THE IMPACT OF RISK MANAGEMENT IN MITIGATION AGAINST SUPPLY CHAIN BREAKDOWNS IN PUBLIC SECTOR PROCUREMENT. BINDURA UNIVERSITY OF SCIENCE EDUCATION

RESEARCH PROJECT

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A DISSERTATION SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE BACHELOR OF COMMERCE HONORS DEGREE IN PURCHASING AND SUPPLY OF BINDURA UNIVERSITY OF SCIENCE EDUCATION. FACULTY OF COMMERCE

APRIL 2019
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Chiwaridzo

Bindura
DEDICATION
I dedicate this work to my Lord and Saviour Jesus Christ, who strengthens me always and keeps me going, and also to my lovely parents, friends and colleagues who are always there expressing their unwavering love and support.
ABSTRACT
The purpose of this is to assess the impact of risk management in mitigation against supply chain breakdowns in public sector procurement, at Bindura University of Science Education during the period of 2018 to 2019. Increasing in number of the natural disasters and having global supply chains to a larger extent are the factors which have increased the number of risks that are affecting organization’s supply chains negatively. This fact has made it even more important to focus on risk management in supply chain. This study used a sample of 15 employees drawn from the whole population of Bindura University of Science Education’s Workers. Primary Data was acquired by the way of questionnaires and interviews as the research instruments and some of the risks that were identified were delays and supply disruptions by suppliers, delays, inventory and capacity lacks of Bindura University of Science Education. Data was thereafter presented in form of pie charts, tables and graphs. Data was analysed using a blend of qualitative and quantitative data analysing methods. The study found that risk management is very important in the supply chains of public sector organizations because of the interconnectedness of the firms in the networks such that risks are passed onto another firm if it has been occurred. Some of the actions recommended to perform are concluded to be, adopt some of the mitigation strategies that are effective enough to avoid supply chain breakdowns and implement some of the policies and frameworks that are directly linked with risk management and avoiding supply chains of Bindura University of Science Education. The structure of this research study has acted as a basis for the recommended way of continuing the risk management work at Bindura University. The researcher has therefore identified the importance of keeping the risk management process dynamic.

Keywords: Risk management, Supply Chain Breakdown, Disruptions, Impact
ACKNOWLEDGEMENTS

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My profound gratitude is also extended to Faculty of Commerce lecturers at Bindura University of Science Education, especially Dr. B Mushanyuri, Mr Ruzive, Dr. F Chari and Mr. L Muchabaiwa. They equipped me with the necessary skills which made this research a sounding success.

May the Almighty God bless you all!!!!
TABLE OF CONTENTS

APPROVAL FORM .................................................................................................................. i
RELEASE FORM ..................................................................................................................... ii
DEDICATION ......................................................................................................................... iii
ABSTRACT ............................................................................................................................. iv
ACKNOWLEDGEMENTS ...................................................................................................... v
TABLE OF CONTENTS ......................................................................................................... vi
List of abbreviations .................................................................................................................. x
LIST OF TABLES ................................................................................................................... xi
LIST OF FIGURES ................................................................................................................. xii
LIST OF APPENDICES ........................................................................................................ xiii
CHAPTER 1 .............................................................................................................................. 1
INTRODUCTION ................................................................................................................... 1
  1.0 Introduction ....................................................................................................................... 1
  1.1 Background of the Study .................................................................................................. 1
  1.2 Statement of the problem ................................................................................................. 3
  1.3 Objectives of the study .................................................................................................... 4
  1.4 Research Questions ........................................................................................................ 4
  1.5 Significance of the study ................................................................................................ 4
    1.5.1 To the Researcher ...........................................................................................................
      4
    1.5.2 To Bindura University of Science Education. .............................................................. 4
    1.5.3 To Scholars .................................................................................................................... 5
    1.5.4 To Policy makers in the Public Sector. ........................................................................ 5
  1.6 Assumptions of the study ............................................................................................... 5
  1.7 Delimitations of the study .............................................................................................. 5
  1.8 Limitations ....................................................................................................................... 6
  1.9 Definition of terms ......................................................................................................... 6
  1.10 Chapter summary ......................................................................................................... 7
CHAPTER II ............................................................................................................................. 8
LITERATURE REVIEW ....................................................................................................... 8
  2.0 Introduction .................................................................................................................... 8
  2.1 Conceptual Framework ................................................................................................. 8
3.5.2 Reliability ........................................................................................................................................................................ 28
3.5.3 Ethical Considerations .......................................................................................................................................................... 28
3.6 Data Presentation and Analysis ............................................................................................................................................... 29
3.7 Chapter Summary ..................................................................................................................................................................... 29
CHAPTER 4 .................................................................................................................................................................................. 30
DATA PRESENTATION, ANALYSIS AND DISCUSSION ............................................................................................................. 30
4.0 Introduction .................................................................................................................................................................................. 30
4.1 Response Rate from Questionnaires ........................................................................................................................................ 30
4.2 Demographic Characteristics of respondents ......................................................................................................................... 31
Gender of respondents ........................................................................................................................................................................ 31
Age of the respondents ........................................................................................................................................................................ 32
Working Experience or Length of employment ............................................................................................................................... 32
Levels of Education of the Respondents commonly affecting the supply chain ......................................................................... 33
4.3 Determining the nature and drivers of Risks. ............................................................................................................................... 34
Understanding of the Risk Management Concept ......................................................................................................................... 34
Awareness of risks involved in supply chain of BUSE .................................................................................................................... 35
The Risk Drivers influencing the Supply Chain breakdown of BUSE. ................................................................................................. 35
4.4 Ascertaining the extent to which risks are being managed at BUSE ......................................................................................... 36
The extent to which BUSE Procurement Department detects the risks .......................................................................................... 36
Adequacy of the Policies and Legislative Framework to Manage Risks ...................................................................................... 37
The extent to which Risks are managed at BUSE ............................................................................................................................ 38
4.5 Risk Mitigation strategies on supply chain breakdown ............................................................................................................... 39
Risk Mitigation tools used to avoid supply chain breakdown ..................................................................................................... 39
Effectiveness of the Mitigation Strategies ........................................................................................................................................ 40
4.6 Interviews Results .......................................................................................................................................................................... 41
4.6.1 What problems have you faced due to Supply Chain Breakdowns? ..................................................................................... 41
4.6.2 Which of the Risk Mitigation Strategies can help and how then can be implemented? .......................................................... 42
4.6.3 What are the challenges faced in practicing effective risk management in public procurement? ................................................................. 43
4.7 Chapter Summary ......................................................................................................................................................................... 43
CHAPTER V ..................................................................................................................................................................................... 45
SUMMARY, CONCLUSION AND RECOMMENDATIONS .............................................................................................................. 45
5.0 Introduction ................................................................................................................................................................................... 45
5.1 Summary ...................................................................................................................................................................................... 45
5.1.1 To determine the nature and drivers of risks commonly affecting the supply chain of Bindura University ................................................................................................................. 45

5.1.2 To ascertain the extent to which risks are managed by Bindura University of Science education .................................................................................................................. 46

5.1.3 To evaluate the effects of Risk mitigation strategies on lessening Supply Chain Breakdown at Bindura University. .................................................................................. 46

5.2 Conclusions ...................................................................................................................... 46

5.2.1 To determine the nature and drivers of risks commonly affecting the supply chain of Bindura University ............................................................................................................. 46

5.2.2 To ascertain the extent to which risks are managed by Bindura University of Science education .................................................................................................................. 47

5.2.3 To evaluate the effects of Risk mitigation strategies on lessening Supply Chain Breakdown at Bindura University. .................................................................................. 47

5.3 Recommendations of the study ...................................................................................... 48

5.3.1 To determine the nature and drivers of risks commonly affecting the supply chain of Bindura University ............................................................................................................. 48

5.3.2 To ascertain the extent to which risks are managed by Bindura University of Science education .................................................................................................................. 48

5.3.3 To evaluate the effects of Risk mitigation strategies on lessening Supply Chain Breakdown at Bindura University. .................................................................................. 49

5.4 Recommendation for further study ............................................................................... 49

5.5 Summary .......................................................................................................................... 49

REFERENCES ...................................................................................................................... 50
List of abbreviations

SCRM : Supply Chain Risk Management

BUSE : Bindura University of Science Education

PPDPA : Public Procurement and Disposal of Public Assets Act Chapter (22:23)

PPDPA GR: Public Procurement and Disposal of Public Assets General Regulations.
LIST OF TABLES

Table 4:1: Response from Questionnaires ................................................................. 30

Table 4.1.2 Response Rate from Interviews .............................................................. 31
## LIST OF FIGURES

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1</td>
<td>Conceptual framework for Risk Management</td>
<td>9</td>
</tr>
<tr>
<td>2.3</td>
<td>Kraljic Matrix</td>
<td>10</td>
</tr>
<tr>
<td>2.4</td>
<td>Risk Management Process</td>
<td>15</td>
</tr>
<tr>
<td>4.2</td>
<td>Gender of the respondents</td>
<td>31</td>
</tr>
<tr>
<td>4.3</td>
<td>Age of respondents</td>
<td>32</td>
</tr>
<tr>
<td>4.4</td>
<td>working experience</td>
<td>33</td>
</tr>
<tr>
<td>4.5</td>
<td>Level of education of the respondents</td>
<td>33</td>
</tr>
<tr>
<td>4.6</td>
<td>risk understanding</td>
<td>34</td>
</tr>
<tr>
<td>4.7</td>
<td>Awareness of risks</td>
<td>35</td>
</tr>
<tr>
<td>4.8</td>
<td>Risk Drivers</td>
<td>35</td>
</tr>
<tr>
<td>4.9</td>
<td>Risk detection level</td>
<td>36</td>
</tr>
<tr>
<td>4.10</td>
<td>Adequacy of the Policies and Legislative Framework</td>
<td>37</td>
</tr>
<tr>
<td>4.11</td>
<td>Risk Management</td>
<td>38</td>
</tr>
<tr>
<td>4.12</td>
<td>Risk Management tools</td>
<td>39</td>
</tr>
<tr>
<td>4.13</td>
<td>Effectiveness of mitigation strategies</td>
<td>40</td>
</tr>
</tbody>
</table>
LIST OF APPENDICES

APPENDICIES ............................................................................................................. 52
APPENDIX I ............................................................................................................... 52
APPENDIX II ............................................................................................................. 53
APPENDIX III ........................................................................................................... 58
CHAPTER 1

INTRODUCTION

1.0 Introduction
This research seeks to identify and assess the impact that risk management have in mitigation against supply chain breakdowns in Public Institutions. According to (Anin, et al., 2015), because of dynamism and uncertainties in the business environment today, risks emanates which affects the business operations, therefore risk management is of paramount importance to be considered in the Organisation’s functions. This chapter therefore highlight on the background of the study and statement of the problem. To effectively complete the study, the researcher formulated objectives and selected preferable methodology. Other contents in this chapter includes limitations of the study, research assumptions, significance of the study and definition of terms.

