The effects of supply chain resilience on purchasing performance during the Covid-19 period in Zimbabwe: A case of the Ministry of Finance and Economic Development.

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Abstract: **The outbreak of the Covid-19 pandemic posed serious challenges on economic activities in many countries' world over. Precisely, the pandemic ruined the operations of the manufacturing industry and this created severe shortages of supplies of materials and products in both overseas and local markets. The shortage of materials and products became a challenge for procurement functions in public and private sectors. This study therefore aimed to determine the effects of supply chain resilience on purchasing performance in the ministry of finance and economic development during the Covid-19 period. A quantitative approach was used and a sample size of 14 respondents for the questionnaire was selected from a target population of 15 employees working for the Procurement Management Unit in the ministry of finance and economic development. The Statistical Package for Social Sciences (SPSS) version 16 and the Analysis for Moment Structures (AMOS) version 22 programs were used to analyse quantitative data. The findings of the study show that supply chain resilience strategies have a significant positive effect on delivery time and insignificant positive effect on stock availability and purchasing costs. The study concluded that supply chain resilience strategies such as electronic procurement, buyer-supplier partnerships, agility and local sourcing have both positive significant and positive insignificant effect in enhancing purchasing performance in the ministry of finance and economic development in Zimbabwe during the Covid-19 period. Therefore, it is recommended that the Procurement Management Unit in the ministry of finance and economic development must implement the supply chain resilience strategies in order to enhance purchasing performance during the Covid-19 period.**

Key words: **supply chain, supply chain resilience, purchasing performance**

I. INTRODUCTION

The Covid-19 pandemic has disrupted supply chains and this caused procurement challenges for organisations in both the public and private sectors. The pandemic disturbed the operations of manufacturing firms and this created serious shortages of supplies of materials and products in overseas and local markets in Africa (Wamba et al, 2020). Countries that rely on supplies of goods and services from overseas markets succumbed to severe shortages of supplies of materials and products because of supply chain disruptions that were caused by the pandemic. Supply chain disruptions were caused by lockdowns and movement restrictions which were implemented to discontinue the further spread of the virus.

In Europe, the Covid-19 pandemic pitilessly affected public procurement activities and processes (Bird and Bird, 2019). For instance, in Denmark, public authorities postponed procurement deadlines as public procurement procedures and processes were affected by the Covid-19 pandemic. Also, procuring entities succumbed to serious shortages of supplies since the Covid-19 pandemic had crippled the business operations of many suppliers. Furthermore, in the United Kingdom, the procurement activities in the public procurement sector were postponed because of shortages of supplier's goods and services on the market (Bird and Bird, 2019). Generally, suppliers throughout the United Kingdom suffered the effects of the Covid-19 pandemic and this caused them to underperform and some to close their businesses. A study by Quinn (2020) in Ireland, stressed some problems the public procurement system has faced because of the Covid-19 pandemic. The study pointed out that the Covid-19 pandemic generally affected the economy and these affected businesses of suppliers causing serious shortages of goods and services on the market. Therefore, it became very difficult and challenging for procuring entities to procure their requirements given the situation. Also, the reliance of the Irish public procurement sector on off-shore production for key medical equipment and drugs suffered significant risks in securing the supplies. This caused shortages of medical services in hospitals that procuring entities were blamed for poor performance.

In Africa, the public procurement sector was not spared from the ravaging supply chain disruptions that were caused by the Covid-19 Pandemic. The closing up of economies, the trade restrictions which were implemented and lockdown measures,

severely disrupted the supply chains and this created shortages of materials, products, medical drugs and services in most countries in African countries (Zeldy, 2020). Moreover, the disruption on global supply chains has disturbed most economies in African that they failed to carry out their socio-economic programmes during the peak of Covid-19 pandemic.

