

Uncertain Supply Chain Management

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The effect of integration between audit and leadership on supply chain performance: Evidence from UK based supply chain companies

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ABSTRACT

Supply chain performance has been a key element of competitive strategy to boost organizational productivity and profitability. In the United Kingdom (UK), a survey disclosed that approximately 40% of the UK's gross domestic product (GDP) was consumed on supply chain related activities. Because of the extensive use of gross domestic product (GDP) on supply chain, it is important to work on UK based supply chain companies and to reveal various factors to enhance supply chain performance. Therefore, the primary objective of the current study is to investigate the combine effect of audit determinants and leadership styles to enhance supply chain performance in UK based companies. Data were collected from audit department employees and other managerial employees who are closely related to supply chain activities. After analyzing the data through Smart PLS 3, it was found that audit and leadership styles played important contribution in supply chain performance. Moreover, top management and employee commitment to change maintained significant influence to enhance positive effect on audit and leadership. This study is much significant for UK supply chain companies to enhance supply chain performance.

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1. Introduction

Supply chain performance has been a key element of competitive strategy to boost organizational productivity and profitability (Gunasekaran et al., 2004; Palandeng et al., 2018; Singh et al., 2018; Imran et al., 2018). Now a day, supply chain management, analysis, and development are becoming increasingly important. It is evident from literature that various methods to supply chain management are available (see, for instance, Bytheway, 1995a; 1995b; Lamming, 1996; New, 1996; Waters-Fuller, 1995). However, still a gap exists, which is needed to be filled to boost up supply chain performance, particularly in United Kingdom (UK) based companies. In the UK, a survey disclosed that approximately 40% of the UK's gross domestic product (GDP) was consumed on supply chain related activities (Gunasekaran et al., 2004). Therefore, such type of findings and developments show noteworthy visible impact of supply chain management on company assets and UK's economy. Most

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of the managers in manufacturing organization majorly focus on supply chain performance. As it plays vital role in cost management and overall company's profitability. Hence, because of the extensive use of gross domestic product (GDP) on supply chain, it is important to work on UK based supply chain companies and to reveal various factors to enhance supply chain performance.

It is evident from the literature that many factors affect the supply chain performance. However, the most important factors are audit determinants and leadership. Audit is one of the factor, which minimizes the enterprise risk (Hameed et al., 2017) and decreases the cost of supply chain process by presenting the true and faire view of company's financial statements. Determinants of audit, namely; competency of internal audit department (Alzeban & Gwilliam, 2014; George et al., 2015) and relationship between internal and external auditor's (Alzeban & Gwilliam, 2014; Corina-Maria, 2014) has link with supply chain performance. These two determinants have significant influence on supply chain performance.

Moreover, leadership also has significant association with supply chain performance. Leadership is much important for any organization (Haider et al., 2018). An effective leadership leads the employees to use resource effectively and efficiently. It increases the performance of employees which ultimately influences positively on supply chain performance. However, two forms of leadership; transformational leadership and transactional leadership (Avolio & Bass, 2004) are more important to lead employees in right direction. Therefore, audit practices and leadership are more important to enhance supply chain performance in UK.

Additionally, audit effectiveness for supply chain performance can be enhanced through better top management support for audit practices. As the top management support has significant influence on audit practices (Alzeban & Gwilliam, 2014; George et al., 2015). Furthermore, leadership is only effective if the employees want to adopt change and committed to absorb change as the employee commitment to change is most important in any organization (Herscovitch & Meyer, 2002). Thus, to transfer the positive effect of leadership on supply chain performance, employee commitment to change is most crucial. The combination of all these factors are shown in Fig. 1, which is the proposed framework of the current study.

The literature on supply chain performance that deals with different strategies as well as technologies for successfully managing a supply chain is quite vast (Gunasekaran et al., 2004). Various studies discuss supply chain performance (see, for example, Divyaranjani, 2018; Saleheen et al., 2018; Tarafdar, & Qrunfleh, 2017; Thanki, & Thakkar, 2018), however, in rare cases any study documented the combination of audit practices and leadership to boost the supply chain performance.

Therefore, the primary objective of the current study is to investigate the combine effect of audit determinants and leadership to enhance supply chain performance in UK based companies. However, the study has sub-objectives;

1. To investigate the role of audit determinants in supply chain performance,
 - 1.1. To examine the effect of competency of internal audit department and relationship between internal and external auditors on supply chain performance,
 - 1.2. To examine the moderating role of supply chain top management support,
2. To investigate the role of leadership in supply chain performance,
 - 2.1. To examine the effect of transformational leadership and transactional leadership on supply chain performance,
 - 2.2. To examine the moderating role of supply chain employee's commitment to change,

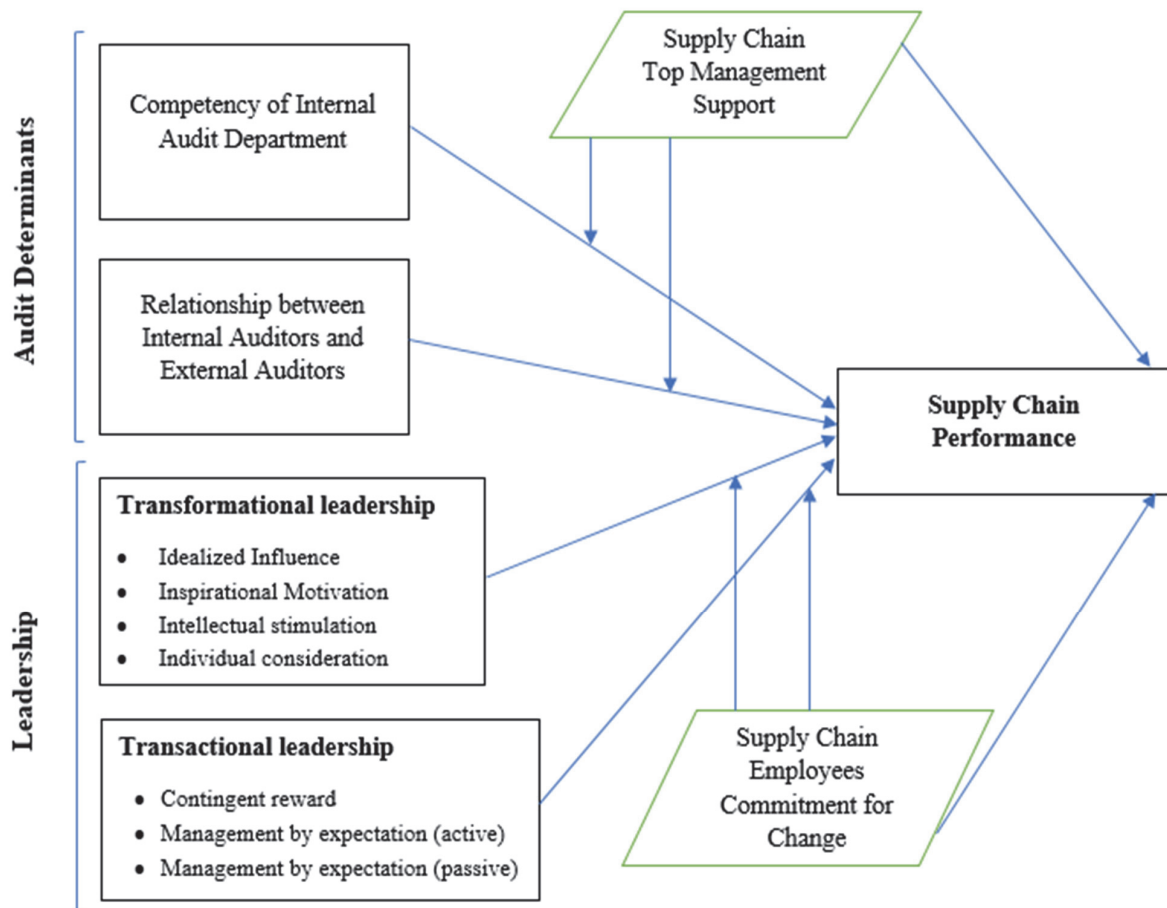


Fig. 1. Theoretical Framework

The current study contributed in the body of knowledge by investigating the combine effect of audit determinants and leadership to enhance the supply chain performance in UK. Additionally, the study investigated the moderating variables; supply chain top management and supply chain employee commitment for change.

