Leadership, Audit, and Supply Chain: The Effect and the Integration, Evidence from a Developing Country

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Abstract: - Productivity and Profitability in the firms. Several studies have found that supply chains are one of the most essential drivers for raising gross domestic product in all countries. Because of the significant usage of GDP on supply chains, it is critical to focus on Jordan-based supply chain enterprises and identify numerous aspects to improve the performance of the supply chain. As a result, the major aim of this research is to explore the combined impact of types of Leadership and auditing factors on the performance of supply chains in Jordanian firms. Data were gathered from the department of audit officials and other management personnel who are involved in the activities of the supply chain. After analyzing the results of the questionnaire using Smart-PLS3, the research found that types of Leadership and audit influenced the performance of the supply chain . Furthermore, top management and staff commitment to change had a substantial impact in enhancing the advantageous effect on leadership and audit. This result is very important for Jordanian supply chain firms looking to improve the performance of the supply chain. Also, top management has played a key role in accelerating effective audit efforts.

Key-Words: - Jordan, Employee commitment, Top management, Leadership, Audit, Performance of supply chain.

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1 Introduction

Performance of supply chain (PSC) has long been recognized as a vital component of competitive strategy for increasing firm efficiency and profitability, [1], [2], [3], [4]. Supply chain management (SCM), development, and analysis are turning out to be more vital nowadays. Various methods for SCM are obvious in the literature, , [1], [5], [6]. However, there is still a vacuum that has to be addressed to improve supply chain (SC) efficiency, notably in Jordan-based enterprises. In Jordan, many studies indicated that SC contribute a large part of the country's GDP and that they are considered the main driver of it, [7], [8], [9]. As a result, such results and advancements demonstrate a notable visible influence of SCM on firm assets and the Jordanian economy. Most industrial executives are preoccupied with PSC. Because it is critical to cost control and overall corporate performance. As a result of the increased use of GDP on SC, the situation is critical to focus on Jordanian-based SC firms and uncover numerous aspects to improve PSC.

According to the studies, numerous factors influence the PSC. The most essential components, however, are auditing and leadership. Audit is one of the factors that reduces business risks, [10], [11] and lowers SC costs by offering an accurate and fair view of the company's financial statements. Internal audit efficiency (IAE) and the connection between internal and external auditors are audit determinants. These two factors have a substantial impact on PSC, [12], [13], [14].

Also, leadership has a strong relationship with PSC. Leadership is critical for every company, [15], [16]. An effective leader inspires staff to use resources wisely and efficiently. It improves staff performance, which in turn has a good impact on PSC. Yet, two types of leadership are more significant in leading individuals in the proper direction: leadership transformative and leadership transactions, [17]. As a result, audit methods and leadership are increasingly crucial in improving PSC.

Also, improved top management support (TMS) for audit procedures can improve audit effectiveness for PSC. Senior management support has a substantial impact on audit procedures, [12].

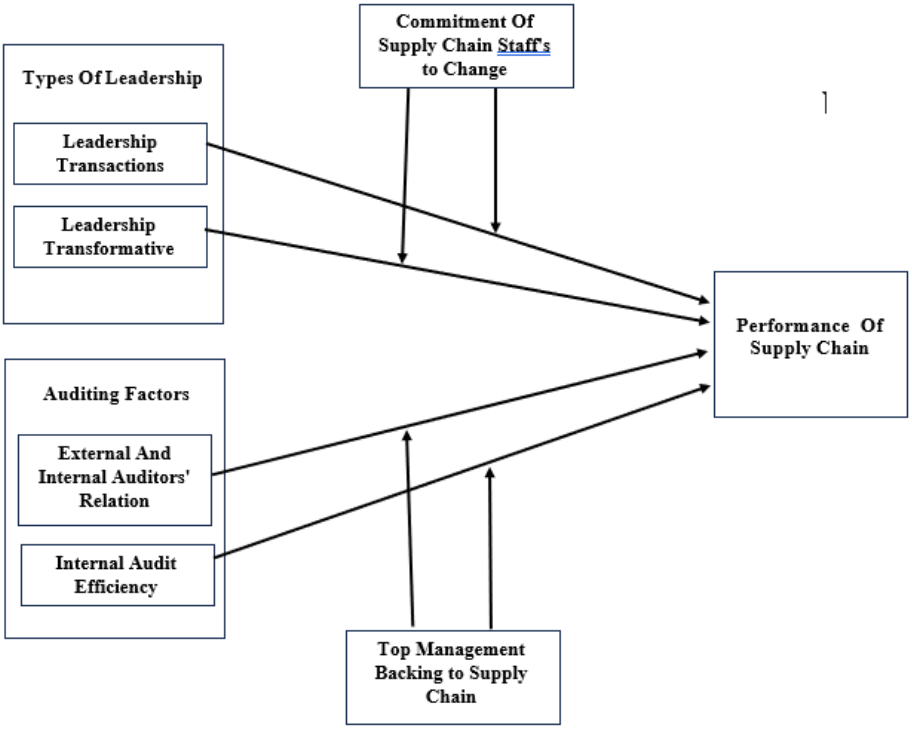

Fig. 1: Study Model

Additionally, leadership is just efficient if people desire to change and are dedicated to absorbing change, as staff commitment to change is the most crucial factor in any business, [18]. Hence, in order to transferal the beneficial impact of leadership to PSC, staff commitment to change is critical. All these criteria are depicted in Figure 1, which is the recommended model for the study.

