

Supply Chain Risks and Organisational Competitiveness in Corporate Timber Manufacturing Companies in Mutare Metropolitan Region, Zimbabwe

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ABSTRACT

The study assessed the effect of supply chain risks and organisational competitiveness in corporate timber manufacturing companies in Mutare metropolitan region, Zimbabwe. The study was guided by the resource-based theory and a positivist philosophy. A cross-sectional descriptive survey was utilized. Data was gathered from respondents using structured questionnaires. Reliability of data was checked using Cronbach's alpha (α). Five Hypotheses were tested using structural equation modelling having satisfied the validity and normality tests. SPSS® version 21 and AMOS® version 21 was used for data analysis. The research found a statistically significant correlation between manufacturing uncertainty, customer failure deliveries, and supplier malperformance on organisational competitiveness. An increase in manufacturing uncertainty, customer failure deliveries, and supplier malperformance negatively affected organisational competitiveness. The analysis also showed that strategic supply partnerships with services or products suppliers improve efficiency and productivity since this brings sustainability and subsequently influencing organisational performance. In order to promote organisational growth, the research suggested that outsourcing distribution function has a

positive influence on organisational performance. It can be concluded that innovation plays a significant role in mitigating the negative impact of supply chain risks on organizational competitiveness. This suggests that organizations should invest in innovation to develop new products, services, and processes that can help them to adapt to supply chain risks and maintain their competitiveness.

KEYWORDS: supply chain risks · organisational competitiveness · supplier malperformance · manufacturing uncertainty

1 INTRODUCTION

To obtain a competitive edge, businesses are also increasingly implementing complex operational strategies such as manufacturing and global sourcing [34]. Higher levels of susceptibility and supply chain risk are caused by the combination of a complex, rapidly changing environment and the sophisticated operational techniques used by businesses. As a result, supply networks as a whole are more affected by unforeseen interruptions that harm enterprises. Examples that are well known include the Philips plant fire in 2000, which had an impact on both Nokia and Ericsson and interrupted their supply chains, and the quadruple catastrophe that hit Japan in 2011, which caused disruptions in supply networks around the world [49]. Modern businesses have worked in a dynamic environment that has changed quickly under constant cost and quality challenges and increasingly rely on intricate webs of supply chain partners to deliver goods and services in the proper quantity at the proper time and location [49,13].

Global supply chains are a result of international trade, and supply chain management (SCM) involves hazards. Susceptibility to SCM has increased, as have hazards, as a result of globalization and trade



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opening. Manufacturing companies incur supply chain costs at the highest financial cost [49]. However, in the finance and insurance sectors, SCM risks are considered nonfinancial hazards in the conventional meaning of risk. Although not all supply chains face the same dangers, some do. Additionally, the dangers are particular to a line of work or a subject of study. The weakest link in a supply network determines how strong the entire chain is. Consequently, the chance of a supply chain failing increases with chain length, as characterized by the number of players. More players within the supply chain system lures more risks. However, creating a strong supply chain is costly [49].

Numerous research articles have suggested the need for such supply chains because of the magnitude of the adverse effects of risk on performance [30,4,40,34]. Supply chain risk management (SCRM) is a systematic and phased approach for recognizing, evaluating, ranking, mitigating, and monitoring potential disruptions in supply chains [4]. SCRM is an important area because of an incident's cascading effects on logistics networks [28]. September 11, the Gulf War, the outbreak of a pandemic (such as bovine spongiform encephalopathy and coronavirus disease 2019, COVID-19), and the millions of years are a few examples of such occurrences. Vulnerabilities in a supply chain depend on the supply chain [34]. In addition, regardless of their size or stage of development, the COVID-19 epidemic has disrupted the workings of most economies [30].

Globalization, shorter product lifecycles, multifaceted networks of trade partners located in many countries, uncertainty in market demands, cost pressures, outsourcing, and offshoring are a few risks in SCM [40]. The complexities of SCM are increasing, and networks are becoming more complex, resulting in more uncertainty in the business environment. These events represent risk events in supply chains that impact the entire supply chain network [40]. A risk event is an indicator of a threat that disrupts a supply chain [33]. Global supply chains face many challenges and greater risks [26, 22,6]. The dependence on an organization for parts has changed to a supply chain [3]. Greater information sharing and transparency among supply chain participants are necessary for this purpose.

Globalization and states' economic interactions with partner countries have impacted global industrial methods. As a result, supply chains are now more complicated and subject to a variety of dangers. Organizations have created warehouse facilities, production plants, and fulfilment centers across countries to achieve cost benefits, access to cheaper raw material sources, or specialist skills and capabilities [15]. In the current era of global supply chains, distribution centers are also referred to as fulfilment centers. The place where client needs are met is called

a fulfilment centre. As a result, these centers must be effective because their effectiveness influences the overall SCM value [27,39].