2. Review of Literature

2.1 Audit Determinents, Supply Chain Top Management Support and Supply Chain Performacne

Technical competence of every audit committee has significant role in enhancing the effectiveness of audit. According to Mihret Kieran and Mula (2010), training provides competency to internal activities. Moreover, Cohen and Sayag (2010) explained that the professional competence of internal or external auditors is the fundamental factor that effect on the effectiveness of audit. Competency of internal audit has positive linkage with effectiveness (Alzeban & Gwilliam, 2014).

The competency in audit department plays an important role to show the true and fair view of statement of concerned company. This true and fair view is one of the indications of smooth supply chain performance. As risk is an important factor in every organization (Hameed et al., 2017). Good audit practices maximize the enterprise risk management, which enhance the supply chain performance.

Staff competence is a key to the internal audit effectiveness (Al Twaijry *et al.* 2003; Alzeban & Gwilliam 2014). The ISPPIA shows the significance of internal audit team who owns the knowledge, competencies and other skills prerequisite to perform audit function (ISPPIA Standard 1210). Definitely, it is important for internal auditors to have the essential education and other professional

qualifications (Mihret, & Yismaw, 2008). As the supply chain is one of the component of organization, therefore, an increase in overall performance is the indication to increase in supply chain performance.

Hence, good internal audit practices with the help of competency increases the external audit results. Positive auditor's results are one of the guaranties of good operations in supply chain companies. It shows that competency of internal audit department has important link with supply chain performance. Thus, it is hypothesized that;

H₁: There is a significant relationship between competency of internal audit department and supply chain performance.

The effectiveness of audit is mainly dependent on the relationship between internal as well as external audit departments. This relationship certifies an effective communication as well as coordination between internal and external audit. The coordination between them includes exchange of various documented information as well as assistance of audit process. Many previous studies (see, for example, Almohaimed, 2000; Brierley et al., 2001; Golen, 2008; Gwilliam & El-Nafabi, 2002) focus on the impact of the relationship between internal and external audit department on the audit effectiveness.

The communication of various internal and external auditing movements is significant from different perspectives: firstly, external audit because in this process, financial statements accuracy can be enhanced by them; secondly coordination between internal and external auditors helps in risk control aspect (Dobroțeanu, & Dobroțeanu, 2002). Increase in risk control increases the supply chain functions effectiveness and it is based on audit department competency.

Relationship between internal auditors and external auditors enhances the audit performance and increase in audit performance is one of the indication of smooth operations, as discussed earlier. Smooth operations are one of the guaranties of good supply chain practices. Thus, it is hypothesized that;

H₂: There is a significant relationship between internal auditors, and external auditor's department and supply chain performance.

Top management support is one of the most significant factors that can increase the effectiveness of audit committee. Literature shows that management support is an important element for various activities of audit. For instance, Mihret and Yismaw (2007) investigated a positive link between the management support and effectiveness of audit. Therefore, management support in supply chain companies promote audit practices which increase the supply chain performance.

In line with Cohen and Sayag (2010), other studies also disclosed that management support is a vital determinant of internal audit effectiveness in all companies. Furthermore, Alzeban and Gwilliam (2014) supported the positive association between the management support and internal audit. It has the ability to enhance the positive relationship between internal auditors and external auditors in supply chain companies.

Internal auditors must shape a close relationship with top management support to achieve their monotonous activities. For good audit activities, auditors require positive support from the higher-level management to achieve their work more effectively according to main goals. Top management support is a factor which can take the various shapes like the support of audit through providing essential resources. These various resources may be in form of financial resources, non-financial resources such as training, management support, other transport facility, technology with latest procedures, professional certificates funds etc. (Alzeban & Gwilliam 2014; Hailemariam, 2014). Hence, below hypotheses are proposed;

H₃: Supply chain top management support moderates the relationship between competency of internal audit department and supply chain performance.

H₄: Supply chain top management support moderates the relationship between relationship of internal auditors and external auditors, and supply chain performance.

2.2 Leadership Styles, Supply Chain Employee's Commitment for Change and Supply Chain performance

Leaders have two basic personalities; transformational leadership and transactional leadership (Weber, 1947). Bureaucratic leader is a transactional leader and a charismatic leader is a transformational leader. Both leadership styles have significant influence on supply chain performance. Eisenbach et al. (1999) and Herold et al., (2008) postulated that leadership style and organizational change are integrated.

Transformational leadership can be viewed as “the process of influencing major changes in the attitudes and assumptions of organization members and building commitment for the organization’s mission or objectives” (Yukl, 1989). Bass and Steidlmeier (1999) specified that transformational leadership rises the area of effective freedom, and the area for work intention. Researches have been carried out as far back as in the 1980s on how transformational leadership affect change (Bass, 1985; Bennis & Nanus, 1985).

According to Burns (1978), transformational leadership is a way to increase an organization’s necessity for change to an advanced level of development. The author also explained transformational leaders as one of the ordinary agents which can empower subordinates to work on a mission and proper implementation. According to Bass (1985, 1990), transformational leadership emphasizes on the unique behavior of employees of organization that may influence their behavior same with the organizational direction which can change the vital values, beliefs as well as attitudes.

This leadership style always inspires subordinates to search for new methods in carrying out their job from inspiring motivation to knowledgeable stimulation. Ismail et al. (2010) studied the link between individual outcomes and transactional and transformational styles of leadership. Findings showed that transformational style of leadership is a significant indicator of procedural justice, while transactional style of leadership is a significant indicator of distributive justice, and that both leadership styles are crucial indicators of trust in leaders which enhance readiness to change.

Kavanagh and Ashkanasy (2006) found out that there was an association between leadership style and supporting cultural of employees to change. Authors further specified the leader's need to be sufficient experienced to attain a high degree of commitment. It is also demonstrated that leadership was crucial in increasing commitment to change among different employees.

The study of Limsila and Ogunlana (2008) supported the view that transformational style of leadership is significantly related with employee commitment to change; they found that such leadership style had a positive and significant relationship with organizational commitment of followers compared with the transactional kind of leadership. This level of commitment has influence on satisfaction (Hussain et al., 2013) which influence on supply chain management. However, all these leadership styles have a link with supply chain performance.

Notwithstanding the significance role of transformational leadership style on the organizational change, examining the effect of transformational leadership style on employee readiness to change has been ignored in the literature review, particularly in the literature of supply chain performance. Thus, this study attempts to address this gap found in the organizational change and leadership literature in order to get new and deep knowledge about such issue within supply chain performance. Therefore, following hypotheses are proposed;

H₅: There is a significant relationship between transformational leadership and supply chain performance.

H₆: Supply chain employees' commitment for change moderates the relationship between transformational leadership and supply chain performance.

