

---

# Academia Open



*By Universitas Muhammadiyah Sidoarjo*

---

# Academia Open

Vol. 11 No. 1 (2026): June  
DOI: 10.21070/acopen.11.2026.13557

## Table Of Contents

<b>Journal Cover</b> .....	1
<b>Author[s] Statement</b> .....	3
<b>Editorial Team</b> .....	4
<b>Article information</b> .....	5
Check this article update (crossmark) .....	5
Check this article impact .....	5
Cite this article.....	5
<b>Title page</b> .....	6
Article Title .....	6
Author information .....	6
Abstract .....	6
<b>Article content</b> .....	7

## Originality Statement

The author[s] declare that this article is their own work and to the best of their knowledge it contains no materials previously published or written by another person, or substantial proportions of material which have been accepted for the published of any other published materials, except where due acknowledgement is made in the article. Any contribution made to the research by others, with whom author[s] have work, is explicitly acknowledged in the article.

## Conflict of Interest Statement

The author[s] declare that this article was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

## Copyright Statement

Copyright © Author(s). This article is published under the Creative Commons Attribution (CC BY 4.0) licence. Anyone may reproduce, distribute, translate and create derivative works of this article (for both commercial and non-commercial purposes), subject to full attribution to the original publication and authors. The full terms of this licence may be seen at <http://creativecommons.org/licenses/by/4.0/legalcode>

# Academia Open

Vol. 11 No. 1 (2026): June  
DOI: 10.21070/acopen.11.2026.13557

## EDITORIAL TEAM

### Editor in Chief

Mochammad Tanzil Multazam, Universitas Muhammadiyah Sidoarjo, Indonesia

### Managing Editor

Bobur Sobirov, Samarkand Institute of Economics and Service, Uzbekistan

### Editors

Fika Megawati, Universitas Muhammadiyah Sidoarjo, Indonesia

Mahardika Darmawan Kusuma Wardana, Universitas Muhammadiyah Sidoarjo, Indonesia

Wiwit Wahyu Wijayanti, Universitas Muhammadiyah Sidoarjo, Indonesia

Farkhod Abdurakhmonov, Silk Road International Tourism University, Uzbekistan

Dr. Hindarto, Universitas Muhammadiyah Sidoarjo, Indonesia

Evi Rinata, Universitas Muhammadiyah Sidoarjo, Indonesia

M Faisal Amir, Universitas Muhammadiyah Sidoarjo, Indonesia

Dr. Hana Catur Wahyuni, Universitas Muhammadiyah Sidoarjo, Indonesia

Complete list of editorial team ([link](#))

Complete list of indexing services for this journal ([link](#))

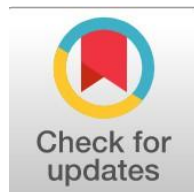
How to submit to this journal ([link](#))

# Academia Open

Vol. 11 No. 1 (2026): June  
DOI: 10.21070/acopen.11.2026.13557

## Article information

**Check this article update (crossmark)**



**Check this article impact (\*)**



**Save this article to Mendeley**



(\*) Time for indexing process is various, depends on indexing database platform

## Effect of (TOC) and Internal Auditing (AI) on Enhancing the Sustainable Performance of Industry: An Empirical Study

**Abdulqudoos Hussein Mohammed, [abdulqudoos\\_hussein@mtu.edu.iq](mailto:abdulqudoos_hussein@mtu.edu.iq) (\*)**  
*Middle Technical University, Suwaira Technical Institute, Wasit, Iraq*

(\*) Corresponding author

### Abstract

**General Background** Sustainable performance has become a central concern for organizations seeking to balance economic, environmental, and social objectives. **Specific Background** Prior studies emphasize sustainability performance measurement systems and managerial frameworks, yet operational limitations often hinder their practical application. **Knowledge Gap** Limited attention has been given to integrating sustainability performance concepts with theory of constraints to explain performance limitations systematically. **Aims** This article aims to analyze sustainable performance by combining sustainability management perspectives with theory of constraints as an analytical framework. **Results** The analysis shows that organizational constraints play a critical role in shaping sustainability performance outcomes and that structured performance management systems can help identify and address these constraints. **Novelty** The novelty of this study lies in linking sustainability performance measurement with constraint-based operational thinking within a unified conceptual framework. **Implications** The findings provide insights for managers and policymakers to better align sustainability goals with operational decision-making processes.

