supplier collaboration has a positive and significant influence on the performance of government ministries in Kenya. The study found government ministries in Kenya do not exchange information that help establish business planning and do not share proprietary information with suppliers. In addition, government ministers do not contact their suppliers frequently and have no compatible communication and information system with their supplier. Also, they do not help suppliers to improve their product quality and they do not solve procurement related problems jointly with suppliers.

Lastly, the study concludes that risk management has a positive and significant effect on the performance of government ministries in Kenya. The study found that ministries' supply chain departments have professional expertise, they frequently review their ministries' records and have a work flow chart for their ministry. However, they do not carry out identification of potential risk in supply chain and on-site investigation of existence of risk. The study also established that government ministries do not carry out risk audit, risk analysis and regular risk check-ups. In addition, government ministries do not carry out joint training sessions with their suppliers and joint risk workshops with their suppliers. The study found also that government ministries in Kenya have a list of registered suppliers and practice supplier rotation. In addition, government ministries were not carrying out supplier appraisal. In addition, they rarely implemented the recommendations of supplier appraisal report.

The study concludes organizational culture influences the association between the supply chain management practices (supplier selection, supply chain policies, supplier collaboration and risk management) and the performance of government ministries in Kenya.

5.4 Recommendations

5.4.1 Recommendations for policy

The study found that government ministries do not consider requirements for Quality Certification in ISO 19001 and requirement for Environmental Certification ISO 14001 when evaluating suppliers. Low quality products and service have a significant effect on service delivery in government institutions. This study therefore recommends that new policies should be formulated to ensure consideration of quality and environmental certification when selecting suppliers.

The study found that government ministries in Kenya do not have a compatible communication and information system with their supplier. Information sharing and data exchange plays a major role in reducing lead time and reducing chances of stock out and improving on quality. The study therefore recommends that the government

should come up with a policy requiring suppliers to have compatible information system with public institutions.

The study established that government ministries in Kenya do not carry out identification of potential risk in supply chain and on-site investigation of existence of risk. This study recommends that the government of Kenya should formulate policies to enhance frequent identification of potential risk in supply chain and on-site investigation of existence of risk.

5.4.2 Recommendations for Management

The study found that government ministries were not considering the provision of after sales service when evaluating suppliers. Equipment such as printers, motor vehicle and other types of machines require frequent services as a way of ensuring their efficiency. This study therefore recommends that government ministries in Kenya should consider provision of after sales service when evaluating suppliers.

The study found that government ministries in Kenya were not updating their procurement risk register and other public assets disposal documents. One of the main factors affecting constant update of files is the low adoption of information technology in supply chain and procurement department. The study therefore recommends that the government ministries should ensure full adoption of information technology in procurement and supply chain departments.

The study established that government ministries do not help suppliers to improve their product quality and do not include their suppliers in continuous improvement programs. Continuous improvement programs are key in ensuring improvements in service delivery. The study therefore recommends that the government of Kenya should come up with training programs to help suppliers improve the quality of their products and services.

The study revealed that government ministries do not carry out risk audit, risk analysis and regular risk check-ups. Risk management is a key factor in enhancing efficiency in a supply chain. This study therefore recommends that the government of Kenya should ensure that supply chain departments in government ministries frequently conduct risk audit, risk analysis and regular risk check-ups.

5.4.3 Suggestions for Further studies

This research study was conducted in government ministries in Kenya and hence the findings cannot be generalized to other public institutions. This study therefore suggests further studies on the influence of supply chain management practices on performance of Parastatals in Kenya. The study also found that supply chain management practices explain 96.4% of the performance of government ministries in Kenya. The study therefore suggests further studies on the other factors affecting the performance of government ministries in Kenya. Additional model could be explained through the insertion of other moderators like political power to the hypothesized relationship. With continuation of research on supply chain management practices, There is need of researching on the conventional accepted supply chain management practices for harmonization and improvement on the overall performance of the public and private sector. The relationship between e-procurement and supply chain management practices should also be researched to improve on the body of knowledge on supply chain management practices and performance.

The study established that government ministries were not using supplier certification criteria in evaluating suppliers. The study therefore suggests further studies on the utilization of supplier certification in supplier's evaluation in government ministries in Kenya.

5.5 Contribution to the Body of Knowledge

This study adds more information to the body of knowledge. The study found that supplier selection practices have an influence on the performance of government ministries in Kenya. The study also found that supply chain policy has a positive and significant effect on the performance of government ministries in Kenya. In addition, the study revealed that supplier collaboration has a positive and significant influence on the performance of government ministries in Kenya. Further, the study found that risk management influences on the performance of government ministries in Kenya. Organizational culture influences the association between the supply chain management practices (supplier selection, supply chain policy, supplier collaboration and risk management) and the performance of government ministries

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APPENDICES

Appendix I: Questionnaire

The questionnaire is structured to collect information from government ministries with an objective of examining the influence of supply chain management practices on performance of the government ministries in Kenya.

PART A: Demographic Information

1. What is your highest level of education? (Please tick as appropriate)

Doctorate []

Masters []

Undergraduate []

College Diploma []

School Certificate []

Others, (please specify)

2. How many years of have you worked in public procurement and supplies management? Please (√) as appropriate

Less than a year ago []

Between 1-5 years []

Between 5-15 years []

15 and above years []

3. Which of the following sections do you belong to?

Records Management []

Procurement []

Stores []

4. Kindly indicate if you belong to any other section apart from the ones indicated in three above.....

5. Please indicate your membership category in your procurement professional body

None []

Student member []

Associate member []

Full member []

Affiliate member []

Fellow member []

PART B

SECTION I: SUPPLIER SELECTION PRACTICES

Kindly indicate your level of agreement with the following aspect of supplier selection practices that contributes to performance of government ministries by ticking (√) appropriately.

Supplier Evaluation	Strongly disagree (1)	Disagree (2)	Neither agree or disagree (3)	Agree (4)	Strongly agree (5)
We use technical capability, criteria when evaluating suppliers					
We use technical expertise criteria when evaluating supplier					
We use financial capability criteria when evaluating suppliers					
We consider provision of after sales service when evaluating suppliers					
We consider suppliers past performance and current relationship when evaluating suppliers					

Based on your responses above, kindly make any comment on supplier evaluation in your

ministry.....

Please suggest any other criteria that your ministry uses to evaluate suppliers

.....