1.1 Background of the Study
Supply chains have expanded and increased over the last decade, because of the reasons to increase throughput, fulfil demands in the evolving markets, lower costs and hence gain a competitive advantage. The expansion of these supply chains are associated with so much complications which hinders visibility and therefore reduces the organization’s control over the development. Cases of disruptions such as the one faced by Telefon A.B L.M. Ericson after its supplier, Royal Philips Electronics’ plant had been struck by a lightning, (Chopra & Sodhi, 2004) can show that a risk that occurs to one member of the supply chain, can also affect greatly other members when it is not properly managed. There is a need therefore for supply chain to maintain the expected yields and results of the system in the situations of risks and in order to achieve that there is need to identify potential risks and evaluate their impacts, and design risk mitigation policies to locate and relocate resources to deal with risk events.

CIPS (2010) alluded that risks can be complex and are inevitable, therefore there is need for Risk Management in order to help Supply chains sustain. Good risk management is proportional to the likelihood and expected impact of each risk. Another incidents like the Arab
Spring Protest, the Sendai earthquake and the Thailand floods in 2011 can bear witnesses on how such disruptions can severely affect even the most stable supply chains.

Like any other supply chains, Public Sector Procurement supply chains can be affected by a number of different factors resulting in vulnerabilities and potential risks. Public Sector procurement is referred to as the process by which public sector organisations, that is, ministries, parastatals and local authorities, acquire goods and services, (Roodhooft and Abbeele 2009). The importance of public procurement cannot be overstressed bearing in mind the huge financial commitment that is usually involved in the procurement process. Usually, the governments uses mainly public funds among other sources of revenue to finance national projects, with public procurement expending a significant proportion of that government expenditure. Mahmood (2010) suggests that generally, public procurement constitutes 18.42% of the world’s gross domestic product. Chizu (2013), further alludes that procurement in most economies is responsible for spending up to 60%–80% of the national budget. A look at these statistics would suggest that, public procurement is an important function that requires close attention as procurement officials in public entities are governed by regulations, policies and procedures (Odhiambo & Kamau 2003).

Bindura University’s Procurement as a public institution is governed by the Public Procurement and Disposal of Public Assets Act (22:23) of 2017 and a support of Public Procurement and Disposal of Public Assets (22:23) General Regulations Statutory Instrument 5 of 2018. Essentially, the procurement act regulates all public entities with regards to procurement activities, where it look at both central and local government procurement, through a regulatory board being Procurement Regulatory Authority of Zimbabwe (PRAZ). The Procurement Act (22:23) clears out of the processes and procedures of sourcing, tendering, negotiation, procurement meetings. By the end of 2017, Bindura University’s procurement noticed that 60% of the its Orders of purchased goods for the year were not delivered and 40% of services not executed and from the expedition information is has been noted that many suppliers faced high acquisition costs resulting from fluctuating exchange rates which, hence forcing them to increase prices thereby failing to supply at the Order prices. During the first six months of 2018 (January-June), about 65% of the purchases were not delivered. These risks were caused by political instability whereby prices were not stable in Zimbabwe, hence delaying or even disrupting the smooth functioning of the University’s supply chains.
However, because of being governed by PRAZ, Bindura University’s procurement is mandated to operate within a framework of the Act in which Procurement profession is not innovative enough to react to the Risks when they arise. Bindura University’s choice of suppliers are those registered with PRAZ and listed in the Zimbabwean Government Gazette. This opens a door for many risk to be experienced since being registered by the authorities and capability or performances issues are not related. In addition, the systems employed in the Public sector are technologically outdated and too centralized to the point that many delays occur in the procurement process, which is a hazard to the supply chains of the firm.

While effective and efficient public procurement is a prerequisite for economic growth and effective public investment, poor management of risks can lead to closure of the public organisations, thereby resulting in poor service delivery, (Dzuke and Naude 2015). A closer look at these irregularities, can point out that the way public sector procurement is being done has created some loopholes which is why delays, disruptions and project delays have been on the rise. A look at this has therefore prompted the researcher to look at just how far Risk Management can go or has gone in mitigating supply chain breakdowns in the public sector procurement.

1.2 Statement of the problem

Despite having the Public Procurement and Disposal of Public Assets Act Chapter (22:23) supported with the Public Procurement and Disposal of Public Assets General Regulations Statutory Instrument 5 of 2018 and other supporting regulations pertinent to public sector procurement, Zimbabwe public sector procurement has been ailing and never fallen short of problems. These procurement problems have translated into hindrances of development goals, wastages of public funds and hence poor service delivery in the public sector. The public procurement problems specifically at Bindura University have revealed that there have been risks associated with the supply chains which is highly are leading to the breakdowns of these supply chains. Such risks have existed in the form of capacity, inventory, disruptions, delays, inaccurate forecasts and procurement associated risks. Faced with such risks, questions have been asked as to whether Bindura University is effective in managing these risk so as to reduce supply chain breakdowns.
1.3 Objectives of the study
The objectives of the research are to

1. To determine the nature and drivers of risks commonly affecting the supply chain of Bindura University.
2. To ascertain the extent to which risks are managed by Bindura University of Science education
3. To evaluate the effects of Risk mitigation strategies on lessening Supply Chain Breakdown at Bindura University.

1.4 Research Questions
1. What are the Risks and what are the drivers of these risks affecting the supply chain of Bindura University of Science.
2. How are the risks managed in mitigating Supply chain breakdown at Bindura University of Science Education.
3. What is the effects of Risk management and mitigation strategies in lessening supply chain breakdown at Bindura University of Science Education.

1.5 Significance of the study
This research will be of paramount importance to the researcher, Bindura University of Science Education (Scholars), and Policy Makers in public sector.

1.5.1 To the Researcher
The researcher will be in partial fulfilment of the Bachelor of Commerce (Honours) in Purchasing and Supply. The Research will improve the researcher’s skills and knowledge on managing risks in lessening Supply Chain Breakdown.

1.5.2 To Bindura University of Science Education.
The university from which the researcher comes from also will stands to benefit from this research as it is going to be archived at the university library for the benefit of the future
generation. This research project will be used as basis for literature review for anyone who wish to carry out further research or any other research related to the subject in question.

1.5.3 To Scholars

The research will proffer as literature review and open up the avenues for further study for some other students and scholars. This means that those who wish to research the area can have a point of reference to research from.

1.5.4 To Policy makers in the Public Sector.

The research is meant to enlighten the policymakers in the public sector on how well risks can be managed in mitigating or lessening supply chain breakdowns. The findings may be used for gap analysis, where the policymakers can assess the current way risk management is carried out and what should be done so that recommendations can be put in place to improve the system towards efficiency.

1.6 Assumptions of the study

i. In carrying out the study, the respondent to the questionnaire will be able to read and write, that is being literate.

ii. The respondents to the questionnaire will be able to produce genuine answers relevant to the research under study.

iii. The researcher assumes that respondents will be aware of risk management and could apply personnel experience in the survey, therefore they would be able to answer meaningfully and express their behavior by answering questionnaires honestly.

iv. The research environment remains constant.

1.7 Delimitations of the study

The research study will be mainly concentrated to Bindura University of Science Education located in Bindura Town and covered the period from 2017-2018.
1.8 Limitations
i. This research was constrained by time constraints since the research was self-sponsored.

ii. Some of the information is regarded as confidential, the researcher was not in a position to access to that information.

iii. The management give cosmetic results in order to protect corporate image of the organisation.

iv. Respondents like the senior management were too busy to respond to the research questions.

1.9 Definition of terms
PROCUREMENT-It is that function responsible for obtaining by purchase, lease or other legal means equipment, materials, works, supplies and service required by an entity for use to satisfy wants (Lysons and Farrington 2012).

PUBLIC PROCUREMENT- an acquisition, whether under formal contract or otherwise, of works, supplies and services by public bodies using publicly sourced finances. It involves the purchasing, hiring or obtaining by any contractual means of publicly needed goods, construction works and services by the public sector. It also includes situations in which public funds are mobilized to procure works, goods and services even if the government does not get directly involved (Uromi, 2014).

RISK-the potential of loss (an undesirable outcome, however not necessarily so) resulting from a given action, activity and/or inaction, (Crane, et al., 2013)

SUPPLY CHAIN RISK MANAGEMENT- is the identification and management of risks within the supply chain through a coordinated approach among supply chain members to reduce supply chain vulnerability and to identify supply chain opportunities, (Ritchie & Zsidisin, 2008)

SUPPLY CHAIN MANAGEMENT- the delivery of enhanced customer and economic value through synchronised management of the flow of the physical and associated information from sourcing to consumption, (Lambert, et al., 1998)

SUPPLY CHAIN- a system of organisations, people, activities, information and resources involved in moving a product or service from supplier to customer, (Lambert, et al., 1998)
1.10 Chapter summary
The chapter laid the foundation for the whole research as it introduced the research topic, giving the background of the study to give the reader a brief knowledge of the area to be studied, statement of the problem, objectives of the study, research questions and significance of the study. The chapter also cited the limitation to carrying out effective research and the delimitations of the study as well as the definition of the key terms used in the research paper. The following chapter is the literature review which focuses on the theoretical and conceptual appreciation of relevant literature in risk management and supply chain breakdown at Bindura University of Science Education.
CHAPTER II

LITERATURE REVIEW

2.0 Introduction
Literature review is the chapter that addresses the research problem using a critical analysis of literature which was authored by other scholars. Risk management has become a common function within the private and public organizations. Due to the widespread of risk management practices, it has become an important subject in literature, benefits as well as challenges have also been identified by researchers. The main objective of the literature review is to underline and bring to light the extent to which the existing theory does compliment the subject under review as well as highlighting conflicting views amongst various authors. The literature section looked at the available literature and sources for the fundamental principles of risk management and its impact in mitigating against supply chain breakdown. It also highlighted the conflicting views and comments of various authors and also critically evaluated and interpreted their contributions towards the impact of risk management. Reviewing of related literature was done to lay the conceptual framework for this research and together with empirical evidence, which enables the identification of research gaps, thus further justifying the research.

