Volume: 3, Issue: 2
Page: 11-25
YEAR: 2022

ISSN: 2708-4841(Print), 2708-7042 (Online)

Commonwealth Journal of Academic Research (CJAR.EU)

Effects of Top Management Support On Operational Performance: The Mediated-Moderated Roles of External Integration and Supply Chain Resilience

AUTHOR(S): Kenneth Asiamah Appah[1, 2], Yee Choy Leong[3], Devika Nadarajah[1], Ho Jo Ann[3]

Abstract:

Purpose: This paper targets the relationship between different dimensions of the supply chain systems. Specifically, it scrutinizes the link between top management support and external integration to describe operational performance. The study further explores how supply chain resilience affects the relationship between external integration and operational performance.

Design: Data was collected through a survey questionnaire responded by Ghanaian cold pharmaceutical suppliers with multiple-informants sample of 170 middle-to-large size firms. The data was analysed using partial least squares structural equation modelling (PLS-SEM) version three. The relationship suggested in the advanced theoretical model were described through hypothesis: H1 – there is significant relationship between top management support and operational performance; H2- there is significant relationship between top management support and external integration; H3- there is significant relationship between external integration and operational performance; H4- external integration mediates the relationship between top management support and operational performance; and H5- supply chain resilience moderates the relationship between external integration and operational performance.

Findings: The findings of this study indicate that, top management support significantly affected both operational performance and external integration (H1 and H2 supported). External integration again significantly affected operational performance (H3 supported). Also, external integration partially mediates the relationship between

CJAR
Accepted 21 February 2022
Published 28 February 2022
DOI: 10.5281/zenodo.6326638

top management support and operational performance (H4 supported). However, supply chain resilience did not moderate the relationship between external integration and operational performance (H5 not supported).

Originality and Value: This study is one of the very first supply chain researches on cold pharmaceutical products on the Ghanaian supplies sector, notably, in relation to the practices that, supplying firms in Ghana need to embrace to make their supply chain a strong ambitious mechanism for their advancement. The findings have extensive supplying and improvement of unified supply chains which are major steps in economic evolution.

Keywords: top management support, external integration, supply chain resilience, supply chain systems, pharmaceutical suppliers and operational performance,

About Author

Author(s):
Kenneth Asiamah Appah[1, 2], Yee Choy Leong[3], Devika Nadarajah[1], Ho Jo Ann[3]

1. Putra Business School, Selangor, Malaysia.
2. Koforidua Technical University, Faculty of Business and Management Studies, Koforidua, Ghana.
3. Universiti Putra Malaysia, Faculty of Economics and Management, Selangor, Malaysia.

1. Introduction

The storehouse, manipulation and supply of time and temperature-sensitive pharmaceutical products has become a critical aspect of the international pharmaceutical supply chain system which needs to be handled with utmost care because of the health of humans. In Ghana, every single child out of 10 children are denied the oral polio vaccine while every child out of 5 children are denied all the basic vaccines required to keep them healthy (World Health Organization [WHO], 2016). This took the lives of almost 25 per cent of motherly deaths internationally. On the 19th of August 2019, the WHO office in Ghana identified a girl of about two years and nine months spreading vaccine-derived poliovirus type 2 (cVDPV2). This virus was detected in the North-east region and later found in the Greater-Accra region. More so, a research conducted using a monovalent oral polio vaccine type 2 (mOPV2) in seven regions in Ghana, generally had poor results. To this, another survey was conducted to authenticate the Lot Quality Assurance Sampling (LQAS) in all the affected districts and the results did not show positive either. This prompted the WHO to help the Ghana government to deal with such a problem (Ghana Annual Report, 2019). Research on cold chains has found changes in the environmental situations affecting the quality of products which also negatively impact the health of consumers (Tsang et al., 2018). Kumar & Kushwaha (2018) in their research on supply chain management practices (SCMPs) on performance dwelt on only three SCPPs and suggested other supply chain practices such as just-in-time, top management support and information sharing practices should be looked at. According to Abebe et al. (2020), when the supply chains are managed well, organizational performance will be enhanced. In their study, supply chain management practices generally affected organizational performance. More so, studies on supply chain integration mediating SCMP and SCP is scant and as such must be vigorously pursued (Phan et al., 2020). Lloyd et al., (2015) in a research conducted in Tunisia realized performance challenges that ultimately affected the potency of vaccines supplied which were as a result of machine periods, cold chain verification, support and supervising of the cold supply chain.

Studies related to performance in the supply chain has become very critical to researchers (e.g., see Phan et al., 2020) and firms (Awini et al., 2019) which have dwelt much on the supply chain information, supply environment, level of information sharing and agreed vision and goals (Abebe et al., 2020; Wong et al., 2020; Khalil et al., 2019; Veera et al., 2016) to advance performance. Top management support as a practice has been given less attention in the supply chain management field (Kumar & Kushwaha (2018). There has not been any effort as at now to find out how the support given by top management of cold pharmaceutical companies in improving the operational performance of firms, this study seals this gap by delving into how top management support can impact on the performance of firms. According to Sanchez et al. (2015), the expertise, readiness, direction and rapport are bringing new dimensions of the manpower base of firms. Thus, Vermeulen et al. (2016) has suggested that top management support must be revisited using a critical model which has been echoed by Kumar and Kushwaha (2018).

The main objective of the current study is to find out how top management support affects the operational performance of cold pharmaceutical suppliers in the supply chain systems in Ghana. The current study contributes to relevant studies by firstly providing a

theoretical model to link top management support, external integration, supply chain resilience and operational performance. Secondly, it investigates how external integration and supply chain resilience could help mediate and moderate the link amongst top management support and operational performance. Thirdly, this research empirically gives evidence of the relationships that exist amongst top management support, external integration, supply chain resilience and operational performance. Finally, this research exemplifies various strategies that professionals can use in advancing resources to become competitive in the cold pharmaceutical sector. The goal of this paper is to ascertain how the cold pharmaceutical suppliers will transport the cold products safely to their destinations to maintain the potency and efficacy. The scientific contributions of this paper are:

(1) Having cold pharmaceutical suppliers give out prompt deliveries with no or limited lead time.
(2) Using both proactive and reactive resilience methods to deal with any natural or artificial challenges in the environment when transporting the products.
(3) Provision of rightful material resources (cold chain vehicles) to transport the cold pharmaceutical products so that human lives will not be lost when consumed.
(4) Integrating the upstream members within the supply chain system to deal with the distribution chain metrics.

The rest of the paper is organized as follows: in section 2, we present the literature review and hypothesis development. Section 3 deals with the various methods used in gathering information. In section 4, results and discussions are undertaken on the data gathered. Section 5 talks of the conclusions of the whole study. In section 6, the implications for managers are discussed while section 7 discusses the implications for theory. Section 8 gives the limitations and future research of the study.

2. Literature Review and Hypothesis Development

2.1 Resource- based view theory (RBV)

The resource- based view (RBV) theory sees the different resources that organizations have to identify their performances (Peteraf & Biney, 2003) which has been a unique theory used in the supply chain management (SCM) field as a tool used has an edge in the supply of merchandise (Veera et al., 2016). The resources which the organizations have in the fields of workers comprehension, capabilities, competence behaviour and applications will push them to advance (Wernerfelt, 1984). These assets are made up of SCM practices such as the support from top management and supply chain integration (SCI), for example external integration (EI) capabilities (Blome et al., 2014), which are operational and ideas-sharing activities used by organizations to be in business. Again, the different resources that organizations have are not only reserved for internal workings but also its external members to be used to improve its performance (Blome et al., 2014).