In the current corporate climate, a supply chain spans the entire world. As a result, this circumstance exposes the supply chain to a completely new set of variables (external variables), which may result in confusion and interruption. This does not, however, imply that there are no internal hazards in the supply chain [15]. Supplier problems, labor disputes, quality issues, and logistical problems increase internal operational risk, each of which requires a distinct level of mitigation [37,7]. Over the past few years, there has been a steady increase in academic research on supply chain hazards [19]. The need to prevent or at least lessen the effects of supply chain disruption and establish a continuously operating supply free from any uncertainty is the main goal of this research on supply chain risk [11]. It is necessary to investigate both proactive and reactive approaches to address the effects of supply chain management practices on organizational performance because this is not always attainable [20, 1].

Supply chains are becoming more susceptible to disruptions as a result of trends in supply chain management, increasing the role of risk and disruption management [25]. Without it, a supply chain's susceptibility could result in more interruptions, higher costs, and an inability to satisfy customer demand [52]. Risks often do not occur on their own; instead, they frequently occur in tandem with other risks, and when this happens, the supply chain as a whole and organizational competitiveness are affected [54]. As a result, the study's knowledge gap is defined as an imperfect grasp of the impact of supply chain risk on organizational competitiveness.

The study is vitally seen as a portfolio of decisions, acknowledging that supply chain decision-makers must handle a variety of risk interactions with the full supply chain network at once. The majority of earlier research has been devoted to examining how supply chain risk affects organizational performance, and it has largely ignored nonfinancial performance indicators such as agility, shared vision, and customer satisfaction in favour of focusing only on financial performance indicators of firm performance. The ability to analyse the influence of supply chain risk on other performance components, such as nonfinancial performance indicators, is constrained by this limited conception of business performance. To avoid serially addressing individual dyadic supply chain risk interfaces, this study focuses on portfolio interface supply chain risks. The study aims to further contribute to closing the knowledge gap while also enhancing the higher education sector's service delivery system. In light of this, this study adds to the body of knowledge

about supply chains by analysing how supply chain risk affects organizational competitiveness.

The wood manufacturing sector in Zimbabwe has experienced major growth in the postindependence era, making it one of the soundest foreign income earners with exports to China, the United Kingdom, Japan, Italy, Germany, South Africa, Egypt, the SADC and COMESA regions [13]. The players in the industry face competition from local players and those from other lumbering nations. The number of Zimbabwean exports of global wooden products was US\$3,1 million, which was 18% growth from US\$2,6 million, which was recorded in 2017. In addition to exporting wooden products, the industry also serves local buildings, constructions, furniture, domestic industries and allied industries.

Timber manufacturers are characterized by companies that use wood to manufacture doors, blockboards, supatex and chair seats and backs. These companies are the largest producers of doors in Zimbabwe, and they run a number of departments to increase the efficiency of the core business; as such, their supply chain management practices need to be improved. The industry's mission is to ensure the positive success of local and regional customers through the integration of suppliers and other strategic business partners. The industry's supply chain has faced a number of challenges in recent years due to global changes in technology and supply chain management dynamics. Therefore, organizations seek to improve supply chain management practices (strategic supplier partnerships, outsourcing and information communication technology (ICT)) and organizational performance in timber manufacturing firms [8, 2]. In return, this study addressed the following research questions:

- i. What is the effect of manufacturing uncertainty on organisational competitiveness?
- ii. What is the effect of customer failure deliveries on organisational competitiveness?
- iii. What is the influence of supplier malperformance on organisational competitiveness?
- iv. How does innovation moderate the effect of supply chain risk on organisational competitiveness?

2 LITERATURE REVIEW, HYPOTHESIS AND MODEL DEVELOPMENT

This section provides a literature review, hypotheses and their development.

2.1 Supply chain management risk

Several different sources of uncertainty, which create an uncertain business environment for firms, have been recognized in the supply chain management (SCM) literature. [55, 18] proposed three main sources of supply chain uncertainty, namely, demand, supply and technology. The supply chain network consists of trade-offs interrelated with monetary, information, and material flows. Since 2000, many supply chain disruptions, such as terrorist attacks, fuel protests, and disease outbreaks, have occurred [10]. The risk is the probability of differences in expected outcomes. One can assign probabilities to various outcomes and calculate risk. However, uncertainty cannot be quantified. Risk means that there is uncertainty about an outcome. Consequently, uncertainty describes a risk that might not be mitigated. However, with careful evaluation and preparation, these uncertainties can be reduced [5].

Understanding supply chain risk has benefited from a wide range of theoretical viewpoints. For example, [45] defines supply chain risk as potential deviations from the initial overall objective that, consequently, trigger a decrease in value-added activities at different levels. Supply chain risk can also be broadly categorized into disruption risk and operational risk [14]. While disruption risks are linked to circumstances such as natural calamities, terrorist attacks and labor strikes, operational risks are caused by high uncertainty and a lack of coordination between supply and demand [44]. Operational risk is also referred to as internal supply chain risk [5]. According to a Deloitte industry report, the supply chain risks of "high-tech industrial products and diversified manufacturing industries" have increased in cost as a result of the complexity of their supply chains and fast shifting consumer demand [14].