Supplier certification	Strongly disagree (1)	Disagree (2)	Neither agree or disagree (3)	Agree (4)	Strongly Agree (5)
We include requirement for Environmental Certification ISO 14001 in our evaluation criteria					
We include requirement for Quality Certification in ISO 19001 in our evaluation criteria					
We include requirement for Life Cycle Certification ISO 14044:2006					
We have knowledge on ISO 26000:2010 on Social Responsibility					

Based on your responses above, kindly make any comment on supplier certification in your

ministry.....

Please suggest any other certification requirement that your ministry includes in the evaluation

criteria.....

Supplier comparison	Strongly disagree (1)	Disagree (2)	Neither agree or disagree (3)	Agree (4)	Strongly agree (5)
We rank suppliers on product quality.					
We rank suppliers on service quality.					
We rank suppliers on lead time.					
We rank suppliers on reputation.					
We rank suppliers on responsiveness.					
We rank suppliers on price.					

Based on your responses above, kindly make any comment on supplier comparison in your ministry.....

Please suggest any other criteria that your ministry uses to rank suppliers.....

SECTION II: SUPPLY CHAIN POLICIES

This section covers a number of statements regarding supply chain policies and how its effective implementation impacts on performance of the government ministries.

Kindly indicate your level of agreement with the statements by ticking (√) appropriately.

Disposal policy	Strongly disagree (1)	Disagree (2)	Neither agree or disagree (3)	Agree (4)	Strongly agree (5)
We use our disposal policy.					
We carry out identification and reporting of items before disposal.					
We prepare a disposal plan.					
We carry out assessment of items earmarked for disposal.					
We carry out evaluation of items earmarked for disposal.					
We prepare a disposal report.					

Based on your responses above, kindly make any comment on disposal policy in your ministry.....

Please suggest any other disposal procedure that your ministry uses before disposing the assets.....

Asset management policy

Asset management policy	Strongly disagree (1)	Disagree (2)	Neither agree or disagree (3)	Agree (4)	Strongly agree (5)
We use our asset management policy					
We maintain fixed asset register					
We insure our assets					
We update our asset register					

Based on your responses above, kindly make any comment on asset management policy _____ in _____ your ministry.....

.....

Please suggest any other asset management strategy that your ministry implements.....

.....

.....

Risk management policy

Risk management policy	Strongly disagree (1)	Disagree (2)	Neither agree or disagree (3)	Agree (4)	Strongly agree (5)
We use our risk management policy.					
We identify risk in procurement.					
We maintain a risk register.					
We update procurement risk register					

Based on your responses above, kindly make any comment on risk management policy _____ in _____ your ministry.....

.....

.....

Please suggest any other risk management strategy that your ministry implements.....

.....

.....

SECTION III: SUPPLIER COLLABORATION PRACTICES

Kindly indicate your level of agreement with the following aspect of supplier collaboration practices that contributes to performance of government ministries by ticking (√) appropriately.

Information Sharing	Strongly disagree (1)	Disagree (2)	Neither agree or disagree (3)	Agree (4)	Strongly agree (5)
We share proprietary information with suppliers.					
We share business knowledge of core business process					
We provide advance information of changing need to suppliers					
We provide full information to suppliers about issues that affect business					
We exchange information that help establish business planning					
We keep each other informed about the changes that may affect the other					

Based on your responses above, kindly make any comment on information sharing in your ministry.....

Please suggest any other information that your ministry shares with the suppliers.

Supply chain integration	Strongly disagree (1)	Disagree (2)	Neither agree or disagree (3)	Agree (4)	Strongly agree (5)
We frequently contact our suppliers					
We have a compatible communication and information system with our suppliers					
We participate in the marketing efforts of our suppliers					

Based on your responses above, kindly make any comment on supply chain integration in your ministry.....

.....

Please suggest any seamless coordination that exists between your ministry and your suppliers.....

.....

Supplier Strategic Partnership	Strongly disagree (1)	Disagree (2)	Neither agree or disagree (3)	Agree (4)	Strongly agree (5)
We solve our procurement related problems jointly with suppliers.					
We consider quality in supplier selection.					
We help suppliers to improve their product quality.					
We include our suppliers in continuous improvement programs					
We include our suppliers in planning and goal setting activities					
We involve our suppliers in key development processes					

Based on your responses above, kindly make any comment on supplier strategic partnership in your ministry.....

.....

Please suggest any other activity you carry out together with the suppliers.....

.....

.....

SECTION IV: SUPPLY CHAIN RISK MANAGEMENT PRACTICES

Kindly indicate your level of agreement with the following aspect of supply chain risk management practices that contributes to performance of government ministries by ticking (√) appropriately

Risk Identification	Strongly disagree (1)	Disagree (2)	Neither agree or disagree (3)	Agree (4)	Strongly agree (5)
We carry out identification of potential risk in supply chain.					
We frequently review our ministry's records.					
We have a work flow chart for our ministry.					
We have professional expertise in our ministry.					
We carry out on-site investigation of existence of risk.					

Based on your responses above, kindly make any comment on risk identification in your ministry in your ministry.....

.....

Please suggest any other risk identification strategy that is used in your ministry.

.....

Risk Assessment	Strongly agree (1)	Disagree (2)	Neither agree or disagree (3)	Agree (4)	Strongly agree (5)
We carry out risk audit.					
We carry out regular risk check-ups.					
We carry out risk analysis.					
We carry out joint risk workshops with our suppliers.					
We carry out joint training sessions with our suppliers.					

Based on your responses above, kindly make any comment on risk assessment in your ministry.....

.....

Please suggest any other risk assessment strategy that is used in your ministry.

.....

Dual Sourcing	Strongly agree (1)	Disagree (2)	Neither agree or Disagree (3)	Agree (4)	Strongly agree (5)
We use our list of registered suppliers.					
We practice supplier rotation.					
We carry out supplier appraisal.					
We prepare a supplier appraisal report.					
We implement the recommendations of supplier appraisal report.					

Based on your responses above, kindly make any comment on dual sourcing in your ministry.....

.....
.....

Please suggest any other strategy that your ministry implements for dual sourcing.....

.....
.....
.....

SECTION V: ORGANIZATIONAL CULTURE

Kindly indicate your level of agreement with the following statement on moderating effect of organizational culture on performance of government ministries

Hierarchical culture	Strongly disagree (1)	Disagree (2)	Neither agree or disagree (3)	Agree (4)	Strongly agree (5)
We adhere to procurement regulation to guide our activities and processes.					
We practice centralized procurement system.					
We adhere to laid down procurement approval systems and structure.					
We adhere to the controls in the procurement system.					
We adhere to the laid down timeliness in the procurement legal framework.					

