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# Role of Supply Chain Risk Management on Performance of Private Organizations: A Case of MTN Rwanda

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## Abstract

The purpose of this study was to examine the role of supply chain risk management on performance of private organizations (2017-2022). Despite this, the performance of MTN Rwanda as a private company remains critical and ineffective due to inappropriate supply chain risk management through risk identification; risk measurement and assessment; risk mitigation; risk reporting and monitoring. In conducting this research, four objectives were focused on the role of supply chain risk identification on performance of MTN Rwanda, the role of supply chain risk measurement and assessment on performance of MTN Rwanda, the role of supply chain risk mitigation on performance of MTN Rwanda and lastly the role of supply chain risk reporting and monitoring on performance of MTN Rwanda. To achieve these objectives, literature was reviewed on the subject matter including definitions of key concepts, conceptual review, theoretical framework, conceptual framework and research gap analysis, additionally the study population was 300 employees of MTN Rwanda, and out of them a sample size of 171 respondents was purposively selected. Questionnaire, interview guide and documentation were used as tools of data collection. Furthermore, the data was analyzed by using descriptive statistics. Findings indicated that holding all the supply chain risk management on MNT Rwanda's performance will be -.769 percent, a unit increase in the use of Supply chain risk identification would lead to increase in MTN Rwanda's performance by 42.3%, a one percent increase in the use of supply chain risk measurement and assessment would lead to an increase MTN Rwanda's performance by 23.1%, a one percent increase in the use of supply chain risk mitigation would lead to an increase MTN Rwanda's performance by 103.8%, and lastly a one percentage increase in the use of supply chain risk reporting and monitoring would lead to 3.8% increase of MTN Rwanda's performance. Overall, the supply chain risk mitigation had the greatest effect on MNT Rwanda's performance, followed by supply chain risk identification, supply chain risk measurement and assessment and lastly supply chain risk reporting and monitoring. At 5% level of significance and 95% level of confidence, supply chain risk mitigation at 1.038 level of significance; supply chain risk identification had a 0.423 level of significance, supply chain risk measurement and assessment had a 0.231 level of significance, while Supply chain risk reporting and monitoring had a 0.038 level of significance. All the variables were significant ( $p < 0.05$ ). The study concluded that implementing a global supply chain risk management strategy can help companies operate more efficiently, reduce costs, and improve customer service. Therefore, with reference to MTN Rwanda, the study concludes that there is a positive relationship between supply chain

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risk management and performance of private organizations. The researcher in line with the findings and objectives of the study made the following suggestion that MTN Rwanda should continuously develop supply chain risk management policies and frameworks to enable employees to identify, assess, address, control and evaluate risks faced by the company.

**Key words:** *Supply chain, risk management, performance, private organization, MTN Rwanda.*

## 1. Introduction

Implement supply chain daily and abnormal risk management strategies based on ongoing risk assessment to reduce vulnerabilities and ensure continuity is a strategic management function within an organization that affects business performance. Areas to focus on when managing supply chain risks include the business environment, customers, products and services, and suppliers (Afriz *et al.*, 2021). Founded in 1994, MTN Group is a leading mobile phone company in emerging markets that is at the forefront of global technological change (Exauce-Cherelle, 2017). MTN has invested heavily in an advanced communications network that connects above 203 million clients in twenty-two countries across Africa continents and the Middle East region. However, the performance of MTN Rwanda in terms of sales performance, financial performance, and market expansion in Rwanda remains significant and ineffective due to poor supply risk management practices. Furthermore, the company in recent years has faced potential financial losses, high competition, and disruptions that occur when it works with third-party organizations, particularly suppliers. For example, MTN Group operates all over the world, but its decisions are always taken centrally and do not fully take into account the internal decisions of the countries in which the company operates.