The article on PSC dealing with various tactics and technology for successfully managing a SC is extensive, [19]. Many research have discussed PSC in the developed and developing countries, [1], [2], [3], [5], [19], [20], [21], [22], but unfoundedly, a very few of studies focused on the Arabs countries, especially in case of Jordan as one of the developing and Arab countries. Also, the majority of the prior studies focused on the relationship between TMS and PSC, but they did not take into consideration the probability of the integration between types of leaders and audit factors to strengthen the PSC. Furthermore, this research contributed to the literature by evaluating the combined influence of auditing variables and leadership on PSC in Jordan. Moreover, the study looked at the moderating variables: commitment of supply chain staff to change and top management backing to the supply chain.

Consequently, the objective of this research is to explore the effect of auditing factors including internal audit efficiency and external and internal auditors' relation (EIAR) on PSC, with the effect of top management backing to supply chain (TMBSC) as a moderating variable in Jordan-based companies. In addition, this study tries to investigate the role of leadership including the effect of leadership transformative and leadership transactions to enhance PSC in Jordan-based companies, with the moderating role of CSCSC.

2 Review of Literature

2.1 Audit Factors, and Performance of Supply Chain

Every audit committee's technical expertise plays a key part in boosting the efficacy of the audit. [23], assert that internal activity proficiency is gained by training. Furthermore, a few researchers emphasized that the key variable that affects the efficiency of audits is the professional competency of internal or external auditors. Effectiveness and internal audit competency are positively correlated, [14], [24].

To present a genuine and fair perspective of the financial statements of the concerned organization, the audit department's competence is crucial. One of the signs of a smooth PSC is this accurate and fair perspective. Because risk is a crucial component of any firm [11], [25]. Effective auditing procedures improve the PSC by maximizing company risk management.

Internal audit effectiveness is dependent on

staff expertise [14], [26]. The importance of internal audit teams that possess the knowledge, competencies, and other abilities necessary to conduct audit functions is demonstrated by the ISPPIA (ISPPIA Standard 1210). Without a doubt, it is crucial that internal auditors possess the necessary training and other credentials, [27]. A rise in overall performance is a sign that PSC will rise as the SC is one of the components of a business.

Thus, effective internal audit procedures combined with expertise improve the outcomes of external audits. One of the guarantees of effective operations in SC firms is positive auditor outcomes. That demonstrates how connected IAE and PSC are. Hence, it is assumed that.

H_1: The internal audit efficiency significantly affects the performance of the supply chain**.**

The interaction between internal and external audit departments heavily influences how effective an audit will be. This connection attests to efficient coordination and communication between internal and external audits. They cooperate by exchanging various pieces of documentation and helping with the auditing process. The influence of the interaction between the external and internal audit departments on audit effectiveness is the subject of several prior research, [28], [29], [30].

Interaction between external and internal auditors is important from a few angles. First, external auditing is important because it can improve the accuracy of financial reports. Second, internal, and external auditor collaboration is important for risk management, [21]. The efficacy of the SC activities rises with increased risk control, and it is based on the competence of the audit department.

As previously noted, the relationship between external auditors and internal auditors improves the performance of the audit, and a rise in the auditing process is one of the indicators of smooth procedures. One of the guarantees of successful SC procedures is smooth operations. As a result, it is speculated that:

H_2: The external and internal auditors significantly effect the performance of supply chain.

2.2 Audit Factors, Top management backing to supply chain, and Performance of Supply Chain

TMS represents one of the particularly important aspects that will improve the efficacy of the audit committee. According to prior studies, management assistance is essential for several audit operations. For example, [31], explored a favorable relationship between managerial support and audit efficacy. As a result, management support in SC firms promotes audit procedures that boost PSC.

Some research, including [24], found that the support of the management is a critical factor in effectiveness of the internal audit in all firms. Also, some authors highlighted the beneficial relationship between internal audit and managerial support. It has the potential to improve positive interaction with external auditors and internal auditors in SC organizations, [14].

Internal auditors should develop a strong relationship with TMS to do their boring tasks. Auditors need favorable assistance from top management to do their tasks more efficiently by the major aims. TMS is a factor that can take numerous forms, such as audit support by supplying necessary resources. These resources might take the shape of non-financial and financial resources like training, management assistance, alternative modes of transportation, technology with cutting-edge processes, professional certificate funding, and so on [14], [32]. As a result, the hypotheses listed below are presented:

H_3: The relation between internal audit efficiency and the performance of the supply chain moderated by top management backing.

H_4: The relation between external and internal auditors and the performance of the supply chain **is** moderates by top management backing.

2.3 Types of Leadership, and Performance of Supply Chain

There are two primary personality types of leaders: leadership transformative and leadership transactions, [33]. A transactional manager is a bureaucratic manager, while a charismatic manager is a transformational manager. Both forms of leadership have a tremendous impact on the PSC. According to the scholars, leadership style and organizational transformation are intertwined, [34], [35].