2.2 Dynamic Capabilities Theory (DCT)

Dynamic capabilities theory (DCT) in this study is used to illustrate the relationships involving top management support (TMS) and external integration and the moderating role of supply chain resilience (SCR) in the relationship amongst external integration and operational performance (OP). DCT which organizations have, argued that, special

resources which firms have is needed to give results to the differences in a firm's performance (Blome et al., 2014). According to Tari et al. (2007), the inclusion of TMS and sincerity are changing the trends at the firm's level in order to achieve critical performance levels and product quality (Tari et al., 2007). The obligation of top management when integrated by the complete supply chain members (Yeung et al., 2005), clients (Robinson & Malhotra, 2005) and suppliers (Wang et al., 2011), then will performance be enhanced (Ou et al., 2010). The research again contends that, some logistics assets if integrated appropriately could affect SC resilience which if executed well will improve the interaction between SCI and OP by the use of DCT as extended from the RBV (Mandal, 2017; Ali et al., 2018; Martinelli et al., 2018). The present research makes an input to literature by using the dynamic capabilities agenda underpinned by (Teece, 2012) for assessing an organization's resilience to risks and plans adding to the body of learning on resilience (Kantur & Iseri-Say, 2015) by looking into the stage to which the use of a dynamic capability stance may add to the understanding of distributors' dynamic capabilities to guard against risks and show resilience.

2.3 Top Management Support

Top management support (TMS) has been one of the SCM practice that when utilized well will go a long way to augment performance. Sana et al. (2020) are of the view that, TMS affects the atmosphere and societal-centred development goals. According to Chen and Huang (2009), the workers in firms have different tasks they perform to improve the firm's performance so as to supply defect-free products. Singh et al. (2021) contend that, the understanding and practices by top management affects open innovation and ultimately, the performance levels of firms. Sanchez et al. (2015) also contend that, the expertise, proficiency, leadership and rapport are crucial and found at the organizational level. TMS and allegiance are bringing a shift in firms by undertaking crucial tasks in order to yield crucial delivery and quality levels. It is in view of this that Vermeulen et al. (2016) suggested that top management support should be investigated again. This was actualized by Lo & Fu (2016) who also challenged that, the workings of greater outcomes of firms' performance do not reside in an individual's bosom but a collective team from management who are intensely involved in the daily administration of the firm and supposed to act swiftly when there is any set-back.

2.4 External Integration

External integration can be defined as the degree by which a firm will be able to link up with its dominant supply chain members (internal and external) to reposition their strategic agenda collectively to serve their buyers well (Zhao et al., 2011). Suppliers are the members in the chain known as upstream members and are categorized as those that supply merchandize to the firms that are used for mutual benefit (Danese & Romano, 2011). The suppliers are integrated into the organization in order to dwell primarily on the distribution of products (Koufteros et al., 2010). Extant studies have however found different levels of relationships amongst supplier integration (SI) and performance as a result of different performance measures. For example, a great number of researchers found positive correlation amongst SI and operational performance (Wong et al., 2011; Peterson et al., 2005) On the other hand, varying results found by different academicians saw SI and operational performance witnessed no direct interaction (Flynn et al., 2010; Stank et al., 2001b).

Customer integration (CI), the other dimension of external integration, is known as downstream integration which is made up of the involvement of the customers of the mother organization in providing relevant data and information to attain desired results in a collaborative manner (Koufteros et al., 2010). Past researches have provided that, the integration of suppliers and buyers have positive effect on different performance dimensions. For instance, Droge et al. (2004) deduced a positive link between customers and performance, while Flynn et al. (2010) found no relationship between customer integration and performance. Again, external integration had a positive effect on operational performance from the studies of Danese et al. (2012) and Schoenherr & Swink (2012). Danese & Romano (2011) in their studies however found a non-significant link between customer (external) integration and operational performance.

2.5 Supply Chain Resilience (SCR)

The nature of uncertainties arising from past research has been challenging as one finds it difficult to be abreast with measures to prevent or minimize their occurrence which has made supply chain risk governance not palatable (Petit & Fiksel, 2010). Then arose SCR which is used to rectify issues related to reliable and unreliable supply chain (Fiksel et al., 2015) and prescribed SCR to mean, the might of a phenomenon to revert to its earlier state within an accepted duration after the interruption.

The cold pharmaceutical products distribution has prompted firms to be resourced to enable them face these inherent challenges whenever they arise because of the health of humans. Thus, serious entities in the turbulent distributing environment space need to be prepared at all times to solve any uncertainty that they may face (Panomarov & Holcomb, 2009). Sharma & Srivastava (2015) posited that; firms' resilience is a potent measure to advance erratic delivering chain actions which culminates to augmenting performance heights. That is, when the performance heights of organizations are reduced, reactive SCR should be enforced to enhance the performance heights (Ali et al., 2018). More so, if the interruption is severe and the firms are well-resourced, the maximum resilience efforts need to be enforced to reduce or eliminate the risk that has occurred so that the performance is augmented (Zsidisin and Wagner, 2010).

2.6 Operational Performance (OP)

Operational performance (OP) has been defined by Das (2018) as the stage of improvement in a firm's performance in respect of cost minimization and boosting of fitness in the entire distribution chain. Operational performance has been used by many authors as a form of supply chain performance measure (Truong et al., 2017; Vikas et al., 2017). The performance of firms in the distribution chain has invariably been measured by delivery, time and quality of products supplied (Neely et al., 1995). The inability of firms to work efficiently with its upstream and downstream members might affect its processes of delivery thereby dissatisfying the end-users in terms of its product, service and delivery quality (Fawcett et al, 2009). There has been varying performance measures assigned to SCP. Truong et al. (2017) in their study had no dimension for OP, with Gulin et al. (2016), contending with quality performance. Veera et al. (2016), conducted a study into supply chain practices and performance with no dimensions. Truong et al. (2017) and Anabela et al. (2017) conducted similar studies on quality performance which did not contain any dimensions. In the current research, the researcher hopes to measure

operational performance without any dimensions because of the complex supply routes tangled in the cold pharmaceutical delivery.

2.7 Top Management Support and Operational Performance

Top management support and sincerity are moulding the stance of organizations by seriously undertaking various roles to achieve demanding operational performance levels (Tari et al., 2007). The support from management comes in various forms as in finance, effective dialogue, incentive, respect and critical determination (Kaynak, 2003; Tari et al., 2007). Truong et al, (2017) suggested that, the necessary attention and conditions given to the supply chain members, in a way motivate and empower them to give out their best which eventually enhance performance. Sana et al. (2020) were of the view that, it is the inputs and domination of the support from top management that affects the atmosphere and societal-centred sustainable goals which dwells on performance. The RBV theorizes that different resources issued go to improve the performance when utilized well (Perteraf & Biney, 2003). So, if the top hierarchy in the firm are able to provide the needed material and financial resources, then the members within the chain will give out their best to augment performance. It is therefore postulated that;

H1: Top management support significantly affects operational performance.

2.8 Top Management Support (TMS) and External Integration (EI)

International SC is seen as the crucial force for rivalry but the lower integration efforts amongst firms have resulted in the scuffle between local and international organizations which has affected their operations (Liu et al., 2015). Researchers however contend that, firms may be able to rely on top managers to develop and preserve SC associations (Shou et al., 2016; Wang et al., 2016). In the research conducted by Xu et al. (2014), top management support significantly affected SCI and buttressed by Lockstrom et al. (2010). This assertion goes to prove that, TMS is an enabler to SCI (external integration). According to the DCT, it emphasizes on exceptional resources that need to be utilized to come out with greater performance outcomes. That is, when resources are well-utilised by the suppliers in the chain, work can go on smoothly and ultimately, performance augmented. Chen et al. (2018) posited that, top managerial links positively influenced SCI (customer and supplier) which resulted in good collaborative efforts. Based on the arguments deduced above, it is postulated that;

H2: Top management support significantly affects external integration.