2.1 Conceptual Framework
This is the researcher’s own position on the problem and gives direction to the study. Mugenda and Mugenda (2003) described conceptual framework as an expression of a relationship between variables in a study and can be shown diagrammatically or graphically. Conceptual Framework helps the researcher in developing, understanding and giving awareness of the situation under study and communicate this. It can be an edition of a model used in a previous study, with modifications to suit the research at hand. (Mitchell, 1999) defined risk as the likelihood of loss and implication of that loss for the individual or organization in which he formulated a principle of risk to assess the probability of loss (P) and significance (1) of that loss as; Risk = P(loss) X 1(loss). Another conceptual definition of risk was given by (Ritchie & Brindley, 2007) as the multiplication of risk event, and the ability to detect the risk, and was formulated in the notation as Risk= Likelihood X Severity X Detection. In this research study, the dependent variable is supply chain breakdown while the independent variable is risk
management represented by reasons, benefits and also challenges of risk management as shown on Figure 2.1 below

**Figure 2.1: Conceptual framework for Risk Management**

### Independent Variable

<table>
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<th>Drivers of Risks</th>
<th>Current Risk Management</th>
<th>Effects of Risk Mitigation Strategies</th>
</tr>
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**Dependent Variable**

Supply Chain Breakdown

Source: Thomas (2010)

### 2.2 Theoretical literature

Thornhill (2003), defines theory as a formulation regarding the cause and effects of relationships between two or more variables which may or may not have been tested. Theoretical literature is a review in which several theories or concepts focused on the same topic are presented and compares them on the basis of assumptions, logical, consistency and scope of explanation (Neuman, 2006). The theoretical literature was developed so as to highlight the research problem which has placed into two variables that are risk management and supply chain breakdown. The purpose of this part of the thesis work is to set up a basis for theoretical framework on risk mitigation strategies and investigate whether the managerial advantages and the theoretical benefits are likely to create some impact on Public sector procurement and also to find out whether they help in value addition in the public sector supply chains.
2.3 Supply Chain Risk Management Strategies and Risk Management Related Models and Theories

2.3.1 The Kraljic Matrix Model
According to Gelderman (2005), the Kraljic matrix classifies the stages of purchasing sophistication within companies and identifies four stages which are: purchasing management; materials management; sourcing management and supply management. (Kraljic, 1983) argues that supply management is critical when the supply market is complex and the importance of purchasing is high. The Kraljic Model highlights the procurement as an important managerial area with an enormous impact on profit in the company. The other reason for the success of the model was the different purchasing situations which were clearly distinguished and the logical recommendations on how to act in these situations. Fenson (2008) alluded that supply management is of relevance when critical items are being procured throughout complex situations. He continued saying supply management is of critical value also if the level of uncertainty rises in the buyer-supplier relationship. (Kraljic, 1983) highlighted the Model proposed for two factors which are important for a supply strategy of any company, as illustrated by the diagram below.

![Kraljic Matrix Diagram](image)

**Fig 2.3  Kraljic Matrix**

The first factor concerns the strategic importance of the purchasing in terms of the value added by the product line, the percentage of raw materials of the total costs and the impact on
profitability, business critical, and expenditure level. The second factor involves the complexity of the supply market measured by supply which is influenced by scarcity, pace of technology and/or materials substitution, entry barriers, logistics, and the market structure (monopoly or oligopoly for example), all these being conditions for supply risk. Appropriate supply strategies can be implemented effectively if the top management and senior purchasing get to understand these two dimensions; profit impact and supply risk. This can help companies to improve the power balance with their suppliers and thereby exploit its buying power towards important suppliers. Risk aspects can also be reduced by this approach as the contractual coverage, regional spread of supply sources and availability of scarce materials contributes to the risk profile of the company which the company faces

Classification of products

As illustrated from figure 2.3 above, the Kraljic matrix classifies products into a two by two grid as Strategics items, bottleneck items, leverage or bulk purchase items and non-critical items. The dimensions used for the classification are profit impact and supply risk. In the Kraljic P (1983) presented the matrix, a working method with four phases should be followed classification, plotting bargain power between the buyer and the different suppliers, strategic positioning of products identified in the classification phase and finally setting up long-term action plans. The first phase in the Kraljic Matrix Model is to classify a company’s different commodities, based on the profit impact and supply risk dimensions. The classification in the four categories requires a distinctive approach and the complexity of supply market/supply risk is in proportion to the strategic implications. In the strategic quadrant analytic techniques are needed to support supply decisions. Kraljic gives examples of such techniques as market analysis, risk analysis, computer simulation and optimization models, price forecasting and other micro-economic analyses. Specific market analyses and decision models are needed for bottleneck products and vendor and value analysis, price forecasting models and decision models may be important for leverage items. The model can be useful in the public sector procurement to assess the amount of risk associated with commodities being procured specifically by the Bindura University. The model assist the University to categorize its items and be able to guard against lack of critical components for its developmental projects and education facilitation. The categorization will also help to identify which components represent the greatest value which needs a great deal of protection in the stores section of the University.
However the model cannot be fully applicable to the public sector procurement as Bindura University is a nonprofit making government department with the mandate to undertake offer educational services at the lowest possible cost. That as it may, the model can be useful if the University is to adopt a profit based system towards its purchases and storage which would put a monetary value to the risk that could potentially befall the department and assist in risk management.

The power dependence between the buyer and the supplier

The second phase in the Kraljic’s Model after the classification of product categories deals with the market analysis by plotting the bargaining power of the suppliers against its own strength as a buyer. This involves everything from quality and quantity aspects to relative strength of existing suppliers. Important factors during this phase are the check of supplier’s capacity utilization, supplier’s break-even stability, uniqueness of supplier’s product, past variations in capacity utilization of main production units and the potential costs of non-delivery and inadequate quality. Taken together, Peter Kraljic stress the importance of knowing both the supplier strength and company strength in order to do good market analysis. The evaluation criteria will also differ for different Industries.

Strategic positioning of the products identified in the classification phase

Fenson (1983), the third phase concerns strategic positioning of the materials/products identified in phase one. This makes it possible spot opportunities and vulnerabilities in the supply markets and it also makes it possible to develop counter strategies. Three basic risks categories are possible in the strategic quadrant depending on where in the matrix a product category is positioned. Different actions are needed for volume, contractual coverage, price and new suppliers, inventories, own production, substitution, value engineering and logistics. The normal situation is that companies will have roles when different items and suppliers are regarded. The company will have more flexibility in negotiations if the company is stronger than its supplier.

The exploit strategy is used when the buyer plays a dominant role and the supplier’s strength is medium or low; there should however be a balance in order not to jeopardize the relationship with the supplier. With an equal power situation a balanced approach are used and when the supplier dominate a diversified approach is used

Long-term action plans and strategies
The fourth face as identified by (Kraljic, 1983), concerns setting up actions plans for the long term and opens up for changing the prevailing conditions in phase three above. The previous phases have dealt with volume, price, supplier selection, material substitution, inventory policy and so forth. This phase makes it possible to improve the general sourcing strategies. This means securing long-term supply and taking actions depending on the risks the company faces. Options with clear objectives, steps, responsibilities and different measurements need to be clear for the top management. The forth phase should lead to strategies for critical purchasing materials both considering time and what actions that needs to be taken. Kraljic also discuss in his article the importance that the purchasing function reflects the overall corporate set-u. These concerns for example if the purchasing department should be centralized or decentralized.

Kraljic also points out the problem of the purchasing department not being informed when new actions are taken and that the information period is too short. The purchasing department needs information at least three to six months before the start-up of a new project, in order to negotiate prices, rescheduling supply quantities and so forth. Tailor made systems are probably also needed for complex companies with numerous products and multiple plants. This can include forecast systems, EDP- supported planning, integration of purchasing systems with other corporate system, purchasing analyses approaches such as commodity analysis, value analysis and improved systems support, both in order to work less with administrative task but also in order to be more efficient.

2.3.2 Financial Economics Approach
According to (Miller & Modigliani, 1963), financial economics approach to corporate risk management is the most prolific in theoretical model. This approach was based upon classic Modigliani-Miller which states the conditions for irrelevance of financial structure for corporate value in which was later extended to the field of risk management. (Miller & Modigliani, 1963) posits that hedging leads to lower volatility of cash flow and therefore lower volatility of firm value. The results of hedging as advocated by (Miller & Modigliani, 1963) are beneficial to the firm, which are higher value (a hedging premium). In this theory, rationales for corporate risk management where deduced to higher debt capacity, progressive tax rates, lower expected costs of bankruptcy, securing internal financing, information asymmetries and corporate advantage in information.
2.3.3 Agency Theory
In the field of risk management, the agency explains a mismatch of interests between shareholders, management and debt holders due to the asymmetries in earning distribution which can result in the organization taking too much risks or not even engaging in positive net value projects, (Mayers & Smith, 1987). According to (Fite & Pfeiderer, 1995), the agency theory implies that the defined hedging policies can have important influence on firm value. This theory provides strong support for hedging as a response to the mismatches between managerial incentives and shareholder interests.