Leadership transformative may be defined as the procedure of affecting significant shifts in organizational employees' attitudes and beliefs and developing commitment to the company's aims, [36]. Moreover, transformational leadership expands the region of efficient independence and the space for employment intention. Studies on how leadership transformative impact change have been conducted since the 1980s, [37], [38], [39].

According to [37], [40], transformative leadership focuses on the distinctive behavior of

organizational personnel, which may impact their conduct, as well as the organizational direction, which can alter key values, beliefs, and attitudes. Besides that, [41], clarified that transformative leadership is a method of increasing a firm's need for change to an advanced degree of growth.

This type of leadership often motivates subordinates to seek out novel methods to do their jobs, by motivating them to stimulate their knowledge. The relationship between individual results and transformative and transactional leadership types was investigated by [42]. Results revealed that transformational leadership is a principal factor of routine justice, whereas transactional leadership is a strong factor of fair treatment, and equally types of leadership are critical factors of confidence in leaders, which improves willingness to change.

Moreover, there is a link between leadership style and employee support for cultural transformation based on the result of the study of [43]. In addition, the author went on to say that proved that leadership was critical in building staff commitment to change. It is also the leader must have enough experience to achieve a prominent level of devotion.

In research conducted by [42], a transformational leadership style has a significant and positive relation with employees' organizational commitment compared to leadership transactions. This finding supported the idea that staff commitment to change is significantly correlated with leadership style. According to [44], this level of commitment affects satisfaction, which affects SCM. All these leadership philosophies are connected to PSC, though.

The impact of the leadership transformative type on members of staff willingness to change has not been examined in the prior studies, notably in the literature of PSC, despite the importance of this type of leadership's role in organizational change. To fill this vacuum in the literature on organizational transformation and leadership and get a fresh and in-depth understanding of this topic within PSC, this study aims to address it. Hence, the following hypotheses are put forth:

H_5: The leadership transformative significantly affects the performance of the supply chain.

H_6: The relation between leadership transformative and the performance of the supply chain is moderated by the commitment of supply chain staff to change.

2.4 Types of Leadership, the Commitment of Supply Chain Staff to Change and Performance of the Supply Chain

Leadership transactions guarantee that behaviors are focused on a give-and-take cycle whereby the leader provides employees rewards or penalties depending on their performance and efforts, [41]. It may be considered as leaders that prioritize work completion and meeting expectations while paying tiny awareness to the requirements of the organization, [45]. Transactions of leadership have three features. To begin, transactional leaders collaborate with employees to achieve their aims. Second, these benefits are exchanged for labor effort, [46], [47]. Finally, leaders are aware of their employees' self-interest. Furthermore, they entail an exchange or transaction, which is a necessary component between employees and leaders.

According to [37], transactions of leadership include activities like performance monitoring, offering conditional significant incentives, and presenting conditional personal rewards to ensure that duties are accomplished as planned. Others argue that to create effective organizational transformation, leaders must exhibit transactional behaviors such as articulating goals, establishing performance indicators, and implementing incentives and punishments, [48]. As a result, leadership transactions are inextricably linked to the notion of trade between subordinates and leaders. All these elements affect the PSC personnel, which has a good impact on the PSC.

The Study, [41], used a qualitative analysis of leadership instances to distinguish between transformational and transactional leadership. According to him, most relationships between leaders and employees are commercial. The approach of leaders their employees with the intention of one thing for another when swapping, such as employment for subsidies or votes for political donations, has an impact on their followers' commitment to change. Effective leadership improves an organization's ability to adapt to change, which impacts the PSC.

The transactional form of subordinate and leader interactions is centered on benefit and cost, according to [41]. In addition to the above, Bass said that leadership transactions are a lower-level leadership approach and that a leadership type has several elements that are present-focused and have their roots in maintaining the status quo, which are counterproductive for changing organizations and fostering change, [40]. He suggested three aspects

of transactional culture: contingent reinforcement or reward, active management by exception, and passive avoidant behaviors of passive management by exception. According to [40], dependent reward or contingent reinforcement refers to an employee receiving a reward contingent upon meeting particular performance standards set out by the boss. To assess the impact of leadership transactional type on employee willingness to change and PSC, this research decided to add it as an independent variable. So, it is clear from this debate that leadership transactions have an impact on staff performance, which in turn has an impact on PSC. On the other side, staff adaptability is yet another element that affects how leadership transactions and PSC interact. Leadership is also crucial for greater SC credit use, which impacts the PSC. Since credit is one of the most crucial components of PSC, [11], [48]. This leads to the following hypotheses:

H_7: The leadership transactions significantly affect the performance of the supply chain.

H_8: The relation between leadership transactions and the performance of the supply chain is moderated by commitment of supply chain staff to change.

Furthermore, based on the prior discussion in the above literature, this study proposed the additional hypothesis as follows:

H_9: The top management backing significantly affects the performance of the supply chain.

H_{10}: The commitment of supply chain staff to change significantly affects the performance of the supply chain.