2.9 External Integration (EI) and Operational Performance (OP)

The sophisticated international SC has required using supply chain integration as a major cause of improvement to the supply chains aggressive performance (Lu et al., 2017; Sharifkhani et al., 2016; Prajogo et al., 2015). It is broadly argued that, there exist a positive relation between SCI and operational performance yet on circumstantial footings

(Cao et al., 2015; Bae, 2017; Ebrahimi, 2015). The study of Flynn et al. (2010) indicated a positive link between internal and customer integration and operational performance, whereas there existed no significant link amongst supplier integration and operational performance. Zahra et al. (2013) who researched on the link between SCI and product quality thought that, if organizations focused on external integration (supplier and customer integration), they may enhance and escalate their quality fields. Supply chain integration (internal and external) affected operational performance positively (Saragih et al., 2020). These researchers contended that, the rightful conversation amongst the various departments might have effect on the buyers and suppliers which will finally augment the firm's performance. The RBV theory sees organizations having the rightful resources which are used to improve their human services which are then generated into the organizational assets and capabilities (Teece, 2012). Based on the arguments deduced above, it is postulated that;

H3: External integration significantly affects operational performance.

2.10 Mediating effect of External Integration on the relationship between Top Management Support and Operational Performance.

According to Kwamega et al. (2018), supply chain integration partially mediated supply practices and the performance of the firm. Saragih et al. (2020) in their study also had SCI influencing the supply practices and operational capacities of organizations. Phan et al. (2020) in their research found SCI to significantly mediate between SCMP and SCP. In all these, there was the idea that, supply chain integration serves as a critical link between supply chain practices and the firm's performance. A study by Jin et al. (2013) posited that, firms when integrated and collaborated effectively influenced business performance. They were of the view that, the singular efforts of people within the firms cannot guarantee operational success. Integrating the firm's customers and distributors is to yield changed performance in the actions involving the firm's aggressive program (Zailani & Rajogopal, 2005). A further research by Seo et al. (2014) found that, internal and supplier integration mediated 'innovativeness-supply chain performance' links; however, customer integration did not mediate such relationships. From a RBV theory, Mazzola and Perrone (2013) testified that, when firms are interlinked, they get the power to obtain the needed resources that they might be deficient in, allowing aggressive dependence in obtaining an exceptional, unique, quality and superior resources. Based on the deductions above, it is postulated that;

H4: External integration mediates the relationship between top management support and operational performance.

2.11 Moderating role of Supply Chain Resilience on the relationship between External Integration and Operational Performance.

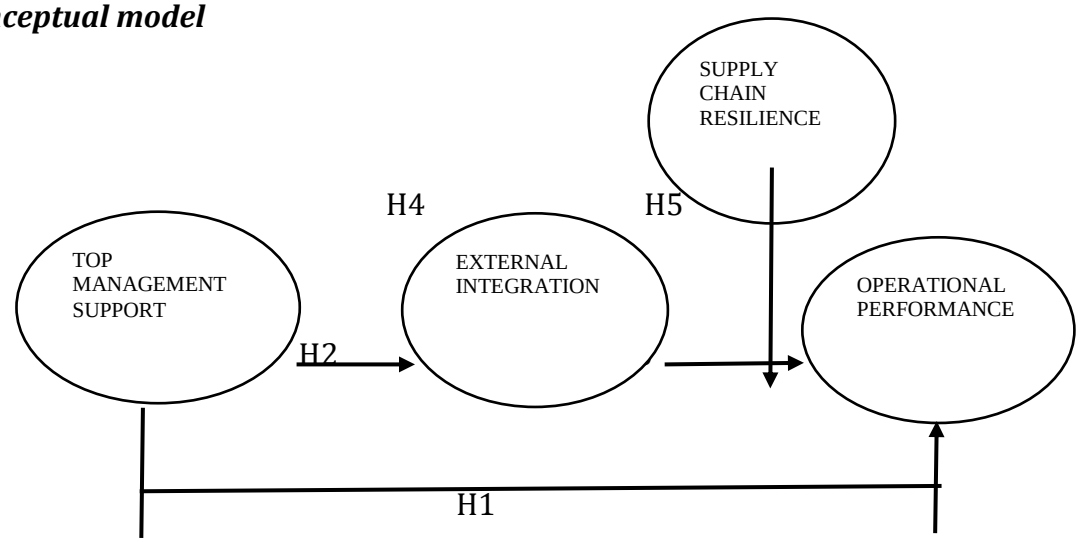
Ates and Bititci (2011) argued that, resilience gives organizations power to absorb disturbances and gives the delivery chain association renewed to its original situation

quickly, by that positively impacting performance. Dynamic capabilities enable SC establishments to sustain their treasured venues even in uncertain environments amidst securing performance (Teece, 2007; Mandal, 2015). It is believed that, increase in the uncertainties in the environment could be reduced when resilience is advanced to combat it (Rha, 2020). In such situations, the external members (both upstream and downstream) are to be resourced so that they can reduce the environmental challenges thereby improving performance. That is, when the disruption is high, there need to be flexible resilience to build their resource capacities to contain the effect between the external integration and performance and increase performance at the end. In the cold supply chain, it is also necessary to have increased visibility so that the environmental challenges are seen faster and outwitted to improve performance. More so, the turbulent situations surrounding the cold supply chain need proper collaborative schemes where information and valuable resources are shared amongst the partners so that, as performance is low, higher collaboration should be adopted so that performance is augmented. When the visibility, flexibility and collaborative resilience efforts are higher, it goes to reduce the low performance between the external integration-performance link, thereby increasing the performance measures and quality merchandise supplied. From the DCT perspective, the capabilities that organizations and suppliers have go to improve their performances when utilized and shared well. Based on the deductions above, it is postulated that;

H5: Supply chain resilience moderates the relationship between external integration and operational performance.

Figure 1

Conceptual model



3 Method

3.1 Selection of the Sample

A list of cold pharmaceutical suppliers was extracted from the Ghana Manufacturers Pharmaceutical Association and Ghana Yellow online directory, the data base for all specialized manufacturing and supply companies which had 170 suppliers. All these suppliers provided delivery services.

3.2 Survey measures and items

This research's questionnaire was designed on the basis of recommendations by Truong et al. (2017). The introductory survey was pre-tested in Ghana and was undertaken by experts from the FDA, Ghana health service, four lecturers from Koforidua technical university, Kumasi technical university, Kwame Nkrumah University of science and technology and university of professional studies, Accra to review the language and wording levels. It was then pilot-tested by 35 respondents who were to answer the questionnaire based on the proposal by Hertzog (2008) who said between 35 and 40 respondents are enough for any pilot test for a survey questionnaire. The questionnaire covered four areas: top management support, external integration, SCR and OP about the cold pharmaceutical suppliers. A total of 18 items were applied to measure operational performance. Six items were taken from the work of Truong et al. (2017) on TMS; four items from Veera et al. (2016) on EI; four items from Mandal (2017) on SCR and four items from Wong et al. (2015) on OP. Respondents weighted the 18 items using a five-point Likert scale spanning 1 for "strongly disagree" and 5 for "strongly agree".

3.3 Data Analysis

A lot of past studies adopted Smart partial least squares – structural equation modelling (Smart PLS-SEM) approach in the testing of both the direct and indirect relationships of the variables (Veera et al., 2016; Mandal, 2017 and Truong et al., 2017). Accordingly, the current research used Smart PLS-SEM version 3, in testing the research hypothesis. The structural and measurement model of this study were appraised by the use of Smart PLS 3 software. According to Hair et al. (2014), PLS-SEM approach is suitable when dealing with a small sample size.

4 Results and Discussions

Mann-Whitney U-Tests employed to test for non-response. The results of the sample distribution of the two groups were statistically indifferent (P>0.05) across a range of indicators for the constructs and the demographic variables, indicating the non-existence of response bias in the dataset (Armstrong & Overton, 1977). Common Method Variance was also explored as per Harman (1967) recommendation; hence an Exploratory Factor Analysis was conducted and results revealed three (3) factors had Eigen values above 1.0, which accounted for 63.7% of the variance, with the highest factor accounting for 48% of the explained variance. Since no factor solely explained majority (50%) of the covariance, the study concludes that the data has no issues of common method bias. The KMO

sampling adequacy of this dimension of the study was 0. 942. Hence, showing a high significance of these variables under this dimension in correlating with each other differently from 0 or an identity matrix.