Transactional leadership ensures that behavior is concentrated on a give and take process in which leader gives rewards or punishments to subordinates based on their efforts and performance (Burns, 1978). It can be viewed as leaders who focus on completing tasks and achieving expectations; usually they pay little attention to the needs of the organization (Avolio, 1999). According to Bryant (2003), there are three characteristics of transactional leadership. Firstly, transactional leaders work with subordinates and try to attain goals. Secondly, they exchange these rewards for work effort. Lastly, leaders are sensitive to the self-interests of subordinates. In addition, they involve a transaction or an exchange, which is an essential element between leaders and subordinates.

Bass (1985) declared that transactional leadership involves behaviors like monitoring performance, providing contingent material rewards, and providing contingent personal rewards, so that tasks are completed as expected. Some arguable issues are that to achieve effective organizational change leaders need more than charisma; they must also display transactional behaviors, for example clarifying goals, setting up performance measures and applying rewards and punishments (Nadler & Tushman, 1990). Therefore, transactional leadership is strongly related to the concept of exchange between a leader and subordinates. All these factors influence on the performance of supply chain employees which automatically affect positively on supply chain performance.

Burns (1978) qualitatively analyzed leadership cases to differentiate transformational from transactional leadership. He stated that "the relations of most leaders and followers are transactional. Leaders approach followers with an eye to exchanging one thing for another, jobs for votes or subsidies for campaign contributions which effect on the commitment of employees to change". Good leadership qualities enhance the employees to absorb change which influence on overall supply chain performance.

Burns (1978) explained that this transactional style of leader-subordinate relationships is based on cost and benefit. Bass (1985, 1990) considered transactional leadership to be a lower order approach to lead by suggesting that leadership style possesses many dimensions that are focused on the present and have their basis on keeping the status opposed for transforming organizations and driving change. He introduced three dimensions of transactional culture; namely passive avoidant behaviors of passive management by exception, active management by exception, and contingent reinforcement or reward and the. Bass (1990) further explained that contingent reinforcement or contingent reward is referred to as the follower's receiving of the reward depending on the accomplishment of specific performance expectations provided by the manager.

To conclude that, it seems that transactional leadership style is less studied when comparing with transformational leadership style (Whittington *et al.*, 2009). Nevertheless, it is argued that specific characteristics of transactional leadership style could create positive attitude among employees which in turn result in effective organizational change leadership (Whittington *et al.*, 2009; Bennett, 2004). As it is an essential factor for the growth and survival of the organization we need to find leaders who are able to inspire and motivate employees to embrace repeated change in the organization (Westover, 2010). Consequently, this study decides to include transactional leadership style as an independent variable that will be examined its effect on employee readiness to change and supply chain performance. Hence, from this discussion, it is evident that transactional leadership has influence on the employee's performance which influence on supply chain performance. On the other hand, employee's readiness to change is also another factor which influence on the relationship of

transactional leadership and supply chain performance. Moreover, leadership is also important to utilize credit for supply chain in a better way which affect the supply chain performance. As credit is one of the most important elements (Hameed et al., 2018; Hameed et al., 2017) for supply chain performance. Thus, it creates following hypotheses;

H₇: There is a significant relationship between transactional leadership and supply chain performance.

H₈: Supply chain employees' commitment for change moderates the relationship between transactional leadership and supply chain performance.

Additionally, from above discussion, the following hypotheses are proposed;

H₉: There is a significant relationship between supply chain top management support and supply chain performance.

H₁₀: There is a significant relationship between supply chain employee commitment for change and supply chain performance.

3. Research Method

Research methodology of any research study is most crucial part (Hameed et al., 2018) as the research method is generally based on the objective, problem and nature of the study (Hameed et al., 2017). Therefore, by following the nature of current research study, cross-sectional design with quantitative research techniques was adopted to achieve the major objective. Data were collected from the supply chain companies in UK. Employees of these companies were selected as the respondents for this study. To get the responses, the respondents were divided into two parts. One part was consisted of audit department employees. In second part, the managerial employees were selected. Only those employees were selected having direct link in supply chain process. Comrey and Lee (1992) presented sample in a series for inferential statistics. "Sample having less than 50 participants will observed to be a weaker sample; sample of 100 size will be weak; 200 will be adequate; sample of 300 will be considered as good; 500 very good whereas 1000 will be excellent". Therefore, in the current study 300 sample size was selected. Survey questionnaire was used to collect the data from supply chain companies. Questionnaires were distributed by using area cluster sampling. As the area cluster sampling is suitable technique while collecting data on wide area. Because the population is spread on a wide area, thus, area cluster sampling is most appropriate. Hence, 300 questionnaires were distributed among the employees of supply chain companies through area cluster sampling. Response rate is shown in Table 1. Moreover, 5-point Likert scale was used to analyze the data. The 5-point Likert scale was selected based on the argument that it increases response rate as well as response quality along with dropping respondents' "frustration level" (Babakus & Mangold, 1992). Therefore, as compared to 7-point Likert scale, 5-point Likert scale decrease the frustration level because it has 05 options, however, 7-point scale has 07 options which confuses the respondent and ultimately effect of the quality of responses. Moreover, Smart PLS 3 was used to analyze the data.

Table 1

Response from respondents

Response	Frequency/Rate
Total questionnaires distributed	300
Total questionnaires returned	164
Total Useable questionnaires	150
Total questionnaires excluded	14
Total response rate	54.6%
Total response rate after data entry	50%

4. Data Analysis and Results

Majorly, the analysis of this study is based on two parts. First part is comprised of measurement model assessment. Second part is comprised of structural model assessment in which hypotheses were tested. Moreover, R-Squared (R^2) value, effect size (f^2) and quality of model is also addressed in this part.

4.1 Measurement Model Assessment

The first part of analysis comprised of factor loading, Cronbach alpha, composite reliability and average variance extracted (AVE) (Hair *et al.*, 2014; Hair *et al.*, 2010; Henseler *et al.*, 2009). Factor loadings should be more than 0.5 and all the items should be deleted below 0.5 (Hair *et al.*, 2010). George and Mallery (2003) provided the rule of determining the value “alpha; “ $\alpha > 0.9$ - Excellent, $\alpha < 0.8$ - Good, $\alpha < 0.7$ - Acceptable”. The composite reliability should also be more than 0.7. Furthermore, to attain the convergent validity, average variance extracted (AVE) should be more than or equal to 0.5 which achieves the internal consistency.

Fig. 2 shows the measurement model assessment. Table 2 shows the results of measurement model assessment. It is evident that all the values are under acceptable range. Factor loading is above 0.7, Cronbach alpha and composite reliability also above 0.7. Furthermore, average variance extracted (AVE) is more than 0.5 which attain the convergent validity.