Based on your responses above, kindly make any comment on hierarchical culture in your ministry.....

Please suggest any other supply chain system used in your ministry

Role culture	Strongly disagree (1)	Disagree (2)	Neither agree or disagree (3)	Agree (4)	Strongly agree (5)

			(3)		
We adhere to contractual obligations.					
We exhibit loyalty towards systems in the ministry.					
We ensure documentation and information management.					
We only do what we are authorized to do.					

Based on your responses above, kindly make any comment on role culture in your ministry.....

.....

Please suggest any other requirement that your ministry uses to ensure adherence to individual

roles.....

.....

Achievement culture	Strongly disagree (1)	Disagree (2)	Neither agree or disagree (3)	Agree (4)	Strongly agree (5)
We recognize employee's contributions and suggestions					
We pursue goals and targets					
We encourage employee participation					
We encourage continuous achievement					

Based on your responses above, kindly make any comment on achievement culture in _____ your ministry.....

Please suggest any other activity carried out in your ministry that recognizes individuals achievement.....

SECTION VI: PERFORMANCE OF GOVERNMENT MINISTRIES

This section seeks to evaluate the effect of supply chain management practices and organizational culture on performance of government ministries in Kenya.

Non-Financial Indicators

Kindly provide as a percentage, your assessment of the effect of supply chain management practices and organizational culture on various aspects of performance by ticking at the space provided, by the scale indicator where (1=between 0-20%), 2= 20% - 40%, 3= 40% - 60%, 4= 60% – 80%., 5= 80% – 100%)

Product Quality	1	2	3	4	5
Indicate the percentage of defect free goods deliveries					
Indicate the percentage of product rejection on deliveries					
Indicate the percentage of products that meets specifications.					
Indicate the percentage of product returns for repair during warranty period					

Based on your responses above, kindly make any comment on product quality in your ministry.....

.....

Please suggest any other aspect of quality that has changed in your ministry

.....

Compliance with statutory obligations	1	2	3	4	5
Indicate the percentage of statutory reports submitted on time					
Indicate the percentage of audit queries on non-compliance					
Indicate the percentage of queries from procurement regulator on non-compliance					

Based on your responses above, kindly make any comment on compliance with statutory obligations in your ministry.....

.....

Please list statutory reports that your ministry rarely submits to the regulator

.....

Service delivery	Strongly disagree (1)	Disagree (2)	Neither agree or disagree (3)	Agree (4)	Strongly Agree (5)
We receive deliveries of goods from our suppliers on time					
We get after sales service from our suppliers					
We receive prompt response to our queries from our supplier					
Our suppliers are readily available for consultation					

Based on your responses above, kindly make any comment on service delivery in your ministry.....
.....
.....

Please list services provided by your suppliers that are not satisfactory.....
.....
.....

Financial Indicators

Kindly provide as a percentage, assessment of the effect on various aspects of performance by ticking at the space provided, by the scale indicator where (1=between 0-20%), 2= 20% - 40%, 3= 40% - 60%, 4= 60% – 80%., 5= 80% – 100%)

Cost efficiency	1	2	3	4	5
Indicate the percentage of cost savings of procured goods/works/services on budgeted amount					
Indicate the percentage of cost deviation of procured goods /works/services from market price					
Indicate the percentage of cost overrun of procured goods/works /services on budgeted amounts					

Based on your responses above, kindly make any comment on cost efficiency in your ministry.....

.....

Please list other aspects of cost that affects operations in your ministry.....

.....

Budgetary Compliance	1	2	3	4	5
Indicate the percentage of goods/works/services procured without budgetary allocation					
Indicate the percentage of goods/works/services procured above the budgetary allocation					
Indicate percentage of purchase orders pending due to budgetary constraints					
Indicate the percentage of audit queries on budgetary compliance					

Based on your responses above, kindly make any comment on budgetary compliance in your ministry.....

.....
.....

Please suggest budgetary concerns that affects operations in your ministry.....

.....
.....

Appendix II: Summary of the Empirical Review

Author	Purpose	Methodology		Indicators	Findings	Context Geographic/industry	Research Gaps
		Research design	Data analysis				
Hsu et al. (2006)	To develop and test a reliable and valid supplier selection measurement scale that can be applied in different geographic regions, namely, the USA and Europe	Descriptive Survey	<ul style="list-style-type: none"> • exploratory factor analysis • Confirmatory factor analysis 	<ul style="list-style-type: none"> • Supplier Quality • Supplier Service • Strategic/Management fit 	This study demonstrates that underlying the documented supplier selection criteria is the need to assess a supplier's quality and service capabilities as well as its strategic and managerial alignment with the buyer.	<ul style="list-style-type: none"> • USA and Europe 	The study was conducted in Developed countries, USA and Europe and hence its findings cannot be generalized to Kenya. The study focused on supplier selection and not sustainable supplier selection
Ageron et al. (2013)	To examine and evaluate the importance of IS/IT criterion in the suppliers selection process.	<ul style="list-style-type: none"> • Exploratory research design 	<ul style="list-style-type: none"> • Likert scale 	<ul style="list-style-type: none"> • Technology • Risk • Quality • Flexibility • Intra-or Inter-Organizational Information system 	The results suggest that IT/IS is a significant supplier selection criterion within supply chain context because of the rapid proliferation of information	<ul style="list-style-type: none"> • French companies 	Having been conducted in France, the findings of this study cannot be generalized to Kenya. The study did not look at the influence of supplier

Micheli (2008)	decision-maker-centered supplier selection approach for critical supplies, with an aim of investigating the supplier selection issue as a way to mitigate the overall supply risk	Structural modelling	<ul style="list-style-type: none"> • risk efficiency-based supplier selection (REBaSS) approach 	<ul style="list-style-type: none"> • Supplier evaluation • Supplier comparison 	<p>sharing across upstream chains. The research finding portrayed a present total cost profile (PTCP) related to every supplier to be assessed, as a function of the possible investments that can be made to exploit the upside and to mitigate the downside supply risks.</p>	<ul style="list-style-type: none"> • Italy 	<p>selection on performance. Having been conducted in Italy, the findings of this study cannot be generalized to Kenya. The dependent variable was supplier risk, which is different from organizational performance.</p>
Girubha et al. (2016)	Application of interpretative structural modelling (ISM) integrated with multi-criteria decision-making (MCDM) techniques for enabling the sustainability supplier selection	Interpretative structural modelling (ISM)	<ul style="list-style-type: none"> • Comparison of ISM–ANP – ELECTRE and ISM–ANP – VIKOR • Analytic Hierarchy Process (AHP), ANP, Data Envelopment Analysis (DEA), Neural Network 	<p>Selection criteria</p> <ul style="list-style-type: none"> • Quality • Resource consumption • Currency risk • Financial capability • Performance history • Certification • Rights of employee • After sales service • E-Commerce 	<ul style="list-style-type: none"> • Two modules ISM–ANP – ELECTRE and ISM–ANP – VIKOR were compared for the problem of sustainable supplier selection. ELECTRE results with a single solution showed that Supplier 2 can be selected as the 	<ul style="list-style-type: none"> • India 	<p>The study was conducted in India and hence the findings cannot be generalized to Kenya. The study was limited to multi-criteria decision-making (MCDM) techniques and did not show the include of the techniques on</p>

