ANALYZING EFFECTS OF FIRM RESOURCES AND RELATIONSHIP ON SUPPLY CHAIN RELIABILITY

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ABSTRACT

Supply chain reliability is one of the emerging sectors in which companies need to invest and make sure nothing within or outside the supply chain will cause any disruptions given the unforeseeable occurrences. The researcher analyzed the relationship between firms' resources and the reliability of their supply chain. Companies worldwide were hit by the outbreak of the Covid-19, which virtually brought the world's businesses to a halt. The researcher saw that as a gap that needed investigation on analyzing the effects of firm resources and relationships on supply chain reliability.

Dynamic capability theory was used to model the work where related literature was reviewed to ascertain the depth of work done so far in the supply chain and firms' resources relationship in line with sustainability in the supply chain management. A quantitative design was instituted to conduct the study using a multiple linear regression model to give estimations and discussions as well as results. A sample size of 100 was purposively selected to respond to the data collection and analysis test items. At a 5% significance level, the study found that company resources positively affect supply chain resilience/reliability. According to the study, the dynamic capability has a favorable impact on supply chain reliability, although it is statistically insignificant at the 5% level. Although there was a positive association between firm resources and supply chain reliability, it was weak. Finally, at a 5% level, the role of firm resources has a substantial positive effect on supply chain reliability.

Keywords: supply chain reliability / resource (SCRE), dynamic, capability, (DC)

INTRODUCTION

The study's purpose is to investigate the link between a business's resources and supply chain reliability. The ability of a company's resources to strategically adapt their capabilities to endure the competition in the business environment and respond promptly to supply chain disruptions is critical. Supply chain reliability (also known as resilience) is a global challenge to relate customers to their demands. This can be accomplished by carefully organizing resources. According to Wong et al. (2012), resources are the essential part of corporate holding that organizations must pay attention to effectively use to fulfill organizational goals and objectives, Leuschner and Rogers (2013) describe resources as a model that emphasizes the importance of organization in achieving superior company performance, supply chain resilience is claimed to be completed by allocating significant resources efficiently and effectively. According to Steveson et al.,(2019) r searchers and practitioners have recognized supply chain reliability (SCRE) as a vital capacity to help firms foresee, prepare for, and respond to supply chain instability.

Research Question

i. How might firm resources affect supply chain reliability and reliability?
ii. What is the link between supply chain reliability and company resources?
iii. What role do firm resources play in supply chain reliability and reliability?

Objectives of the Study

i. The effect of firm resources on supply chain reliability and resilience.
ii. To find is the relationship between business resources and supply chain reliability.
iii. The role firm resources play in supply chain reliability and reliability.

LITERATURE

In today's business environment, supply chain reliability and industry player resources have been the subject of numerous studies. Several academics, notably Hult et al. (2008) and Mentzer et al. (2001), have published papers on supply chain management and network dependability. Mangan et al., 2008 recognized the requirement for continuous supply network operationalization to be an ongoing effort to meet the demands of theories such as lean supply, improved lead time, and Just-In-Time (JIT) practices. Customers' needs must be met, and supply chain resilience must be balanced against available resources to ensure long-term viability.

Empirical review

Resources can be described as a company's productive assets and bluntness by which operations are carried out (Bakar and Ahmad) (2010). Through empirical study, Widener (2006), Amit and Schoemaker (1993), Barney (1991), Puente and Rabbino (2003) argued that a firm's resources are divided into six strategic resources: organizational, physical, reputational, technological, human intellectual, and financial posit. These resources play an essential part in the supply chain reliability of any firm. Furthermore, Supply chain reliability (SCRE) help businesses adapt rapidly to unplanned events and restore operations by bringing together all of the company's resources and skills (Feisel et al., 2015). For example, Sheffi (2005) defined SCRE as a network or system's ability to return to its target level of performance after receiving a jolt or susceptibility in a supply chain. According to Brandon-Jones (2014), a recent study defined the SCRE as an organization's ability to quickly mitigate any vulnerabilities in the supply chain and restore normalcy as soon as they exist. Despite varied descriptions of the SCRE by researchers, the general perception of the SCRE is comparable. In keeping with this line of thought, a recent study defines the SCRE as the ability of supply chains to adapt to disruptions and restart operations quickly. Many literary works are constantly coming up due to the cumulative number of echelons, the existence of worldwide supply lines, and the dynamic character of businesses. The dynamic capabilities model (Teece et al. 1997), on the other hand, emphasizes both internal and external skills equally. This method introduces the concept of innovation as a source of competitive advantage. Dynamic capability also refers to the renewal of capacity or power to the ever-changing business environment. While capabilities

refer to management's adaption of strategy, a firm's resources, whether tangible or intangible resource and, the opportunity to transform from its current state to a more competitive position.