In Zimbabwe, the scourge of Covid-19 disrupted the supply chains, causing shortages of goods and services on the local market and this impelled the government of Zimbabwe to appoint an inter-ministerial taskforce and to commission it to come up with appropriate strategies to manage and monitor the Covid-19 situation. The inter-ministerial taskforce was mandated with the responsibility of mobilising financial resources and the procurement of materials, goods and services in order to manage the situation (Special Audit Report of the Auditor General, 2021). So, the ministry of finance and economic development was tasked with the responsibility of supporting the inter-ministerial task force for the Covid-19 pandemic through providing budgetary support and the procurement of materials, goods and services. However, the Procurement Management Unit (PMU) in the ministry of finance and economic development experienced challenges to secure supplies of procurement requirements from foreign markets because of the Covid-19 pandemic (Mhlanga and Ndhlovu, 2020). Also, the PMU faced the problem of highly priced materials, goods and services on both the local and foreign markets as there were few remaining suppliers who inflated prices as there was no competition. Therefore, it is against this background that the researchers were encouraged to carry out a study on the effects of supply chain resilience strategies on purchasing performance during the Covid-19 period in Zimbabwe specifically in the ministry of finance and economic development.

II. LITERATURE REVIEW

2.1 Purchasing performance

Procurement performance is a measure of identifying the extent to which the procurement function is able to reach the objectives and goals with minimum costs (Van Weele, 2002). An obvious performance measure of the success of any purchasing department in a company, is an element of the overall organisation, which must contribute to the achievement of the corporate goals (Nyeko, 2004). The research will use three performance indicators to measure the purchasing performance (delivery time, materials availability and purchasing costs).

Stock Availability

The Procurement Management Unit in the ministry of finance and economic development must keep sufficient inventories in storage facilities to avoid stock outs in support of user departments. This is supported by Niemann, (2018) who put forward that, companies must protect themselves from supply variability and disruption by keeping adequate inventories and

capacity levels. Therefore, the Procurement Management Unit in the ministry of finance and economic development must be agile enough to ensure that the operations of the ministry and other departments are not negatively affected by the shortage of stock of critical materials and goods during the Covid-19 period.

Delivery Time

During the Covid-19 period, response time is an important aspect of purchasing performance in procuring entities. According to Balcik and Beamon, (2008), the response time is a key purchasing performance indicator on timely deliveries and customer response time. The time in which purchased goods and services are delivered to procuring entities is important. Specifically, the delivery time the most critical measure of purchasing performance. So, in public procurement, particularly in the PMU at the ministry of finance and economic development there are many factors that contribute to the time of receipt of purchased goods and these are, procurement and delivery strategies, supplier location, transportation choice, topology, safety, infrastructure, and politics.

Purchasing costs

Supply chain resilience strategies have a greater impact on purchasing cost. In public procurement in Zimbabwe, one of the most important objectives as prescribed in the public procurement and disposal of public assets act (chap; 22:23) is to ensure that procurement is affected in a cost's effective manner. This all about procuring sustainably with the intent to achieve minimisation of procurement costs. Hill (2000), states that in procurement, cost reduction is important to improve efficiency.

2.2 Supply Chain Resilience

Ates and Bititci (2011) define supply chain resilience as the capacity of an organisation to survive, adapt, and sustain the business in the face of turbulent change. On the other hand, Ponomarov and Holcomb (2009), view supply chain resilience as the adaptive capability of the supply chain to prepare for unexpected events, respond to disruptions, and recover from them by maintaining continuity of operations at the desired level of connectedness and control over structure and function. During the Covid-19 period, the Procurement Management Unit in the ministry of finance and economic development face challenges such as prolonged procurement processes, suppliers failing to meet deadlines, and suppliers charging unbearable prices for goods and services on the market. For the Procurement Management Unit in the ministry of finance and economic development to respond to the needs of user departments, other ministries and the nation, it should be resilient to supply chain disruptions. When the Procurement Management Unit is resilient to supply chain disruptions during the Covid-19 period, governments business will not be interrupted. Therefore, the following strategies are imperative in ensuring that the Procurement Management Unit is resilient to the aforementioned procurement challenges that

emanate from supply chain disruptions during the Covid-19 period:

Agility

Agility refers to the ability to respond promptly to unpredictable changes in demand or supply (Christopher, 2004). Since the outbreak of the Covid-19 pandemic was unforeseen, procuring entities were exposed to supply chain risks as many of them had no response strategies in place. The situation exacerbated by the rapid spread of the pandemic which affected the operations of local suppliers. Lack of agility in the public procurement sector caused serious delays in the receipt of goods and services from suppliers and this affected the business of governments. However, this became an awakening call for Procurement Management Units in procuring entities to identify and put in place some strategies in order to make their procurement agile. This was in line with Esmark, and Holcomb (2015), who stress that organizations must be agile enough in their procurement functions to respond quickly to the needs of their clients.