3 Research Method

Each research study's research methodology is its most vital component since it is often dependent on the study's goal, problem, and nature, [11], [48]. To accomplish the main goal, quantitative research methods and cross-sectional design were used by the nature of the current research study. Data were gathered from Jordanian SC firms. The respondents for this survey were chosen from the staff of these businesses. The respondents were split into two groups gathering to gather replies. Employees from the audit department made up one portion. The managerial workers were chosen in the second stage. Just those personnel who had a direct relationship with the process of SC were chosen.

With respect to calculating the sample size, [49], as cited in [50], indicated that the rule of thumb when it comes to the size of the sample entails multiplying the number of constructs by ten. These criteria were also suggested by several researchers such as [51], [52]. This study followed the suggestion of [53], who postulated that in every 1600 elements of the population under study, 310 elements will be sufficient as a sample size. In addition, this is consistent also to the argument of [54], clarified that Inferential statistics require a sample from a series. A sample of fewer than fifty elements will be deemed a weaker sample; a sample of one hundred will be poor; a sample of two hundred will be adequate; a sample of three hundred will be considered acceptable. As a result, in the current investigation, a sample size of three hundred was used. The data for SC firms was gathered via survey questionnaires. The distribution of surveys was done by region cluster sampling. As an appropriate strategy for gathering data across a large region, area cluster sampling is used. Area cluster sampling is ideal since the population is dispersed over a large region. As a result, three hundred questionnaires were given via area cluster sampling to workers at SC organizations. In Table 1, the response rate is displayed.

Also utilized to assess the data was a 5-point Likert scale. The 5-point Likert scale was chosen with the justification that it lowers respondents' "frustration level," while also improving response quality and response rate, [55]. Since it has fewer alternatives than the 7-point Likert scale (the 7-point scale offers seven possibilities, which confuses the responder and eventually affects the quality of replies), the 5-point Likert scale reduces respondents' levels of annoyance. The data was further examined using Smart PLS 3.

Table 1. Response Rate of the Questionnaires

Response	Frequency/Rate
Distributed Questionnaires	386
Returned Questionnaires	296
Useable Questionnaires	251
Excluded Questionnaires	50
Response Rate	% 76.6
Response Rate Used in The Analysis	% 65

4 Data Analysis

This part of the research talked about the analysis used in this research, the analysis of the current research is mostly arranged into two components. Assessment of the measuring model makes up the first section; This section debates the reliability and the validity of research measurements by using Confirmatory Factor Analysis (CFA). Which include Outer Loadings, Cronbach Alpha, CR, and AVE. The assessment of the structural model makes up the second section, this section will discuss the hypotheses test for both direct relationships and moderating relationships. Also, the effect size (f2), R-Squared (R2) value, and model quality are all covered in this section.

4.1 Evaluation of the Measurement Model

Outer loading, composite reliability, average variance extracted (AVE), and Cronbach's alpha made up the first section of the analysis, [52], [56], [57], [58]. In respect to outer lodgings, anything below 0.5 should be removed, and outer lodgings should be more than 0.5, [53]. The formula for calculating the value of "alpha;" "> 0.9- Excellent, 0.8- Good, 0.7- Acceptable" was presented by [59]. Moreover, the composite reliability (CR) needs to be greater than 0.7. Furthermore, the average extracted variance (AVE) must be greater than or equal to 0.5 to ensure internal consistency and convergent validity.

The measurement model evaluation is shown in Figure 2. The evaluation of the measurement model's findings is presented in Table 2 (Appendix). Every value falls inside the permitted range. Outer loading, composite reliability, and Cronbach's alpha are all higher than 0.7. Moreover, AVE is greater than 0.5, achieving convergent validity.