4.1 Data Analyses and Results

The study employed Structural Equation Modelling (SEM) using Smart PLS as a statistical method to examine the relationship between the dependent and independent variables (Hair et al., 2017; Wong et al., 2019). The result comprised the measurement model and the structural model. While the measurement model explores the relationship between the latent variables and observed variables and to provide reliability and validity of the variables used in this study, the structural model examines the direction and strength of the path.

4.2 Measurement Model Assessment

The study employed Confirmatory Factor Analysis (CFA) to ascertain the extent of reliability and validity of the measurement model prior to the structural model or hypotheses testing (Voorhees et al., 2016**:** Ab Hamid et al., 2017). The measurement model test included construct reliability, indicator reliability, convergent validity and discriminant validity which is showed in Table 1 below.

Table 1

Quality Criteria and Factor Loadings

Variables	Items	Loadings	Cronbach's Alpha	Composite Reliability	AVE
External Integration	EI3	0.915	0.789	0.905	0.826
	EI4	0.902			
Operational Performance	OP1	0.902	0.848	0.908	0.768
	OP3	0.863			
	OP4	0.863			
Supply Chain Resilience	SCR1	0.888	0.834	0.901	0.751
	SCR3	0.850			
	SCR4	0.862			
Top Management Support	TMS1	0.854	0.846	0.896	0.684
	TMS3	0.797			
	TMS5	0.822			
	TMS6	0.835			

Construct Reliability was explored using Composite Reliability (CR). The CR coefficient of 0.70 or higher is considered to have good scale reliability (Hair et al., 2010). The results as shown in Table 1 indicate the computed Composite Reliability (CR) of all the latent variables ranges between 0. 896 and 0.908, and all were above the 0.70 threshold. Therefore, produces evidence that all the latent variables have good reliability.

Additionally, the Cronbach alpha was also measured to determine the items' reliability. Although Wang and Tai (2003) were of the view that composite reliability is very similar with Cronbach alpha, Nunnally and Bernstein (1994) holds the view that there is the need to measure the two. Again, the Cronbach alpha values ranged between 0.789 and 0.848. All the latent variables were above the 0.60 threshold as recommended by (Huang et al, .2017; Nuanally & Berntein, 1994). For convergent validity, it is required that AVE values be greater than 0.5 to confirm convergent validity, the results in Table 1 showed that AVE and Factor Loadings were greater than 0.5 hence the result confirm the construct ability to explain over half of the variations of its indicators. The study also explored the extent to which individual constructs are divergent from other constructs (Hair et al., 2010; Henseler et al., 2016b). To confirm discriminant validity, it is required that the diagonal values (square root of AVE) of each latent variable having higher values than its highest correlation of the construct. Thus, the result in Table 2 supports discriminant validity. The result again confirms the absence of multicollinearity (Byrne, 2013). Additionally, Henseler et al., (2015) is of the view that, to further confirm the presence of discriminant, the heterotrait-monotrait ratio of correlations (HTMT), which is a multitrait-multi method matrix, ought to be explored to validate the result of the Fornell-Larcker (1981) criterion. Therefore, the HTMT technique was used to test the discriminant validity. According to Kline (2011), to confirm discriminant validity, the HTMT value should not be better than 0.85. Gold et al (2001) on the other hand is of the view that the HTMT value should not be more than 0.90 to confirm discriminant validity. The result as presented in Table 3 indicates that all the values passed the HTMT 0.90 (Gold et al., 2001). Consequently, using both the Fornell and Larcker (1981) criterion and the heterotrait-monotrait ratio of correlations (HTMT), the results indicate that discriminant validity was realized as illustrated in table 2 below.

Table 2
Discriminant Validity

Variables	1	2	3	4
1. External Integration	0.909			
2. Operational Performance	0.707	0.876		
3. Supply Chain Resilience	0.786	0.801	0.867	
4. Top Management Support	0.666	0.804	0.814	0.827

Table 3
Heterotrait-Monotrait Ratio (HTMT)

Variables	1	2	3	4
1. External Integration				
2. Operational Performance	0.766			
3. Supply Chain Resilience	0.725	0.826		
4. Top Management Support	0.786	0.744	0.715	

4.3 Structural Model and Hypotheses Testing

The hypothesis and construct relationship were tested using the standardized path coefficients. The paths significance level was calculated using the bootstrap resampling procedure (Henseler et al., 2009), with 500 iterations of resampling (Chin, 1998). The results as presented in table 5 below shows that the model accounts for 72% of variations in Operational Performance and 44% in External Integration. Again, the result as presented in Table 4 showed that Top Management Support has a statistically significant effect on External Integration and Operational Performance all with $p<0.05$, thus confirming hypotheses H_1 and H_2. Again, External Integration had statistically significant effect on Operational Performance at 5% level of significance thus supporting hypotheses H_3. Similarly, the mediating effect was examined in accordance with Preacher and Hayes (2008) recommended compliance by Hair et al (2013) for mediating analysis and model bootstrapping for exploring indirect effects of the mediating variable (External Integration). The result showed that External Integration partially mediates Top Management Support and Operational Performance of Pharmaceutical firms in Ghana, supporting hypothesis H_4. The study further explored the moderating role of supply chain resilience; however, result showed that supply chain resilience does not support the relationship between External Integration and Operational Performance of Pharmaceutical firms in Ghana, thus hypothesis H_5 not supported. The results showed four (4) out of the five (5) hypotheses were supported.

Table 4

Hypothesis Relationships

Hypotheses	Path Coefficient	T Statistics	STD	P Values	**Conclusion**
Top Management Support -> External Integration	0.669	18.197	16.669	0.000	Supported
Top Management Support -> Operational Performance	0.444	5.769	4.980	0.000	Supported
External Integration -> Operational Performance	0.162	2.272	2.289	0.024	Supported
Top Management Support -> External Integration -> Operational Performance	0.109	2.227	2.278	0.026	Supported
Moderating (SCR) External Integration-> Operational Performance	0.037	0.158	0.869	0.874	Not Supported

5 Discussions

From table 4 above, we postulated that there is significant relationship between TMS and OP. This hypothesis was found to be true and as such, hypothesis H1supported. The efficient support from TM is strong catalysts to bring about good operational performance (Sanchez et al., 2015). According to the authors, the expert advice and provision of tangible and intangible resources are critical for any organization to yield deserving performance. This was supported by Lo and Fu (2016) who argued that, good and fulfilling performance of firms are achieved when the management at the top level give greater support for the firms' working. Truong et al. (2017) in supporting this assertion said when the support from managers is high, there will be stronger and high performance at the end since the needed resources supplied will motivate the workers to give out their best.

Again, on the relationship between TMS and EI, it was postulated that, there exist a positive relationship between TMS and EI. This hypothesis revealed that, there exist this relationship and as such, hypothesis H2 is supported. This finding is consistent with the argument that TMS affected the SC members who were integrated in the supply chain systems (Xu et al., 2014). According to the authors, the TM in the firm offered the needed assistance to the upstream members within the chain to do their work effectively. Shou et al. (2016) in supporting this position said, the collaboration of the SC linkages was influenced by the TM teams which were the reason why, there was understanding. Chen et al. (2018) empirically found that, the links within the management settings affected the external supply chain members.

More so, hypothesis H3 sought to find out if there existed a positive relationship between EI and OP. This study empirically showed that, there exist a positive relationship between EI and OP, hence hypothesis H3 supported. This was consistent with the findings of Lu et al. (2017) who argued that, the integration of the supply chain members improves SC competitive outputs. In supporting this assertion, Sharifkhani et al. (2016) argued that, well integrated SC members collaborate to yield good performance. The authors were of the view that, when proper understanding exists between members, there would be the needed support from each of the partners. This was also supported by Cao et al. (2015) who empirically showed a positive link between SCI and OP arguing that, it is only when all the upstream and downstream members collaborate well, will there be improved performance.