2.3.4 Risk Management Theory: The Integrated Perspective and its application in the Public Sector
The main aim of this theory by (Spikin, 2013) is to discuss the foundations of risk management, showing its evolution and reviewing the main best practices. There was a quick description of the current environment into which both public and private organizations struggle, but the application was then made to the Public Sector. (Spikin, 2013) in his theory, expounded three key areas which are

i. The Concept of Risk
Risk can be defined as the change of injury, damage or loss, (Spikin, 2013). Risks can be defined as the level of exposure to uncertainties that the enterprise must understand and effectively manage as it executes its strategies to achieve its business objectives and create value (Deloach, 2000). (Society, 1992) Also defined a risk as the chance, in quantitative terms, of a defined hazard occurring. He went on alluding that it therefore combines probabilistic measure of the occurrence of the primary event with a measure of the consequences of that event. Therefore risk in general is a quality that reflects both the range of possible outcomes and the distribution of respective probabilities for each of the outcomes. (Spekman and Davis, 2004) posited that risks definitions can either be objective or subjective, in which those to be considered objective are risks which relies on likelihood alone, such as coin flipping or dice throwing and those to be considered subjective are risks which needs the its penalties to be assessed along with its probability of occurrence.

According to (Spikin, 2013) risks were classified as; financial and non-financial, dynamic and static, systematic and diversified, pure and speculative, fundamental and particular, core and non-core, and operational and strategic risks. Risks can be categorized also as viewed by
Christopher & Lee (2004) as effect of external events such as wars, strikes or terrorist attacks and impact of changes in business strategy. Chopra and Sodhi (2004) however present nine risk categories, which include disruptions, delays, systems, forecast, intellectual property, procurement, receivables, inventory and capacity. They also discuss the impact of implementing a single or combination of mitigation strategies towards supply chain flows.

ii. Comprehensive Risk Management Approach

According to Spikin (2013) this step of his risk management theory focuses on giving the proactive way of managing risks associated with their strategic objectives and monitoring them in a continue and conscious way. The management of risks was therefore in this theory an integral part of the organization and its process, in the understanding that potential upside and downside factors can affect the organization. He structured the integrated perspective of risk management in a process that includes a sequence of logical steps which can be illustrated by the figure below

Fig 2.4: Risk Management Process
Organization’s Strategic Objectives

The first of the risk management process as advocated by (Spikin, 2013) is to set clear objectives for the risk management program. In simple terms, this would be the first decision by the organization to determine what it like the risk management program to do for them. Various objectives are established.

Identification of risks

Several instruments such as internal records of the organization, insurance policy checklist, risk analysis questionnaires, flow process charts, analysis of financial statements are used on this step, (Spikin, 2013). On this stage risk analysis, identification, evaluation and estimation are carried out.

Risk reporting

According to (Spikin, 2013), different levels of information that should be distributed within the organization is established.

Decision

The results of the evaluation step are used therefore to make decisions about the significance of risks to the organizations and whether each specific risk should be accepted or treated.

Risk Treatment

This is the process of selecting and implementing measures to modify the risk found which includes risk financing, (Spikin, 2013). It is also referred to as “strategies for responding to risk”.

Monitoring and Reviewing

This is the last step of risk management process as posited by (Spikin, 2013), in which it aims to assure that risks are effectively identified and assessed and the appropriate controls and responds are all in place. Also there are regular audits and standards compliances being carried out and standards performance reviewed to identify opportunities for improvements.

iii. Public Sector Risk Management

Emphasis was made that since public organizations faces the same threats to people, property and processes as the private and non-profit organizations do, there is needs to apply risk
management function in the public sector. Classification of Four dimensions of where risk management would develop within public entities was made in which there is a political dimension at first. On this dimension, there are legal of institutional existence. A second dimension is a strategic dimension in which there is need for the public organizations to formulate mission-objective process. The third dimension therefore is a tactical dimension which refers to the risks related to budget execution and intermediate range decision making. The final and fourth dimension of risk management as advocated by (Spikin, 2013) is the Operational dimension which refers to risks related to the day to day operations, short-term planning and execution and functional performance.

2.3.5 Importance of Supply Chain Risk Management in the Public Sector

Supply chains and their associated management processes often remain invisible to the public sector client. Government has traditionally focused on the contracting process with first tier suppliers, the supply chain members with whom the procuring organization directly contracts. For example in the United Kingdom (UK), Public accounts committee Report on ‘Improving departments’ capability to procure cost-effectively highlighted that only 17% of departments, agencies and non-departmental public bodies analyze their suppliers’ supply chains as part of their criteria for selecting suppliers and thus suffer from a lack of assurances about the reliability and resilience of their key suppliers’ subcontractors, OGC (2004).

According to the Office of Government Commerce (2006) supply chain risk management is important for better risk allocation. In an increasingly complex delivery landscape, effective risk allocation is a critical consideration in procurement. Risk should always be allocated according to the party best placed to manage it, and a better understanding of the way in which the requirement can be delivered allows the authority to assess how.

2.4 Empirical Literature Review

The empirical study of literature is an interdisciplinary field of research which includes the psychology, sociology, philosophy, the contextual study of literature and the history of reading literacy texts (Schmidt, Siegfried, 1998). It is derived from the observation or experiment empirical results that supported the hypothesis. It is verifiable or provable by means of observation or experiment derived from of relating to experiment and observation rather than theory (Freedictionary, 2013). Lisiak et al (2010), highlights that the empirical study of literature attracts scholarship particularly in the areas of reception and audience studies and in
cognitive psychology when it is concerned with questions of reading. Empirical literature review, makes an irreplaceable contribution to the development of a more rational, scientific and socially relevant study of literature (Gorp et al, 1991).

2.4.1 Drivers of Risks
A research was carried out by Thun & Hoenig (2009) investigating the vulnerabilities of supply chains. This was carried out in the German Automotive Industry within a survey of about 67 manufacturing plants. The researchers had find out that supply chain risks are predominantly vulnerable wherein globalization, supplier reduction, product variant and outsourcing being some of the key drivers of disruptions within the supply chain.

The researchers alluded that the internal supply chain risks are more likely to occur and affect the performance of the supply chain more adversely. Companies with a higher degree of supply chain risk management were found out that they are better in performance than those performing at a lower level of risk management. In addition, the results of the research shows that the groups using reactive supply chain risk management ways have a higher average value in terms of disruptions resilience or reduction of the bull whip effect. On the other hand, the group that have a proactive way of risk management in supply chain has better values concerning flexibility or safety stocks.

2.4.2 How Risk Management can be conducted
A study was conducted by (Chopra & Sodhi, 2004) on managing risks on an organisation to improve supply chains. The researcher noted that if the organisations understands the variety and interconnectedness of supply-chain risk, managers can tailor balanced, effective risk-reduction strategies for their companies. In this case, lightning had struck a local plant of Royal Philips Electronics which damaged millions of microchips which it produced and supplied many companies in the electronic and telecommunications industries. Amongst these customers of Royal Philips were a Scandinavian mobile-phone manufacturer Nokia Corporation and Telefon AB I.M Ericson another mobile-phone manufacturer. The Risk occurred to these two studied customers of Royal Philips in the form of a lightning. Progress of manufacturing phones at Ericson was said to have stopped after the lightning event since it had adopted a Single-sourcing strategy; the shutdown of chips Supplier resulted in the breakdown of buyer’s whole supply chain from the 1st tier to the last user. In contrast, Nokia Corporation, it did not stop its productions since it had been using a multiple sourcing strategy.
The shutdown of Royal Philips resulted in Nokia switching to its chip orders to other Philips plants, as well as other Japanese and American suppliers.

Following the research findings on the state of supply chains after a risk have occurred from these two companies, the researcher went on to classify risks that occurs and disrupt or delay material, information and cash flows. Also mitigation strategies for these risks were suggested by the researcher. Hence the researcher articulated that, how a company fares against such threats depends on the type of disruption and the level of the Organisation’s preparedness. Taking from the event of Ericson which was supposed to delicate a balancing act to keep inventory, capacity and other elements at appropriate levels across the entire supply chain in a dynamic, fast changing environment.

Hallikas et al. (2004) carried out a research in Finland on risk management in supplier networks. This research was carried out to illustrate challenges that network co-operation brings to risk management. The researchers outlined the general structure of the risk management processes and presented methods for risk management in a complex environment. The research findings were included the indication that risk management is an important development target in the studied supplier networks. They presented processes facilitate understanding and managing of uncertainties and risks in supplier networks.

Kersten, et al. (2010) carried out a research at Hamburg School of Logistics, Germany to develop a strategic framework to supply chain risk management. This research therefore, focuses companies risk assessment as well as on its relevance on potential barriers and o methods of an inter-organisational risk management approach. The research findings after a risk assessment showed that the application of supply chain risk management approach is low in many companies since there are barriers in practice which foreclose the rapid increase of supply chain risk management importance. These barriers from the research are, lack of transparency and insufficient trust within the network. Many companies experienced that the application of Supply chain does not only have positive consequences like customer service increment and cost reduction. One of the major challenges of Supply Chain Management is the growing exposure towards supply chain risks which companies are facing. They also found out that risks that occur on the supply and on the demand side are most dangerous for most companies in today’s business environment. Therefore, companies are not able to recognize many of their supply chain risks before they have occurred, and to this therefore shows that strategic risk management in the supply chain is important.
2.4.3 Effects of Risk Mitigation Strategies.
The researchers conducted a research by Manuj & Mentzer (2008) in United States with the purpose to explore the phenomenon of risk mitigation strategies in global supply chains. The researchers had an insight into applicability of six risk management strategies with the respect to the environmental conditions and the role of the three moderators. The research findings involved implications in which the researchers found out a need to identify the antecedents to supply chain risk management. They found out that the implementation of several strategies for managing risks, they won’t be effective and fall short in identification of when to use them, if the antecedents of risk are not taken note of. In addition, the research findings outlined the moderating effect of team composition on the relation between the selection of risk management strategies and its antecedents.