				<ul style="list-style-type: none"> capability Buyer supplier constraints. 	best supplier; VIKOR result shows that Supplier 1 and Supplier 2 can be selected as the best suppliers.		organizational performance
Kellner (2016)	Configuration of the optimal strategic supplier portfolio in terms of traditional, performance-related objectives and sustainability targets.	Case study	<ul style="list-style-type: none"> A hybrid model of the analytic network process (ANP) and goal programming (GP) 	<ul style="list-style-type: none"> Financial stability Technological competency Supplier location Time horizon Strategic orientation Dual sourcing 	In the combined ANP-GP model, all requirements are satisfied. A balanced view on the three sustainability dimensions is provided as the deviations from the target values of all three dimensions are minimized.	Germany	Having been conducted in Germany, the findings of this study cannot be generalized to Kenya
Bai and Sakaris, (2014)	To introduce a methodology to identify sustainable supply chain key performance indicators (KPI) that can then be used for sustainability performance evaluation for suppliers.	Descriptive research	Descriptive statistics Correlation analysis	<ul style="list-style-type: none"> Cost Time Quality Flexibility Innovation 	The results show that KPI can be determined using neighborhood rough set, and DEA performance results provide insight into relative performance of suppliers.	USA	The study looked at sustainable performance evaluation of suppliers, which is different from supplier selection practices
Ann et al.	To investigate	Descriptive	<ul style="list-style-type: none"> Descriptive 	<ul style="list-style-type: none"> Waste reduction 	The results	Malaysia	The study was

(2006)	the impact of EMS certification on the performance of firms, including economic and environmental aspects and perceived customer satisfaction.	survey	<ul style="list-style-type: none"> statistics • Pearson product-moment correlation • Factor analysis • Regression analysis 	<ul style="list-style-type: none"> • Company reputation • Sales • Increase customer satisfaction • Competition • Lead time • Costs 	reveal that certification impacts positively on both the environmental and economic performance of enterprises.		limited to only one aspect of sustainable procurement policies, certification Having been conducted in Malaysia the findings of the study cannot be generalized to Kenya
Mahmood et al. (2014)	to explore and compare the asset management policies and practices of six Australian states to improve understanding of the policy context to best shape policy focus and guidelines.	• Comparative study	• Thematic Mapping technique	<ul style="list-style-type: none"> • Asset management • Projects • Costs • Service delivery • Planning • Design • Operation • Maintenance • Disposal • Performance • Agencies • Risk • Information • Community • Climate change 	New South Wales has covered most of the key concepts in relation to asset management; the remaining five states are yet to develop a comprehensive and integrated approach to asset management policies and guidelines.	Australia	The study main looked at the understanding of policy and not how the policy influence performance Having been conducted in Australia the findings of the study cannot be generalized to Kenya
Faulkner et al. (2005)	To draw conclusions about the relationship between environmental	• Longitudinal study	• Correlational analysis	<ul style="list-style-type: none"> • Leadership style • Decision making process • Environmental strategies • External factors 	Organizations are still primarily influenced by short-term rather than	• United Kingdom	Having been conducted in the United Kingdom, the findings of this study

	concerns and organizational strategy making				<ul style="list-style-type: none"> • Technology 	<p>long-term imperatives, and although recognition of opportunity offered by the environment is increasing, organizations are still liable to adopt a reactive position, increasingly so as the size of the organization decreases.</p>	cannot be generalized to Kenya. The study did not outline how procurement policies influence performance
Tiryakioğlu and Yülek, (2015)	A selective literature survey of academic research and policy experience on public procurement policies utilized to foster technological development	<ul style="list-style-type: none"> • Descriptive research design 	<ul style="list-style-type: none"> • Descriptive statistics • Correlational analysis 	<ul style="list-style-type: none"> • Framework conditions • Organizations and capabilities • Identification and specification of signaling needs • Incentivizing innovation solutions 	<ul style="list-style-type: none"> • Turkey 	<p>In the Turkish case, some policy texts have been prepared, revealing that some form of “development-based procurement” policy is considered. However, current experience shows that most of the practical policy concentrates</p>	The study was limited to public procurement policies utilized to foster technological development

Nijaki and Worrel, (2012)	To demonstrate how local entities, such as cities and counties, can use environmental y preferable purchasing plans as a tool in developing the local green economy	Descriptive research design	<ul style="list-style-type: none"> • Descriptive statistics 	<ul style="list-style-type: none"> • Efficiency • Maximum benefits • Cost effectiveness • Transparency • Equity • Economy • Environment 	on military offsets. It is found that procurement can be used as a viable tool in fostering both economic and environmental goals, and as a key policy and planning tool for sub-national governments in the pursuit of a green economy	<ul style="list-style-type: none"> • USA 	The study did not outline various procurement policies and how they influence performance. Different countries are governed by different procurement policies and hence the findings of this study cannot be generalized to Kenya
Flynn and Davis (2016)	To test the relationship between firms' experience of small- and medium-size enterprise (SME)-friendly policy and their participation and success in public procurement.	<ul style="list-style-type: none"> • Cross-sectional research design 	<ul style="list-style-type: none"> • Descriptive statistics • Multiple regression analysis • Step-wise regression analysis 	<ul style="list-style-type: none"> • Frequency of tendering • Success rate in public contract competitions • Commercial orientation towards the public sector 	SME-friendly policy is found to be significant in explaining success rates and commercial orientation towards the public sector marketplace. It is not significant in explaining frequency of	<ul style="list-style-type: none"> • Ireland 	The study looked at small- and medium-size enterprise (SME)-friendly policy which is different from public procurement policy