Buyer-supplier partnership

Buyer-supplier partnership is a supply chain resilience strategy that is used by procuring entities. This strategy provides procuring entities with benefits that include improved quality of purchased products and services, increased flexibility, reduced inventory levels and enhanced procurement and firm's performance. Chen and Palraj (2004) opine that, purchasing functions effectively manage their supply chains through building strategic supplier partnerships. Firms that put effort on creating high quality partnerships with suppliers are better equipped to become accustomed to unforeseen changes, identify and produce solutions to the challenges of the organisation and reduce costs (Ryu et al, 2007).Therefore, this study recognises the importance of the strategic partnership between the PMU in the ministry of finance and economic development during the Covid-19 period as this facilitates the timely delivery of supplies, delivery of quality products and the minimisation of procurement costs.

Electronic Procurement

Electronic procurement is a purchasing strategy that is dependent on a specific information technology that is well thought-out as the contribution side of supply chains and their management (Presutti, 2003). Procurement has evolved from traditional purchasing processes that required the use of numerous documents which resulted in an increase in administrative costs that inflated organizations' operating costs. As technological advancements have occurred, organizations have gradually replaced traditional purchasing processes with electronic procurement. The efficacy of electronic procurement in building resilient supply chains in public procurement during the Covid-19 period is that it bridges the geographical gap between procuring entities and suppliers and thus helps to reduce procurement costs (Vaast and Walsham, 2009). Furthermore, electronic procurement is

a preventative measure against the spread of Covid-19 between procurers and suppliers. However, electronic procurement strategy has risks. Davila et al., (2003) put forward that with electronic procurement there always exist a risk of leak of information since there will be a great amount of exchange of information between a procuring entity and its suppliers. This usually happens where there is lack of integration between a firm and its suppliers and also where there is lack of investment in development of the required system.

Local sourcing

According to the International Living Future Institute (ILFI) (2000), local sourcing as an agile supply chain strategy that is used by many organisations in response to global supply chain disruptions. Local sourcing represents an opportunity for organisations to ensure a quick supply of goods and services while building a more locally based, and reliable source of materials, goods and services. Furthermore, local sourcing involves the art of making purchases of goods and services from sources within a 300-mile radius from a firm's offices as a geographic component of local sourcing. For that reason, procuring entities in the public procurement sector in Zimbabwe can use local sourcing as a supply chain resilience strategy in response to supply chain disruptions that are caused by the Covid-19 pandemic.

Conceptual framework on supply chain resilient strategies and purchasing performance

Subsequent to the above review a conceptual framework was developed to show the relationship between supply chain resilience strategies and purchasing performance;
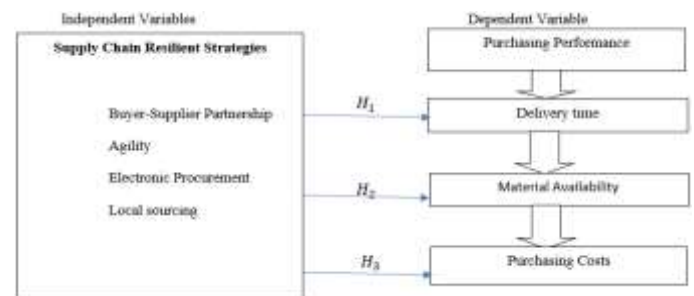

Figure 1. Source: Authors (2022)

2.3 Hypothesis of the study

The following are the hypotheses of the study:

H_1: Supply chain resilient strategies have a negative and insignificant effect on delivery time.

H_2: Supply chain resilient strategies have a negative and insignificant effect on material availability.

H_3: Supply chain resilient strategies have a negative and insignificant effect on purchasing costs.

III. RESEARCH METHODS

A quantitative approach was used to collect quantitative primary data. Questionnaires were self-administered to the

respondents to collect primary data from the targeted respondents. The sample size which was used in this study was drawn from the targeted population of 15 employees working in procurement, finance and administration, and the budgets departments in the ministry of finance and economic development in Zimbabwe. Therefore, a sample size of 14 employees was used for the study. The sample size was determined using the Krejcie and Morgan (1970) model.