Furthermore, this study sought to find out if external integration mediated the relationship between TMS and OP. The study showed that, EI partially mediated the relationship between TMS and OP. this was consistent with the studies of Jin et al. (2013) and Seo et al. (2014). According to the authors, when firms are integrated will they yield effective performance. It is therefore suggested that in the cold pharmaceutical supply chains, the integration of the upstream and downstream members will bring out good performance measures.

Finally, the study sought to interrogate the moderating role of SCR on the relationship between EI and OP. This assertion was not validated and so hypothesis H5 was not supported. For example, the external members were unable to apply the needed capabilities to enable the external members bounce back to its original position (Tukamuhabwa et al., 2015). This result also occurred because there seems to have been

more collaboration with the distributors rather than the clients where there should have been more resilient strategy on the disruption occurrence (Chen et al., 2013).

On the contrary, it is argued that, when the external members are integrated within the supply systems and face any disturbances in their delivery efforts, the reactive resilience efforts adopted will bring them under control thereby reverting back to their initial stance. The uncertainties observed in the distribution chain ought to be halted by using higher resilience efforts to cancel the negative effects thereby maintaining the needed equilibrium (Rha, 2020).

Table 5
Predictive Relevance of the Model

Variables	R Square	R Square Adjusted
External Integration	0.444	0.442
Operational Performance	0.721	0.719

Figure 2
Measurement model

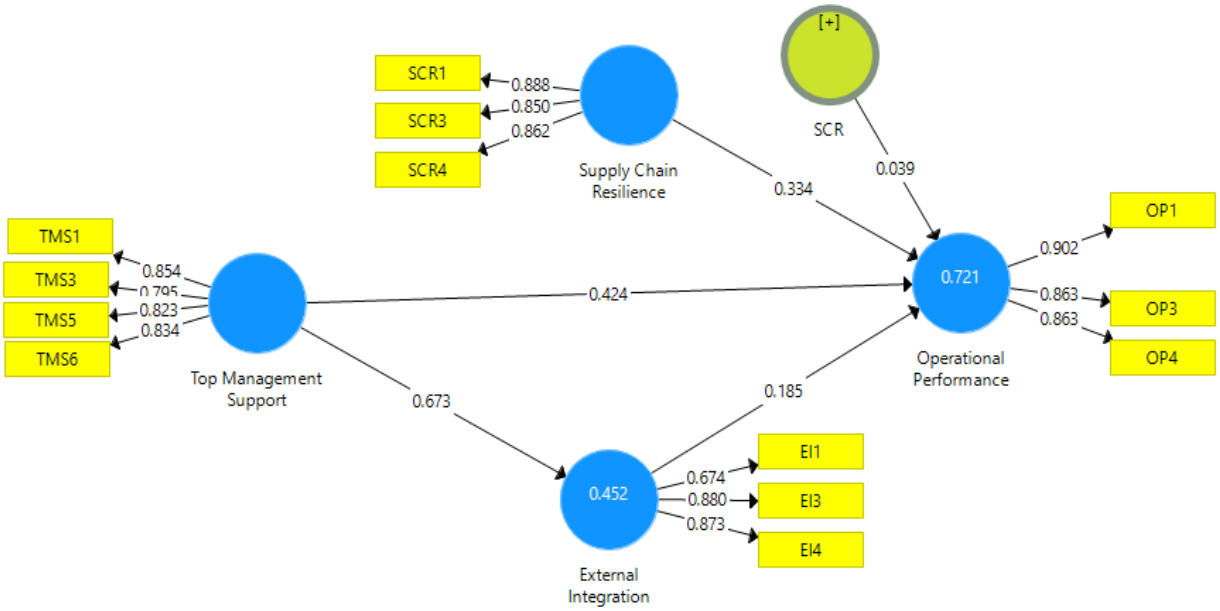
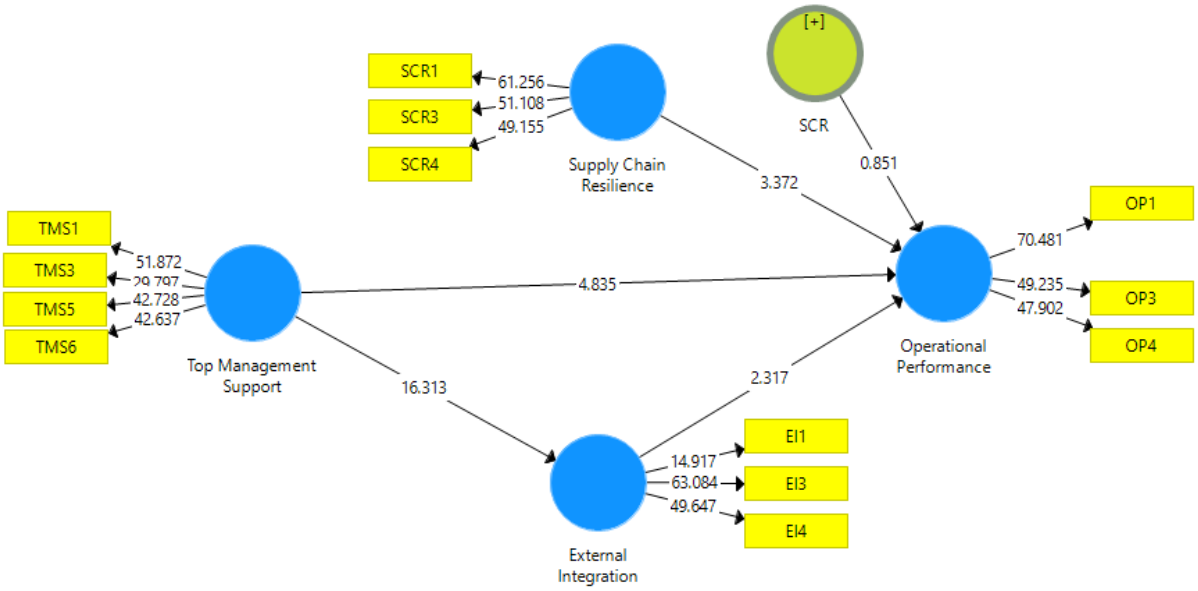


Figure 3
Structural model



6 Conclusions

The current study makes significant contribution to existing literature. Firstly, it gives empirical evidence on the relationships involving top management support (TMS), external integration (EI), supply chain resilience (SCR) and operational performance (OP) of the Ghanaian cold pharmaceutical industry which reinforce the results of past research (Singh et al., 2021; Abebe et al., 2020; Tsang et al., 2018; Phan et al., (2020); Sarajgih et al., 2020; Truong et al., 2017; Veera et al., 2016; Mandal, 2017; Wong et al., 2015). Secondly, this research is one of the very few that investigates the relationship between TMS and the operational performance of cold pharmaceutical suppliers and how the mediated and moderated roles play in the relationship in developing countries. Again, it broadens the literature and gives generalizability to the results of past research on advanced countries (Donadoni et al., 2018). Lastly, this research gives empirical backing to the indirect effects of EI and SCR in the linkage of TMS on OP and EI on OP respectively.

7 Implications for Managers

This research provides enormous implications to managers in the cold pharmaceutical industry. Firstly, it gives the strategy of augmenting OP via TMS as a SCM practice and EI. Moreover, it inspires managers to support their workforce within the chain and integrating the upstream members to enhance their operational performance in their

delivery efforts. This will motivate them and improve their confidence in implementing managerial support metrics in their present SCM system. Finally, this study will help managers of cold pharmaceutical supply firms in improving their competitive advantage through advancing a critical decision on top management support (TMS), external integration (EI) and operational performance (OP).