RESEARCH METHODOLOGY

The techniques of data collecting and their justification are explored in detail here. The methodical technique for achieving these outcomes is known as a research design (Sarantakos 2012). The exploratory design was utilized with a well-structured survey questionnaire to gather data from primary sources and process it into information for discussion (Ngai and Law 2007, Yin, 2013). In addition, observations were made to conclude. Because of the sample size and sample frame, it was decided that a cross-sectional design would be the accurate option for the investigation.

The sample size was calculated as follows;

$$n = \frac{N}{1+N\,(\alpha)^2} \quad (1)$$

Where:

N = the sample frame,

n = is the sample size and

α = is the margin of error (which is 0.05)

N= 134

$$n = \frac{134}{1+134\,(0.05)^2} \quad (2)$$

$$n = 100.375 \text{ (3 decimal places)} \quad (3)$$

The sample size was estimated as **100** participants since the human population cannot be in decimals or fractions.

Data Collection Techniques

A linear regression model was used to measure the relationships between these variables.

The questionnaire was chosen because it is simple to administer and has a low cost when compared to the length of time necessary for the investigation (Saunders, 2019). This was done using a Google survey questionnaire approach to reach as many people as feasible, and as quickly as possible. The information was gathered using a five-point Likert scale questionnaire, with respondents having the option of choosing between **(1-Strongly Disagree 2-Disagree) or (1-Strongly Disagree 2-Disagree). 3-Neutral, 4-Agree, 5-strongly agree).** The study's participants were also carefully selected because it would incorporate cross-sectional data on supply chain reliability and its relationship to business resources. Data reliability and variability were all examined to see if data variables were divergent or convergent. This was done to back up the acceptability of any outcomes that came out of the analysis.

Data Analysis Techniques

The study was conducted using a quantitative design, and the results were analyzed using the OLS regression model to examine the link between the variables and correlation analysis as

well. Internal and external validity and reliability were assessed to see if the data was divergent or convergent. The discussions were based on a structured questionnaire that collected data from employees in some selected companies in Kumasi Metropolis Ghana which were randomly selected. The researcher adopted STATA software for the data analysis. The stationarity test was conducted using the Augmented Dickey-Fully test (ADF) on the econometric variables. Cronbach alpha measures of consistency were used to quantify the reliability of the data, and conclusions were drawn based on the discussion.

Model specification

The estimated model equation is as follows: **SCR=**$\boldsymbol{\beta_1 + \beta_2\,(FR) + \beta_3(DC)} + \varepsilon$ **…….eq(1)**
Where **SCR**= Supply chain resilience**,** $(\boldsymbol{\beta_1})$ is contant, **FR**= firm resources, **DC=** Dynamic Capability, and $\varepsilon = \boldsymbol{error\ term}$
The study also estimated the role that firms' resources play in supply chain reliability using a simple regression model. Simple regression model because the researcher wants to know the direct role of firm resources on supply chain without the influence of other explanatory variables in the model. A similar simple regression model was also adopted by Kasidi, (2017) to measure the effect of inflation on real GDP in Tanzania.
The estimated model equation is as follows: **SCR=** $\boldsymbol{\beta_1 + \beta_2(RFR)} + \varepsilon$ **…….eq (2)**
Where SCR= Supply chain resilience, $(\boldsymbol{\beta_1})$ is contant, **RFR**= Role of firm resource and $\varepsilon = \boldsymbol{error\ term}$

DISCUSSION AND FINDINGS

Discussions and findings of the study of the effect of firm resources on supply chain reliability in an organization. The broader aim of the study was to find out the effects that firm resources could have on supply chain reliability or resilience, the relationship between firm resources and supply chain resilience, and how firm resources play a role in supply chain resilience or reliability. To draw conclusions and make recommendations, the study used econometric analysis (regression analysis) to find out the extent to which firm resources affect supply chain resilience, and correlation analysis to determine its relationship.