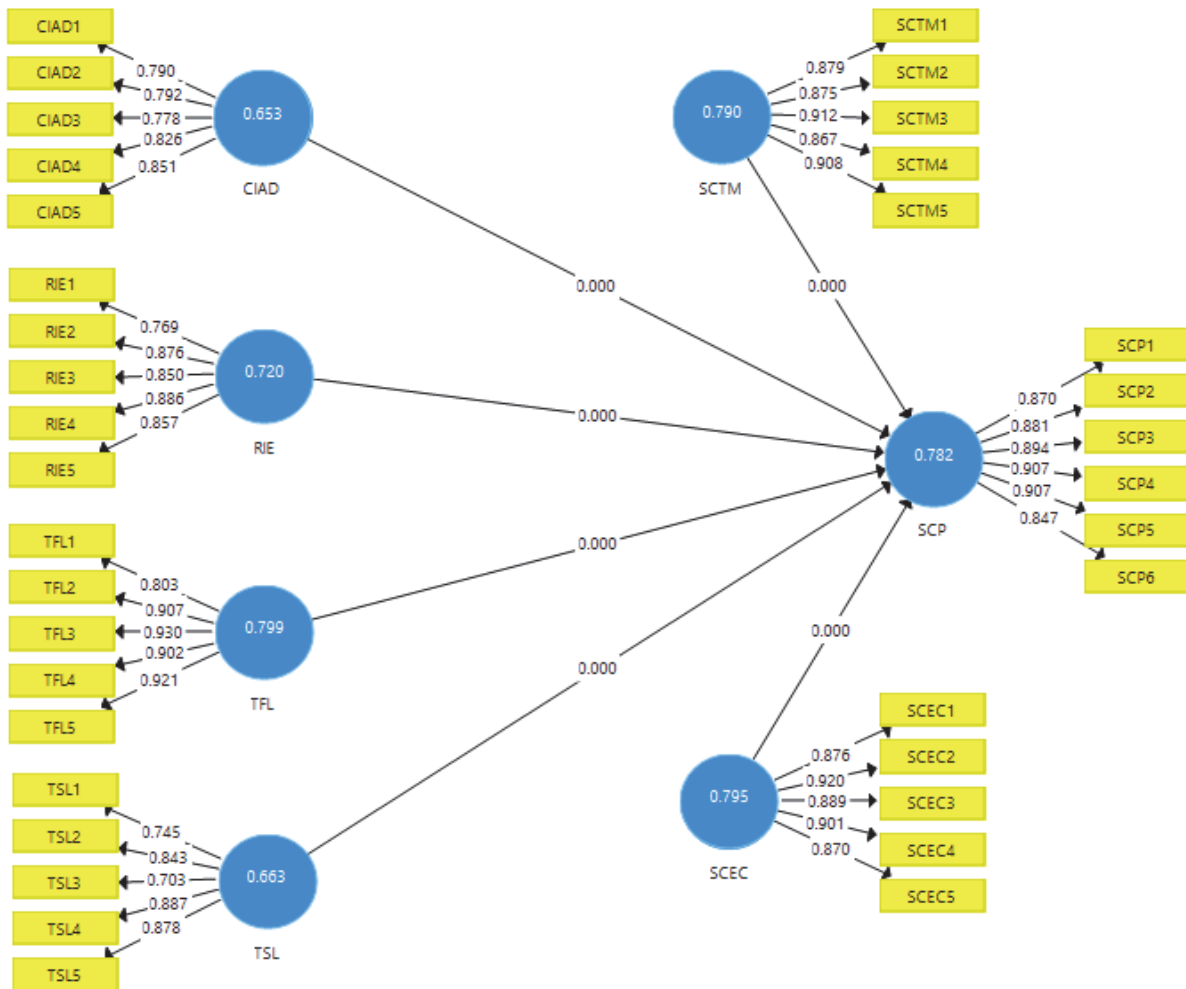


Fig. 2. Measurement Model Assessment

Table 2
Factor Loading, Reliability, Convergent Validity, AVE.

Construct	Indicators	Loadings	Cronbach Alpha	Composite Reliability	AVE
Competency of Internal Audit Department (CIAD)	1. Auditor academic qualification affects the effectiveness of internal auditing.	.790	.867	.904	.653
	2. Internal auditors can maintain communication with highly qualified external auditors.	.792			
	3. Internal auditors are qualified to an adequate level.	.778			
	4. Auditor professional qualification affects the effectiveness of internal auditing.	.826			
	5. Auditor experience in internal audit affects the effectiveness of internal auditing.	.851			
Relationship between Internal Auditors and External Auditors (RIE)	1. External auditors willingly provide an opportunity to internal auditors for explaining their concerns.	.769	.902	.928	.720
	2. External auditors share their work plans with the internal auditors.	.876			
	3. External auditors show reliance on the reports and findings of internal auditors.	.850			
	4. External auditors frequently meet with internal auditors.	.886			
	5. External auditors share their work in progress with internal auditors.	.857			
Transformational leadership (TFL)	1. Talks about his or her most important values and beliefs.	.803	.937	.952	.799
	2. Emphasizes the importance of having a collective sense of mission.	.907			
	3. Talks optimistically about the future.	.930			
	4. Seeks differing perspectives when solving problems.	.902			
	5. Treats me as an individual rather than just as a member of a group.	.921			
Transactional leadership (TSL)	1. Provides me with assistance in exchange for my efforts.	.745	.872	.907	.663
	2. Discusses in specific terms who is responsible for achieving performance targets.	.843			
	3. Focuses attention on irregularities, mistakes, exceptions and deviations from standards.	.703			
	4. Fails to interfere until problems become serious.	.887			
	5. Waits for things to go wrong before taking action.	.878			
Supply Chain Top Management Support to Audit (SCTM)	1. Senior management provides needed support to the internal auditor in carrying out their audit function effectively and efficiently.	.879	.934	.949	.790
	2. Internal audit department has sufficient human and other resources to perform internal audit function.	.875			
	3. Management provide enough financial resources to internal audit department.	.912			
	4. Top management provides moral support and encouragement to internal auditors for performing audit function effectively and efficiently.	.867			
	5. Top management has knowledge about need and issues of internal audit department.	.908			
Supply Chain Employees Commitment to Change (SCEC)	1. I believe this change is valuable.	.876	.934	.951	.795
	2. The change is a good strategy for this organization.	.920			
	3. It would be risky to speak out against this change.	.889			
	4. I feel a sense of duty to work toward this change.	.901			
	5. I do not think it would be right of me to oppose this change.	.870			
Supply Chain Performance (SCP)	1. My organization has achieved high customer satisfaction through supply chain.	.870	.944	.956	.782
	2. With organized information, my organization has increased process transparency.	.881			
	3. With organized information in supply chain, it reduces errors in work processes in my organization.	.894			
	4. Good supply chain process reduces work redundancies.	.907			
	5. Good supply chain process reduces administration cost.	.907			
	6. My organization can attribute high return through effective supply chain process.	.847			

Discriminant validity is attained through square root of average variance extracted (AVE) and cross loadings. Cross loadings were examined by following the instructions of Chin (1998). However, the square root of average variance extracted was examined by following the instructions of Fornell and

Larcker (1981). Both criteria are shown below. Square root of average variance extracted (AVE) is shown in Table 3 and cross loadings in Table 4.