2.2 Organization Competitiveness

According to [40], competitiveness refers to how well-positioned a region's businesses are to compete with those found elsewhere. The elements that influence how productive a region is in comparison to other locations are crucial for competitiveness. [9] alludes that competitiveness is the set of institutions, policies, and factors that determine the level of productivity of a country.

Firm-level competition refers to the rivalry between businesses in various industries or sectors, such as agriculture. The goal is to increase a company's productivity at a local level, such as a city, region, or

country, to increase productivity in that area. According to [9], competitiveness is a gauge of an economy's capacity to sustainably offer its population both high and rising standards of living and high rates of employment. Productivity growth and competitiveness are largely fuelled by intense competition in a climate that is favourable for businesses [38].

2.3 THEORIES UNDERPINNING THE STUDY

The study is grounded in the theory of constraints and resource-based theory. The research used the theory of constraints to discuss the relationship between the influences of supply chain management practices on organizational performance. The theory of constraints was proposed by Goldratt in 1984 to help explain the concept of how organizations are supposedly managed. The theory of constraints (TOC) posits that every manageable system is limited in achieving most of its objectives by a very small number of constraints. In organization management, a single constraint always exists, and the TOC uses a focusing process to recognize the constraint to streamline the organization around it. In the context of this research outsourcing, strategic partnerships with suppliers and adoption of ICT entail the utilization of these practices by company executives to develop decisions that enhance competitive advantages for their organizations for analysing business behaviour and competitive strategy. According to the RBV, the significant constituents of long-term competitive advantage for businesses are their distinctive resources and abilities.

2.4 HYPOTHESIS DEVELOPMENT

Supply risk, on the other hand, is defined as the probable failure in the supply of goods in terms of "time, quality and quantity", resulting in incomplete orders [16]. The unpredictable market response to innovations increases the risk of shortfalls or excess supplies [41]. Furthermore, owing to rapid swings in the demand and supply characteristics of products, the possibility of losses due to the delivery of wrong products or the delivery of right products, but at the wrong time, is very high [42]. In addition, as the uncertainty in the volume or mix requirements of an order increases, suppliers' ability to deliver on time and in the right quality decreases [16]. On the basis of the above arguments, the following hypothesis is posited:

H₁ Establish the effect of manufacturing uncertainty on organisational competitiveness

The level of predictability or variability in the manufacturing process is referred to as manufacturing uncertainty [17]. This unpredictability may be caused by variables such as shifts in demand, obstructions in the supply chain, malfunctions of the machinery, and variations in the quality of the raw materials. Manufacturing uncertainty can have both good and negative effects on an organization's ability to compete. On the one hand, manufacturing uncertainty might

offer businesses the chance to set themselves apart from rivals by creating adaptable and flexible manufacturing procedures. For example, a business may be able to outperform rivals who react more slowly to market changes if it can swiftly and effectively adapt output to suit changing client demands [50].

On the other hand, manufacturing uncertainty can also increase costs and decrease productivity, which hurts a company's ability to compete. For example, unanticipated equipment failures or supply chain interruptions can result in production delays and higher costs, which lower a company's capacity to produce goods on schedule and at a reasonable cost [50]. Organizations must take measures to reduce risk and increase agility if they are to successfully manage unpredictability in manufacturing and maintain or improve competitiveness. These tactics can include diversifying the supply chain to lessen reliance on any one supplier or location, investing in technology and automation to increase efficiency and lower the risk of human error, and creating contingency plans to address any interruptions. Lean manufacturing principles can also be implemented by businesses to reduce waste and enhance responsiveness to consumer demand [51]. Manufacturing uncertainty has a complex relationship with organizational competitiveness, which is influenced by several variables. While there may be potential for distinctiveness and competitive advantage, uncertainty can also lead to higher expenses and lower efficiency. By creating flexible and adaptive manufacturing processes, investing in technology and automation, diversifying their supply chain, and implementing lean manufacturing concepts, businesses can preserve or increase their competitiveness [51].

H₂ Determine the effect of customer failure deliveries on organisational competitiveness

Customer delivery failures occur when a business fails to deliver a good or service to a client on schedule, in the desired condition, or with the desired level of quality [42]. Such mistakes can significantly harm an organization's ability to compete. Losing the trust and loyalty of customers is one of the main consequences of poor customer delivery [50]. Customers may be less likely to do business with a company in the future if they are dissatisfied by a delivery failure, which could result in a loss of market share and decreased revenue. Additionally, bad word-of-mouth publicity from dissatisfied consumers can harm a business's credibility and reputation, making it more challenging to draw in new clients and keep hold of current ones [50].