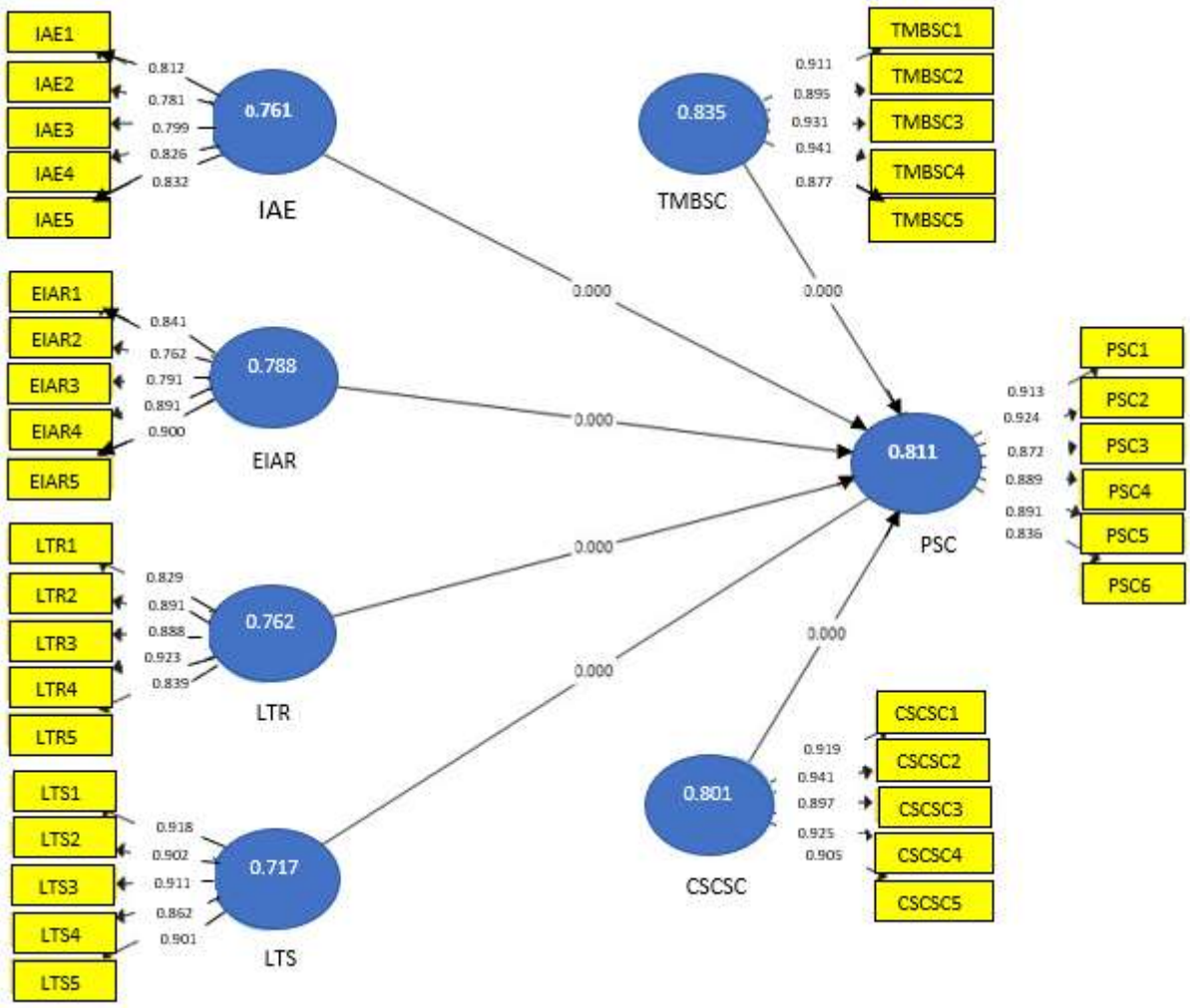

Fig. 2: Evaluation of the Study Model

Cross loadings and the square root of the AVE are used to achieve discriminant validity. As directed by [59], cross-loadings were investigated. To evaluate the square root of AVE, however, [60], guidelines were followed. The two requirements are displayed below. Table 3 displays the square root of the AVE, while Table 4 displays cross-loading.

Table 3. Discriminant Validity

	IAE	EIAR	CSCSC	PSC	TMBSC	LTR	LTS
IAE	**0.782**						
EIAR	0.702	**0.889**					
CSCSC	0.671	0.718	**0.895**				
PSC	0.681	0.679	0.801	**0.900**			
TMBSC	0.715	0.778	0.821	0.808	**0.914**		
LTR	0.700	0.810	0.795	0.765	0.816	**0.873**	
LTS	0.701	0.784	0.608	0.736	0.809	0.831	**0.846**

Table 4. Cross-Loadings

Items	IAE	EIAR	CSCSC	PSC	TMBSC	LTR	LTS
IAE1	**0.812**	0.618	0.581	0.335	0.662	0.458	0.471
IAE2	**0.781**	0.700	0.678	0.571	0.711	0.517	0.586
IAE3	**0.799**	0.591	0.582	0.552	0.658	0.591	0.619
IAE4	**0.826**	0.554	0.645	0.561	0.752	0.658	0.668
IAE5	**0.832**	0.719	0.718	0.668	0.458	0.699	0.555
EIAR1	0.598	**0.841**	0.545	0.558	0.369	0.710	0.568
EIAR2	0.691	**0.762**	0.486	0.593	0.756	0.722	0.648
EIAR3	0.705	**0.791**	0.471	0.607	0.686	0.663	0.598
EIAR4	0.718	**0.891**	0.585	0.643	0.678	0.788	0.729
EIAR5	0.786	**0.900**	0.555	0.555	0.565	0.812	0.599
CSCSC1	0.667	0.752	**0.919**	0.698	0.761	0.776	0.764
CSCSC2	0.755	0.716	**0.941**	0.734	0.711	0.668	0.789
CSCSC3	0.711	0.555	**0.987**	0.544	0.720	0.695	0.830
CSCSC4	0.712	0.723	**0.925**	0.617	0.703	0.655	0.814
CSCSC5	0.666	0.711	**0.905**	0.629	0.614	0.700	0.788
PSC1	0.596	0.695	0.789	**0.913**	0.512	0.689	0.681
PSC2	0.686	0.559	0.718	**0.924**	0.606	0.596	0.635
PSC3	0.600	0.617	0.800	**0.872**	0.666	0.755	0.611
PSC4	0.625	0.552	0.801	**0.889**	0.756	0.722	0.662
PSC5	0.669	0.667	0.596	**0.891**	0.766	0.763	0.667
PSC6	0.684	0.705	0.666	**0.836**	0.661	0.664	0.609
TMBSC1	0.468	0.708	0.751	0.662	**0.911**	0.740	0.844
TMBSC2	0.636	0.685	0.722	0.624	**0.895**	0.735	0.809
TMBSC3	0.725	0.666	0.718	0.599	**0.931**	0.743	0.817
TMBSC4	0.712	0.440	0.800	0.632	**0.941**	0.717	0.789
TMBSC5	0.769	0.714	0.834	0.645	**0.877**	0.818	0.766
LTR1	0.594	0.489	0.499	0.654	0.777	**0.829**	0.718
LTR2	0.686	0.501	0.576	0.666	0.799	**0.891**	0.800
LTR3	0.651	0.565	0.814	0.701	0.785	**0.888**	0.822
LTR4	0.754	0.715	0.561	0.711	0.755	**0.923**	0.759
LTR5	0.717	0.704	0.826	0.699	0.798	**0.839**	0.831
LTS1	0.522	0.699	0.755	0.499	0.447	0.629	**0.918**
LTS2	0.485	0.688	0.707	0.581	0.565	0.761	**0.902**
LTS3	0.514	0.456	0.452	0.457	0.555	0.544	**0.911**
LTS4	0.607	0.677	0.386	0.687	0.667	0.338	**0.862**
LTS5	0.681	0.669	0.577	0.382	0.807	0.285	**0.901**