In addition to the above implications of the findings, there are also managerial implications of this study. In this study, comments were repeatedly made on comments about the fact that growth in sourcing and off-shoring, increasingly demanding customers, geographical dispersion of supply chain, access to markets in emerging economies, and unanticipated events such as terrorist acts and natural disasters will lead to increases complexity, risks and opportunities in global supply chains. The researchers elaborated that, the area they researched on is ripe with opportunity, both for future research and competitive advantage.

2.4 Gap Analysis
Previous researchers looked at the concept of risk management on logistics services providers, Electronics and Automotive Industries which are in Private sector. This research however, goes further to evaluate the impact of risk management in mitigation against supply chain breakdown in the Public Sector being specific in Public Institutions. Moreover, many of the published researches on the subject under study were carried out in developed countries and it would be credible for the third world countries to carry out the research as it applies in our own situations. Differences in economic conditions, climates, technological, social and political environments between developed and developing countries lies a reason for the research to be carried out in considering our situations. The previous researchers in addition shows the need for supply chain risk management and their main focus were on coming up with strategies to be implemented to overcome the risks in supply chains but they did not go further to show their impact on mitigation against supply chain breakdown.
2.5 Chapter Summary
This chapter examined the literature review which included theoretical literature found in text books and empirical evidence theory found in previous research findings from other researchers on the similar topic of risk management in mitigation against supply chain breakdown. Gaps were also found by the researcher which were left by other researchers in the field under study. The next chapter therefore will focus on the research methodology that is how the researcher collected information related to the problem at hand.
CHAPTER 3

RESEARCH METHODOLOGY

3.0 Introduction
This purpose of this chapter is to give an overview of the methodology of the research being undertaken. (Kothari, 2004) Defines research methodology as a way to systematically solve the research problem, it may be understood as a science of studying how research is done scientifically. He further explained that whenever we talk of research methodology we do not consider only of the research methods but also considering the logic behind the methods that have been used in context of our research study and explain why a particular method or technique is used; why not using others in the way that research results may be evaluated either by the researcher himself or by others. Focus in this study will be put in research designs, research subjects, population design, methods of data collection used and data analysis methods used. However data was presented in both qualitative and quantitative techniques.

3.1 Research Design
According to Kerlinger (1986), a Research Design has been defined as a plan, structure and strategy of investigation so conceived as to obtain answers to research to research questions and problems. He went on explaining that it includes an outline of what the researcher will do in writing the hypothesis and their operational implications to the final analysis of data. (Kothari, 2004) Argued that research design has a great bearing on the reliability of the results arrived at and such constitutes the firm foundation of the entire edifice of the research work. The researcher adopted a descriptive design, and this was because it provides chances to note the attitudes, opinions and the real behavior of employees of BUSE on the issues pertaining to the impact of risk management in mitigation against supply chain breakdown.

3.1.1 Descriptive Survey Research Design
To this end, the researcher employed the descriptive survey research design. A descriptive survey design can be defined as a scientific method which involves observing and describing the behavior of a subject without influencing it in any way. It also involves the collection of data, analyzing it to validate or discard the knowledge under investigation. This method of design was chosen because the data obtained can be presented and analyzed using qualitative
methods. Therefore to collect data which is related to the organization evaluations and assessments on the impact of risk management and supply chain breakdown from Bindura University, questionnaires and interviews were used. This enabled the researcher to find out all the facts relating to the study, which have resulted then in significant judgments and appropriate recommendations at the end of the study.

3.1.2 Justification of Descriptive survey method of research design
The descriptive survey method was used as it gives an opportunity to unearth the data that lies buried in the minds of people as well as their feelings and attitudes. To this end, feeling scales as well as attitude scales of the respondents towards the impact of risk management in mitigation against supply chain breakdown in public sector procurement at Bindura University were unearthed through properly structured questionnaires and interviews.

(Kothari, 2004) stated that descriptive survey method can be used to gather up some data which is current about peoples’ opinions and views. This was however achieved by the researcher by soliciting information collected from respondents about their current opinion in relation to the impact of risk management in mitigating supply chain breakdowns in the public sector in the case of Bindura University. Moreover, the descriptive method design is easier to collect and condense for both the present and the past using graphs, tables and charts. To this end the researcher collected data by interviews and the data was then presented using tables, graphs and charts.

3.1.3 Case Study approach and justification
The case study was conducted at Bindura University of Science Education. The main purpose of using a case study approach was to evaluate the impact of risk management in mitigation against supply chain breakdown in public sector, using the frameworks and matrices gathered from the literature review. The case study was primarily being in form of questionnaires and personal interviews with the respective people from different departments of the organization.

In addition, the case study was chosen because the researcher wanted to highlight some unique features within Bindura University. Also this approach was preferred as it allows the solutions for complex issues to be explored, it is inexpensive and it saves on time when conducting the research. One of the advantages of the case study approach over other methods is that it attempts to be comprehensive, and helps in describing and analyzing the full richness and
variety of events and issues in the organization or department in question, (Kothari, 2004). He added that it is very useful especially when exploring an area where little is known or where you want to have a holistic understanding, phenomenon, episode, site, group or community. To this end it will be noted that a case study method is appropriate to be used since the focus of the study is on extensively exploring and understanding rather than confirming and quantifying.

3.3 Subjects

3.3.1 Population
A population can be described as all items in any field of inquiry, (Kothari, 2004). He further defined subjects as the population for an enquiry in the totality of all elements under investigations. Investigating a population is expensive and time consuming as it is demanding and cumbersome. Therefore to this end, the researcher targeted BUSE as the case, and used the personnel directly involved in the procurement activities of BUSE to represent the targeted population.

3.3.2 Sample Design
According to (Kothari, 2004), a sample design is defined as a technique or the procedure the researcher would adopt in selecting items for the sample. It is a definite plan for obtaining a sample from a given population. Another author, (Jankowicz, 2000) defined sampling as the deliberate choice of a number of people, who are to provide the researcher with data from which he will withdraw conclusions about some larger group. The aim of sampling is to obtain a sample that is representative of the target population. Therefore to this end, the researcher used a sample of 17 employees directly involved in procurement activities of BUSE. The selection however of the respondents was based on their knowledge, flexibility, availability and convenience, which guarantees the accuracy of the responses from this study.

3.3.3 Probability sampling design
According to (Cooper & Schindler, 2003), probability sampling has been described as unrestricted, simple random sampling. He further explained that it is based on the concept of random selection. This simply shows that in probability sampling design, every participant in the population has a certain probability of being included in the sample and chances of being
included in the sample is independent of the selection. However in this case the researcher discovered that two advantages therefore accrue which are

- The possibility of bias on the investigator's part is removed
- There is the application of the laws of mathematical probability to estimate the accuracy of the sample.

Therefore, to this end, a stratified random sampling was used by the user

### 3.3.4 Stratified Random Sampling

According to (Kothari, 2004), under a stratified random sampling, the population is divided into several sub-populations which are called strata, that are individually homogeneous than the total population and from each stratum items are selected which constitute a sample. This sampling method is applied to obtain a representative but a population from which a sample is to be drawn does not constitute a homogeneous group. However the researcher used a stratified random sampling because of its advantage of ensuring representation of each sub-group in the population and produce improved estimates with less variation.

### 3.4 Research Instruments

(Wilkinson & Birmingham, 2003) described research instruments as devices for obtaining information relevant to a research project in which there are many alternatives to choose. Research Instruments can also be described as tools used in collecting information to find solutions to the problems under investigations, (Black, 1999). The researcher used the questionnaires and interviews to collect data regarding the impact of risk management in mitigation against supply chain breakdown in the public sector. Selection of these two instruments were reliability, validity, cost and time constraints.

#### 3.4.1 Questionnaires

(Saunders, et al., 2007) Is of the opinion that the term questionnaire includes all techniques of data collection in which a person is asked to respond to the same set of questions in a pre-determined order. The researcher in this study used a questionnaire as the main data collection method from BUSE. The questionnaire is a favored tool to elicit the views and opinions from individuals regarding a particular topic and it provide an effective way of collecting data. A summated scale or Likert-type- scale was used for questions directed at risk and risk
management. The four point Likert scale used by the researcher had response scale ranging from; 1= strongly agree; 2= agree; 3= disagree; 4= strongly disagree.

Justification of Questionnaires
The researcher chose the questionnaire after realizing some merits attached to it as compared to the other methods of gathering data. Questionnaires provides a feeling of privacy to the respondents. This is due to the fact that one questionnaire is given to one respondent and answers alone without anyone knowing and this promotes anonymity. Also, this a cheapest way to gather up data in this study even if the whole universe is to be covered, since the researcher did not afford other expensive instruments because of financial constraints. In addition to the above, there is better comparability since there is uniformity in the questions asked and answered. For an example the questions asked the Director are the same with the questions asked to the Stores man. The questions were structured and designed correctly which guarantees to the respondents that their responses are accurate and directly straight to the issue of risk management.

Disadvantages of using questionnaires
Despite the above merits of using a questionnaire, there are also demerits of using it. One of the disadvantages is that the questionnaire might be completed by the wrong person who will not be a targeted respondent, hence this have led the researcher to appeal to the respondents to complete personally the questionnaires. Also, there are questions on validity and accuracy when using a questionnaire, in the sense that the respondents might not give true views and opinions but however respond only to please the researcher, and this hence the accuracy of the solution becomes questionable. Furthermore, delays in responses and incompleted questionnaires may be given back to the researcher in which this will become a challenge in presenting the data.

3.4.2 Interviews
An Interview can be defined as a purposeful conversation between the interviewer and the respondent aimed at eliciting some information from the latter, (Beri, 2007). He went on explaining that it is an opportunity for the researcher to explore deeply to uncover new ideas, open new dimensions of the problem and provide accurate accounts. Interviews can be conducted face to face or through the telephone, and they can either be structured (having a
planned series of questions or unstructured (with formal talk on the topics to being studied). The researcher in this study used structured interviews as a second method to gather data.