Table 3
Discriminant Validity

	CIAD	RIE	SCEC	SCP	SCTM	TFL	TSL
CIAD	0.823						
RIE	0.822	0.868					
SCEC	0.799	0.757	0.892				
SCP	0.660	0.712	0.762	0.885			
SCTM	0.808	0.800	0.852	0.707	0.907		
TFL	0.800	0.849	0.766	0.744	0.840	0.894	
TSL	0.802	0.807	0.798	0.711	0.889	0.854	0.815

Table 4
Cross-Loadings

	CIAD	RIE	SCEC	SCP	SCTM	TFL	TSL
CIAD1	0.790	0.546	0.628	0.444	0.605	0.577	0.597
CIAD2	0.792	0.668	0.681	0.493	0.669	0.647	0.636
CIAD3	0.778	0.619	0.574	0.516	0.631	0.630	0.579
CIAD4	0.826	0.699	0.605	0.585	0.683	0.645	0.681
CIAD5	0.851	0.760	0.737	0.602	0.724	0.720	0.723
RIE1	0.603	0.769	0.481	0.576	0.544	0.707	0.628
RIE2	0.716	0.876	0.696	0.628	0.678	0.757	0.692
RIE3	0.696	0.850	0.684	0.591	0.731	0.664	0.695
RIE4	0.745	0.886	0.719	0.636	0.783	0.811	0.736
RIE5	0.722	0.857	0.621	0.587	0.646	0.740	0.669
SCEC1	0.767	0.716	0.876	0.714	0.870	0.811	0.809
SCEC2	0.677	0.645	0.920	0.687	0.759	0.704	0.765
SCEC3	0.720	0.665	0.889	0.698	0.685	0.630	0.652
SCEC4	0.713	0.701	0.901	0.673	0.739	0.649	0.643
SCEC5	0.679	0.644	0.870	0.615	0.741	0.609	0.681
SCP1	0.563	0.612	0.666	0.870	0.621	0.673	0.615
SCP2	0.630	0.611	0.764	0.881	0.671	0.603	0.653
SCP3	0.577	0.645	0.736	0.894	0.649	0.670	0.645
SCP4	0.574	0.630	0.609	0.907	0.579	0.705	0.603
SCP5	0.586	0.617	0.621	0.907	0.626	0.678	0.613
SCP6	0.570	0.664	0.633	0.847	0.602	0.620	0.640
SCTM1	0.698	0.705	0.665	0.561	0.879	0.704	0.813
SCTM2	0.697	0.663	0.662	0.576	0.875	0.682	0.813
SCTM3	0.711	0.721	0.702	0.610	0.912	0.731	0.809
SCTM4	0.737	0.715	0.859	0.688	0.867	0.770	0.753
SCTM5	0.799	0.742	0.861	0.684	0.908	0.823	0.845
TFL1	0.518	0.672	0.508	0.532	0.619	0.803	0.638
TFL2	0.717	0.830	0.619	0.694	0.742	0.907	0.799
TFL3	0.743	0.768	0.691	0.680	0.749	0.930	0.751
TFL4	0.777	0.799	0.749	0.704	0.795	0.902	0.793
TFL5	0.788	0.800	0.826	0.695	0.828	0.921	0.820
TSL1	0.672	0.700	0.711	0.611	0.658	0.736	0.745
TSL2	0.688	0.715	0.678	0.630	0.744	0.764	0.843
TSL3	0.460	0.432	0.373	0.369	0.545	0.410	0.703
TSL4	0.660	0.638	0.723	0.621	0.829	0.755	0.887
TSL5	0.724	0.736	0.676	0.597	0.868	0.723	0.878

4.2 Structural Model Assessment

The second part of the analysis majorly comprised of hypotheses testation. It includes both direct and moderation hypotheses. First of all, direct hypotheses were tested as shown in Table 5. To accept or reject the hypotheses, p-value 1.96 was considered. All the relationships having t-value below 1.96 will be rejected and all other having t-value above 1.96 (t-value > 1.96) will be accepted. It is clear from

Table 5 that all the relationship has t-value more than 1.96 which shows significant relationship. Thus, all the direct hypotheses (H_1 , H_2 , H_5 , H_7 , H_9 , H_{10}) are accepted.

Table 5
Structural Model Assessment (Results)

Hypotheses	Relationship	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics ((O/STDEV))	P Values	Decision
H_1	CIAD \rightarrow SCP	0.119	0.098	0.030	3.963	0.000	Supported
H_2	RIE \rightarrow SCP	0.145	0.147	0.028	5.149	0.000	Supported
H_{10}	SCEC \rightarrow SCP	0.512	0.462	0.185	2.771	0.006	Supported
H_9	SCTM \rightarrow SCP	0.129	0.091	0.051	2.527	0.012	Supported
H_5	TFL \rightarrow SCP	0.334	0.340	0.136	2.454	0.014	Supported
H_7	TSL \rightarrow SCP	0.112	0.096	0.057	1.961	0.050	Supported

Moreover, Table 4 shows the moderating effect of supply chain top management support to audit. The moderating effect between competency of internal audit department and supply chain performance is insignificant. As the t-value is 0.673 which is less than 1.96 (t-value < 1.96). Thus, it rejects the H_3 . However, in case of moderation effect between internal, and external auditor's relationship and supply chain performance, the t-value is 2.099 (t-value > 1.96) which show significant effect. Hence, it accepts the H_4 .

Table 6
Structural Model Assessment Moderation Results (Supply Chain Top Management Support to Audit)

Hypotheses	Relationship	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics ((O/STDEV))	P Values	Decision
H_3	CIAD \times SCTM \rightarrow SCP	0.112	0.096	0.167	0.673	0.501	No Moderation
H_4	RIE \times SCTM \rightarrow SCP	0.227	0.224	0.107	2.099	0.035	Moderation

Furthermore, second moderation effect of supply chain employee commitment for change is given in Table 5. From the table it is evident that supply chain employee commitment for change is a moderating variable between transformational leadership and supply chain performance as the t-value 4.247 which is above 1.96 (t-value > 1.96). Secondly, the moderation effect between transactional leadership and supply chain performance is also significant with t-value 2.565 (t-value > 1.96). Therefore, H_6 and H_8 are accepted.

Table 7
Structural Model Assessment Moderation Results (Supply Chain Employee Commitment for Change)

Hypotheses	Relationship	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics ((O/STDEV))	P Values	Decision
H_6	TFL \times SCEC \rightarrow SCP	0.175	0.172	0.041	4.247	0.000	Moderation
H_8	TSL \times SCEC \rightarrow SCP	0.203	0.199	0.079	2.565	0.008	Moderation

Apart from hypotheses testation, this part of analysis also shows the variance explained (R^2) in endogenous variables. In the current study R^2 is 65.1% which is moderate value according to Chin (1998). It indicates that all the set of exogenous variables, namely; competency of internal audit department, relationship between internal and external auditors, transformation leadership, transactional leadership, supply chain top management support and supply chain employee's commitment to changes are expected to explain 65.1% variance in dependent variable, namely; supply chain performance.

Table 8

R-Square (R^2) Value	
Latent Variable	Variance Explained (R^2)
Supply Chain Performance (SCP)	0.651

Furthermore, effect size (f^2) of each exogenous variable is shown in Table 7. Competency of internal audit department, transformational leadership and transactional leadership have small effect size (f^2) of 0.041, 0.031 and 0.033, respectively. Relationship between internal auditors and external auditors and supply chain employee's commitment are 0.358 and 0.181, respectively with strong and moderate effect size (f^2), respectively. However, supply chain top management has no effect size (f^2). Effect size (f^2) value was examined by following the instructions of Cohen (1988).

Table 9

Effect Size (f^2)		
R-Squared	f-squared	f^2
Competency of Internal Audit Department	0.041	Small
Relationship between Internal Auditors and External Auditors	0.358	Strong
Transformational leadership	0.031	Small
Transactional leadership	0.033	Small
Supply Chain Top Management	0.006	None
Supply Chain Employees Commitment	0.181	Moderate

Finally, the quality of model was examined through construct cross-validated redundancy which is known as predictive relevance (Q^2). This test is alternate to goodness-of-fit (GOF). According to the instruction of Chin (1998), to attain a certain quality of model, the value of predictive relevance (Q^2) should be above zero. Table 8 shows that the value of predictive relevance (Q^2) is above zero.