Vieira and Mergulhão (2015)	To assesses the effect of buyer-supplier collaboration on logistical performance by considering sustainable criteria	Descriptive survey design	<ul style="list-style-type: none"> • chi-square tests • correlation analysis • Descriptive statistics • factorial analysis • Regression analysis 	<ul style="list-style-type: none"> • Strategic • Tactical and Operational • Interpersonal 	tendering. Research The results disclose that elements of logistical collaboration (interpersonal, tactical and strategic) exert positive influence in logistical performance (reliability, transport and risk).	<ul style="list-style-type: none"> • Brazil • Consumer Packaged Goods (CPG) industry and Carriers 	The study was conducted in Consumer Packaged Goods (CPG) industry and Carriers which are mostly private institutions. The dependent variable was logistical performance which one aspect of organizational performance
Blome et al. (2014)	To analyze the deviation from an optimal profile of supply chain collaboration and its detrimental effect on sustainability performance as well as market performance.	<ul style="list-style-type: none"> • Descriptive survey 	<ul style="list-style-type: none"> • Descriptive statistics • Factor analysis • Advances structural equation modeling approach 	<ul style="list-style-type: none"> • Sustainable production • Supply side collaboration • Demand side collaboration • Sustainability performance • Market performance • Misalignment 	Alignment between supply chain initiatives does pay off. Furthermore, the results show that the effects of alignment on performance measures are mediated by the firm's internal sustainable production.	<ul style="list-style-type: none"> • European manufacturing firms 	The study was conducted in the private sector and hence the findings cannot be generalize to public institutions Having been conducted in Europe the findings of this study cannot be generalized to

Vereecke and Muylle (2006)	To empirically test the relationship between supply chain (SC) collaboration and performance improvement.	Descriptive statistics	<ul style="list-style-type: none"> • Pearson correlation • ANOVA • Factor analysis 	<ul style="list-style-type: none"> • Information exchange • Structural collaboration 	For information exchange, performance improvement in respect of cost, flexibility, quality, and procurement was supported, whereas for structural collaboration, only improvement in respect of flexibility and procurement was supported.	<ul style="list-style-type: none"> • 11 European countries. • Engineering/assembly industry 	Kenya The study was conducted in the assembly industry and hence its findings cannot be generalized to government ministries
Soosay and Hyland (2015)	To conduct a systematic review of the literature on supply chain collaboration. It explores the nature and extent of research undertaken to identify key themes emerging in the field and gaps that need to be addressed.	Literature Review	<ul style="list-style-type: none"> • Descriptive analysis 	<ul style="list-style-type: none"> • Information sharing • Decision synchronization • Incentive alignment • Integrated supply chain process • Collaborative performance system and communication • Goal congruence • Joint knowledge creation 	Key themes include the meaning of collaboration; considerations for supply chain collaboration theory; emerging areas in collaboration for sustainability, technology-enabled supply chains and	<ul style="list-style-type: none"> • Australia 	The study looked at supply chain collaboration and not sustainable supply chain collaboration. The study did not show how supply chain collaboration influence performance

Barrat, (2004)	Understanding the meaning of collaboration in supply chain	Critical Review of literature	of	<ul style="list-style-type: none"> • Descriptive analysis 	<ul style="list-style-type: none"> • Information exchange • Process alignment • Joint decision making • Intra-organizational support • Cross functional activities • Supply chain metrics • Corporate focus • Openness and communication 	<p>humanitarian supply chains; and the need for a more holistic approach, multi-tier perspectives and research into B2C collaborations.</p> <p>Collaboration elements such as culture trust information exchange and supply chain wide performance measure have been to a large extent ignored due to their complexity</p>	<ul style="list-style-type: none"> • USA 	<p>The study did not show the influence of supply chain collaboration on performance. The study was limited to USA which is developed country</p>
Bhatti (2016)	To employ a newly developed framework to examine the complex relationship between different components of	Study utilizes survey		<p>Sobel test and bootstrapping approach</p> <p>Descriptive statistics</p>	<p>Supplier Strategic Partnership (SSP)</p> <p>Customer Relationship (CR)</p> <p>Information Sharing (IS)</p>	<p>SCI has fully and partially mediated the relationship between supply chain management practices (SCMPs) and SCP.</p>	<p>Malaysian electronics sector.</p>	<p>The study did not look at supply chain collaboration practices. Having been conducted in Malaysia, the findings of this study</p>

	supply chain practices, supply chain integration (SCI) and supply chain performance (SCP)			Information Quality (IQ) Postponement (POS) Agreed Vision and Goals (VIGOL) Risk and Reward Sharing (RR)			cannot be generalized to Kenya The study was limited to the electronics sector, which is different from government ministries
Winter, & Knemeyer, (2013)	Exploring the integration of sustainability and supply chain management	Literature review	<ul style="list-style-type: none"> • Descriptive statistics • Classification matrix 	<ul style="list-style-type: none"> • Customer relationship management, • Supplier relationship management, • customer service management, • demand management, • order fulfillment, manufacturing • flow management, • product development and commercialization, and returns management. 	Both the emergence of a group of themes within an individual dimension, such as green logistics within the environmental dimension as well as a set of themes that are consistent across dimensions.	USA	The study was limited to USA which is developed country The study focused on supply chain integration which is one aspect of supply chain collaboration. The dependent variable was supply chain management, which is different from organizational performance
Soita, (2015)	To establish the factors affecting supply chain collaborations	<ul style="list-style-type: none"> • Descriptive research design 	<ul style="list-style-type: none"> • Descriptive statistics • Multiple Regression analysis 	<ul style="list-style-type: none"> • Legal framework • Quality of personnel • Compliance with policies 	The study found that there was a moderate level of	<ul style="list-style-type: none"> • Kenya • Government ministries 	The study only outlined factors affecting supply chain

	in the public sector in Kenya and how the government and its citizen stands to gain if the said factors were dealt with.		<ul style="list-style-type: none"> • ANOVA • Factor analysis 	<ul style="list-style-type: none"> • Information technology • Stakeholder involvement 	collaboration among the ministries and various stakeholders with the highest being subcontracting partners, followed by that of suppliers, then outsourcing partners and finally customers		collaborations , but did not show how supply chain collaborations practices include performance
Wieland & Wallenburg (2012)	Dealing with supply chain risks with a view of providing clarity by empirically testing the assumption that SCRM helps supply chains to cope with vulnerabilities both proactively by supporting robustness and reactively by supporting agility.	Descriptive survey design	Structural equation modeling. Descriptive statistics	Robustness (proactive)- Multiple sources of supply Inventory Make-and-buy Product design Logistical network design Agility (reactive) - Supplier/buyer communication Business continuity planning Visibility Assortment planning Make-to-order/postponement	It is found that SCRM is important for agility and robustness of a company. While agility has a strong positive effect only on the supply chain's customer value, but not directly on business performance, robustness has a strong positive effect on both performance dimensions.	Manufacturing companies in Germany	The study was limited to Germany which is developed country The study outlined ways of dealing with supply chain risks, but did not show the influence of risk management practices on improving performance The study looked at supply chain