To examine this, the study considered the following variables which data were collected using structured questionnaires. Accordingly, tangible resources of a firm, intangible resources, human resources, and the role of firm resources in the supply chain as variables, firm capabilities, and firm competitiveness as predictors of supply chain resilience as a response variable were considered. The estimated model combines tangible, intangible, and human resources to form firm resources as a variable, and as well, dynamic capabilities were also driven by firm capabilities and firm competitiveness. Model diagnoses were also conducted for serial correlation, normality test, multicollinearity, and heteroscedasticity. An Augmented Dick-Fuller (ADF) test for unit root was also conducted to find out whether the variables are co-integrated.

Unit Root Test Outcomes

Before this study can be subjected to empirical review, the variables must be stationary. The study conducted a unit root test to check the level of stationarity. The study used Augmented Dick-Fuller (ADF), (1979) to present a test for unit root; whether the series is stationary at level or first difference. The results of the test are presented below in Table 4.1.

Table 1. The Results Of Unit Root Test

SCR; Dickey-Fuller test for unit root.			
Dickey-Fuller test for unit root Number of obs = 99			
---------- Interpolated Dickey-Fuller ---------			
Test	1% Critical	5% Critical	10% Critical
Statistic	Value	Value	Value
Z(t) -7.723	-3.511	-2.891	-2.580
MacKinnon approximate p-value for Z(t) = 0.0000			
FR-Dickey-Fuller test for unit root.			
Dickey-Fuller test for unit root Number of obs = 99			
---------- Interpolated Dickey-Fuller ---------			
Test	1% Critical	5% Critical	10% Critical
Statistic	Value	Value	Value
Z(t) -9.680	-3.511	-2.891	-2.580
MacKinnon approximate p-value for Z(t) = 0.0000			
DC; Dickey-Fuller test for unit root.			
Dickey-Fuller test for unit root Number of obs = 99			
---------- Interpolated Dickey-Fuller ---------			
Test	1% Critical	5% Critical	10% Critical
Statistic	Value	Value	Value
Z(t) -9.273	-3.511	-2.891	-2.580
MacKinnon approximate p-value for Z(t) = 0.0000			
RFR; Dickey-Fuller test for unit root.			
Dickey-Fuller test for unit root Number of obs = 99			
---------- Interpolated Dickey-Fuller ---------			
Test	1% Critical	5% Critical	10% Critical
Statistic	Value	Value	Value
Z(t) -7.723	-3.511	-2.891	-2.580
MacKinnon approximate p-value for Z(t) = 0.0000			

Source: Authors' own Estimation (2021)

From the ADF test for unit root output at levels in table 4.2, it indicates that all the variables are stationary at levels. The absolute value of the test statistic is greater than the absolute value

of the 5% critical value across all the variables. The p-value can also be used to make a decision. The p-value is less than 5% of the critical value in all the variables estimated, that is (p-value=0.0001 =0.05). The null hypothesis (Ho) states that the series is non-stationary. The decision rule is that Ho is rejected in favour of the alternative hypothesis (H1), which concludes that the variables are stationary at a level or they are not co-integrated. The test variables pass the stationarity test at level zero.

The Influence of Firm Resources on Supply Chain Reliability

To estimate the impact of firm resources on supply chain reliability, the study used OLS regression analysis method. To quantify the extent of the effect, the study measured the impact of firm resource and dynamic capabilities on supply chain, the linear regression equation as illustrated below.

Table 2. Regression Analysis Results

Source SS df					Number of obs = 100
F(2, 97) = 10.07					Prob > F = 0.0001
Model 10.7292517					R-squared = 0.1719
Residual 51.6776233					Adj R-squared = 0.1549
					Root MSE = .7299
SCR	**Coef.**	**Std. Err.**	**t**	**P>t**	**[95% Conf. Interval]**
FR	.3906725	.1559342	2.51	0.014	.0811862 .7001587
DC	.1875428	.1353173	1.39	0.169	-.0810246 .4561103
cons	1.411389	.4964816	2.84	0.005	.4260107 2.396768

Source: Authors' own Estimation (2021)

The coefficient of determination (R2) is statistically significant at 17.19%, which means that variations in supply chain reliability are explained by variations in firm resources and dynamic capabilities. A 5% level of confidence is used to determine the significant level of the variables. The results of the regression analysis show that firm resources (FR) have a marginally positive statistically significant effect on supply chain resilience and are statistically insignificant at the 5% level. The results indicate that when firm resources go up by 1 unit, it leads to a.3907% increase in supply chain reliability. These findings justify the expectation in the literature that firms' resources on supply chain reliability. Moreover, dynamic capabilities (DC) have a positive effect on supply chain reliability. This indicates that, when dynamic capabilities go up by 1 unit, the supply chain in an organization increases by.1875% on average. The study concludes that firm resources have a positive significant effect on supply chain reliability in organizations in Kumasi, Ghana.

