

# Uncertain Supply Chain Management

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## The role of internal audit in improving supply chain management in shipping companies

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### ABSTRACT

#### Article history:

Received December 1, 2021

Received in revised format

December 18, 2021

Accepted February 21 2022

Available online

February 21 2022

#### Keywords:

Internal Audit

Supply Chain Management

Independence and Objectivity of

Internal Audit

Efficiency of Internal Audit

Internal Audit Quality

In the backdrop of several recent accounting crises, internal auditing has emerged as a major force in supporting effective controls and risk management. Therefore, internal auditing of the supply chain management performance is one of the strongest and quickest ways to reduce operational costs and provide the company competitive advantages in the global market in times of economic crisis. The purpose of this study was to examine the role of internal audit in improving supply chain management in shipping companies, the questionnaire was used to suit the nature of this study. Also, the survey included 167 participants of these companies. The results indicated a statistically significant relationship between the internal audit (independence and objectivity of internal audit, efficiency of internal audit and internal audit quality) and supply chain management in shipping companies.

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### 1. Introduction

In the context of several recent accounting crises, internal auditing has become a significant force in advocating effective controls and risk management (Akram & Iskandar, 2019; Kruger et al., 2002). An effective internal auditing (IA) process is one of the four cornerstones of companies, along with the audit board of the board of directors, executive administration and the external auditor. With all of this emphasis, figuring out how the IA adds strategic value or benefits to the organization has become a hot topic (Tsai et al., 2015). Also, the IA is an independent, objective assurance and consulting activity designed to add value and improve an organization's operations. Also, the recent data suggest internal audit as an antidote to the impacts of economic recession, whereas the present review shows internal audit as a tool for competitiveness through the implementation of perfect practices (Tsvetanova, 2014). IA of the SCM performance is one of the strongest and quickest ways to reduce operating costs and supply the company with competitive advantages in the global market in times of economic crisis. The supply chain has a significant impact on shipping firms, affecting their operational expenses directly. SCM within the organization also has an important effect on the company's ability to provide services to clients and add value to shipping companies (Pasula et al., 2013). Internal audits of SCM of economic activity in general, as well as components of export operations, continue to be the most difficult and time-consuming aspects of the audit. Not only does the economic activity auditor need to be well-versed in accounting and taxation, but he or she also needs to be well-versed in economics, as well as civil, international, and transportation firms (Petukh et al., 2020). SCM performance has long been seen as a critical component of a competitive strategy for increasing organizational productivity and profitability. As a result, supply chain firms should improve their auditing efforts, which will inevitably improve their performance (Ul-Hameed et al., 2019). In addition, the IA is undertaken on a regular basis to provide input for process and quality improvement, which increases the value of finished goods and, ultimately, benefits customers. IA and documentation can also be used to solve supplier-related issues and improve supplier relationship management. To reduce the number of suppliers providing goods or components, dedicated staff that are familiar with suppliers should be allocated to the purchasing function (Prajogo et al., 2012).

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doi: 10.5267/j.uscm.2022.2.011

## 2. Literature Review

### 2.1 Internal Audit (IA)

The IA is an objective, independent assurance and consulting activity that is aimed to assist the organization in developing and operating more efficiently (Jarrah & Iskandar, 2019). In addition, the IA helps to manage risk management in a variety of ways, both in its assurance and consulting functions. Its primary purpose in enterprise risk management is to provide objective assurance to the board of directors on risk management efficacy, and IA activities and controls can assist virtual businesses in improving and operating more efficiently (Panayiotou et al 2011). Furthermore, the best practices in IA are derived from a diversified, experienced, and qualified audit workforce with professional training. Leading firms take advantage of IA staff's professionalism by giving management trainees a rotation in the department to gain firsthand experience with company operations and acquire risk recognition and mitigation abilities. In addition to proper handling of resources, maintaining records, effective communication through adopting technology offered by information technology is critical to ensure completeness of the audit process and benefit auditors (Moorthy et al., 2011).