Interviews allows the researcher to have firsthand information pertaining to the questions to be asked on certain topics, and to the knowledge, values, experience, beliefs and feelings of the people. Another advantage of using interviews to collect data is that both verbal and non-verbal information is collected simultaneously since there is a provision of direct interaction between the interviewer and the respondents, and this however gives room for the interviewer to read the gestures, feelings and body language of the respondents. Also interviews are more applicable for complex and sensitive situations that can only be expressed orally. Information collected through interviews can be supplemented with that obtained from other instruments like observations. In addition to the advantages of an interview, errors of misinterpreting or misunderstanding the questions are minimized since the interviewer might repeat the question until it is understood by the respondent. This method of collecting data has a wider application since it may be used for any type of the population: illiterate or the old age or even the handicapped.

However, there are also demerits of using interviews to collect data. Interviews are expensive to conduct, especially when the respondents are scattered over a wide geographical area. They are time consuming since you will ask one after the other the same questions. The quality and nature of the interaction determines the quality of data to be obtained, the differences in approaches in each interview implies that the data may also not be of the same quality pertaining to accuracy.

3.5 Data Collection Procedure
The data was collected by the combination of questionnaires and interviews. The researcher made a delivery and collection of questionnaires to and from by hand to 17 respondents at BUSE. He used hand delivery to ensure the all questionnaires have reached the intended respondents and confidentiality will be ensured to the responses they get. The researcher made a hand collection of the questionnaires to ensure 100% response made. A 100% post check of completed questionnaires was made as a way to ensure quality of data in this research exercise. Also quality control measures were put to ensure quality at all the stages of the research process. The respondents were also assured that their responses will be treated with strict confidentiality and they were also given much time to complete their questionnaires. The
researcher also fixed appointments to have face to face interviews with 4 respondents at BUSE to cover up and supplement the questionnaires.

3.5.1 Validity
Validity is a test of sound measurement criterion which indicates the degree to which an instrument measures what it is supposed to measure. It can also be described in simple form as the appropriateness of each step in finding out what is set out to. The results of a research obtained from the instrument cannot be used with any degree of confidence unless they are tested for validity. The researcher ensured that each question asked was related to the problem and objectives of the study as a way to incorporate validity in the study.

3.5.2 Reliability
The reliability of an instrument refers to the ability to produce consistent measurements each time, (Kumar, 2011). In other way, reliability refers to the ability of the instrument to produce the same results if it can be administered under the same conditions to the same population. In a simpler way then reliability we can talk of it as the extent of accuracy. To ensure reliability and validity of the research instruments, the researcher formulated the questions that covered the contents of each objective and these questions were structured in a direct way to avoid ambiguity.

3.5.3 Ethical Considerations
According to (Kumar, 2011) ethics are principles of conduct that are considered correct, especially those of a given group or profession. As for this study, the ethical rights of the respondents were maintained. The researcher sought consent before carrying out the study at BUSE and this is ethical since the research participants must know of the research before. Confidential information released by the respondents was kept and maintained confidential. Also the respondents were notified of the aims, benefits and hazards of the research before they committed themselves to it. On the side of the researcher, bias was avoided and information gathered was used only for research purposes.
3.6 Data Presentation and Analysis
The data will be collected using questionnaires and interviews. It will be presented in a logical, clear and meaningful way. Tables are used to validate the data gathering. Computer- aided packages as Microsoft Excel will be used to analyze data. The data will be presented in the form of tables, graphs, narrations and figures.

3.7 Chapter Summary
This chapter explained the methodology used by the researcher in carrying out this study. The research design, description of the population, sampling procedure used, research instruments used, challenges encountered during the study and justifications of the procedures and instruments used in the research were outlined.
CHAPTER 4
DATA PRESENTATION, ANALYSIS AND DISCUSSION

4.0 Introduction
The researcher’s intention in this chapter is to present and analyze data gathered from the field research on the impact of risk management in mitigating supply chain breakdown in public procurement. Illustrations were done using tables and figures. Research findings, analysis and the discussions are therefore done on the basis of the key concepts that are according to each of the research questions contained in the questionnaire and interview guide used in this study. Pie charts, tables, figures and graphs will be used where necessary to present the research findings, and these findings are linked to the objectives of sub-section 1.4.

4.1 Response Rate from Questionnaires
Table 4.1 below shows the breakdown of response rate of the questionnaires for this study, the number and percentage of the questionnaires distributed and the questionnaires returned by the respondents.

<table>
<thead>
<tr>
<th>Questionnaires</th>
<th>Quantity</th>
<th>Response Rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Issued</td>
<td>17</td>
<td>100</td>
</tr>
<tr>
<td>Positive response</td>
<td>15</td>
<td>88.24</td>
</tr>
<tr>
<td>Non response</td>
<td>2</td>
<td>11.76</td>
</tr>
</tbody>
</table>

Source: Primary Data (2019)

17 Questionnaires were issued, and all the 15 were returned and collected by the researcher giving a response rate of 88.24% while 2 were not returned thereby making a non-response rate of 11.76. A higher response rate was due to the fact that the respondents had enough time to complete the questionnaires and a user friendly approach was used to get respondents accept to answer the questionnaires. A response rate can be referred to as the total of respondents contacted who participated in completing the questionnaires, (Cooper & Schindler, 2003). (Saunders, et al., 2007) alluded that a response rate that is higher than 50% in respect of
questionnaires obtained from a representative sample that is greater than 30 justifies generalizing the findings to the population of study.

Table 4.1.2 Response Rate from Interviews

<table>
<thead>
<tr>
<th>Interviews Conducted</th>
<th>Quantity</th>
<th>Response rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Issued</td>
<td>4</td>
<td>100</td>
</tr>
<tr>
<td>Positive response</td>
<td>4</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: Primary Data

4.2 Demographic Characteristics of respondents

Figures and Tables are used to present the demographics of respondents and each of these characteristics will be briefly discussed below the relevant illustrating tables and figures.

Gender of respondents

Fig 4.2: Gender of the respondents.

<table>
<thead>
<tr>
<th>Gender</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>73%</td>
</tr>
<tr>
<td>Female</td>
<td>27%</td>
</tr>
</tbody>
</table>

Source: primary source

The study shows that the majority of the respondents are Males as compared to their females, with 73% and 27 respectively. The findings above might be because of the nature and scope of the procurement work that is mostly dominated by men and not yet embraced in the business environment as a function on itself. The demographic attributes of the population of the study
and the sample in respect to gender are however fairly and truly represented by the demographic attributes of the respondents.

Age of the respondents
Fig 4.3 below presents the age of the respondents

Fig 4.3 Age of respondents

Source: Primary data (2019)

20% of the respondents ranged between 20-30 years, while 40% were aged between 30-40 years. 13.33% of the total response were aged between 40-50 years, 13.33% consisting of the age between 50-60 years of age, then 6.67% aged between 60-65. An age group of 65 years and above accounted for 6.67%. The data above clearly shows that the majority of respondents were between 26-35 years and this could be because this age is regarded as a most economically active group in Zimbabwe. The age group of 65 and above marked the least percentage because most of them are pensioners and retired from work.

Working Experience or Length of employment
Fig 4.4 below represents the working experience of the respondents at BUSE
The data above shows that 80% of the respondents were between 2-5 years and 5-10 years which were tallying according to their percentages. 13.33% consisted of those who were above 10 years and those who were less than 2 years were therefore recorded the least number of respondents with 6.67%. The results above shows reveals that most of the employees were above two years and this therefore gives confidence to the researcher about the knowledge of the respondents about risks in their supply chain since they have been at the organization for many years.

Levels of Education of the Respondents commonly affecting the supply chain. Fig 4.5 below represents the level of education of the respondents.
A large percentage of the respondents are holders of at least Honors Degree and above (Masters, PHDs or higher) being 40%. The holders of Diplomas consist of 33% of the number of the respondents, while 20% have ‘A’ level and 7% for ‘O’ level. The above results however shows that most of the respondents are highly educated. This is because the researcher concentrated on the management level which includes mainly of educated personnel. This is of use in this research in which the respondents are educated enough to give important and valid information on risk management in mitigating supply chain break down of BUSE.

4.3 Determining the nature and drivers of Risks.

Understanding of the Risk Management Concept
Fig 4.6: risk understanding
Primary source.

80% of the respondents understand risks to a greater extent and 20% understand it to a lesser extent. This simply shows that everyone at BUSE understand what will be meant when risks are concerned, and this will validate this research since chances of getting accurate information are high. The results above might be because the researcher mainly targeted the respondents who are involved in the supply chain activities of BUSE and are educated. Due to this the researcher assumed that the results may be positive to show the impact of risk management in mitigation against supply chain breakdown in public sector procurement.

**Awareness of risks involved in supply chain of BUSE**

**Fig 4.7: Awareness of risks**

Primary source

87% of the respondents were aware of the risks in supply chain at BUSE. 13% were not aware of the risk involved in their supply chain and this might be because they may not be directly involved in procurement activities. The results therefore shows that the majority of the respondents are aware of these risks which gives the researcher more confidence to carry out a research. The researcher therefore assumed that the results may come out positive to show the impact of risk management in mitigation against supply chain breakdown.

**The Risk Drivers influencing the Supply Chain breakdown of BUSE.**

**Fig 4.8: Risk Drivers**
According to the study findings, many respondents were certain that planning and control area (10 respondents) are the most areas which are driving the risks that are experienced by the Supply Chain of BUSE. 8 showed that some most risks are demand driven, whilst 7 were certain that they are supply driven. 5 respondents were of the idea that drivers like supply, demand, process and mitigation and contingency had great possibility of causing supply chain breakdowns at BUSE.

On the other hand, no one gave a respond that supply drivers of risks occur, meaning they were all certain that this is the most driver of the risks affecting the organization’s supply chain. Therefore, the above results proves that the respondents are all positive of the occurring of the risks at BUSE and are all understanding that the factors driving these risks, which gives rise to the confidence about this study.