Wong (2014)	Emphasizing the need of managing environmental and social issues for enhancing corporate sustainability.	Review of Literature	of Descriptive statistics	-Reduction of operating costs - Compliance with regulatory requirement -Increased stakeholder relations -Perceived environmental visibility	The management of non-financial risk enables decision-makers to devise strategies that can produce significant cost savings and opportunities.	Hong Kong Corporations	risk management, which is different from sustainable risk management The study was limited to environmental and social issues. The study was limited to Hong Kong
Roehrich et al. (2014)	explores how constraints posed by bounded rationality impact on firms' implementation of sustainable supply chain management	Descriptive research design	- Inductive methodology	-conflicting priorities; and capabilities; and resources; and contextual setting,	Reputational risk exposure is a central driver in a company's decision to implement SSCM practices	UK based companies	The study was limited to constraints posed by bounded rationality and hence did not look at sustainable risk management practices and how their influence performance
Li and Barnes (2008)	to identify proactive supply risk	Literature review	Case study analysis	<ul style="list-style-type: none"> • Quality approvals • Dual sourcing level 	Applying the risk management	Western based manufacturing companies	The study only identified supply risk

	management methods which can be used to reduce or remove risk sources during the supplier selection process			<ul style="list-style-type: none"> • Strategic partnership • Technical and quality training 	process into supplier selection was particularly important and effective for supply risk reduction when sourcing from emerging markets		management methods but did not show their influence on performance Having been conducted in the manufacturing sector, the findings of the study cannot be generalized to government ministries
Ritchie and Brindley, (2007)	to examine the constructs underpinning risk management and explores its application in the supply chain context through the development of a framework	<ul style="list-style-type: none"> • Descriptive Survey 	<ul style="list-style-type: none"> • Descriptive statistics 	<ul style="list-style-type: none"> • Risk sources and profile • Risk and performance drivers • Risk and performance consequence • Risk management responses • Risk and performance outcomes 	A new framework is presented that helps to integrate the dimensions of risk and performance in supply chains and provide a categorization of risk drivers.	<ul style="list-style-type: none"> • UK Construction sector 	The study was limited to United Kingdom The study was limited to the construction sector, which is different from government ministries
Tummala and Schoenherr, (2011)	To propose a comprehensive and coherent approach for managing risks in supply chains.	<ul style="list-style-type: none"> • Modelling 	<ul style="list-style-type: none"> • Descriptive statistics • Probability 	<ul style="list-style-type: none"> • Risk Identification • Risk Measurement • Risk assessment • Risk evaluation • Risk mitigation 	Supply chain risks can be managed more effectively when applying the Supply Chain Risk Management	<ul style="list-style-type: none"> • USA 	The study only gave a comprehensive and coherent approach for managing risks in supply chains, but did

Pakdil and Leonard, (2015)	The effect of organizational culture on implementing and sustaining lean processes.	• Literature Review	• Critical analysis of literature	• Group culture • Development culture • Hierarchical • Rational culture	and contingency plan • Risk control and monitoring	Process (SCRMP). The structured approach can be divided into the phases of risk identification, risk measurement and risk assessment; risk evaluation, and risk mitigation and contingency plans; and risk control and monitoring via data management systems.	• USA	not show how these risks influence performance The study was conducted in USA, which has a different regulatory framework from Kenya In this study organizational culture was the independent variable The study was conducted in USA

					sustainability.		
Bititci et al. (2006)	To model the dynamic relationship between performance measurement, management styles and organizational culture,	<ul style="list-style-type: none"> • Literature review 	<ul style="list-style-type: none"> • Case study analysis 	<ul style="list-style-type: none"> • Role culture, • power culture, • achievement culture and • Support culture. 	Organizational culture and management style seem to be interdependent throughout the lifecycle of the performance measurement system	<ul style="list-style-type: none"> • UK 	The study looked at how organizational culture influence the relationship between performance measurement, management styles The study was limited to United Kingdom
Prajogo and McDermott (2011)	To examine the relationship between the four cultural dimensions of the competing values framework (CVF)	<ul style="list-style-type: none"> • Descriptive survey design 	<ul style="list-style-type: none"> • Structural equation modeling • Correlation coefficient • Descriptive statistics • Harmann's single factor test • Factor analysis 	<ul style="list-style-type: none"> • Group, • Developmental • Hierarchical, and • Rational cultures 	Developmental culture was found to be the strongest predictor among the four cultural dimensions, as it shows relationships with three of the performance measures: product quality, product innovation, and process innovation	<ul style="list-style-type: none"> • Australian firm 	The study was limited to Australia The dependent variable was competing values framework (CVF), which is different from performance The study was conducted in private firms, which are governed by different legal frameworks from government ministries
Puni and Bosco (2016)	Examining the effect of leadership style	<ul style="list-style-type: none"> • Cross-sectional design 	<ul style="list-style-type: none"> • Multiple Regression Analysis 	<ul style="list-style-type: none"> • Innovation • Competition • Bureaucratic 	All corporate culture dimensions	<ul style="list-style-type: none"> • Government Ministries in Accra Ghana 	Corporate culture was treated as the dependent

	and corporate culture on perceived organizational performance.		• Correlation Analysis		(innovative, bureaucratic, and competitive) had significant positive effect on performance		variable in this study
Hilal et al. (2009)	focus on the acquisition of a Brazilian state owned energy distribution company by a Spanish conglomerate during the privatization process and verify if the performance indicators implemented were compatible with the organizational culture (OC) dimensions	• Mixed methods research	• Descriptive statistics • Factor analysis • Pearson product-moment correlation	• Values • Practices • Heroes	Research results indicate the existence of substantial OC differences, as perceived by managers and by the bulk of employees, as shown by the existence of two OC clusters	Brazilian state owned distribution company	The dependent variable in this study was organizational culture. Having been conducted in Brazil, The findings cannot be generalized to Kenya
Murphy et al. (2013)	distinct aspects of firm culture, delineate its effects on performance outcomes, and to examine culture intensity on	• Descriptive Survey	• Structural equation modeling • Descriptive analysis • Correlation coefficient • Hierarchical regression	• Cooperation • Coordination • Unit performance	culture relates positively to cooperation, coordination, and performance and intensity influences cooperation	USA	The study did not show how organizational culture influences the relationship between sustainable supply chain management