Table 10

Construct Cross-Validated Redundancy			
Total	SSO	SSE	$Q^2 = (1-SSE/SSO)$
Supply Chain Performance (SCP)	492.000	262.607	0.466

5. Findings and Discussion

Literature revealed various factors which influence on supply chain performance of different companies. However, from the empirical analysis, it is found that audit and leadership have maintained strong influence on supply chain performance. Various audit determinants such as competency of internal audit department and relationship between internal and external auditors had significant influence.

According to the results of the study, the relationship between competency of internal audit department and supply chain performance is significant with p-value 0.000 and t-value 3.963. On the other hand, β -value is 0.119 which shows positive relationship. Therefore, competency of internal audit department has significant positive relationship with supply chain performance. It demonstrates that any increase in internal audit department competency will directly increase the supply chain performance.

Another audit determinant is relationship between internal auditors and external auditors. In the same direction of internal audit department competency, the relationship between internal auditors and external auditors has had a significant positive relationship with supply chain performance with p-value 0.000, t-value 5.149 and β -value 0.145. Thus, the better the relationship between internal auditors and external auditors, the better supply chain performance.

Additionally, this study has also examined the moderating role of supply chain top management support between the relationship of competency of internal audit department and supply chain performance as well as the relationship between internal and external auditor's relationship and supply chain performance. It has revealed that moderating effect is insignificant between competency of internal audit department and supply chain performance with p-value 0.501, t-value 0.673 and β -value 0.112. The reason behind the insignificant effect is that competency of audit department does not require management support. Competency always influence positively on supply chain performance. Therefore, supply chain top management support has no role between competency of internal audit department and supply chain performance. On the other hand, moderating effect between internal and external auditor's relationship, and supply chain performance is significant with p-value 0.035, t-value 2.099 and β -value 0.227. Furthermore, moderation effect is shown in Fig. 3, which shows that supply chain top management support strengthens the positive relationship of between internal and external auditor's relationship, and supply chain performance.

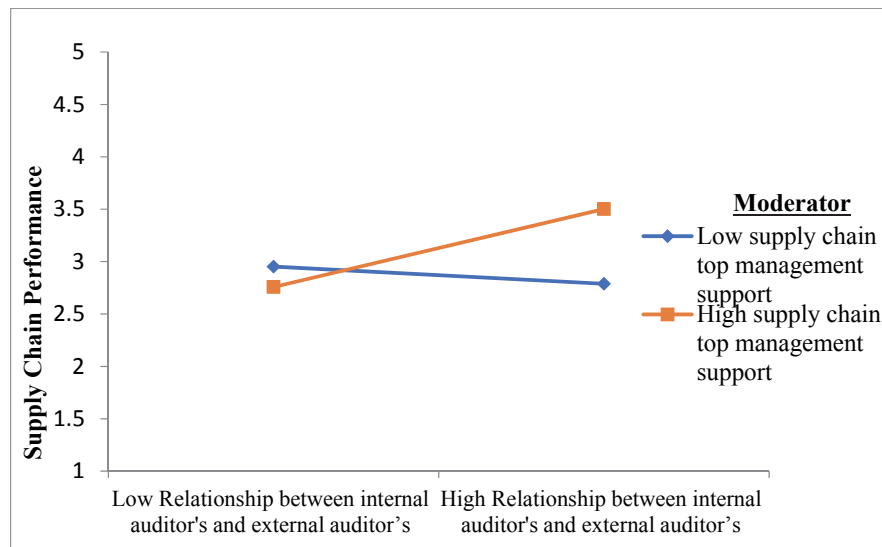


Fig. 3. Moderation effect of supply chain top management support between relationship of internal auditors and external auditors, and supply chain performance

Nevertheless, the results of the study have revealed that relationship between transformational leadership and supply chain performance was significant with p-value 0.014 and t-value 2.2454. On the other hand, β -value is 0.334 which shows positive relationship. Hence, transformational leadership has maintained significant positive relationship with supply chain performance. It demonstrates that an increase in transformational leadership will directly increase the supply chain performance. The relationship of transactional leadership and supply chain performance is also significant positive with p-value 0.05, t-value 1.961 and β -value 0.112. Therefore, transactional leadership also enhances the supply chain performance.

Nonetheless, in case of moderation influences on supply chain employee's commitment for change between transformational leadership and supply chain performance is significant with p-value 0.000 and t-value 4.247. The β -value for this moderation effect is 0.175. It is proved that supply chain employee's commitment moderates the relationship between transformation leadership and supply chain performance. The moderation effect is shown in Fig. 4, which shows that supply chain employee's commitment enhances the positive effect of transformational leadership on supply chain performance.

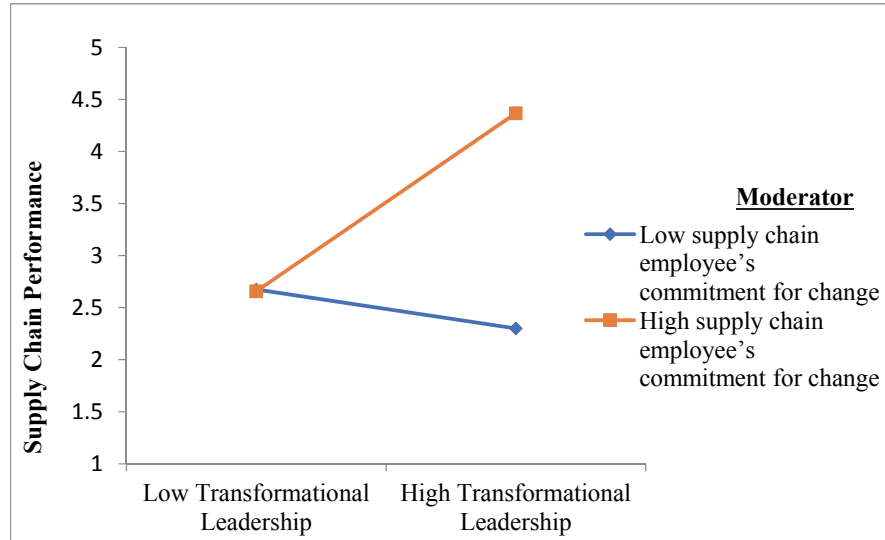


Fig. 4. Moderation effect of supply chain employee's commitment for change between relationship of transformational leadership and supply chain performance

Moreover, moderation effect of supply chain employee's commitment for changing between transactional leadership and supply chain performance is significant with p-value and t-value of 0.008 and 2.565, respectively. The β -value for this moderation effect is 0.203. Thus, it is clear that supply chain employee's commitment for change moderates the relationship between transactional leadership and supply chain performance. The moderation effect is shown in Fig. 5, which indicates that supply chain employee's commitment enhances the positive effect of transactional leadership on supply chain performance.