Additionally, some customers in Rwanda are now claiming that the high cost of internet services and limited call advertising on other websites are issues that should be dealt with and addressed centrally by MTN Group rather than MTN Rwanda, additionally there is inadequate comprehensive understanding of the role of SCRM in private organizations. Although SCRM practices are widely discussed in the literature, there is a need to examine the specific challenges, benefits, and outcomes of implementing SCRM in private organizations. Furthermore, there is limited empirical research assessing the impact of SCRM on operational efficiency, risk reduction, and overall business performance in the private sector. This study therefore aims to fill these gaps and shed light on the role of SCRM in private organizations by providing insights and recommendations for organizations wishing to improve their risk management capabilities and achieve sustainable business performance. Therefore, the researcher needed to fill this gap by determining the role of supply chain risk management on the performance of private organizations by referring to MTN Rwanda as a private company.

### 1.1. Study Objectives

The general objective of this research was to examine the role of supply chain risk management on performance of private organizations.

Specific objectives:

- i. To examine the role of supply chain risk identification on performance of MTN Rwanda.
- ii. To assess the role of supply chain risk measurement and assessment on performance of MTN Rwanda.
- iii. To determine the role of supply chain risk mitigation on performance of MTN Rwanda.
- iv. To analyze the role of supply chain risk reporting and monitoring on performance of MTN Rwanda.

## 1.2. Research hypothesis

H<sub>01</sub>: There is no significant role of supply chain risk identification on performance of MTN Rwanda.

H<sub>02</sub>: There is no significant role of supply chain risk measurement and assessment on performance of MTN Rwanda.

H<sub>03</sub>: There is no significant role of supply chain risk mitigation on performance of MTN Rwanda.

H<sub>04</sub>: There is no significant role of supply chain risk reporting and monitoring on performance of MTN Rwanda.

## 2. Literature review

In this chapter, the researcher explores how various books, reports, and authors understand the benefits of supply chain risk management and its means with a private entity.

### 2.1. Theoretical review

A theoretical framework is a structure that can contain or support a research theory. The theoretical framework proposes and describes a theory that explains why the research question being studied exists (Vollstedt and Rezat, 2019). Therefore, this section discusses agency theory and stakeholder theory.

#### 2.1.1 Stakeholder Theory

Freeman (1984), a major proponent of stakeholder theory, described what managers do through their relationships with other stakeholders and the consequences of adhering to stakeholder management principles.

Bebington (2008) “state that organizational reputation is at risk in the day-to-day interactions by relating business entities and its stakeholders, where risk has multiple causes such as strategic, operational, compliance and financial risks and as a result needs to be organized in terms of: in order to improve the "performance" of the organization.

Stakeholder theory focuses on the balance of interests of the stakeholders in the organization. In some organizations, especially in the service industry, the key benefit of the organization depends largely on the trust and loyalty of consumers.

Therefore, whether enterprise risk management practices can reduce expected costs and improve organizational performance (Klimczak, 2005). Therefore, stakeholder theory is relevant to this study because the behavior of MTN Rwanda management and the way it manages relationships with various stakeholders affects the strategies for managing risks that occur within the organization.

#### 2.1.2 Agency Theory

According to Ross (1973), as a major component of agency theory, an agency relationship arises when an agency relationship exists between one party or two or more parties (called the “agent”) acts on behalf of another party (called the “principal”). Eisenhardt (1989) believes that the risk sharing problem is described in the literature as a problem that arises when cooperative parties hold different attitudes towards risk. He notes that agency theory extends the risk-sharing literature to include so-called agency problems, which occur when collaborating parties have different goals and divisions of labor. This theory expands organizational management to include shareholder ownership and control as well as

management control. Furthermore, risk management enterprise, agency problems are thought to influence management attitudes toward risk management (Smith and Stulz 1985).

The theory explains the different interests of shareholders, management, and debtors due to different levels of returns. Public officials are representatives of government whose actions or decisions may cause any business entity to take on excessive risks or engage in projects with negative net worth. Agency theory therefore implies that an explicit risk hedging policy can have an effect on organizational value (Fite and Pfleiderer, 1995).