	theoretic grounds		analysis		and coordination directly and does not moderate culture's relations with those outcomes		practices and performance The study was limited to USA, which is a developed country
Cadden et al. (2013)	Investigating the extent to which organizational cultural fit between a buyer and supply chain participants influences performance.	<ul style="list-style-type: none"> • Mixed methods research design 	<ul style="list-style-type: none"> • Descriptive statistics • ANOVA 	<ul style="list-style-type: none"> • Result • Employee • Loose • Norm • Open • Market 	Organizations in the high-performing supply chain had significantly different cultural profiles, reporting significant statistical differences across all six cultural dimensions. Organizations in the low-performing supply chain had almost identical profiles across all six cultural dimensions with significantly lower mean scores across	<ul style="list-style-type: none"> • Fast Moving Consumer Goods Sector in UK 	Organizational culture was treated as the independent variable. The study was limited to Fast Moving Consumer Goods Sector, which is government by different legal frameworks compared to government ministries.

Roh al.(2008)	et Linking organizational culture and SCS using competing values and an uncertainty framework.	<ul style="list-style-type: none"> • Literature review 	<ul style="list-style-type: none"> • Critical analysis of literature 	<ul style="list-style-type: none"> • Hierarchical • Rational • Group • Development 	<p>each dimension.</p> <p>The findings presents diverse requirements for effective design of supply chain in that for each pattern of organizational culture, corresponding SCS is identified: efficient for hierarchical, risk-hedging for group, responsive for rational, and agile for developmental culture</p>	<ul style="list-style-type: none"> • USA 	<p>The study was limited to USA. Organizational culture was the independent variable in this study</p>
Chomchaiya Esichaikul and (2016)	to develop a consolidated framework for government e-procurement (e-GP) performance measurement	<ul style="list-style-type: none"> • Mixed-methods approach 	<ul style="list-style-type: none"> • Factor analysis • Thematic analysis • Descriptive Statistics 	<ul style="list-style-type: none"> • Reliability • Agility • Responsiveness • Cost • Transparency • Efficiency • Effectiveness 	<p>Eight measures and 44 corresponding metrics were consolidated, and 21 significantly distinct performance metrics were identified from stakeholders'</p>	<ul style="list-style-type: none"> • Thai government's e-GP system 	<p>The study was limited to government e-procurement (e-GP) performance measurement, which is only one aspect of organizational performance</p>

Ntayi et al. (2013)	Examine the prevalence and relationships between constructs of mindfulness, task autonomy, inter-functional coordination, teamwork, contract implementation and monitoring; and attempt to use them to predict contract performance.	<ul style="list-style-type: none"> Analytical research design 	<ul style="list-style-type: none"> Descriptive Statistics Correlation analysis 	<ul style="list-style-type: none"> Competence of procurement staff Inter-functional coordination Teamwork Task autonomy Contract implementation Contract monitoring 	<p>perceptions. As expected, financial measures were most important to financial officers, while contract management was most important to service support staff.</p> <p>The study findings reveal that deontology, mindfulness procurement task performance, competence of the procurement staff, inter-functional coordination and teamwork, coordination, contract implementation and monitoring for contract implementation and positively predict</p>	<ul style="list-style-type: none"> Government ministries in COMESA member states 	The study looked at contract performance, which is different from organizational performance
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Tumuhairwe and Ahimbisibwe (2016)	To investigate the relationship between procurement records compliance, effective risk management and records management performance in Ugandan PDEs.	<ul style="list-style-type: none"> • Cross sectional survey 	<ul style="list-style-type: none"> • Descriptive statistics • ANOVA • Correlation analysis • regression analysis 	<ul style="list-style-type: none"> • procurement records compliance, • effective risk management and • records management performance 	<p>contract performance. Findings also reveal that procurement records compliance and effective risk management are significant predictors of record management performance. The performance measures utilized by organizations to a great extent were in the areas of cost efficiency and quality measures and those utilized to least extent were for learning and growth measures and to satisfy legislative requirements and manage programs.</p>	<ul style="list-style-type: none"> • Ugandan, Public Procurement and Disposing Entities (PPDE's) 	The study looked at records management performance, which is only one aspect of organizational performance
Adams et al. (2014)	To identify current performance measurement practice within state, territory and federal government departments in Australia with a particular emphasis on the importance of sustainability performance measures	<ul style="list-style-type: none"> • Descriptive survey design 	<ul style="list-style-type: none"> • Descriptive statistics • Exploratory factor analysis • Regression analysis 	<ul style="list-style-type: none"> • Cost efficiency • Quality • Learning and growth • Legislative requirements • Environmental responsibility • Employee diversity 	<p>The performance measures utilized by organizations to a great extent were in the areas of cost efficiency and quality measures and those utilized to least extent were for learning and growth measures and to satisfy legislative requirements and manage programs.</p>	<ul style="list-style-type: none"> • Government departments in Australia 	The study was conducted in Australia , which has different legal framework and political environment from Kenya.

Abdallah and Alnamri,(2015)

to investigate the use of financial and non-financial performance measurement practices, including the use of the balanced scorecard (BSC) and the impact of the cultural values on the use of performance measurement systems (PMSs),

- Descriptive survey design

- Descriptive statistics
- Correlation analysis

- Total sales
- Rate of achieved budget
- Rate of return on investment
- Number of customer complaints
- On time delivery
- Customer satisfaction
- Measure of defective units
- Employee satisfaction

Financial measures are more widely used by most of the companies, the use of the non-financial measures was at a very low rate compared with the use of financial measures.

in multinational companies (MNCs) operating in the Middle East with a special attention to the Saudi Arabian subsidiaries.