8 Implications for Theory

Very few studies have been conducted on the links between TMS and OP with EI and SCR mediating and moderating respectively. Phan et al. (2020) suggests that, it is only when SCMPs are strongly mediated by SCI that, fulfilling results will be achieved, in this case performance measures. Kwamega et al. (2018) also suggests that, the mediation of SCMPs and the performance of companies by SCI yields strong and rewarding results. Huo et al. (2016) contend that, when the supply chain systems are well integrated, there do firms have fulfilling operational performance. The present model presented and tested may prompt firms willing to implement a unique strategy to yield utmost performance measures. The support from top management are the greatest treasures of firms that yield substantive performance results when mediated by the internal and external members within the supply systems (Huo et al., 2014). Pharmaceutical cold products need to be transported safely to maintain its quality standards. To maintain this status quo, the products must be checked at each buffer stage of the supply chain due to its temperature-sensitive nature. TMS can contribute towards operational performance not only by firms but also the economy as well (Beheshti et al., 2014). Therefore, TMS affect EI which in turn affects the operational performance. This brings about quality in the supply chain systems. The dual application of the RBV and DCT theories give an added contribution to literature since these combinations will help researchers know the valuable contributions of resources and capabilities that can help firms have an edge over their competitors.

9 Limitations and future research

The present study has some limitations that need some acknowledgement. The study has a cross-sectional design and the data obtained make deductions about the answers only at a time. Nonetheless, a longitudinal is preferred to investigate the change in answers at different points of time. Again, the data was taken from Ghanaian cold pharmaceutical suppliers. So, future study should broaden the sample and balance the number of supply chain managers, directors and procurement officials, to conduct a comparative analysis amongst non-cold pharmaceutical suppliers. Finally, the research used only one dimension of the many SCM practices to draw the general conclusion about the latent variable. Thus, it is suggested that, future research should test this model by adding just-in-time as another SCM practice.

References

Abebe, N. T., Beyecha, L. T., & Gemeda, A. M. (2020). Effects of Supply Chain Management Practices on Organizational Performance. A Case of Food Complex Industries in Asella Town, *International Journal of Business Marketing and Management*, *5*(9).

Ali, I., Nagalingam, S. & Gurd, B. (2018). A resilience model for cold chain logistics of perishable products. *The International Journal of Logistics Management*, *29* (3), 922-941. DOI: 10.1108/IJLM.06.2017.0147

Anabela, S., Ephraim, S., Ying-Ying, L. (2017). The influence of supply chain quality management practices on quality performance: An empirical investigation. *Supply Chain Management: An International Journal*, *22*(2), 122-144.

Aswini, P.S., Pulidindi, V.G., Subashini, R., & Velmurugan, G. (2019). Emerging Applications in Supply Chains for Sustainable Business Development. 9, 142-159. DOI: 10.4018/978-1-5225-5424-0.ch009.

Ates, A. & Bititci, V (2011). Change process: a key enabler for building resilient SMEs. *International Journal of Production Research*, *49*(18), 5601-5618. DOI: 10.1080/00207543.2011.563825

Bae, H.S. (2017). Empirical Relationships between Perceived Environmental Uncertainty, Supply Chain Collaboration and Operational Performance: Analyses of Direct, Indirect and Total Effects, *the Asian Journal OF Shipping and Logistics*, *33*(40), 263-272.

Beheshti, H.M., Mostaghel, R., Oghazi, P. & Hultman, M., 2014, 'Supply chain integration and firm performance: An empirical study of Swedish manufacturing firms', *Competitive Review 24*(1), 20-31.

Blome, C., Paulraj, A. & Schuetz, K. (2014). Supply chain collaboration and sustainability: a profile deviation analysis. *International Journal of Operations & Production Management*, *34*(5), 639-663. DOI: 10.1108/IJOPM-11-2012-0515

Cao, Z., Huo, B., Li, Y. & Zhao, X. (2015). The impact of organizational culture on supply chain integration: a contingency and configuration approach. *Supply Chain Management: An International Journal*, 20, 24-41. DOI: 10.1108/SCM-11-2013-0426

Chen, C.J. & Huang, J. W. (2009). Strategic human resource practices and innovation performance the mediating role of knowledge management capacity. *Journal of Business Research, 62*(1), 104 – 114.

Chen, J., Sohal, A.S. and Prajogo, D. I. (2013). Supply Chain Operational Risk Mitigation: A Collaborative Approach. *International Journal of Production Research*, *51* (7), 2186-2199. DOI:10.1080/00207543.2012.727490

Chen, M., Liu, H., Wei, S. & Gu, J. (2018). Top Managers ties, supply Chain Integration, and Firm Performance in China: A Social capital perspective, *Industrial Marketing Management*, 74, 205-214.

Danese, P & Romano, P. (2011). Supply Chain Integration and efficiency performance: A study on the interactions between customers and suppliers integration. *Supply Chain Management: An international Journal, 16*(4), 220 – 230. DOI: 10.1108/13598541111139044

Danese, P., Romano, P. & Bortolotti, T. (2012), JIT production, JIT supply and performance: Investigating the moderating effects, *Industrial Management & Data Systems, 112*(3), 441-465. DOI: 10.1108/02635571211210068

Das, D. (2018). The impact of Sustainable Supply Chain Management Practices on firm performance: Lessons from the Indian organizations, *Journal of Cleaner production*, 203, 179-196. DOI: 10.1016/j.jclepro.2018.08.250

Donadoni, M., Caniato, F. & Cagliano, R. (2018). Linking product complexity, disruption and performance: the moderating role of supply chain resilience, Supply Chain Forum. *An International Journal*, *19*(4), 300-310. DOI: 10.1080/16258312.2018.1551039

Droge, C., Jayaram, J. & Vickery, S. K. (2004). The effects of internal versus external integration practices on time-based performance and overall firm performance. *Journal of Operations Management*, 22, 557-573.DOI: 10.1016/j.jom.2004.08.001

Ebrahimi, S. M. (2015). Examining the Impact of Supply Chain Integration on Organization Structure and Operational Performance in Oil and Gas Supply Chains: A Contingency Approach. University of Sheffield.

Fawcett, S-E., Allred, C., Magnan, G. M., & Ogden, J. (2009). Benchmarking the viability of SCM for entrepreneurial business model design. Benchmarking: An International Journal, 16, 5- 29.

Fiksel, J., Polyviou, M., Croxton, K.L. & Pettit, T.J. (2015). From risk to resilience: learning to deal with disruption. *MIT Sloan Management Review*, *56* (2), 79-88.

Flynn, B. B., Huo, B. F., and Zhao, X.D. (2010). The impact of supply chain integration on performance: A contingency approach. *Journal of Operations Management; 28*(1), 58-71. DOI: 10.1016/j.jom.2009.06.001.

Ghana Annual Report. (2019, August 19). *Outbreak of circulating vaccine-derived poliovirus type 2.* https://www.afro.who.int./default/files/2020-20.

Goetsch, D. L., & Davis, S. B. (2010). *Quality management for organisational excellence.* 6th Ed.Pearson, New Jersey-USA.

Gulin, I.S.B., Sitki, G., Lutfihak, A. & Selim, Z. (2016). The impact of technology transfer performance on total quality management and quality performance. *Procedia Social and Behavioural Sciences*, 235, 755-764.

Hair Jr, J. F., Sarstedt, M., Hopkins, L., & Kuppelwieser, V. G. (2014). Partial least squares structural equation modeling (PLS-SEM). *European business review*.

Handoko, B. L. Aryanto, R., & So, I. G. (2015). The impact of Enterprise Resource System and Supply Chain Practices on Competitive Advantage and Firm Performance: Case of Indonesian Companies. *Procedia Computer Science*, 72, 122 – 128. DOI: 10.1016/j.procs.2015.12.112.

Hertzog, M. A. (2008). Considerations in determining, sample size for pilot studies. *Research in nursing and health*, *31*(2), 180-191. DOI: 10.1002/nur.20247

Huo, B., Qi, Y, Wang, Z. & Zhao, X. (2014a). The impact of supply chain integration on firm performance: The moderating role of competitive strategy. *Supply Chain Management: An International Journal*; *19*(4), 369-384. DOI: 10.1108/SCM-03-2013-0096

Huo, B., Ye, Y., Zhao, X., & Shou, Y. (2016). The impact of human capital on supply chain integration and competitive performance. *International Journal of Production Economics*, 178, 132–143. DOI: 10.1016/j.ijpe.2016.05.009

Huo, B., Zhao, X. and Zhou, H. (2014b). The effects of competitive environment on Supply Chain Information sharing and performance: an empirical study in China, *Production Operations Management, 23*(4), 552-569. DOI: 10.1111/poms.12044

Jin, Y. H. J., Fawcett, A.M. & Fawcett, S. E. (2013). Awareness is not enough: commitment and performance implications of supply chain integration, *International Journal of Physical Distribution & Logistics Management, 43* (3), 205-230.