Failures in customer delivery can increase costs for the company in addition to reducing customer trust and loyalty [16]. These expenses may include the price of exchanging or fixing faulty or damaged goods, the price of rushing shipments to compensate for delays, and the price of compensating or refunding dissatisfied clients

[42]. These expenses may decrease a company's ability to invest in expansion and innovation while also eroding profit margins [17]. Businesses should prioritize supply chain management and delivery process investments to lessen the negative effects of customer delivery failure. This can involve making technology investments to increase shipping monitoring and visibility, enhancing inventory management to decrease stockouts, and putting in place quality control methods to guarantee that goods live up to consumer expectations. Companies should also make investments in customer care and communication channels to proactively handle any delivery issues and give customers quick updates [42].

H₃ Evaluate the effect of demand and supply uncertainty on organisational competitiveness

[32] postulates that uncertainty in the supply and demand of a good or service can significantly affect an organization's competitiveness. While supply uncertainty relates to the unpredictability of the availability and quality of the raw materials, components, or completed items required to generate a good or service, demand uncertainty refers to the unpredictability of client demand for a good or service [21]. Uncertainty in demand and supply can have either a good or negative effect on an organization's ability to compete. On the plus side, uncertainty can give businesses the chance to set themselves apart from rivals by creating flexible and adaptable production methods. For example, a business may be able to acquire a competitive edge over rivals who react to market changes more slowly if it can swiftly and effectively adapt output to suit shifting demand or supply restrictions [47].

Uncertainty in demand and supply, however, can also increase costs and reduce productivity, which can negatively affect a company's ability to compete [47]. For example, unanticipated shifts in demand could lead to overproduction or stockouts, which would result in excess inventory or missed revenues. Like manufacturing delays, increased prices, or decreased product quality, supply chain disruptions can harm consumer happiness and loyalty. Organizations can employ a number of measures to lessen the negative consequences of demand and supply uncertainty [47]. To increase demand forecasting and supply chain visibility, one strategy is to make investments in technology and data analytics. This can aid businesses in better anticipating shifts in supply and demand and adjusting output as necessary. Another strategy is to create backup plans and risk management plans to address probable supply chain disruptions, such as varying suppliers or increasing safety stock levels [24].

Additionally, businesses can apply the concepts of lean manufacturing to reduce waste and increase responsiveness to customer demand [41]. By doing so, they can increase their capacity to swiftly alter

production levels and satisfy altering client demands, as well as cut costs and boost efficiency. Uncertainty in demand and supply has a complicated effect on an organization's ability to compete. Even though it can foster chances for differentiation and competitive advantage, uncertainty can also drive up costs and decrease productivity. Organizations must use methods to manage risk and increase agility, such as investing in technology, creating contingency plans, and using lean manufacturing concepts, to successfully navigate demand and supply unpredictability and retain or improve competitiveness [41].

H₄ Establishing the influence of supplier malperformance on organisational competitiveness

When a supplier falls short of a buying organization's expectations for quality, delivery, or pricing, this is referred to as supplier malperformance. Supplier underperformance can have a large and complex effect on an organization's ability to compete [32]. A decline in the quality of the goods or services the purchasing organization offers is one of the main effects of supplier underperformance. The final product or service might not satisfy the desired quality requirements if a supplier does not provide high-quality inputs. Customer unhappiness, unfavourable reviews, and decreased revenue may result from this, which may hurt the organization's ability to compete. Additionally, the expense of fixing quality problems, such as product recalls or replacements, can be high and have a detrimental effect on profitability [32].

Delivery reliability decreases as a result of poor supplier performance [46]. The buying organization may encounter production delays or stockouts as a result of a supplier's late delivery of inputs, which can lead to lost sales, decreased customer satisfaction, and increased costs. As a result, the company may be less able to meet client demand and adjust to market changes, which could hurt its competitiveness [42]. Supplier underperformance can affect cost competitiveness in addition to quality and delivery difficulties. When a supplier does not deliver inputs at the anticipated price, the purchasing organization might have to pay more for the same inputs, diminishing its profit margins and making it less competitive against rivals who can provide equivalent goods or services at a cheaper price [41].

H₅ To test the moderating effect of innovation on the effect of supply chain risk on organisational competitiveness

To test the moderating effect of innovation on the effect of supply chain risk on organizational competitiveness, a statistical analysis can be conducted. Timber manufacturing firms that were successful in adapting their practices to incorporate new innovative technologies managed to have an increased output compared with those who were not acquainted with

the use of innovations such as training and the use of high-tech imports in timber manufacturing supply chains [13]. [36] further revealed that the extent of innovation in information sharing significantly affects organizational competitiveness since it lowers production costs by increasing the efficiency of work execution by manufacturing organizations. Innovation in information technology enables firms to share quality information, which is accurate and delivered in a timely manner, improving credibility and information availability, which is a strategic asset that improves decision making and the overall competitiveness of an organization [36].

This research focuses exclusively on operational risk in supply chains for the purposes of our study. Figure 1

illustrates a conceptual framework for the relationships among environmental uncertainty, different aspects of supply network flexibility, and supply chain risk. In the following subsections, the relationships between these components, as shown in the framework, are covered in more detail, followed by matching assumptions. The study identified five constructs, namely, manufacturing uncertainty, customer failure deliveries, demand and supply uncertainty, supplier malperformance cost and innovation. Finally, innovation (IN) factors moderate the indirect relationship between supply chain risk (SCR) and organizational competitiveness (OC). On the basis of these constructs, the study hypothesized relationships and formulated a conceptual framework, as shown in Figure 1.