### 2.3 Independence and Objectivity of Internal Audit (IOIA)

IA is an objective, independent assurance and consulting activity that adds value to an organization's operations. It assists a company in achieving its goals by implementing a systematic, disciplined approach to evaluating and improving risk management, control, and processes (Ogoun & Atagboro, 2020). This definition highlights the importance of independence and objectivity to the IA function. Independence is denoted as not having a relationship which would interfere with the exercise of independent judgment in carrying out the functions of the committee. But it would appear that objectivity is strengthened when the organization staffs the function with professional IA (Goodwin & Yeo, 2001). Also, the independence internal audit it's a freedom from conditions that threaten objectivity or the appearance of objectivity. Such threats to objectivity must be managed at the individual auditor, engagement, functional and organizational levels. The objectives are the organizational status of internal audit, the IA dual role as a provider of assurance and consulting activities, internal audit's involvement in risk management, outsourcing and sourcing of IA activities, and the use of IA as a training ground for managers (Mutchler, 2003). Objectivity also refers to an unbiased mental attitude that allows IA to execute engagements in such a way that they have a genuine belief in their work product and make no significant quality sacrifices. Objectivity compels IA not to defer to the opinions of others on audit issues (Stewart & Subramaniam, 2010).

### 2.4 Efficiency of Internal Audit (EIA)

The IA has grown in importance within firms, evolving from a control function responsible for the inspection of accounting and financial data to a strategic partner for shareholders and company management in process improvement. The EIA is capable of carrying out its duties properly. EIA is determined by its subordination level, which must be appropriate for internal audit to be independent and objective, the professional qualification and practical experience of internal audit staff, the IA strategy, activities, and value added to the company, and its ability to improve itself (Savuk, 2007).

Furthermore, the EIA's role in aiding enterprises in mitigating major risks has grown, ensuring that engagements are carried out more effectively and efficiently, and that all of the company's key risks are handled (Coetzee & Lubbe, 2014). Furthermore, IA departments are service departments, and the question of whether they are sufficiently efficient is a constant source of concern for management. IA departments can account for a significant amount of employment and investment, as well as contribute to a company's growth and economic success. In addition, the EIA's role in assisting businesses in reducing big risks has expanded, ensuring that engagements are carried out more effectively and efficiently, and that all of the company's major risks are addressed (Coetzee & Lubbe, 2014). Furthermore, IA departments are service departments, and management is constantly concerned about their efficiency. IA departments can contribute to a company's growth and economic success by providing a large quantity of employment and investment. In addition, the EIA aids in the development of the company's work because the financial reports reflect the quality of the internal audit department. Furthermore, an IA is an important aspect of an organization's corporate structure, which includes the board of directors' and audit committees' supervision responsibilities to ensure that the financial reporting process is trustworthy (Al-Matari et al., 2014).

### 2.5 Internal Audit Quality (IAQ)

IA is an important part of the company structure within an organization. Company includes those oversight activities undertaken by the board of directors and audit committee to ensure the integrity of the financial reporting process. Therefore, the management and the external auditor should assess the quality of internal control, which includes evaluation of the IAQ function, as the IA in its wider sense, including the IA function (Sl Shbail et al., 2018). Add to that the standards of the Institute of Internal Auditors required the executive's managers of internal audit to ensure and improve the quality and function of IA which includes periodic evaluation of the IA functions quality and continuing IA (Al Matarneh, 2011). That IAQ is a critical component of successful internal control, which is critical to the quality of financial reporting. Managers, shareholders, investors, auditors, and, as a result, society at large are all interested in the IAQ. In addition, the authors argue that utilizing text mining to classify textual disclosures concerning IA could help with internal audit research by offering a proxy for IAQ based on publicly available data in annual reports (Boskou et al 2019). Similarly, annual report text disclosures concerning internal audit methods provide a publicly available source of information that can be utilized to classify IAQ and construct a new proxy for IAQ (Bame-Aldred et al., 2013).