**4.4 Ascertaining the extent to which risks are being managed at BUSE**

**The extent to which BUSE Procurement Department detects the risks**

**Fig 4.9 Risk detection level**
Primary Source.

60% of the respondents gave a positive response in terms of how risks are detected by BUSE supply chain in which they showed that risk detection level is of a greater extent. 33% were of the view that risk detections are there at a lower extent. 7% then were of the view that risks at BUSE are rarely detected and then no one showed that risks are not detected. These results therefore gives a positive point of whether BUSE detects risks or not, in which these shows risks are being detected it might be either when they are incurred or before they occur. The outcome of these results is positive since the many of the respondents are directly involved in the supply chain activities of BUSE, so they have an understanding of the measures the procurement function takes to detect these risks.

**Adequacy of the Policies and Legislative Framework to Manage Risks**

Fig 4.10 presents if the policies of BUSE and the Legislative Frameworks, both of the Company and from the Professional Bodies are adequate to manage the risks.

**Fig 4.10: Adequacy of the Policies and Legislative Framework**
Policies and Frameworks of the Companies Internally they are those set by Managers or even departmental, and Externally they are those set on by Professional bodies like Procurement Regulatory Authority of Zimbabwe (PRAZ) or Chartered Institute of Purchasing and Supply (CIPS) and those at a notional level (Constitutions). With the help of these frameworks and policies, only 27% strongly agrees with their effectiveness to manage risks, and the other 27% agrees. 40% therefore disagrees with that these frameworks and policies are effective in managing the risks to mitigate against supply chain breakdown at BUSE. Only 6% strongly disagrees with the view that the policies are helping in managing the risks.

**The extent to which Risks are managed at BUSE**

**Fig 4.11: Risk Management**
Primary Source.

The graph above shows that disruptions, delays and systems are the most risks which are rarely managed at BUSE. This is also supported by the responses on the same risks which many were of the view that they are unlikely managed. Only a few of the respondents showed certainty in management of systems, delays and disruptions. Capacity risks as shown on the graph above are also not managed effectively as many of the respondents proved that it is unlikely to be managed, though no one gave a response that capacity risks are rarely managed. On the other hand is was managed clear that many respondents were certain that receivables, forecasts and inventory risks were being managed at BUSE.

4.5 Risk Mitigation strategies on supply chain breakdown.

Risk Mitigation tools used to avoid supply chain breakdown.

Fig 4.12: Risk Management tools
Primary Source.

Almost all of the respondents clearly showed that relationship management, inventory management and increasing responsiveness are the commonly used tools used by BUSE with 13, 14 and 9 respondents respectively. On the other hand, tools such as category management with 5 responses, capacity management with 3 responses and pooling demand with 7 responses are not common and they are not used frequently. This might be because most risks that BUSE faces do not require these strategies or the respondents who are in the procurement office are the ones who responded only since they have full information of how these. 2 of the respondents shows that there are some of the strategies not mentioned.

**Effectiveness of the Mitigation Strategies**  
Fig 4.13 below represents the effectiveness of specified mitigation strategies at BUSE to mitigate against supply chain breakdown.

**Fig 4.13: Effectiveness of mitigation strategies**
Many respondents strongly disagree with the effectiveness of recycling and robust reporting and data analytics mitigation strategies with 12 and 11 respondents respectively. None of the respondents strongly agreed with the effectiveness of robust reporting and data analytics and only two strongly agrees with the effectiveness of recycling measures to mitigate supply chain breakdown at BUSE. Also 7 respondents disagrees with effectiveness of inventory management strategies. These results therefore simply portrays the lack of confidence the workers of BUSE have with these strategies as far as mitigating supply chain breakdown is concerned. On the hand, 9 respondents strongly agrees with the effectiveness of flexible customizable solutions and 7 agrees with the effectiveness of Order management, which then shows that the Organization is confident of these strategies.

4.6 Interviews Results

The researcher, besides the questionnaires undertook Personal Interviews with the Procurement professionals. Interview questions were conducted on a face to face mode with the procurement professional. All of the respondents managed to answer all of the questions on the interview guide, in which the results of these interviews are to be analyzed below.

4.6.1 What problems have you faced due to Supply Chain Breakdowns?

The findings on this study clearly shows that all of the respondents (100%) agreed to the fact that they are facing problems resulting from supply chain breakdowns. The respondents
mentioned the most frequent problem they are facing from supply chain as input provision delays which leads to massive production delays and slowing down of productivity.

From the above findings, it is shown that the whole organization is suffering from the effects and risks that are incurred by other members of their supply chain. These problems they are therefore sometimes noticed as they manifests in the reduction of the output, in this case the services BUSE must offer to its customers (students and staff) will be limited in supply since there will also be limited supply of the resources. The other problem mentioned by the respondents as a result of supply chain breakdown is the use of poor quality inputs which end up delivering poor quality services.

A lack in procurement functions in form of these supply chain breakdowns have resulted in the effects spilling over to all of the departments and services, both academic and non-academic functions. The respondents have clearly shown that they have suffered from loss of customers (students) which have resulted in reduction of enrolment number at the University, and this is because of the bad reputation the university have got from the poor service deliveries, poor quality services and even delays and disruptions in service delivery.

4.6.2 Which of the Risk Mitigation Strategies can help and how then can be implemented?

The researcher gathered data on the risk mitigation strategies that can help and how they can be implemented using the interviews. Open questions were used in the interviews so as to allow the respondents give detailed responses.

The respondents to this research on their responses however mentioned some of the risk mitigation strategies that they think can help the organization to mitigate against supply chain breakdown. After the analysis of the results, the researcher identified partnerships, improved supplier relations and insurances as the mitigation strategies proposed by the respondents to be implemented at BUSE. Early supplier involvements and supplier developments can be adopted as means of implementing these strategies effectively. Some of the respondents included the need for insurances as a mitigation strategy against supply chain breakdown. They were of the view that some of the services and goods the procurement buys must be insured or must have warranties, this will help in mitigating risks. Others were of the view that the other strategy will be of having short supply chains than the long ones which implies a great effect to track when a risk has occurred, so if the procurement department engage short supply chain it will become easier to manage risks and hence avoiding supply chain breakdowns.
However, a few respondents were of the view that there are no new mitigation strategies that the organization must adopt, they have to use the current strategies but fully implement them. They were of the point that the strategies already in the procurement and the whole organization’s hand are helpful, but the challenge is that they are not being fully implemented and used to mitigate against supply chain breakdowns.

4.6.3 What are the challenges faced in practicing effective risk management in public procurement?

The researcher gathered data on the challenges that are being faced in practicing effective risk management in public procurement. All of the respondents reviewed that there are challenges they are facing in implementing an effective risk management. The procurement professionals interviewed on their responses mentioned many challenges they are facing, and the researcher upon analyzing the results identified that lack of supply chain understanding and lack of responsiveness to the market changes were the major challenges the public procurement faces. The respondents explained that the public sector is slow to respond and adapt to the dynamic technological business environment we are existing in and this as a result stands as a barrier to the progress of an effective risk management.

The researcher also identified that high costs and holding stock were other challenges the respondents mentioned. They said risk management calls for a lot of money since some of the activities will need some financial support, therefore since the public sector is bureaucratic, it is a challenge for the procurement professionals to engage in effective risk management. Another challenge the respondents mentioned is of having limited suppliers. This is because of the legislations which the Public Procurement and Disposal of Public Asset Act Chapter (22:23) states that the Public procurers must deal with the suppliers only registered with the Procurement Regulatory Authority of Zimbabwe (PRAZ).

4.7 Chapter Summary

The chapter discussed the findings on risk management in mitigation against supply chain breakdown in public procurement and mitigation strategies employed by BUSE. The challenges faced by BUSE in practicing effective risk management were also discussed. The chapter finally discussed the possible recommendations that can be adopted in mitigating against supply chain breakdown of BUSE. The findings of this study are interpreted and
discusses with the reference to the literature review described in chapter two. The next chapter will present the study conclusions and recommendations.
CHAPTER V

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.0 Introduction
This chapter summarizes the major findings of the research study that are based on the data presented in chapter four. It gives the conclusions of the research study and finally presents the recommendations to BUSE on how best they can manage the risks in order to mitigate against supply chain breakdown. The recommendations for further studies were also summarized in this chapter.

5.1 Summary
This study assessed the impact of risk management in mitigation against supply chain breakdown in public procurement with the focus on Bindura University of Science Education (BUSE). The researcher aimed at identifying whether there was an overall negative or positive outcome on the risk management strategies employed and supply chain breakdown based on the respondents from the employees of BUSE, The results of mitigation against supply chain breakdown were based entirely on the data collected from the respondents on the important factors derived from the risk drivers, level and extent of risk management and risk mitigation strategies within BUSE. The study employed the use of questionnaires and interview guide as the main instruments for the research. The data gathered was analyzed using percentages and frequency on the pie charts, graphs and tables. The following findings therefore developed from the study were presented according to the research objectives.

5.1.1 To determine the nature and drivers of risks commonly affecting the supply chain of Bindura University.
The researcher identified that many of the employees at the organisation understands and aware of risks commonly affecting BUSE. Planning and control, demand, process, and supply are the key drivers of risks that are causing supply chain breakdowns at BUSE. Research findings also indicated that massive production delays, slowing down of productivity and reduction in output have emerged to be the major contributors to the need for risk management effectiveness.
Therefore, the respondents confirmed that they are all positive of the occurring of the risks at BUSE and are all understanding the factors that are driving these risks.

**5.1.2 To ascertain the extent to which risks are managed by Bindura University of Science education**

The findings shows that much attention of risk management was being given to receivables, forecasts and inventory at Bindura University. Inventory management proved satisfactory which reduces demand and supply uncertainty and increasing product value, accurate forecasts were more probably given at BUSE, and the receivables were being effectively managed. On the other hand it was found out that BUSE paid less attention given to disruptions, delays, capacity and systems related risks which were hence contributing much to the University’s supply chain breakdowns. These findings in short showed that the extent of risk management at BUSE is not adequate enough to mitigate against supply chain breakdown.