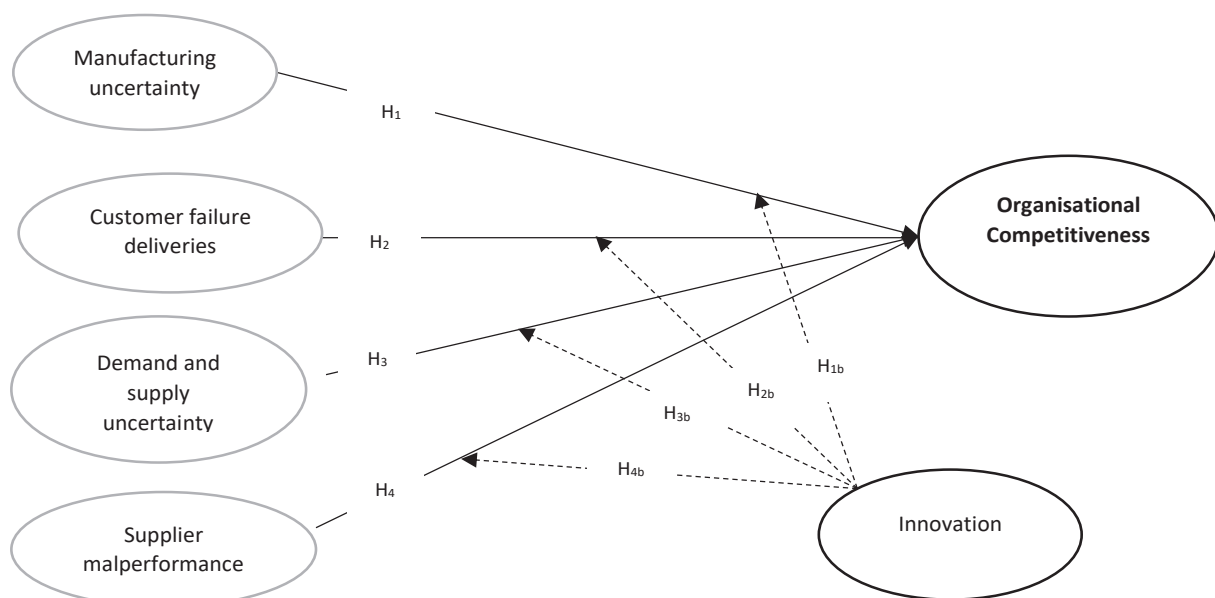


Fig. 1. Relationships among manufacturing uncertainty, customer failure deliveries, demand and supply uncertainty, supplier malperformance and innovation

Source: (Researchers., 2023)

3 RESEARCH METHODOLOGY

The positivist research philosophy was applied to the study since it takes objectivity into account and has the ability to support or refute hypotheses (Ryan, 2018). The positivist approach was also used to test the study's null hypothesis and to confirm the association between the dependent variable of organizational performance and the independent variable of supply chain management practices. A descriptive research design was used for the study, and 120 employees from the timber manufacturing industries composed the study's target population, which was obtained from internal documents for the firms under study. The production, procurement, logistics, warehousing and financial staff members who are involved in

supply chain management were chosen as the study respondents. A sample size of 93 respondents, or 78% of the study population, was used by the researchers. A simplified formula to calculate the sample size was used, as provided by Yamane (1967). The researcher adopted stratified random sampling to obtain the desired representative sample of existing employees. A self-administered questionnaire was used to collect data from the major primary source. The questionnaire had closed- and open-ended questions. The compiled data were coded before being put into the Statistical Package for Social Sciences (SPSS) version 23 to ensure accurate input of research responses. Cronbach's alpha (α) was used to assess reliability. Before the hypotheses were tested, the data were verified via exploratory factor analysis (EFA), convergent validity, and discriminant

validity. Hypotheses were tested via structural equation modelling with satisfactory validity and normality tests, and the data were analysed via SPSS® version 21 and AMOS® version 21.

4 RESULTS

Prior to performing exploratory factor analysis, the viability of the data for factor analysis was assessed via Bartlett’s test of sphericity and the Kaiser Meyer Olkin measure of sampling adequacy (KMO) in SPSS Version 20. To assess the sample’s suitability, a KMO measure of sampling adequacy was applied. The KMO statistic has a range of 0--1, with 0 denoting that the sample is completely inadequate and 1 denoting that it is completely adequate. For the sample to be sufficient, Kaiser recommended that the measurement be at least 0.5. To check whether the data could be used for factor analysis, Bartlett’s test of sphericity was employed. Field (2009) recommended that Bartlett’s test of sphericity should be significant at $p < 0.05$ for factor analysis to be performed. Table 1 presents the results obtained (KMO = .948, Approx. Chi-square = 20385.878, degrees of freedom [DF] = 595; $p < 0.001$) and indicates that the sample was suitable and allowed exploratory factor analysis to be performed, as recommended by Field (2009). To prevent results from being duplicated in subsequent studies, exploratory factor analysis was used to limit and condense the number of linked variables to a manageable and pertinent amount. To make factor findings easier to read, the factor rotation approach was applied. The analysis of factors was simplified via the varimax method, as it maximizes the total sum of variables of the squared loadings, which are squared correlations between variables and factors.