Stakeholder theory provides new clear into the possible reasons why risk management improves organizational performance by addressing the expected costs of financial distress and loss of goodwill caused by poor risk management practices from the perspective of stakeholders such as private companies, and customers and also the organization itself (Judge, 2006).

### 2.1.3. Transaction costs theory

It can eliminate transaction costs through better institutional design, fewer resources will be unnecessary and more financial means can be traded, thereby improving economic efficiency. The transaction costs' concept was formally proposed by Ronald Coase in 1937 to explain the existence of companies. Generally speaking, there are many benefits to suppliers or organizations working with other organizations in a "supply chain" network. However, close cooperation also brings some risks and uncertainties to "network" companies, and some industries have lower levels of integration (Rindfleisch, 2020). Transaction cost theory provides a possible framework for analyzing industrial networks and the risks and uncertainties associated with network membership. Transaction cost theory is developed from neoclassical economic theory. Due to the obvious limitations of neoclassical economic theory in describing inter-organizational relationships, transaction cost theory gradually developed. Neoclassical theory is based on the idea that single-product firms operate in a perfectly competitive environment, where a huge number of competitors all produce the same product and face the same costs and demand curves (Hobbs, 1996). The theory was later expanded to include market situations such as monopolistic competition and oligopoly.

The neoclassical theory of standardization implies that transactions are exchanges of homogeneous products, with no quality fluctuations and therefore no costs of measuring product quality (Taschner *et al.*, 2020). This means there is no uncertainty about price, product performance, or the behavior of competitors or customers. Neoclassical theory and economic analysis focus on equilibrium market conditions and consider how business relationships arise. Assume that transactions take place in a frictionless environment. Looking at neoclassical theory and its key assumptions, it is clear that its framework provides little insight into the study of supply chain management (*ibid.*). In contrast to neoclassical economics, the Coase approach (Coase, 1937) focuses on the costs of using market mechanisms. Coase (*ibid.*) argued that the major idea for starting a business is the costs associated with using pricing mechanisms.

These costs include (a) pricing costs and (b) costs of negotiating individual contracts and finalizing transaction details (Baştürk, 2016). These costs also definitely refer to transaction costs. Transaction costs are an important explanation of a firm's organizational form and its business relationship with its environment.

For example, if transaction costs are higher in the public market, other things remain equal, one might expect an organization to trade through vertical integration rather than through the public market.