Table 5. Results of Evaluation Structural Model

Hypotheses	Relationship	β	Sample Mean	Std. Dev.	T-Values	P-Values	Decision
H_1	IAE → PSC	0.201	0.075	0.020	2.961	0.001	Accepted
H_2	EIAR → PSC	0.162	0.136	0.031	4.258	0.008	Accepted
H_5	LTR → PSC	0.286	0.259	0.098	2.358	0.005	Accepted
H_6	LTS → PSC	0.172	0.064	0.045	1.972	0.000	Accepted
H_9	TMBSC → PSC	0.253	0.067	0.061	2.566	0.010	Accepted
H_{10}	CSCSC → PSC	0.491	0.371	0.086	2.898	0.000	Accepted

Table 6. Results of assessing the Moderator effect (TMBSC)

Hypotheses	Relation	β	Sample Mean	Std. Dev.	T-value	P-value	Decision
H3	IAE × TMBSC → PSC	0.128	0.109	0.135	0.712	0.625	Rejected
H4	EIAR × TMBSC → PSC	0.189	0.186	0.114	1.999	0.018	Accepted

Table 7. Results of assessing the Moderator effect (CSCSC)

Hypotheses	Relation	β	Sample Mean	Std. Dev.	T-Values	P-Values	Decision
H6	LTR× CSCSC → PSC	0.192	0.186	0.056	5.018	0.002	Accepted
H8	LTS× CSCSC → SCP	0.188	0.201	0.068	3.833	0.001	Accepted

Table 8. R-Square (R^2) Value

Latent Variable	R^2
PSC	0.682

Table 9. Effect Size (f^2)

R-Squared	f-squared	f^2
Internal audit efficiency	0.041	Small
External And Internal Auditors' Relation	0.401	Strong
Leadership transformative	0.042	Small
Leadership transactions	0.051	Small
Top management backing to supply chain	0.004	None
The commitment of supply chain staff to change	0.192	Moderate

Table 10. Predictive Relevance (Q2)

Total	SSO	SSE	Q^2
Performance of Supply Chain	486.000	273.511	0.560

4.2 Evaluation of Structural Model

Most of the analysis' second section was devoted to testing hypotheses. Either direct or moderate hypotheses are included. Initially, as indicated in Table 5, direct hypotheses were investigated. The t-value of 1.96 was used to decide whether to reject the hypotheses or accept the hypotheses. Any associations with t-values less than 1.96 will be rejected, while those with t-values more than 1.96 will be accepted. Table 5 makes it evident that every link has a t-value greater than 1.96, indicating a meaningful relationship. The H1, H2, H5, H7, H9, and H10 direct hypotheses are all regarded as true.

Moreover, Table 5 shows that the influence of (IAE on PSC) and (EIAR on PSC) for hypotheses H_1 and H_2 indicate that, there is a relationship, based on the significance value, standard beta, and t-value indicate that, the research finding is significant (β= 0.201, t=2.961, and P=0.001) and (β= 0. 162, t=4.258, and P=0. 008) respectively. Hence the hypotheses H_1 and H_2 is accepted.

In addition, H_5 and H_6 are accepted, based on the result presented in Table 5, which shows that (LTR on PSC) and (LTS → PSC) have a significant positive influence with standard beta (β= 0. 286, β= 0. 172), (t=2.358, t=1.972), and (P=0. 005, P=0. 000) respectively. Henceforth the hypothesis H_5 and H_6 is accepted.