Table 1: KMO and Bartlett’s tests

| KMO and Bartlett’s Test | | |
|--|--------------------|----------|
| Kaiser–Meyer–Olkin Measure of Sampling Adequacy. | | .575 |
| Bartlett’s Test of Sphericity | Approx. Chi-Square | 2750.815 |
| | Df | 666 |
| | Sig. | .000 |

Source: Research data (2023)

Table 2 displays the factor loadings for each factor. Factors with loadings of less than 0.6 were suppressed; therefore, they were not included. [53] recommended the consideration of loadings above 0.6 to make understanding much easier. As a consequence, the results in Table 2 met the minimum cut-off limit for factor loadings [53]. Reliability is the degree to which

results attained by a measurement procedure may be replicated and produce similar results on repetitive trials. The internal consistency of each construct was evaluated via Cronbach’s alpha (α). The reliabilities of the study’s constructs are depicted in Table 2. Table 2 shows that all the constructs had a Cronbach’s alpha (α) of more than 0.6, as recommended [53].

Table 2: Construct, number of items and Cronbach’s α

| Construct | Number of Items | Cronbach’s alpha (α) |
|-------------------------------------|-----------------|-------------------------------|
| Manufacturing uncertainty (MU) | 6 | .839 |
| Customer failure deliveries (CFD) | 6 | .727 |
| Demand and supply uncertainty (DSU) | 6 | .788 |
| Supplier malperformance (SM) | 5 | .846 |
| Innovation (IAC) | 6 | .716 |

Source: Research data (2023)

To ensure that no construct was correlated with other ideas, the researcher used convergent analysis. A measurement model was initially evaluated to ensure that it was suitable for testing before convergent validity was determined. Maximum likelihood estimation (MLE) was used to estimate the measurement model to acquire better estimates of the CMIN/DF (χ^2/Df), goodness-of-fit index (GFI), adjusted GFI (AGFI), normed fit index (NFI), Tucker–Lewis index (TLI), comparative fit index (CFI) and root mean square error of approximation (RMSEA) were used to determine the measurement model fit indices. CMIN/DF = 4.619; GFI = 0.899; AGFI = 0.871; NFI = 0.939; TLI = 0.944; CFI = 0.952; and RMSEA = 0.071 were the proper model fit indices reported by the measurement model. A decent model, according to [53], should have a χ^2/DF between the scales of 0 and 5, with smaller values suggesting a better match. [53] suggested that values for GFI, AGFI, NFI, TLI and CFI specify a good fit when they are closer to 1, and RMSEA must be between 0.05 and 0.10 for it to be satisfactory.

5 HYPOTHESES TESTING

The structural equation modelling technique was used to investigate the hypothesized associations (H1, H2, H3, H4, and H5) in AMOS version 21. Supply chain risk was considered a second-order construct. The structural model was estimated via maximum likelihood estimation (MLE). The structural equation

modelling technique is appropriate since it may identify associations as well as recommend a general match between observed data and the research model [53]. The structural model revealed acceptable model fit indices. (CMIN//DF = 4.619; GFI = .899; AGFI = .871; NFI = .939; TLI = .944; CFI = .952 and RMSEA = .071). Table 3 shows the results of the hypotheses tests.

Table 3: Results of hypothesis testing (H₁, H₂, H₃ and H₄)

| Hypotheses | Hypothesized Relationship | SRW | CR | Remark |
|----------------|--|------|-----------|-----------|
| H ₁ | Manufacturing uncertainty → Organisational Competitiveness | .329 | 19.056*** | Supported |
| H ₂ | Customer failure deliveries → Organisational Competitiveness | .207 | 2.685*** | Supported |
| H ₃ | Demand and supply uncertainty → Organisational Competitiveness | .227 | 3.959*** | Supported |
| H ₄ | Customer failure deliveries → Organisational Competitiveness | .301 | 10.739*** | Supported |

Notes: SRW standardized regression weight, CR critical ratio, ** significant at p < 0.05, *** significant at p < 0.001, Source: Research data (2023)

Table 3 shows that H₁, H₂, H₃, and H₄ were supported. This implies that manufacturing uncertainty (MU), customer failure deliveries (CFD), demand and supply uncertainty (DSU) and supplier malperformance (SM) have a direct influence on organisational competitiveness.

5.1 Results for the moderating effect of innovation

H5: Innovation plays a moderating role in the effect of supply chain risk on organisational competitiveness.