**5.1.3 To evaluate the effects of Risk mitigation strategies on lessening Supply Chain Breakdown at Bindura University.**

The findings of the study indicated that relationship management, inventory addition and supply market analysis are the most effective mitigation tools commonly used by BUSE to mitigate supply chain breakdowns. None of the respondents agreed with the effectiveness of robust reporting and data analytics and recycling as mitigation strategies to avoiding supply chain breakdown. It was also established that adding capacity, adding inventory and increasing responsiveness can greatly reduce delays and supply disruptions. Such mitigation tools such as category management, capacity management, pooling demand are not commonly applied in the supply chain of BUSE, hence proving ineffective in mitigating against supply chain breakdown of BUSE. These findings, hence portrays the lack of confidence the workers of BUSE have with these strategies as far as mitigating supply chain breakdown is concerned.

**5.2 Conclusions**

**5.2.1 To determine the nature and drivers of risks commonly affecting the supply chain of Bindura University.**

The researcher concluded that BUSE’s supply chain faced breakdowns driven by supply because of poor quality or yield at a supply source. Many of its suppliers are still Small to
Medium Enterprises (SMEs), they are still growing and the quality of their products is not yet guaranteed. Dependency on a single source of supply on some of the products since they are guided by the PPDPA [Chapter 22:23] as well as capacity and responsiveness of alternative supplier have affected led to the risks occurring. Supplier Bankruptcy also affects the supply chain of BUSE. The planning and control measures BUSE is implementing in its procurement function is poor to the effect of causing many risks to befall the organization and the supply chain as a whole. BUSE Procurement Committee is so slow to adapt to the dynamic business environment to the effect that they have not yet created the Procurement Management Unit which must be responsible for planning and control of the procurement activities as proposed in the PPDPA [Chapter 22:23]. Also some of the risks are being driven by the processes of procurement. Public Procurement’s process is bureaucratic and long to the extent that probability of confusion and slow in responses are high or even obsolete products being procured is high.

5.2.2 To ascertain the extent to which risks are managed by Bindura University of Science education

The study concludes that BUSE pays little attention in managing delays in material flows occurring because suppliers through inflexibility are not responding to changes in demand. Since most of BUSE suppliers are SMEs, they depend on importing, which then delays are experienced when they face high levels of handling or inspection during border crossings and transportation modes. Situations that are beyond human control such as natural disasters are also contributing to the disruptions of the material flow in the supply chain of BUSE. Also there are also factors of dependency on certain few suppliers of particular products, since they are guided by the PPDPA [Chapter 22:23] which according to this study it is concluded that this Legal framework and other framework and policies are ineffective in managing risks to mitigate against supply chain breakdown at BUSE.

5.2.3 To evaluate the effects of Risk mitigation strategies on lessening Supply Chain Breakdown at Bindura University.

Based on the findings from the study, the researcher concluded that concludes that only a few of the mitigation tools being applied by BUSE are being effective enough to help in mitigating against supply chain breakdown. Relationships with the suppliers and the rest of the supply chain are being managed well, Inventory addition is being effective to reduce risks, and they
are engaged in quality supply market analysis, but these are the only risk management strategies they commonly use and proving effective. Many of the other risk management strategies such as capacity addition, category management, increasing responsiveness are not utilized to prove their effectiveness. Risk mitigation strategies such as recycling and robust reporting and data analytics are not being implemented. Hence the above results simply concludes that, the mitigation strategies that are being used to manage supply chain risks at BUSE are ineffective and this is the reason why supply chain breakdowns are being experienced many times and is a challenge to the effectiveness of the organization as a whole and including the procurement department.

5.3 Recommendations of the study
The following recommendations were derived from the findings and conclusions of the study. Based on the findings of the study, it is expected that BUSE will gain a better understanding of the impact of risk management in mitigation against supply chain breakdown.

5.3.1 To determine the nature and drivers of risks commonly affecting the supply chain of Bindura University.
Supplier development practices will allow the SMEs suppliers to grow enough to produce quality products and this will help in reducing the drivers of risks. Also supplier developments helps to grow the suppliers, hence avoiding supplier bankruptcy. BUSE must engage in Multi-sourcing strategies to cater for the risks that emanates from the supply side, which will then avoid supply disruptions. To reduce risks emanating from the planning and control measures of BUSE, the organization must adhere fully to the PPDPA [Chapter 22:23] Part IV, Section 21 which emphasizes on how Public Procurement Planning must be conducted. BUSE must establish a Procurement Management Unit which will be responsible for procurement activities.

5.3.2 To ascertain the extent to which risks are managed by Bindura University of Science education
The study concludes that BUSE pays little attention in managing delays in material flows occurring because suppliers through inflexibility are not responding to changes in demand. Since most of BUSE suppliers are SMEs, they depend on importing, which then delays are experienced when they face high levels of handling or inspection during border crossings and
transportation modes. Situations that are beyond human control such as natural disasters are also contributing to the disruptions of the material flow in the supply chain of BUSE. Also there are also factors of dependency on certain few suppliers of particular products, since they are guided by the PPDPA [Chapter 22:23] which according to this study it is concluded that this Legal framework and other framework and policies are ineffective in managing risks to mitigate against supply chain breakdown at BUSE.

5.3.3 To evaluate the effects of Risk mitigation strategies on lessening Supply Chain Breakdown at Bindura University.
To ensure the effectiveness of the mitigation strategies to avoid supply chain breakdown, BUSE have to increase its capacity so as to reduce the rate of delays and procurement risks as well as inventory risks. The rate of responsiveness to the dynamic business environment have to increase so as to avoid the risks of buying obsolete goods and reducing delays and forecasts risks. BUSE have to implement fully some of the mitigation strategies such as aggregating or pooling demand, having more customer accounts and increasing flexibility so as to adapt to the market changes without compromises.

5.4 Recommendation for further study
The study has recommendation for further research. A comparative study using a University and other Public entities could be conducted with much emphasis on the benefits and challenges associated with risk management in operational performance of procurement. Other researchers can further research on the impact of risk management in other sectors rather than the public sector in order to establish the initiative impact in other sectors in mitigating against supply chain breakdown.

5.5 Summary
This chapter focused on the main findings, the conclusions obtained from the findings as well as the recommendations, which the researcher recommends to BUSE so that they will understand how risk management will mitigate against supply chain breakdown.
REFERENCES


APPENDICIES
APPENDIX I

APPROVAL LETTER

Bindura University of Science Education

P. Bag 1020

Bindura

13 February 2019

Bursary Department

Bindura University of Science Education

Harare

Dear Sir/Madam

RE: APPLICATION FOR APPROVAL TO CONDUCT RESEARCH STUDY

I am a student from Bindura University of Science Education, doing Bachelors of Commerce Honors Degree in Purchasing and Supply. I’m conducting a research study on, “The impact of risk management in mitigation against supply chain breakdown” in partial fulfillment of my degree. I write this letter seeking approval to conduct my research project with the Procurement Proffessionals and other Related Departments at your Organization.

The information provided will only be used for academic purposes, and will be treated with utmost confidentiality.

Your cooperation will be greatly appreciated

Yours faithfully

Tawanda Chaleka
APPENDIX II

INSTRUCTION TO THE RESPONDENT

i) Kindly answer the following questions by placing a tick in the appropriate box provided for each question constituting this questionnaire

ii) More than one tick may be placed in answer to some of the questions where so indicated.

iii) Please feel at home to provide any necessary comments in the space provided below some of the questions for the purposes of clarifying out response or raising relevant issues of material concern.

SECTION A. Please tick the appropriate.

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SECTION B: To determine the nature and drivers of risks commonly affecting the supply chain of BUSE
1. To what extent do you understand the concept of Risk management?

   Lesser extent   Greater extent

2. Are you aware of risks involved in the supply chain of Bindura University?

   Yes   No

3. What are some of the risk drivers being experienced by Bindura University?

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<tr>
<th>Type of risk driver</th>
<th>Rare</th>
<th>Unlikely</th>
<th>Possible</th>
<th>Likely</th>
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<td>Planning and control risk drivers</td>
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<td>Mitigation and contingency risk drivers</td>
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If there are other risks not mentioned above please specify  ..................................................
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SECTION C: To ascertain the extent to which risks are managed by BUSE

4. To what extent is the Procurement Department of Bindura University able to detect all the above mentioned risks?

   Greater

   Rarely

   Lesser

   Not at all

5. Are the Policies and Legislative frameworks of the Public Sector adequate enough to be used to Manage these Risks identified at question 3 above?

   Strongly agree

   Agree

   Disagree

   Strongly Disagree

6. To what extent are these risks managed by BUSE?

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<thead>
<tr>
<th>Type of risk</th>
<th>Rare</th>
<th>Unlikely</th>
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<td>Capacity</td>
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SECTION D: To evaluate the effects of risk mitigation strategies on lessening supply chain breakdown.

7. What tools do you use to mitigate Risks with a view to avoid a Supply Chain Breakdown?

- Relationship Management
- Supply Market Analysis
- Category Management
- Capacity Addition
- Increase Responsiveness
- Inventory Addition
- Aggregate or Pool demand
- None of the above

If there are other tools the Department is using, please specify:

8. Are the following strategies effective in mitigating risks to avoid a Supply Chain Breakdown at BUSE?
<table>
<thead>
<tr>
<th>Risk Mitigation Strategy</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
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<th>Strongly agree</th>
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<td>Order Management</td>
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<td>Robust reporting and data analytics</td>
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<td>Transportation services</td>
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9. What are your recommendations for improvement in Risk Management of Bindura University to Mitigate against a Supply Chain Breakdown?
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APPENDIX III

INTERVIEW GUIDE

Topic: The impact of risk management in mitigation against supply chain breakdown.

My name is Tawanda Chaleka studying Bachelor of Commerce in Purchasing and Supply Honours Degree with Bindura University of Science Education. I am carrying out an analysis on the impact of supply chain risk management in the supply chain using a case of Bindura University of Science Education. The outcome of this discussion will be treated with utmost confidentiality.

1. What impacts have your organisation faced due to supply chain breakdown?

2. What risk management strategies do you think will help your organisation from Supply chain breakdown and how can they be implemented?

3. What are the challenges faced in practicing effective risk management in public procurement?
4. In your own opinion, what feasible recommendations can be implemented to create strong supply chains?

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