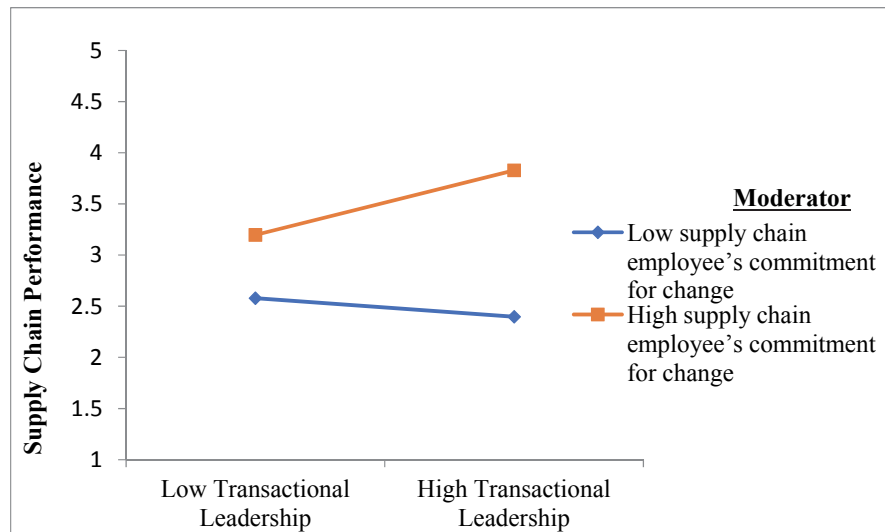


Fig. 5. Moderation effect of supply chain employee's commitment for change between relationship of transactional leadership and supply chain performance

Additionally, the results of the study have revealed that supply chain top management support and supply chain employee's commitment for change had significant and positive relationship with supply chain performance with p-value 0.012, 0.006 t-value 2.527, 2.771 and β -value 0.129, 0.512, respectively. Thus, the supply chain top management support and supply chain employee's commitment enhance the supply chain performance.

6. Conclusion

The current study is based on supply chain firms working in UK. Majorly, this study has investigated the role of audit and leadership to boost the supply chain performance. Moreover, the moderating role of supply chain top management and supply chain employee's commitment for change was also examined.

Findings of the study have revealed that audit had significant role to enhance supply chain performance. The audit determinants, namely; competency of internal audit department and relationship between internal and external auditors had positive influence on supply chain performance in UK. Supply chain companies should enhance the audit activities which will automatically enhance the performance of supply chain companies. Additionally, top management also has maintained crucial role to expedite the effective audit activities. The same direct effect with audit, the role of leadership cannot be neglected. An effective leadership can enhance the supply chain activities in a supply chain company. It has positive effect through transformational leadership and transactional leadership activities. However, supply chain employee's commitment for change is one of the essential element to enhance the positive effect of leadership on supply chain performance. Collectively, audit, leadership, top management and employee's commitment are the real determinants of better supply chain performance in UK based supply chain companies.

Hence, supply chain companies should enhance four major elements, namely; audit, leadership, top management and employee's commitment to boost supply chain performance. Researchers are invited to apply this framework on developing countries as the results might differ in those countries. The other audit determinants such as independence of auditors and size of internal audit department should also be included in the current framework. Moreover, information and communication technology (ICT) should be used as a mediating variable between audit determinants and supply chain performance. As the information and communication technology (ICT) has important role in supply chain (Hameed et al., 2018).

References

- Almohaimed, A. (2000). *Performance auditing in the Saudi public sector: its nature and effectiveness*. Ph.D. Thesis. University of Kent at Canterbury, the UK
- Al-Twaijry, A. A., Brierley, J. A., & Gwilliam, D. R. (2003). The development of internal audit in Saudi Arabia: an institutional theory perspective. *Critical Perspectives on Accounting*, 14(5), 507-531.
- Alzeban, A., & Gwilliam, D. (2014). Factors affecting the internal audit effectiveness: A survey of the Saudi public sector. *Journal of International Accounting, Auditing and Taxation*, 23(2), 74-86.
- Avolio, B.J., & Bass, B.M. (2004) Multifactor Leadership Questionnaire Manual and Sample Set, 3rd edn. *Mind Garden Inc., Redwood City, CA*.
- Avolio B.J. & Bass B.M. (2004). *Multifactor Leadership Questionnaire Manual and Sample Set, 3rd edn*. Mind Garden Inc., Redwood City, CA.
- Avolio, B. J. (1999). *Full Leadership Development: Building the Vital Forces in Organizations*: Sage.
- Babakus, E., & Mangold, W. G. (1992). Adapting the SERVQUAL scale to hospital services: an empirical investigation. *Health Services Research*, 26(6), 767.
- Bass, B. M. (1985). Leadership: Good, Better, Best. *Organizational Dynamics*, 13(3), 26-40.
- Bass, B. M. (1990). *Bass & Stogdill's Handbook Of Leadership: Theory, Research, And Managerial Applications* (3rd Ed.). New York, NY, US: Free Press.
- Bass, B. M., & Steidlmeier, P. (1999). Ethics, character, and authentic transformational leadership behaviour. *The Leadership Quarterly*, 10(2), 181-217.
- Bennett, K. (2004). A time for change? Patriarchy, the former coalfields and family farming. *Sociologia Ruralis*, 44(2), 147-166.
- Bennis, W., & Nanus, B. (1985). *Leadership: The Strategies for Taking Charge*. New York.

- Brierley, J., El-Nafabi, H., & Gwilliam, D. (2001). The problems of establishing internal audit in the Sudanese public sector. *International Journal of Auditing*, 5(1), 73- 87.
- Bryant, S. E. (2003). The role of transformational and transactional leadership in creating, sharing and exploiting organizational knowledge. *Journal of Leadership & Organizational Studies*, 9(4), 32-44.
- Burns, J. M. G. (1978). *Leadership: Harper & Row New York*.
- Bytheway, A. (1995a). Information in the Supply Chain: Measuring Supply Chain Performance, Cranfield School of Management *Working Paper Series SWP195, March*.
- Bytheway, A. (1995b), A Review of Current Logistics Practice, Cranfield School of Management *Working Paper Series SWP1095, March*.
- Chin, W. W. (1998). The partial least squares approach to structural equation modeling. *Modern Methods for Business Research*, 295(2), 295-336.
- Cohen, A., & Sayag, G. (2010). The Effectiveness of Internal Auditing: An Empirical Examination of its Determinants in Israeli Organizations, *Austr. Accounting Review* 20(3), 296-307.
- Cohen, J. (1988). Statistical power analysis for the behavioral sciences. *Hiltsdale. NJ: Lawrence Earlbaum Associates*, 2.
- Corina-Maria, D. (2014). Processes used in risk management. *Management Strategies Journal*, 26(4), 383-389.
- Divyaranjani, R. (2018). Supply Chain Performance of Customer and Supplier Relationship on Indian Retail Sector. *International Journal of Supply Chain Management*, 7(2), 168-175.
- Eisenbach, R., Watson, K., & Pillai, R. (1999). Transformational leadership in the context of organizational change. *Journal of Organizational Change Management*, 12(2), 80.
- Fornell, C., & Larcker, D. F. (1981). Structural equation models with unobservable variables and measurement error: Algebra and statistics. *Journal of Marketing Research*, 18(3), 382-388.
- George, D. Theofanis, K. & Konstantinos, A. (2015). Factors associated with Internal Audit Effectiveness: Evidence from Greece. *Journal of Accounting and Taxation*, 7(7), 113- 122.
- George, D., & Mallery, M. (2003). Using SPSS for Windows step by step: a simple guide and reference.
- Getie Mihret, D., and Wondim Yismaw, A. (2007). Internal audit effectiveness: an Ethiopian public sector case study. *Managerial Auditing Journal*, 22(5), 470-484.
- Golen, S. (2008). Communication Barriers between Internal and External Auditors. *ABEA Journal*, 27(1), 35- 36.
- Gunasekaran, A., Patel, C., & McGaughey, R. E. (2004). A framework for supply chain performance measurement. *International Journal of Production Economics*, 87(3), 333-347.
- Gwilliam, D., & El-Nafabi, H. (2002). The possibility of transition to public sector modern auditing techniques and procedures found in developing countries; the case of Sudan. *Accounting Research, The Saudi Accounting Association*, 6(2), 161-196.
- Haider, S., Nisar, Q. A., Baig, F., & Azeem, M. (2018). Dark Side of Leadership: Employees' Job Stress & Deviant Behaviors in Pharmaceutical Industry. *International Journal of Pharmaceutical Research & Allied Sciences*, 7(2).
- Hailemariam, S. (2014). *Determinants of internal audit effectiveness in the public sector, case study in selected Ethiopian public sector offices* (Doctoral dissertation, Jimma University).
- Hair Jr, J.F., & Lukas, B. (2014). *Marketing research*. McGraw-Hill Education Australia.
- Hair, J.F., Black, W.C., Babin, B.J., Anderson, R.E., & Tatham, R.L. (2010). *Multivariate Data Analysis*. Prentice Hall.
- Hameed, W. U., Azeem, M., Ali, M., Nadeem, S., & Amjad, T. (2017a). The Role of Distribution Channels and Educational level towards Insurance Awareness among the General Public. *International Journal of Supply Chain Management*, 6(4), 308-318.
- Hameed, W. U., Hashmi, F., Ali, M., & Arif, M. U. H. A. M. M. A. D. (2017b). Enterprise risk management (ERM) system: Implementation problem and role of audit effectiveness in Malaysian firms. *Asian Journal of Multidisciplinary Studies*, 5(11).
- Hameed, W. U., Hussin, T., Azeem, M., Arif, M., & Basheer, M. F. (2017c). Combination of microcredit and micro-training with mediating role of formal education: A micro-enterprise success formula. *Journal of Business and Social Review in Emerging Economies*, 3(2), 285-291.