The ninth and tenth hypotheses developed and tested are on the (TMBSC on PSC) and (CSCSC on PSC) the results for the hypothesis H_9 and H_{10} indicated that there is a significant relationship with positive influence. The significance value, the standard beta and the t-test are (β= 0. 253, t= 2.566, and P= 0.010), (β= 0. 491, t= 2.898, and P= 0.000). The results of H_9 and H_{10} are both accepted.

Furthermore, Table 6 represents TMBSC's moderating influence on audits. The moderating impact of IAE and PSC is negligible. The t-value is 0.712, which is lower than the value of 1.96. As a result, hypothesis three was rejected. Nevertheless, when the moderating impact between internal and external auditor relationships and PSC is included, the t-value is 1.999, which is higher than 1.96, indicating a significant effect. As a result, the fourth hypothesis was accepted.

In addition, Table 7 shows the second moderating impact of the commitment of supply chain staff to change. The table shows that the commitment of supply chain staffs to change is a moderating factor relating to leadership transformative and PSC, with a t-value of 5.018, which is more than 1.96. Second, the moderating impact relating leadership transactions and PSC is likewise substantial, with a t-value of 3.833 (t-value > 1.96). As a result, H6 and H8 are acceptable.

In addition to hypothesis testing, this section of the study displays the variance explained by R^2 in the dependent variable as presented in Table 8. According to [59], the current study's R^2 is 68.2%, which is a moderate result. It suggests that all the independent factors, IAE, EIAR, LTR, LTS, TMBSC, and CSCSC, are anticipated to explain 68.2% of the variance in the dependent variable, PSC. Moreover, Table 9 displays the effect size (f^2) of every independent factor. Small effect size (f^2) values for IAE, LTS, and LTR are 0.051, 0.042, and 0.041, respectively. The correlation between EIAR, as well as CSCSC, is 0.401 and 0.192, with significant and moderate impact sizes (f^2), respectively. TMBSC, however, has a minor impact (f^2). The effect size (f^2) value was analyzed by Cohen's directions [61].

Lastly, the model's quality was evaluated using construct cross-validated redundancy, sometimes referred to as predictive relevance (Q^2). An alternative to the goodness-of-fit test is this one (GOF). [60], [62], advised that to achieve a particular level of model quality, the predictive relevance (Q2) value should be greater than zero. Table 10 demonstrates that the predictive relevance (Q2) value is greater than zero.

5 Findings and Discussion

Research has identified several variables that affect PSC at distinct firms. Yet, the empirical study reveals that audit and leadership have remained to have a significant impact on PSC. IAE and EIAR, among other auditing variables, had a high impact.

The study's findings indicate that there is a significant link between IAE and PSC, with a p-value of 0.001 and a t-value of 2.961. Yet, the β-value is 0.201, indicating a positive association. IAE and PSC thus have a strong positive association. It shows that any improvement in the department of internal audit proficiency would therefore improve the PSC.

Relationships relating to external auditors and internal auditors are another audit-determining factor. EIAR and PSC have a substantial positive association in the same direction, with a p-value of 0.008, a t-value of 4.258, and a -value of 0.162. Hence, the better the PSC, the better the interaction between internal and external auditors.

The moderating influence of TMBSC in the

relationships between IAE and PSC and between external auditors and internal auditors from one side and PSC from the other side has also been investigated in this study. It was discovered that the moderating impact between IAE and PSC is negligible with a p-value of 0.625, a t-value of 0.712, and a -value of 0.128. The competence of the audit department does not require managerial support, which accounts for the minimal impact. Competence has a constant beneficial impact on PSC.

TMBSC hence has no effect between IAE and PSC. In contrast, the association between the internal and external auditors and the PSC has a moderating impact that is significant with a p-value of 0.018, a t-value of 1.999, and a -value of 0.189.

However, the study's findings showed that the relation between LTR and PSC was significant, with a p-value of 0.005 and a t-value of 2.358. Yet, the p-value is 0.286, indicating a positive association. As a result, LTR and PSC continue to have a strong association. It explains how an increase in transformational leadership would always increase PSC. With a t-value of 1.972, p-value 0.000, and β-value 0.172, the association relating LTS and PSC is similarly statistically significant and favorable. Leadership exchanges benefit the PSC as well.

Even so, the impact of LTR and PSC on CSCSC in the case of moderation is significant with a p-value of 0.002, and a t-value of 5.018. The moderating effect's β -value is 0.192. It has been established that CSCSC modifies the interaction between LTS and PSC. The moderating effect demonstrates that CSCSC strengthens the positive impact of transformative leadership on PSC.

Furthermore, with a t-value and p-value of 3.833, and 0.001 respectively, the moderating impact of CSCSC between LTS and PSC is significant. The moderating effect's β -value is 0.188. The CSCSC modifies the connection between leadership transactions and PSC in this way. It has been demonstrated that the CSCSC's moderating influence strengthens the beneficial effects of leadership transactions on PSC.

Furthermore, the study's findings demonstrated that TMBSC and CSCSC had a significant and positive connection with PSC, with p-values of 0.010, 0.000, t-values of 2.566, 2.898, and β-values of 0.253, 0.491, respectively. As a result, the TMBSC and CSCSC became the PSC.