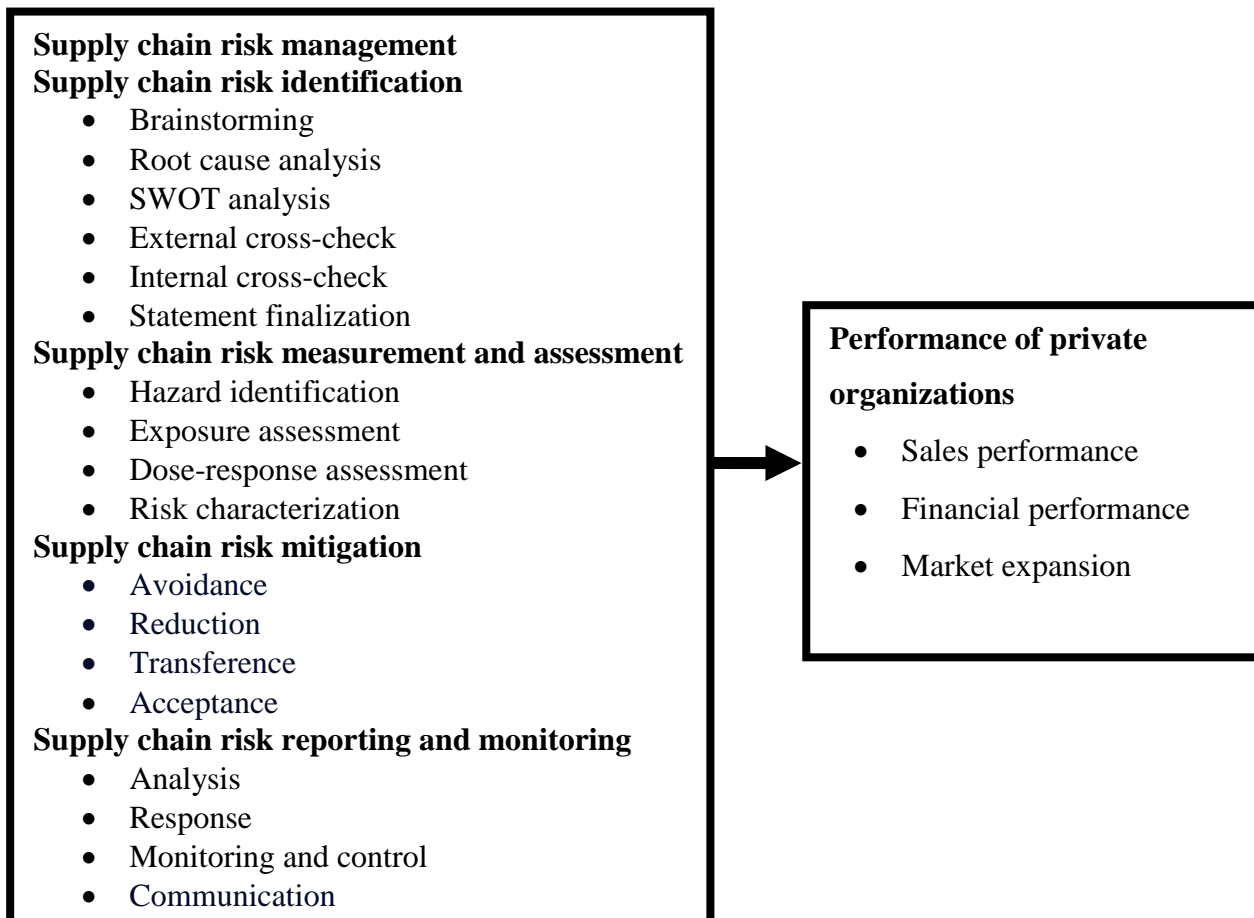
Coase (ibid.) is often considered the “founder” cost economics’ transaction, although he did not use this term (Dietrich, 1994). The first author to use the term was Arrow (1969), who discussed transaction costs as “control of the economic system” and that transaction costs hinder the formation of markets in some cases (Nemmicheet *al.*, 2019). Transaction costs are basically the costs of exchange between firms in a market or the costs of transferring resources between stages of a vertically integrated firm when the neoclassical requirement for perfect and free information is "relaxed". The term "transaction" is used here more broadly than normal English usage, and it does not consider the movement of resources to be a transaction. Transfers of resources within a company are also considered transactions.

## 2.2. Conceptual framework

A conceptual framework is a schematic representation that identifies the variables that together explain a problem. In this case, the independent variable represents supply chain risk management, while organizational performance refers to the dependent variable, as shown below.

**Figure 1: Conceptual framework**  
**Independent Variable**

**Dependent Variable**



Source: Researcher (2023)

The figure above indicated that supply chain risk management currently used by MTN Rwanda is currently working under the guidance of supply chain risk identification, supply chain risk measurement and assessment, supply chain risk mitigation, and finally supply chain risk reporting and monitoring, and this positively influences the performance of the private company in terms of financial performance, market expansion, and sales performance generally.

### 3. Research methodology

This section covered the detailed procedures to be followed to achieve the research objectives. It includes research design, target population, sampling design, sample size and techniques, data collection tools, research procedures and data analysis.

#### 3.1. Research design

The design of the research project is a draft of a scientific study (Ridder, 2017). Therefore, this study used both descriptive and correlational research designs to describe the extent on how risk management in supply chain contributes to the performance of private organizations based on the responses of the respondents. Furthermore, this study considers the use of quantitative methods in terms of statistical and mathematical analysis about the data collected from questionnaire and interview guides. While qualitative methods using non-numeric data are also used to understand the beliefs, experiences, attitudes, behaviors, and interactions of respondents (Gerring, 2017).