Model and Estimation Procedure

The Structural Equation Model (SEM) was used to analyse the structure model and the relationships among exogenous variables, endogenous variables and their indicators. SEM was also used to evaluate the construct validity of the structural model. The bootstrapping method was used to test the level of significance based on standard errors of estimation functions. In this study, Supply Chain Resilience Strategies (SCRS) is the exogenous variable and on the other hand Purchasing Performance (PP) is the endogenous variable. The maximum likelihood (ML) estimation method was used to maximize the likelihood that obtained values of the measurement variables which are SCRS and P.P and their dimensions or items will be correctly predicted. Therefore, the proposed model of the study is as follows:

Figure 2 below shows the Structural Equation Model (SEM) with standardised weights.
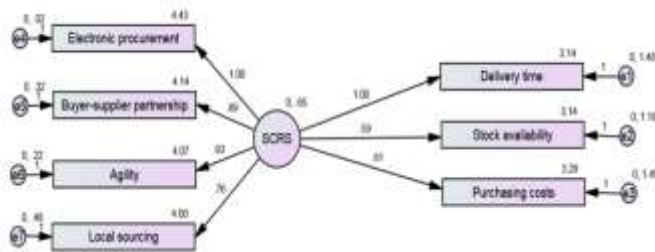

Figure 2. Source: Created by authors (2022)

IV. RESULTS AND DISCUSSION

This section present interprets and discusses the findings of this study. The results show the effects of supply chain resilience on purchasing performance in the ministry of finance and economic development in Zimbabwe during the Covid-19 period.

Table 4.1 Standardized Regression Weights

Parameter			Estimate	Lower	Upper	P
Delivery Time	<---	Supply Chain Resilience Strategies	.553	.233	.795	.010
Stock Availability	<---	Supply Chain Resilience Strategies	.402	-.185	.848	.157
Purchasing Costs	<---	Supply Chain Resilience Strategies	.470	-.280	.729	.157

Source: Primary data (2022)
n = 14

IBM SPSS v 22

The first hypothesis (H_1), states that supply chain resilience strategies have a positive and significant effect on delivery time. The results on table 4.1 above support the hypothesis which is shown by the standardised coefficient with a positive value of 0.553 which is statistically significant at $p < .05$ (0.010). Therefore, the use of supply chain resilience strategies such as electronic procurement, buyer-supplier partnerships, agility and local sourcing is very important to the Procurement Management Unit in the ministry of finance and economic development because they help to improve purchasing performance during the Covid-19 period.

The second hypothesis (H_2), states that that supply chain resilience strategies have a positive and insignificant effect on stock availability. The results on table 4.1 above do not support the hypothesis which is shown by the standardised coefficient with a positive value of 0.402 which is statistically insignificant at $p < .05$ (0.157). Therefore, the results mean that supply chain resilience strategies such as electronic procurement, buyer-supplier partnerships, agility and local sourcing have an insignificant effect in enhancing purchasing performance in the ministry of finance and economic development during the Covid-19 period.

The third hypothesis (H_3), states that that supply chain resilience strategies have a positive and insignificant effect on purchasing costs. The results on table 4.1 above do not support the hypothesis which is shown by the standardised coefficient with a positive value of 0.470 which is statistically insignificant at $p < .05$ (0.157). Therefore, the results mean that supply chain resilience strategies such as electronic procurement, buyer-supplier partnerships, agility and local sourcing have an insignificant effect in enhancing purchasing performance in the ministry of finance and economic development during the Covid-19 period.

V. CONCLUSIONS AND RECOMMENDATIONS

Based on the presentation and discussion of results, it can be concluded that supply chain resilience strategies have both positive significant and positive insignificant effect in enhancing purchasing performance in the ministry of finance and economic development in Zimbabwe during the Covid-19 period. This was shown by the findings of the study that supply chain resilience strategies have a significant positive effect on delivery time and insignificant positive effect on purchasing costs and stock availability in the ministry of finance and economic development during the Covid-19 period. Given this conclusion, it is recommended that the Procurement Management Unit in the ministry of finance and economic development must implement both the supply chain resilience strategies which were used in this study and other supply chain resilience strategies which were not mentioned in this study to enhance purchasing performance during the Covid-19. The PMU must select and implement suitable supply chain resilience strategies to secure products and

services at sustainable prices which minimise procurement costs.

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