The study was conducted in private multinational companies, which are different from government ministries

Appendix III: Operationalization of study variables

Variables	Indicators	Measure	Source	
Independent variable	Sustainable supplier selection practices	<ul style="list-style-type: none"> • Supplier evaluation 	<ul style="list-style-type: none"> • Technical capability • Technical expertise • Financial capability • After sales service • Past performance 	<ul style="list-style-type: none"> • Micheli (2008)
		<ul style="list-style-type: none"> • Supplier certification 	<ul style="list-style-type: none"> • Environmental certification ISO 14001 • Life cycle certification ISO 14044: 2006 • Quality certification ISO 19001 • Knowledge on ISO 26000:2010 on social responsibility 	<ul style="list-style-type: none"> • Girubha et al. (2016)
		<ul style="list-style-type: none"> • Supplier comparison 	<ul style="list-style-type: none"> • Ranking on product quality • Ranking on service quality • Ranking on lead time • Ranking on reputation • Ranking on responsiveness • Ranking on price. 	<ul style="list-style-type: none"> • Micheli (2008)
		<ul style="list-style-type: none"> • Disposal policy 	<ul style="list-style-type: none"> • Existence of disposal policy • Identification and reporting of items for Disposal • Preparation of a disposal plan • Assessment of items earmarked for disposal • Valuation of assets earmarked for Disposal • Disposal report 	<ul style="list-style-type: none"> • Mahmood et al. (2014)
	Sustainable procurement	<ul style="list-style-type: none"> • Asset management policy 	<ul style="list-style-type: none"> • Existence of Asset management policy • Maintenance of fixed asset register 	<ul style="list-style-type: none"> • Mahmood et al. (2014)

policy	<ul style="list-style-type: none"> • Insurance of assets and maintenance • Management of loss and stolen items • Updating of asset register 	<ul style="list-style-type: none"> • Mahmood et al. (2014) 	
<ul style="list-style-type: none"> • Risk management policy 	<ul style="list-style-type: none"> • Existence of risk management policy • Identification of procurement risk • Risk management register • Existence of risk champion in procurement • Updating of procurement risk register • Establishment of risk mitigation factors 	<ul style="list-style-type: none"> • Mahmood et al. (2014) 	
<ul style="list-style-type: none"> • Information sharing 	<ul style="list-style-type: none"> • Sharing of proprietary information • Sharing business knowledge of core business processes • Providing advance information on changing need • Providing full information about issues that affect business • Exchange information that help establish business planning • Keeping each other informed about the changes that may affect the other. 	<ul style="list-style-type: none"> • Bhatti, (2016) 	
Sustainable supplier collaboration	<ul style="list-style-type: none"> • Supply chain integration 	<ul style="list-style-type: none"> • Frequent contact • Compatible communication and information system • Participate in suppliers market effort 	<ul style="list-style-type: none"> • Soosay and Hyland (2015)
<ul style="list-style-type: none"> • Supplier strategic partnership 	<ul style="list-style-type: none"> • Solving problems jointly with suppliers • Quality is considered in supplier selection • Helping suppliers to improve their product quality • Suppliers included in continuous improvement programs • Suppliers included in planning and goal setting activities 	<ul style="list-style-type: none"> • Bhatti, (2016) 	

			<ul style="list-style-type: none"> Suppliers involved in key product development processes 	
		<ul style="list-style-type: none"> Risk Identification 	<ul style="list-style-type: none"> Identification of potential risks Reviewing organization records Creation of flow chart for the organization Professional expertise On- site investigations 	<ul style="list-style-type: none"> Tummala and Schoenherr, (2011)
	Sustainable risk management	<ul style="list-style-type: none"> Risk assessment 	<ul style="list-style-type: none"> Risk audit Regular check ups Risk analysis Joint workshops Training sessions 	<ul style="list-style-type: none"> Tummala and Schoenherr, (2011)
		<ul style="list-style-type: none"> Dual sourcing 	<ul style="list-style-type: none"> List of registered suppliers Supplier rotation Supplier appraisal Implementation of supplier appraisal reports 	<ul style="list-style-type: none"> Li and Barnes, (2008)
	Performance of government ministries			
Dependent variable		<ul style="list-style-type: none"> Cost efficiency 	<ul style="list-style-type: none"> Effect on product cost 	<ul style="list-style-type: none"> Adams et al. (2014)
	Financial indicators	<ul style="list-style-type: none"> Budgetary Compliance 	<ul style="list-style-type: none"> Budget overruns 	<ul style="list-style-type: none"> Abdallah and Alnamri, (2015)
		<ul style="list-style-type: none"> Product quality 	<ul style="list-style-type: none"> Level of supplier defect free delivery % of product rejection Durability of suppliers product 	<ul style="list-style-type: none"> Adams et al. (2014)

Moderating variable	Non-financial indicators	<ul style="list-style-type: none"> • Service delivery 	<ul style="list-style-type: none"> • Timely service delivery • % of products delivered on time • % of products that meeting specifications 	<ul style="list-style-type: none"> • Adams et al. (2014)
		<ul style="list-style-type: none"> • Compliance with statutory obligations • Hierarchical culture 	<ul style="list-style-type: none"> • Timely submission of statutory reports • Adherence to laid down procedures • Centralization • Order • Regulation • Control • Timeliness 	<ul style="list-style-type: none"> • Adams et al. (2014) • Prajogo and McDermott (2011)
	Organizational culture	<ul style="list-style-type: none"> • Role culture 	<ul style="list-style-type: none"> • Contractual obligation • Systems loyalty • Document management • Information management • Authorization 	<ul style="list-style-type: none"> • Bititci et al. (2006)
		<ul style="list-style-type: none"> • Achievement culture 	<ul style="list-style-type: none"> • Recognition for contributions • Pursue goals • Pursue targets • Employee participation • Encourage achievement 	<ul style="list-style-type: none"> • Bititci et al. (2006)

Appendix IV: List of Government Ministries

The Ministries that will be considered in the population are;

1. Ministry of Interior and Coordination of National Government
2. Ministry of Devolution and planning
3. Ministry of Finance and National Treasury
4. Ministry of Defense
5. Ministry of Foreign Affairs & International Trade
6. Ministry of Education
7. Ministry of Health
8. Ministry of Transport and Infrastructure
9. Ministry of Information , Communication and Technology
10. Ministry of Environment and Natural Resources
11. Ministry of Land Housing and Urban Development
12. Ministry of Sports Culture and Arts
13. Ministry of Labour & East African Affairs
14. Ministry of Energy and Petroleum
15. Ministry of Agriculture, Livestock and Fisheries
16. Ministry of Industrialization and Enterprise development
17. Ministry of Public Service Youth and Gender Affairs
18. Ministry of Tourism
19. Ministry of Mining
20. Ministry of Water and Irrigation.