#### 3.2. Study population and sampling

The study population consisted of 300 MTN Rwanda employees working in: corporate business unit, legal and regulatory affairs and corporate secretary, internal audit and forensics, risk and compliance, sales and distribution, technology and information. To examine the number of respondents, the researcher referred to Yamane's (1965) formula as follows:

$$n = 1 + \frac{N}{1 + N(e)^2}$$
$$n = \frac{300}{1 + 300(0.05)^2} = \frac{300}{1 + 0.75} = 171.4 \approx 171$$

**n= 171**

**N:** Study population.

**n** =Sample size

**e:** Margin of error (equal to 5%)

The researcher used purposive sampling technique to select 171 employees of MTN Rwanda because they have sufficient knowledge about the relationship between risk management in supply chain and the performance of private organizations.

#### 3.3. Research Instruments

Questionnaires are preferred because respondents are free to answer questions. The use of questionnaires is a record of short pieces of information of written questions asked to certain categories of employees. The questionnaire consisted of closed-ended questions and consisted of the following three parts: background information about the respondents and questions addressed to each objective.

Interview guide was prepared and addressed to Head of operations and sales management, supply chain risk management specialist, procurement specialist, planning, monitoring, and evaluation specialist, chief of finance specialist, and budgeting specialist in order to gain a

better understanding of the link between the management of risk management in supply chain on organizational performance by regarding MTN Rwanda as a private institution.

MTN Rwanda annual reports were presented, including numbers of subscribers, airtime sales, and net revenues achieved by the company from 2017 up to 2022. Furthermore, company reports, professional magazines, and the Internet were used for research.

### 3.4. Data analysis

The collected data were further analyzed using descriptive and comparative research designs by relating to the research objectives. Also, Statistical Package for the Social Sciences (SPSS) version 20 was used in this study to obtain descriptive data and to consider the use of analytical tools. Results are provided in tabular form. Furthermore, in terms of descriptive statistics, the researchers utilized diagnostic tests related to multiple regression models and Pearson correlation tests to understand how the management of risk in supply chain influence the performance of private companies, as in the case of MTN Rwanda.

Researcher also preferred multiple regression models, which assume a linear relationship between the dependent variable  $Y$  (performance of the private organization) and the explanatory variable  $X$  (supply chain risk management)  $Y = \alpha + \beta X + \epsilon$ , where the error margin  $\epsilon$  includes the omitted factors. Check below:

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

Where:

- $Y$  : Performance of private organizations
- $X_1, X_2, X_3, X_4$ : Independent (explanatory) variables: supply chain risk identification ( $x_1$ ), supply chain risk measurement and assessment ( $x_2$ ), supply chain risk mitigation ( $x_3$ ), finally supply chain risk reporting and monitoring ( $x_4$ ).
- $\beta_0$  : Intercept
- $\beta_1, \beta_2, \beta_3$  and  $\beta_4$ : Slopes
- $\epsilon$  : Residual (error)

Multiple linear regressions follow the same conditions as the simple linear model.

## 4. Research findings

This chapter covers data presentation, analysis and interpretation of results according to the research methodology. The findings are presented based on the role of supply chain risk management on the performance of MTN Rwanda private organization.