Moderated regression analysis was used to test H₅. The results are summarized in Table 4.

Table 4: Coefficients of the moderated regression results

| Variable | Beta | t-statistic | p value |
|--------------------------------|------|-------------|---------|
| Supply chain risk | .113 | 2.391 | .000 |
| Innovation | .035 | 2.115 | .000 |
| Supply chain risk × Innovation | .108 | 2.009 | .000 |

Note: ***Significant at p<0.001
Source: Research data (2024)

The results in Table 4 show that the coefficients for the interaction terms (supply chain risk × innovation) were insignificant (p>0.000). This suggests that innovation moderates the effect of supply chain risk on organisational competitiveness. Therefore, H₅ was supported. A sample t test was considered relevant to test the research hypotheses that were put

forward at the study inception at a significance level of 95% and a confidence level of 0.05. The results of the moderating analysis indicate that innovation significantly moderates the relationship between supply chain risk and organizational competitiveness. It can be concluded that innovation plays a significant role in mitigating the negative impact of supply chain risk on organizational competitiveness. This suggests that organizations should invest in innovation to develop new products, services, and processes that can help them adapt to supply chain risks and maintain their competitiveness. The extracted factor does not have an effect on the propositions. The results of the analysis are shown in Table 5 below.

Table 5: One Sample Test

| One-Sample Test | | | | |
|-------------------------------|----------------|----|-----------------|-----------------|
| | Test Value = 0 | | | |
| | t | Df | Sig. (2-tailed) | Mean Difference |
| Manufacturing uncertainty | 25.865 | 81 | .000 | 3.110 |
| Customer failure deliveries | 22.326 | 81 | .000 | 2.720 |
| Demand and supply uncertainty | 23.412 | 81 | .000 | 2.866 |
| Supplier malperformance | 23.312 | 81 | .000 | 2.690 |

Table 5 shows a single sample, which proves that manufacturing uncertainty is very high, as shown by

the values ($t=25.865$; $p=.000$). A greater t value and $p<0.05$ indicate that the variable has a positive influence on the competitiveness of timber manufacturing firms. The respondents confirmed that the level of uncertainty in the manufacturing of goods at these organisations is very high.

The findings of this study were substantiated by [22], who posited that organisational competitiveness relies on its potential to mitigate supply chain risk. The study findings establish that organizations must put measures to reduce risk and increase agility if they are to successfully manage manufacturing unpredictability and maintain or improve competitiveness. This finding aligns with that of [51], who posited that, by creating flexible and adaptive manufacturing processes, investing in technology and automation, diversifying their supply chain, and implementing lean manufacturing concepts, businesses can preserve or increase their competitiveness. These tactics can include diversifying the supply chain to lessen reliance on any one supplier or location, investing in technology and automation to increase efficiency and lower the risk of human error, and creating contingency plans to address any interruptions. Supplying chain risk management practices influences the organisational competitiveness of timber manufacturing firms.

The study revealed that supplier underperformance can have a large and complex effect on an organization's ability to compete. Customers may be less likely to do business with a company in the future if they are dissatisfied by a delivery failure, which could result in a loss of market share and decreased revenue. In line with our observed results, prior research, such as [50], has indicated that bad word-of-mouth publicity from dissatisfied consumers can harm a business's credibility and reputation, making it more challenging to draw in new clients and keep hold of current ones. Additionally, failures in customer delivery can increase costs for the company in addition to reducing customer trust and loyalty [16]. The study revealed that supplier underperformance can affect cost competitiveness in addition to quality and delivery difficulties. The findings are in agreement with those of [23], who stated that delivery reliability decreases as a result of supplier malperformance. This finding concurs with the results of [41], who posit that when a supplier does not deliver inputs at the anticipated price, the purchasing organization might have to pay more for the same inputs, diminishing its profit margins and making it less competitive against rivals who can provide equivalent goods or services at a cheaper price. The buying organization may encounter production delays or stockouts as a result of a supplier's late delivery of inputs, which can lead to lost sales, decreased customer satisfaction, and increased costs [46].

The study concluded that innovation plays a significant role in mitigating the negative impact of supply chain risk on organizational competitiveness. This finding is consistent with the empirical findings of [36], who further revealed that the extent of innovation in information sharing significantly affects organizational competitiveness since it lowers production costs by increasing the efficiency of work execution by manufacturing organizations. Innovation in information technology enables firms to share quality information, which is accurate and delivered in a timely manner, improving credibility and information availability, which is a strategic asset that improves decision making and the overall competitiveness of an organization [36].

6 CONCLUSIONS

Establish the effect of manufacturing uncertainty on organisational competitiveness

After analysing the effect of manufacturing uncertainty on organisational competitiveness, we can say that manufacturing uncertainty has a complex relationship with organisational competitiveness that is influenced by a number of variables. While there may be potential for distinctiveness and competitive advantage, manufacturing uncertainty can also lead to higher expenses and lower efficiency. It is appropriate to mention that manufacturing industries must comprehend the causal relationships between situations of manufacturing uncertainty by creating flexible and adaptive manufacturing processes, investing in technology and automation, diversifying their supply chain, and implementing lean manufacturing concepts. This can lead businesses to preserve and increase their competitiveness.