### 3. Supply Chains Management (SCM)

SCM now involves a variety of independent enterprises in today's corporate climate. By building virtual enterprise networks, these supply chains may be managed with greater agility, efficacy, and efficiency. The nature of SCM processes, which involve inter-organizational interactions and several firms in a virtual corporate network, necessitates well-designed and structured control (Panayiotou et al., 2011). SCM has become a critical component of an organization's competitiveness and effectiveness. At the same time, most large, and many small, organizations have put a great deal of effort into improving their own and their suppliers' supply chain performance, in developing supply chain strategies that focus on cost reduction (Khan & Burnes, 2007). The findings of Jarah and Almatarneh (2021) revealed that the accounting information system's hardware and software are the best and most up-to-date currently available, and that the accounting information system provides financial information with a high predictive power, which benefits the system's users. SCM refers to a collection of procedures that help two or more firms in the same supply chain enhance their performance. SCM can be achieved by incorporating purchasing, product design and development, production, shipping, packaging, storage, disposal, and end-of-life-cycle management operations. SCM is defined as the integration of issues in interorganizational supply chain management methods (Jabbour et al., 2014). Also, the SCM is an integrated and complex network concept that refers to the aggregate of all the functions starting from the procurement of the raw material from the manufacturer producer and finishing with delivery of the end product to the consumer (Yusnaini et al., 2020). The supply chain is a relatively new and quickly growing discipline that is changing how manufacturing and industrial operations meet their consumers' needs (Almatarneh et al., 2022).

### 4. Hypothesis Development

Internal audit is a key aspect of shipping businesses' supply chain management. Ul-Hameed et al. (2019) discovered that audit and leadership styles had a substantial impact on SCM performance in their study. Furthermore, senior management and staff commitment to change exerted a significant influence on the audit and leadership outcomes. The accuracy and reliability of accounting statements should be improved, according to a study by (Petukh et al., 2020). It also considerably reduces labor costs and time expenditures in the validation process. The findings, according to Jraisat & Sawalha (2013), indicate the high order components of QC and demonstrate the role of quality control in SCM as the primary technique for increasing SCM. The findings of Sari & Susanto's (2018) study show that job experience has a substantial impact on audit quality and supply chain. In addition, auditor competency has a substantial impact on the quality of information systems audits and the supply chain. According to the findings of Mohamadi et al., (2020), the IA variable has a substantial impact on quality management. Furthermore, the SCM variable has a considerable impact on quality management, according to the findings. Finally, the findings revealed that the variable of knowledge management has a considerable impact on quality management. According to the findings of Prajogo et al., (2012), supplier and internal process management both have a beneficial impact on operational performance, whereas customer process management has no meaningful impact. According to Yusnaini et al., (2020), SCM is an effective tool for detecting corruption in the IA. As a result, auditors with independent field cognitive styles (Al-Olimat, 2019) have a stronger perception of responsibility for detecting corruption than auditors with field dependent cognitive types. Furthermore, the findings reveal that auditors with a high moral development level have a stronger perception of responsibility for identifying corruption than auditors with a low moral development level. According to the findings of Almatarneh et al., (2022), there is a statistically significant association between management accounting and supply chain effectiveness in logistics manufacturing firms. Based on the above discussion, the following hypotheses were developed:

**H<sub>1</sub>:** *There is a significant relationship between independence and objectivity of internal audit and supply chain management.*

**H<sub>2</sub>:** *There is a significant relationship between efficiency of internal audit and supply chain management.*

**H<sub>3</sub>:** *There is a significant relationship between internal audit quality and supply chain management.*

### 5. Research Methodology

For achieving the aim of the study, and examining the hypotheses, the descriptive survey method was used. To get the responses, a survey questionnaire was used to collect the data from shipping companies, to examine the role of internal audit in improving supply chain management in shipping companies. The questionnaire was used to suit the nature of this study, where the administered questionnaire consists of two parts. The first part consists of factors on the internal audit as the independent variables which are represented by three variables (Independence and Objectivity of Internal Audit, Efficiency of Internal Audit and Internal Audit Quality), the second part shipping companies as the dependent variable. The questionnaire was designed based on previous studies on the subject under study, and developed to suit the shipping companies accordingly, by using the 5-scale Likert measures. The survey included 167 participants of these companies. Moreover, SPSS program was used to analyze the data. Also, the questions try to measure the perception of participants on the relationship between the roles of internal audit in improving supply chain management in shipping companies.