6 Conclusion

The present analysis is centered on Jordanian supply chain companies. This study focused on the role of leadership and audit in improving the performance of the supply chain. Furthermore, the moderating influence of the commitment of supply chain staff to change and top management backing to the supply chain was investigated.

The study's findings demonstrated that audits had a key influence in improving the performance of the supply chain. The auditing elements, especially IAE and EIAR, had a favorable impact on Jordan's firms the performance of supply chain. Supply chain firms should improve their auditing efforts, which will improve their overall performance. Furthermore, senior management has played a vital role in accelerating effective audit efforts. Leadership has the same significant impact as auditing in that it may improve the activities of the supply chain in a supply chain firm. It has a beneficial influence through transactions of leadership and leadership transformative activities.

Yet, one crucial component to enhancing the favorable impact of leadership on supply chain performance is the commitment of supply chain staff to change. In Jordan-based supply chain firms, the commitment of supply chain staff to change, top management backing to the supply chain, leadership, and audit, all work together to improve the performance of the supply chain.

Finally, for future research, researchers are encouraged to apply this methodology to poor nations, as the outcomes may change. Other auditing elements, such as the size of the department of the internal audit, and the independence of the auditor, should be incorporated in the existing model. Furthermore, information communication technology (ICT) must be employed as a moderator factor relating auditing variables and the performance of the supply chain. Because ICT plays a significant role in the supply chain.

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APPENDIX

Table 2. Outer Loading, Cronbach Alpha, CR, AVE

Variables	Indicators	Outer Loadings	Cronbach Alpha	CR	AVE
Internal Audit Efficiency (IAE)	1. The academic qualification of auditors influences the efficacy of internal auditing.	0.812	0.910	0.941	0.761
	2. Internal auditors and highly skilled external auditors can continue to communicate.	0.781			
	3. Internal auditors are professionally qualified.	0.799			
	4. The level of professionalism of the auditors has an impact on internal auditing effectiveness.	0.826			
	5. The efficiency of internal auditing is impacted by the auditor's internal audit experience.	0.832			
External And Internal Auditors' Relation (EIAR)	1. External auditors are prepared to provide internal auditors the opportunity to clarify their concerns.	0.841	0.895	0.923	0.788
	2. The internal auditors get the external auditors' work plans.	0.762			
	3. The reports and conclusions of internal auditors are relied upon by external auditors.	0.791			
	4. Internal auditors and external auditors meet.	0.891			
	5. Internal auditors get work-in-progress updates from external auditors. .	0.900			
Leadership Transformative (LTR)	1. Leadership discusses his or her core principles and convictions.	0.829	0.924	0.946	0.762
	2. Leadership emphasizes the value of having a shared sense of purpose.	0.891			
	3. Leadership speaks positively about the future.	0.888			
	4. Leadership looks for other viewpoints to help solve troubles.	0.923			
	5. Leadership oversees me as a person instead of just a group follower.	0.839			
Leadership transitions (LTS)	1. Leadership enables me to receive help in return for my efforts.	0.918	0.871	0.928	0.717
	2. Leadership argues in detail who is accountable for meeting performing goals.	0.902			
	3. Leadership draws concentration to inconsistencies, faults, exceptions, and departures from standards.	0.911			
	4. Leadership failure to intervene until issues become severe.	0.862			
	5. Leadership waiting till something goes wrong before acting.	0.901			
Top Management Backing to Supply Chain (TMBSC)	1. The internal auditor receives the necessary assistance from senior management to perform their audit duty effectively and successfully.	0.911	0.913	0.941	0.835
	2. The Department of Internal Audit has adequate personnel and other resources to conduct internal audit role.	0.895			
	3. Management provides the internal audit department with sufficient financial resources.	0.931			
	4. Internal auditors receive moral support and encouragement from top management to carry out the audit role successfully and efficiently.	0.941			
	5. Top management is aware of the department's internal audit requirements and difficulties.	0.877			
Commitment Of Supply Chain Staff to Change (CSCSC)	1. this change is beneficial.	0.919	0.911	0.935	0.801
	2. This organization's changes are a useful the strategy.	0.941			
	3. The situation could be risky if one spoke out about this change.	0.987			
	4. I must strive for this change.	0.925			
	5. I do not believe it would be appropriate for me to object to this change.	0.905			
Performance Of Supply Chain (PSC)	1. Through supply chain management, my company has increased customer satisfaction.	0.913	0.932	0.961	0.811
	2. My firm has boosted handle transparency alongside organized info.	0.924			
	3. My firm's work procedures are less likely to make mistakes with organized info in the supply chain.	0.872			
	4. Effective supply chain management minimizes redundancies at work.	0.889			
	5. Effective supply chain management lowers administrative costs.	0.891			
	6. My company might owe a significant return to its efficient supply chain management.	0.836			

Contribution of Individual Authors to the Creation of a Scientific Article (Ghostwriting Policy)

Yousef Shahwan carried out the Ideas, writing, review, editing, application of statistical, design of methodology; creation of models, provision of study materials. Also, Yousef Shahwan has implemented the Algorithm, organized, and executed the experiments of all Sections, collect the data, and made all Statistics.

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Conflict of Interest

The authors have no conflicts of interest to declare.