Kantur, D. & İşeri-Say, A. (2015). Measuring organizational resilience: a scale development. *Journal of Business, Economic and Finance, 4*(3), 456-472. DOI: 10.17261/Pressacademia.2015313066

Khalil, M. K., Khalil, R. & Khan, S.N. (2019). A study on the effect of supply chain management practice on organizational performance with the mediating role of innovation in SMEs. *Uncertain Supply Chain Management*, *7*(2), 179-190.

Koufteros, X. A., Rawski, G. E & Rupak, R. (2010). Organisational integration for product development: The effects on Glitches, On-time execution of engineering change orders and market success. *Decision Sciences*; *41*(1), 49-80. DOI: 10.1111/j.1540-5915.2009. 00259.X

Kumar, A. & Kushwaha, G.S. (2018). Supply Chain Management Practices and Operational Performance of fair price shops in India: An empirical study. *Log Forum*. *14*(1), 85-99.

Kwamega, M., Li, D., & Abrokwah, E. (2018). Supply chain management practices and agribusiness firms' performance: mediating role of supply chain integration. *South African Journal of Business Management, 49*(1), a317. DOI: 10.4102/sajbm. v49i1.317.

Lee, H. L., Padmanabhan, V., and Whang, S. (1997). The bullwhip effects in supply chains. *Loan Management Review*, *38*(3). 93 – 102.

Liu, H., Ke, W., Wei, K. K. & Hua, Z. (2013). Effects of supply chain integration and market orientation on firm performance: Evidence from China. *International Journal of Operations and Production Management*, 33, 322-346. DOI: 10.1108/01443571311300809

Lloyd, J., Lydon, P., Quhichi, R., & Zaffrar, M. (2015). Reducing the loss of vaccines from accidental freezing in the cold chain. The experience of continuous temperature monitoring in Tunisia. *Vaccine*, 33, 902 –909. DOI: 10.1016/j.vaccine.2014.10.080

Lo, F-Y., and Fu, P-H. (2016). The interaction of chief executive officer and top management team on organization performance. *Journal of Business Research,* 69, 2182 – 2186. DOI: 10.1016/j.jbusres.2015.12.027

Lockstrom, M. Schadel, J. Harrison, N., Moser, R. & Malhotra, M. K. (2010). Antecedents to supplier integration in the automotive industry: a multiple-case study of foreign subsidiaries in China*, Journal of operations Management, 28*(3), 240-256. DOI: 10.1016/j.jom.2009.11.004

Lofti, Z. Sahran, S. & Mukhtar, M. (2013). A product Quality-Supply chain Integration Framework*. Journal of Applied Sciences,* 13, 36 – 48. DOI: 10.3923/jas.2013.36.48

Lu, D., Ding, Y., Asian, S. & Paul, S. K. (2017). From Supply Chain Integration to Operational Performance: The Moderating Effect of Market Uncertainty. *Global Journal of Flexible Systems Management*. http:// doi.org/10.1007/s40171-017-0161-9.

Mandal, S. & Mandal, S. (2017). The influence of dynamic capabilities on hospital-supplier collaboration and hospital supply chain performance. *International Journal of Operations & Production Management*, *37*(5), 664-684.

Mandal, S. (2015). Towards an Empirical-Relational Model of Supply Chain Flexibility. *International Journal of Information Systems and Supply Chain Management* (IJISSCM), *8*(3). Doi: 10.4018/IJISSCM.2015070104.

Martinelli, E., Tagliazucchi, G. & Marchi, G. (2018). The resilient retail entrepreneur: dynamic capabilities for facing natural disasters. *International Journal of Entrepreneurial Behavior & Research*, *24* (7), 1222-1243. DOI: 10.1108/IJEBR-11-2016-0386

Mazzola, E. & Perrone, G. (2013). How the purpose of inter-firm relationships influences the choice of the governance form: evidence from the machine tool and the pharmaceutical industries. *Technology Analysis and Strategic Management*, *25*(9), 1009-1025. DOI: 10.1080/09537325.2013.832745

Neely, A., Gregory, M., & Platts, K. (1995). Performance measurement system design: a literature review and research agenda. *International Journal of Operations and productions Management, 15*(4), 80 – 116. DOI: 10.1108/01443579510083622

Ou, C. S., Liu, F. C., Hung, Y. C., Yen, D. C. (2010). A structural model of supply chain management on firm performance. *International Journal of Operations & Production Management*, 30(5), 526-545.

Peteraf, M. A. & Barney, J.A. (2003). Unraveling the resource-based tangle. *Managerial and Decision Economics*, *24*(4), 309-323. DOI: 10.1002/mde.1126

Peterson, K. J., Handfield, R. B., & Ragatz, G. L. (2005). Supplier integration into new product development: Coordinating product process and supply chain design. *Journal of Operations Management*; *23*(3/4), 371-388. DOI: 10.1016/j.jom.2004.07.009

Pettit, T.J. Fiksel, J., & Croxton, K. L. (2010). Ensuring supply chain resilience. Development of a Conceptual framework. *Journal of Business Logistics*, *31*(1), 1-21. DOI.1002/j.2158-1592.2010.tb00125.x.

Phan, T., Doan, X. & Nguyen, T. (2020). The impact of supply chain practices on performance through supply chain integration in textile and garment industry in Vietnam. *Uncertain Supply Chain Management. 8*(1), 175-186.

Ponomarov, S.Y. & Holcomb, M.C. (2009). Understanding the concept of supply chain resilience. *International Journal of Logistics Management*, *20* (1), 124-143. DOI: 10.1108/09574090910954873

Prajogo D., Toy, J., Bhattacharya, A., Oke, A. & Cheng T.C.E. (2018). The relationships between Information Management, Process Management and Operational performance: Internal and external contexts. *International Journal of Production Economics,* 199, 95 – 103. DOI: 10.1016/j.ijpe.2018.02.019

Rha, J.S. (2020). Trends of Research on Supply Chain Resilience: A Systematic Review Using Network Analysis. *Sustainability*, *12* (11), 4343. DOI: 10.3390/su12114343

Robinson, C. J. & Malhotra, M. K. (2005). Defining the concept of supply chain quality management and its relevance to academic and industrial practice. *International Journal of Production Economics*: *96*(3), 315-337. DOI: 1016/j.ijpe.2004.06.055

Sanchez, A.A., Marin, G. G., & Morales, A. M. (2015). The mediating effects of strategic human resource practices on knowledge management and firm performance. *Revista Europea de Direction Economia de la Empresa.* http://dx.doi.org/10.1016./j.redee.2015.03.003.

Sana, I., Zhineng, H. & Kunakorn, W. (2020). Unleashing the role of top management and government support in green supply chain management and sustainable development goals. *Environment Science and Pollution Research*, 27, 8210-8223. DOI: 10.1007/s11356-019-07268-3.

Saragih, J., Tarigan, A., Silalahi, E.F., Wardati, J., & Pratama, I. (2020). Supply chain operational capability and supply chain operational performance: Does the Supply Chain

Management and Supply Chain Integration Matters? *International Journal of Supply Chain Management, 9*(4), 1222-1229.