**Table 1: Correlation**

		Performance of private organizations	Supply chain risk identification	Supply chain risk measurement and assessment	Supply chain risk mitigation	Supply chain risk reporting and monitoring
Performance of private organizations	Pearson Correlation	1	.471	.346	.251	1.000**
	Sig. (2-tailed)		.056	.174	.332	.000
	N	171	171	171	171	171
Supply chain risk identification	Pearson Correlation	.471	1	.471	.040	.590*
	Sig. (2-tailed)	.056		.056	.879	.016
	N	171	171	171	171	171
Supply chain risk measurement and assessment	Pearson Correlation	.346	.471	1	-.054	.462
	Sig. (2-tailed)	.174	.056		.838	.071
	N	171	171	171	171	171
Supply chain risk mitigation	Pearson Correlation	.251	.040	-.054	1	.367
	Sig. (2-tailed)	.332	.879	.838		.162
	N	171	171	171	171	16
Supply chain risk reporting and monitoring	Pearson Correlation	1.000**	.590*	.462	.367	1
	Sig. (2-tailed)	.000	.016	.071	.162	
	N	171	171	171	171	171

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

\* . Correlation is significant at the 0.05 level (2-tailed).

According to Pearson’s theory on coefficient of correlation, table 4.10 indicates that supply chain risk management influences positively the performance of private organizations by referencing to MTN Rwanda.

**Table 2: Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.884 <sup>a</sup>	.782	.709	.179

a. Predictors: (Constant), Supply chain risk reporting and monitoring, Supply chain risk mitigation, Supply chain risk identification, Supply chain risk measurement and assessment

From table 2 above, R is the correlation coefficient which shows the relationship between the study variables. The findings shown in the table above show a positive relationship between the study variables as shown by 0.782 at the 1% significance level.

Furthermore, the Adjusted R squared is the coefficient of determination which tells us the variation in the dependent variable due to changes in the independent variables, from the findings in the table above the value of adjusted R squared was 0.709 which is an indication that there was variation of 78.2% on MTN Rwanda’s performance due to changes in supply chain risk reporting and monitoring, supply chain risk mitigation, supply chain risk identification, supply chain risk measurement and assessment at 95% confidence interval. This is an indication that 70.9% of the changes in performance could be account for by independent variables.

**Table 3: ANOVA b**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.380	4	.345	10.765	.001 <sup>a</sup>
	Residual	.385	166	.032		
	Total	1.765	170			

a. Predictors: (Constant), Supply chain risk reporting and monitoring, Supply chain risk mitigation, Supply chain risk identification, Supply chain risk measurement and assessment

b. Dependent Variable: Performance of private organizations

For 5% level of significance, the numerator df=4 and denominator df=166, therefore Table 3 shows that there is a significant vary at critical Value equals .001 supply chain risk management on MTN Rwanda’s performance.

**Table 4: Coefficients a**

Model		Unstandardized Coefficients		Standardized Coefficients		Sig.
		B	Std. Error	Beta	t	
1	(Constant)	-.769	.356		-2.159	.052
	Supply chain risk identification	.423	.143	.423	2.966	.012
	Supply chain risk measurement and assessment	.231	.122	.273	1.897	.082
	Supply chain risk mitigation	1.038	.187	.758	5.540	.000
	Supply chain risk reporting and monitoring	.038	.138	.038	.278	.786

a. Dependent Variable: Performance of private organizations

From the regression equation above, it was found that holding all the supply chain risk management on MNT Rwanda’s performance will be -.769 percent, a unit increase in the use of Supply chain risk identification would lead to increase in MTN Rwanda’s performance by 42.3%, a one percent increase in the use of supply chain risk measurement and assessment would lead to an increase MTN Rwanda’s performance by 23.1%, a one percent increase in the use of supply chain risk mitigation would lead to an increase MTN Rwanda’s performance by 103.8%, and lastly a one percentage increase in the use of supply chain risk reporting and monitoring would lead to 3.8% increase of MTN Rwanda’s performance.

Overall, the supply chain risk mitigation had the greatest effect on MNT Rwanda’s performance, followed by supply chain risk identification, supply chain risk measurement and assessment and lastly supply chain risk reporting and monitoring. At 5% level of significance and 95% level of confidence, supply chain risk mitigation at 1.038 level of significance; supply chain risk identification had a 0.423 level of significance, supply chain risk measurement and assessment had a 0.231 level of significance, while Supply chain risk reporting and monitoring had a 0.038 level of significance. All two variables above were significant (p<0.05) while also other two variables are insignificant.