## 6. Results

### 6.1 Reliability and Mean and Descriptive Statistics

Cronbach alpha was employed to test the study's validity and reliability. Cronbach alpha is used to assess internal consistency by determining how closely a group of items are connected. Exploratory factor analysis is one of the approaches for determining dimensionality. In other words, Cronbach alpha is a reliability or consistency coefficient, not a statistical test (Tavakol & Dennick, 2011). Cronbach alpha can also be expressed as a function of the number of test items and their average inter-correlation. The highest Cronbach alpha value was 0.91 for internal audit quality. The highest reliability value was 0.90 for efficiency of internal audit and the alpha value was 0.87 for supply chain management and 0.85 for independence and objectivity of an internal audit, indicating the acceptance of reliability. The Mean and Standard Deviation D.S. where the Mean averages ranged between (3.81-3.98), all were high were calculated as shown in Table 1. Also, this study examined the average variance extracted (AVE) and specified that all AVE values were greater than the recommended value of (0.50) (Hair et al., 2017), therefore, the convergent validity is satisfied convergent validity as presented in Table 1.

**Table 1**  
Reliability and Mean and Descriptive Statistics (S.D) and Average Variance Extracted (AVE)

Variable	Cronbach's Alpha	Mean	S.D	AVE (> 0.5)
Independence and Objectivity of Internal Audit	0.85	3.85	0.75	0.655
Efficiency of Internal Audit	0.90	3.92	0.81	0.687
Internal Audit Quality	0.91	3.81	0.77	0.634
Supply Chains Management	0.87	3.98	0.90	0.590

### 6.2 Durbin-Watson

The Durbin-Watson test was also applied to verify the correlation between the variables. As shown in Table 2.

**Table 2**  
(Durbin-Watson) test of Independent Variables

Variable	Durbin-Watson
Independence and Objectivity of Internal Audit	1.794
Efficiency of Internal Audit	1.916
Internal Audit Quality	1.752

Table 2 shows that all values of Durbin-Watson for the independent variables are less than the value of 4; these values are acceptable and indicate the absence of a self-correlation problem in all independent variables of the study.

### 6.3 Multiple Regression

In order to ascertain the relationship between the roles of internal audit in improving supply chain management in shipping companies, Multiple Regression analyses were used. Accordingly, Table 3 shows that:

**Table 3**  
Result of Multiple Regressions Analysis on the Relationship between the of Internal Audit and Supply Chain Management in Shipping Companies

Variable	"t" value	"t" sig	(β)	R	R <sup>2</sup>	"F" value	"F" sig	Result
Independence and Objectivity of Internal Audit	7.417	.001	0.215	0.958	0.917	414.030	0.01	Accepted
Efficiency of Internal Audit	6.259	.000	0.213					Accepted
Internal Audit Quality	8.080	.000	0.233					Accepted

DV: Supply Chain Management

Table 3 reveals a statistically significant association between the importance of internal audit in enhancing supply chain management in shipping companies and the role of internal audit. The F-value, in this case, was 414.030, which was statistically significant at 0.01 the value of R was 0.958, and the value of R<sup>2</sup> was 0.917. Also, the Internal Audit Quality appears to play a greater role in Supply Chain Management with a t value of 8.080. As for the Efficiency of Internal Audit, the t value was 6.259, while the Independence and Objectivity of Internal Audit obtained a t value of 7.417. Hence, all hypotheses were accepted.

## 7. Discussion and Conclusion

Internal audit is a key aspect of shipping businesses' supply chain management. The findings of this study are consistent with prior research that has identified a link between internal auditing and supply chain management. For example, Ul-Hameed et al., (2019) discovered that audit and leadership styles had a substantial impact on SCM performance. Furthermore, top management and employee commitment to change maintained important influence to enhance the positive

impact on audit and leadership. Also, Jraisat and Sawalha (2013) identified the high-order factors of QC and demonstrated the role of quality control in SCM, acting as the main strategy to increase SCM, as well as a study by Sari and Susanto (2018), showed that job experience has a substantial impact on audit quality and supply chain. In addition, auditor competency has a substantial impact on the quality of information systems audits and the supply chain. Mohamadi et al. (2020) also discovered that the variable internal auditing has a substantial impact on quality management. Furthermore, the SCM variable has a considerable impact on quality management, according to the findings. Finally, the findings revealed that the variable of knowledge management has a considerable impact on quality management. Almatarneh et al. (2022) discovered a statistically significant association between management accounting and supply chain performance in logistics manufacturing organizations in their study.

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