Schoenherr, T. & Swink, M. (2012). Revisiting the Arcs of integration: Corss-validation and extensions. *Journal of Operations Management*; *30*(1-2), 99-115. DOI: 10.1016/j.jom.2011.09.001

Seo, Y-J., Dinwoodie, J. & Kwak, D-W. (2014). the impact of innovativeness on Supply Chain Performance: Is Supply Chain Integration a missing link? *SCM: An International Journal*, *19*(5/6), 733-746. DOI: 10.1108/SCM-02-2014-0058

Sharifkhani, M., Khazaei Pool, J., & Asian, S. (2016). The impact of leader-member exchange on knowledge sharing and performance: An empirical investigation in the oil and gas industry, *Journal of Science and Technology Policy Management, 7*(3), 289-305. DOI: 10.1108JSTPM-11-2015-0037

Sharma, M.G. & Srivastava, S.K. (2016). Leveraging the social welfare chain to provide resilience during disaster. *International Journal of Logistics Research and Applications*, *19* (6), 509-519. DOI: 10.1080/13675567.2015.1090963

Shou, Z., Zheng, X., & Zhu, W. (2016). Contract ineffectiveness in emerging markets: An institutional theory perspective*. Journal of Operations Management*, 46, 38–54. DOI: 10.1016/j.jom.2016.07.004

Singh, S.K., Gupta, S., Busso, D., & Kamboj, S. (2021). Top management knowledge value, knowledge sharing practices, open innovation and organizational performance. *Journal of Business Research,* 128, 788-798. DOI: 10.1016/j.jbusres.2019.04.040.

Stank, T.P., Keller, S.B. & Closs, D.J. (2001b). Performance benefits of supply chain integration, *Transportation Journal, 41* (2), 31-46.

Tari, J. J., Molina, J. F & Castejon, J. L. (2007). The relationship between quality management practices and their effects on quality outcomes. *European Journal of Operational Research*, *183* (2), 483-501. DOI: 10.1016/j.ejor.2006.10.016

Teece, D. J. (2007). Explicating Dynamic Capabilities: The nature and micro foundations of (sustainable) Enterprise Performance. *Strategic Management Journal*, *28*(13), 1319-1350. DOI: 10.1002/smj.640

Teece, D. J. (2012). Dynamic capabilities: Routine versus entrepreneurial action. *Journal of Management Studies*, 49(8), 1395 – 1401. DOI: 10.111/j.1467-6486.2012. 01080.x

Truong, H., Carvalho, M.S., Fernandes, A.C., Sampaio, P., An, D.T.B., & Hiep, D.H. (2014). Supply Chain Management Practices and firms' operational performance: An empirical study of Vietnam garment industry*. Proceedings of the International Conference on Quality Engineering and Management.*

Tsang, Y.P., Choy, K.L., Wu, C.H., Ho, G.T.S., Lam, C.H.Y. & Koo, P.S. (2018). An interest of Things-based risk monitoring system for managing cold supply risks. *Industrial Management and Data Systems, 118 (*7), 1432-1462. DOI: 10.1108/IMDS-09-2017-0384.

Tukamuhabwa, B.R., Stevenson, M., Busby, J. & Zorzini, M. (2015). Supply chain resilience: definition, review and theoretical foundations for further study. *International Journal of Production Research*, *53*(18), 5592-5623. DOI: 10.1080/00207543.2015.1037934

Veera, P. K. S., VGR, C., & Muhammed, A.B. (2016). Supply Chain Practices and Performance: *the indirect effects of supply chain integration. Benchmarking: An International Journal, 23*(6), 1445 – 1471. DOI: 10.1108/BIJ-03-2015-0023

Vermeulen, Y., Niemann, W., & Kotze, T. (2016). Supply chain integration: A qualitative exploration of perspectives from plastic manufacturers in Gauteng. *Journal of Transport and Supply Chain Management, 10*(1), 223 – 235. DOI: 10.4102/jtscm.v10i1.223

Vikas, K., Esinaulo, N. C. Jose, A. G-R., Archana, K., Luis, R-L., & Gabreiela, C. L-. (2017). The impact of supply integration on performance: Evidence from the UK food sector. Elsevier, 27th Int. Conference on flexible automation and intelligent manufacturing. FAIM2017, 27-30 June 2017, Modena, Italy. *Procedia Manufacturing II*, 814-821. DOI: 10.1016/j.promfg.2017.07.183

Wang, B., Childerhouse, P., Kang, Y., Huo, B., & Mathrani, S. (2016). Enablers of supply chain integration: Interpersonal and interorganizational relationship perspectives. *Industrial Management & Data Systems*, *116*(4), 838–855. DOI: 10.1108/IMDS-09-2015-0403

Wernerfelt, B. (1984). A resource-based view of the firm. *Strategic Management Journal*, *5*(2), 171-180.

Wong, C. Y., Boon-itt, S. & Wong, C.W.Y. (2011b). The contingency effects of environmental uncertainty on the relationship between supply chain integration and operational performance. *Journal of Operations Management*, 29, 604-615.

Wong, W., Chandra, S., & Keng-Lin, S. (2020). The relationship between supply environment, supply chain integration and operational performance: The role of business process in curbing opportunistic behaviour, *International Journal of Production Economics, 232*(1); 107966. DOI: 10.1016/j.ijpe.2020.107966.

World Health Organization (2016). Ghana's Ministry of Health and Ghana Health Service with support from WHO and other parties officially launched the 6th African Vaccination and Child Health Promotion Week. https://afro.who.int/pt/node/1314.

Yeung, A. C. L., Cheng, T. C. E., & Lai, K. H. (2005). An empirical model for managing quality in the electronics industry. *Production and Operations Management*, *14*(2), 189-204.

Yu, W., Chavez, R., Feng, M. & Wiengarten, F. (2014). Integrated green supply chain management and operational performance. Supply Chain Management*: An International Journal*, *19* (5/6), 683 – 696. DOI: 10.1108/SCM-07-2013-0325

Zahra, L., Shahnorbanum, S., Muriati, M & Ali, T.Z (2013). The relationship between supply chain integration and product quality. Elsevier, The 4th Int. Conference on Electrical Engineering and Informatics (ICEEI 2013). Procedia Technology II (2013). 471-478. DOI: 10.1016/j.protcy.2013.12.217

Zailani, S. & Rajagopal, O. (2005). Supply Chain Integration and performance: US versus East Asian companies*. Supply Chain Management: An International Journal*, *10*(5), 379 – 393. DOI: 10.1108/13598540510624205

Zhao, X., Huo, B., Selen, W & Yeung, J. H. Y. (2011). The impact of internal integration and relationship commitment on external integration. *Journal of Operations Management*. 29, 17-32. DOI: 10.1016/j.jom.2010.04.004

Zsidisin, G.A. & Wagner, S.M. (2010). Do perceptions become reality? The moderating role of Supply Chain Resiliency on disruption occurrence. *Journal of Business Logistics*, *31*(2). DOI: 10.1002/j.2158-1592. 2010.tb00140.x

Appendix

Factor Loading and Cross Loading

Items	*External Integration*	*Operational Performance*	*Supply Chain Resilience*	*Top Management Support*
EI3	0.915	0.656	0.713	0.634
EI4	0.902	0.629	0.716	0.575
OP1	0.629	0.902	0.714	0.741
OP3	0.657	0.863	0.729	0.690
OP4	0.570	0.863	0.660	0.680
SCR 1	0.694	0.732	0.888	0.747
SCR 3	0.652	0.662	0.850	0.697
SCR 4	0.698	0.686	0.862	0.671
TMS 1	0.582	0.703	0.661	0.854
TMS 3	0.545	0.604	0.657	0.795
TMS 5	0.513	0.664	0.675	0.823
TMS 6	0.563	0.683	0.701	0.834

Cite this article:

Author(s), Kenneth Asiamah Appah, Yee Choy Leong, Devika Nadarajah, Ho Jo Ann, (2022). "Effects of Top Management Support On Operational Performance: The Mediated-Moderated Roles of External Integration and Supply Chain Resilience"***, Name of the Journal:*** Commonwealth Journal of Academic Research, (CJAR.EU), P, 11-25. DOI: http://doi.org/10.5281/zenodo.6326638 , Issue: 2, Vol.: 3, Article: 2, Month: February, Year: 2022. Retrieved from https://www.cjar.eu/all-issues/

Published by

AND

ThoughtWares Consulting & Multi Services International (TWCMSI)