- Hameed, U.H., Shabbir, M.S., Raza, A., & Salman, A., (2018a). Remedies of low performance among Pakistani e-logistic companies: The role of firm's IT capability and information communication technology (ICT). *Uncertain Supply Chain Management*, 7(2).
- Hameed, W. U., Nadeem, S., Azeem, M., Aljumah, A. I., & Adeyemi, R. A. (2018b). Determinants of E-Logistic Customer Satisfaction: A Mediating Role of Information and Communication Technology (ICT). *International Journal of Supply Chain Management*, 7(1), 105-111.
- Hameed, W.U., Manzoor, I., Maqbool, N., Ahmed, S., & Azeem, M. (2018c). A prospective study of factors that lead to invest in mutual funds: A mediating role of investor's perception. *Accounting*, 5(2).
- Hameed, W.U., Mohammad, H.B., & Shahar, H. K. (2018d). Pursuing goal of self-sustainability but leads towards more instability: Challenges and way forward of self-help groups (SHGs). *International Journal of Business and Tehnopreneurship*, 8(1), 67-76.
- Henseler, J., Ringle, C. M., & Sinkovics, R. R. (2009). The use of partial least squares path modeling in international marketing. In *New challenges to international marketing* (pp. 277-319). Emerald Group Publishing Limited.
- Herold, D. M., Fedor, D. B., Caldwell, S., & Liu, Y. (2008). The effects of transformational and change leadership on employees' commitment to a change: a multilevel study. *Journal of Applied Psychology*, 93(2), 346-357.
- Herscovitch, L., & Meyer, J. P. (2002). Commitment to organizational change: Extension of a three-component model. *Journal of Applied Psychology*, 87(3), 474e487.
- Hussain, S., Rizwan, M., Nawaz, M. S., & ul Hameed, W. (2013). Impact of effective training program, job satisfaction and reward management system on the employee motivation with mediating role of employee commitment. *Journal of Public Administration and Governance*, 3(3), 278-293.
- Imran, M., Aziz, A.B., Hamid, S. N. B. A., & Hameed, W. U. (2018). The contributing factors towards e-logistic customer satisfaction: a mediating role of information Technology. *Uncertain Supply Chain Management*, 7(1), 63-72.
- Ismail, A., Mohamad, M. H., Mohamed, H. A.-B., Rafiuddin, N. M., & Zhen, K. W. P. (2010). Transformational and transactional leadership styles as a predictor of individual outcomes. *Theoretical & Applied Economics*, 17(6), 89-104.
- Kavanagh, M. H., & Ashkanasy, N. M. (2006). The impact of leadership and change management strategy on organizational culture and individual acceptance of change during a merger. *British Journal of Management*, 17, S81-S103.
- Lamming, R. (1996). Squaring lean supply with supply chain management. *International Journal of Operations & Production Management*, 16(2), 183-96.
- Limsila, K., & Ogunlana, S. O. (2008). Performance and leadership outcome correlates of leadership styles and subordinate commitment. *Engineering, Construction and Architectural Management*, 15(2), 164-184.
- Mihret, D. & Yismaw, A. (2007). Internal audit effectiveness: an Ethiopian public sector case study. *Managerial Auditing Journal*, 22(5), 470-484.
- Mihret, D.G., Kieran, J., & Mula, J.M. (2010). Antecedents and organizational performance implications of internal audit effectiveness: some propositions and research agenda. *Pacific Accounting Review*, 22(3), 224- 252.
- Mihret, D. G., & Grant, B. (2017). The role of internal auditing in corporate governance: a Foucauldian analysis. *Accounting, Auditing & Accountability Journal*, 30(3), 699-719.
- Nadler, D. A., & Tushman, M. L. (1990). Beyond the charismatic leader: Leadership and organizational Change. *California Management Review*, 32(2), 77-97.
- New, S.J. (1996). A framework for analysing supply chain improvement. *International Journal of Operations & Production Management*, 16(4), 19-34.
- Palandeng, D. I., Kindangen, P., Timbel, A., & Massie, J. (2018). Influence Analysis of Supply Chain Management and Supply Chain Flexibility to Competitive Advantage and Impact on Company Performance of Fish Processing in Bitung City. *Journal of Research in Business, Economics and Management*, 10(1), 1783-1802.

- Saleheen, F., Habib, M. M., & Hanafi, Z. (2018). Supply chain performance measurement model: A literature review. *International Journal of Supply Chain Management*, 7(3), 70-78.
- Singh, R., Sandhu, H. S., Metri, B. A., & Kaur, R. (2018). *Supply Chain Management Practices, Competitive Advantage and Organizational Performance: A Confirmatory Factor Model*. In Operations and Service Management: Concepts, Methodologies, Tools, and Applications (pp. 1181-1207). IGI Global.
- Tarafdar, M., & Qrunfleh, S. (2017). Agile supply chain strategy and supply chain performance: complementary roles of supply chain practices and information systems capability for agility. *International Journal of Production Research*, 55(4), 925-938.
- Thanki, S., & Thakkar, J. (2018). A quantitative framework for lean and green assessment of supply chain performance. *International Journal of Productivity and Performance Management*, 67(2), 366-400.
- Waters-Fuller, N. (1995). JIT purchasing and supply: a review of the literature", *International Journal of Operations & Production Management*, 15(9), 220-36.
- Weber, M. (1947). The theory of economic and social organization. Trans. AM Henderson And Talcott Parsons. *New York: Oxford University Press*.
- Westover, J. H. (2010). Managing organizational change: change agent strategies and techniques to successfully managing the dynamics of stability and change in organizations. *International Journal of Management & Innovation*, 2(1), 45-50.
- Whittington, J. L., Coker, R. H., Goodwin, V. L., Ickes, W., & Murray, B. (2009). Transactional leadership revisited: self-other agreement and its consequences. *Journal of Applied Social Psychology*, 39(8), 1860-1886.
- Yukl, G. (1989). Managerial leadership: a review of theory and research. *Journal of Management*, 15(2), 251.



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