Determine the effect of customer failure deliveries on organisational competitiveness

The research findings revealed that, failures in customer delivery can increase costs for the company in addition to reducing customer trust and loyalty. The study revealed that businesses should prioritize supply chain management and delivery process investments to lessen the negative effects of customer delivery failure. This can involve making technology investments to increase shipping monitoring and visibility, enhancing inventory management to decrease stockouts, and putting in place quality control methods to guarantee that goods live up to consumer expectations.

Evaluate the effect of demand and supply uncertainty on organisational competitiveness

Notably, uncertainty in demand and supply can have either a good or negative effect on an organization's ability to compete. On the plus side, uncertainty can

give businesses the chance to set themselves apart from rivals by creating flexible and adaptable production methods. To increase demand forecasting and supply chain visibility, one strategy is to make investments in technology and data analytics. This can aid businesses in better anticipating shifts in supply and demand and adjusting output as necessary. Organizations must use methods to manage risk and increase agility, such as investing in technology, creating contingency plans, and using lean manufacturing concepts, to successfully navigate demand and supply unpredictability and retain or improve competitiveness.

Establishing the influence of supplier malperformance on organisational competitiveness

The study established that supplier underperformance can affect cost competitiveness in addition to quality and delivery difficulties. When a supplier does not deliver inputs at the anticipated price, the purchasing organization might have to pay more for the same inputs, diminishing its profit margins and making it less competitive against rivals who can provide equivalent goods or services at a cheaper price. The impact of supplier underperformance on organizational competitiveness can be large and multifaceted. Supplier underperformance may have a major impact on an organization's competitiveness across a variety of aspects, including operational efficiency and strategic positioning. Poor quality supplies can cause faults in goods, leading in more rework, waste, and customer discontent. Consistently low-quality inputs can harm a company's reputation, reducing customer loyalty and market share. Supplier underperformance can create delays in manufacturing schedules, resulting in missed deadlines and lost sales opportunities. Companies may need to invest in alternative suppliers or spend additional logistical expenditures to avoid interruptions. To avoid these risks, firms should prioritize cultivating good supplier relationships, executing rigorous supplier assessment procedures, and developing contingency plans for unexpected interruptions.

The moderating effect of innovation on the effect of supply chain risk on organisational competitiveness

The study confirmed that, timber manufacturing firms that were successful in adapting their practices to incorporate new innovative technologies managed to have an increased output than those who were not acquainted with the use of innovations such as training and the use of high-tech imports in timber manufacturing supply chains. These firms should invest highly in timber manufacturing through the adoption and introduction of new and modern technology and the creation of a ready market. The study confirms that innovation has a positive influence on organisational competitiveness. Innovation significantly supports the performance of manufacturing firms through integrating the functions of supply chain members. Innovation significantly affects organizational competitiveness

since it lowers production costs by increasing the efficiency of work execution by manufacturing organisations. Innovation enables firms to share quality information, which is accurate and delivered in a timely manner, which improves credibility, and innovation through information availability is also considered a strategic asset that improves the decision-making and overall competitiveness of an organization.

IMPLICATIONS FOR FUTURE RESEARCH

While this study examined the link between supply chain risk and organizational competitiveness, there is little research that delves deeper into the exact pathways or tactics by which supply chain risk management practices convert into increased organizational competitiveness. This research gap highlights the need for additional research into the mediating elements or mechanisms that can connect successful supply chain risk management to increased organizational competitiveness. Future research could explore how risk mitigation strategies, such as redundancy in supplier networks, real-time information sharing, or collaborative relationships, directly improve various aspects of organizational competitiveness, such as cost efficiency, customer responsiveness, product innovation, and market agility. The literature on supply chain management recognizes the importance of supply chain risk and its impact on organizational competitiveness. Numerous studies have investigated the identification, assessment, and mitigation of various supply chain risks, including disruptions, delays, and quality difficulties. However, there is a gap in the understanding of the exact processes by which good supply chain risk management can directly improve organizational competitiveness.

CONTRIBUTIONS TO THEORY AND PRACTICE

This study investigates the major supply chain risk variables that influence the competitiveness of timber manufacturing enterprises. This study contributes to the theoretical understanding of supply chain risk management by evaluating the specific hazards that these organizations confront and how they affect organizational competitiveness. This study provides insights into the link between supply chain risk and organizational competitiveness, allowing for a better understanding of the significant risks that these organizations face. This knowledge may help influence risk management strategies and decisions and provide practical advice for successful risk management. The report underlines the value of proactive supply chain risk management in the timber manufacturing

industry, urging businesses to engage in risk reduction techniques.

CONFLICT OF INTEREST

The authors declare that they have no conflicts of interest.

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