The Firm's Resource Relationship to the Supply Chain

To determine the relationship between firm resources and supply chain reliability, correlation analysis was employed to measure the strength of a linear relationship between two quantitative variables, that is, firm resources and supply chain reliability or resilience. It was presented in the below table.

Table 3. ***Correlation Analysis***

	SCR	FR	DC	RFR
SCR	1.0000			
FR	0.3944	1.0000		
DC	0.3440	0.6167	1.0000	
RFR	0.5450	0.6172	0.4020	1.0000

Source: Authors' own Estimation (2021)

The results indicate that there is a positive weak relationship between firm resources (FR) and supply chain reliability or resilience (SCR) of 39% as well as dynamic capability (DC) which also shows a positive and weak relationship of 34%. The study concludes that there is a positive relationship between the role of firm resources (RFR) and supply chain resilience (SCR) in the study institutions.

Table 4. The Role of Firm Resources in Supply Chain Resilience or Reliability

Source	SS	Df	Number of obs =	100
	F(1, 98) =	41.40	Prob > F =	0.0000
Model	18.5347905	1	R-squared =	0.2970
Residual	43.8720845	98	Adj R-squared =	0.2898
Total	62.406875	99	Root MSE =	.66908

SCR .	**Coef.**	**Std. Err.**	**t**	**P>t**	**[95% Conf.**	**Interval]**
RFR	.5828665	.090585	6.43	0.000	.4031035	.7626295
_cons	1.207547	.3789375	3.19	0.002	.455558	1.959536

Source: Authors' own Estimation (2021)

The coefficient of determination (R2) is statistically significant at 29.70%, which means that variations in supply chain reliability (SCR) are explained by variations in the independent variable. A 5% significance level is used to determine the fitness and how well the independent variable explains the dependent variable in the model. The results of the regression analysis show that firm resources play a positive statistically significant role in supply chain resilience at a 5% level. In the long term. The results indicate that, when firms play their role in sustaining supply chains by 1 unit increase, supply chain reliability or resilience will increase by 0.5829%. Firms play a positive and significant role in building supply chain resilience in an organization.

Diagnosis of the Model

The results of the model diagnosis showed that the data were normally distributed, had no serial correlation, no heteroscedasticity, and was free from multicollinearity.

SUMMARY AND CONCLUSION

The study's major goal was to look into the impact of business resources and the relationship between supply chain reliability and resilience. The diagnostic tests for all variables were passed, indicating that there was no serial correlation or heteroskedasticity, no multicollinearity, and the series was normally distributed, showing that the estimates are reliable and may be trusted.

This study's approach includes regression analysis to investigate the impact of the stated goal. A quantitative design was introduced to conduct the study through the use of a multiple linear regression model to give estimations and discussions as well as results. The study revealed that firm resource (FR) takes a positive effect on making supply chain resilience at a 5% significance level. When FR goes up by 1 unit supply chain reliability (SCR) increases by 0.3907% on average. The study also revealed that dynamic capability (DC) has a positive impact on supply chain resilience (SCR) however, was statistically insignificant at a 5% level. There was a positive and weak relationship between firm resources and supply chain reliability. Finally, the role of firm resource (RFR) also plays a positive significant effect on making supply chain reliability at 5% level. When RFR go increases SCR also increases by 0.5829%.

Recommendations.

The outcomes of this study will contribute to the expanding body of information about how resources affect supply chain reliability. In rising economies like Ghana, businesses could gain by integrating resources and capabilities to gain reliability, as well as the ability to adapt to changing trends. Given the outbreak of COVID-19, resiliency is crucial for enterprises in emerging markets. Resources and capacities are undeniably important aspects of supply chain reliability. Further, it may also pique academic interest to take a second look at the phenomenon, either to improve it or to refute the order to enhance knowledge in supply chain management studies.

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