Substituting the estimated results in the empirical model specified in chapter three gives:

$$Y = -0.769 + 0.423X_1 + 0.231X_2 + 1.038X_3 + 0.038X_4 + \epsilon$$

The above equation is our final estimated equation which shows how much each independent variable may impact or influence the dependent variable as already explained in the interpretation and analysis above.

The study assessed the role of supply chain risk management on performance of private organizations; multiple regressions were used. Findings are presented below:

**H<sub>01</sub>:** There is no significant role of supply chain risk identification on performance of MTN Rwanda; therefore, the P-value was .012, which means that it was less than the significance level ( $P \leq 0.05$ ); therefore, the researcher did not reject the null hypothesis.

**H<sub>02</sub>:** There is no significant role of supply chain risk measurement and assessment on performance of MTN, therefore, the P-value was .082, which means that it was greater than the significance level ( $P \geq 0.05$ ); therefore, the researcher rejects the null hypothesis.

**H<sub>03</sub>:** There is no significant role of supply chain risk mitigation on performance of MTN Rwanda; the findings indicated that P-Value =.000; which means that it was less than the significance level ( $P \leq 0.05$ ) therefore, this means that all supply chain risk mitigation variables jointly have a positive and significant effect on performance of MTN Rwanda at all levels of significance.

**H<sub>04</sub>:** There is no significant role of supply chain risk reporting and monitoring on performance of MTN Rwanda, therefore, the P-value was 0.786, which means that it was greater than the significance level ( $P \geq 0.05$ ); therefore, the researcher rejects the null hypothesis.

## 5. Conclusion

The study results show that supply chain risk management (SCRM) refers to the process of identifying, assessing and mitigating a company's supply chain risks. Additionally, implementing a global supply chain risk management strategy can help companies operate more efficiently, reduce costs, and improve customer service. Therefore, with reference to MTN Rwanda, the study concludes that there is a positive relationship between supply chain risk management and performance of private organizations; furthermore, risk identification strategies influence the business performance of MTN Rwanda. The organization must have a formal risk identification process. In addition, risk mitigation strategies can also impact a company's performance. The study concluded that a business impact analysis is needed to assess the need for risk mitigation and that business continuity planning is critical for any organization when planning for disruption. Furthermore, the study found that MNT Rwanda's performance would be -769% when considering overall supply chain risk management.

Increasing one unit's use of supply chain risk identification will result in a 42.3%, or 1%, improvement in MTN Rwanda's performance. Increased use of supply chain risk measurement and assessment will lead to a 23.1% improvement in performance for MTN Rwanda, a 1% increase in the use of supply chain risk mitigation will lead to a 103.8% improvement in MTN Rwanda's performance, and finally, the use of risk reporting and supply chain monitoring the percentage increase would have resulted in MTN Rwanda's results improving by 3.8%. Overall, supply chain risk mitigation has the greatest impact on MNT Rwanda's performance, followed by supply chain risk identification, supply chain risk measurement and assessment, and finally supply chain risk reporting and monitoring. When the significance level is 5% and the confidence level is 95%, the significance level of supply chain risk reduction is 1.038; the significance level of identifying supply chain risks is 0.423. The significance of measuring and

evaluating supply chain risks the level is 0.231, while the significance level of reporting and monitoring supply chain risks is 0.038. All variables were significant ( $p < 0.05$ ).

## 6. Recommendations

Below is a section that explains the recommendations per objective about the findings obtained:

- Brainstorming is a creative technique in which a group of people interact and suggest ideas spontaneously to a prompt. In this strategy, companies like MTN will be able to identify the risks that are hitting them highly.
- Checklists and interview tips. The technique involves a structured conversation in which one participant asks a question and another participant provides the answer. Based on the responses, MTN will identify any risks related to the supply chain and its performance.

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