### Highlights:

- Organizational constraints are central determinants of sustainability-oriented outcomes
- Sustainability performance systems benefit from integration with operational frameworks
- Constraint-based analysis supports balanced economic and social decision-making

**Keywords:** Sustainable Performance, Theory of Constraints, Sustainability Management, Performance Measurement, Organizational Constraints

Published date: 2026-02-10

## 1 . Introduction

Internal auditing is an essential focus for scientific organizations at now. Scientific reports in numerous countries have advocated for recognizing the significance of internal auditing, as it serves as an independent evaluative mechanism that enhances operational effectiveness and efficiency, ensures adherence to internal regulations, policies, and directives, and evaluates the efficacy of risk management strategies. The heightened emphasis on the efficacy of this function is predominantly associated with modern principles such as governance, risk management, and the ideals of quality and perfection that organizational management endeavors to attain. Internal control is an essential mechanism for attaining management objectives, especially those related to supervision. In the contemporary business landscape, internal auditing has emerged as a crucial support function for shareholders, management, and external auditors. The degree to which an external auditor depends on the internal auditor's work and their assessment of the efficacy of internal audit functions is contingent upon this.

The rise in global rivalry and advancements in the industrial landscape have heightened the demand for novel methods and theories aimed at enhancing corporate performance and positioning organizations among global leaders. These organizations have significant problems due to internal and external limits imposed by the industrial environment and competitive dynamics. This has led numerous companies to employ multiple strategies to alleviate these constraints, thereby enhancing corporate value through increased profitability, either by minimizing costs or by addressing existing bottlenecks, and achieving more accurate product or service cost assessments via refined measurement techniques. A key innovative method for cost calculation is the company's capacity for sustainability, which fundamentally relies on its ability to balance available economic resources with its ambitions for growth and expansion, while considering the diverse economic, social, and environmental conditions that influence it. The swift advancements in the contemporary business landscape necessitate a transformation in the strategic vision and direction of company managers. This enables them to attain the organization's established objectives while preserving market share and attracting new capital. Recently, there has been heightened interest in how companies enhance sustainable performance to sustain operations, maintain competitive advantages, and ensure financial stability amid available economic resources.

## 2. Goals

- A statement of the concept of internal auditing, its importance, and its relationship to the theory of constraints.
- To clarify the role of the Theory of Constraints (TOC) in setting goals and strategies for the company under study to activate sustainable performance according to its perspective .
- A statement of the effectiveness of the theory of constraints and its various dimensions in activating the sustainable performance of the company under study.

## 3. Hypothesis

The integration of Theory of Constraints (TOC) and internal auditing significantly impacts the sustainable performance of industrial enterprises.

## 4. Methodology

The research employs a descriptive analytical approach to illustrate the influence of integrating the theory of constraints and internal auditing on enhancing the sustainable performance of the company under examination, as well as the effects of this theory's dimensions on the economic, social, and environmental aspects of the company's sustainable performance. The garment factory comprises an accounting department that encompasses a payroll unit, a cost unit for product cost calculation, and an inventory unit. The whole sample comprised 156 accountants from the factory, with 128 forms submitted for voting, accounting for 82% of the overall sample.

## 5. Theoretical background

### 5.1. Theory of Constraints

No company in reality operates without a set of restraints that hinder its ability to fully achieve its objectives. A limitation is described as "any factor that obstructs or impedes our ability to acquire more of what we desire." [1] The most apparent limits in the actual world pertain to time, financial resources, and the inherent capabilities of the individual or organization. The Theory of Constraints is characterized as "a methodology designed to enhance profitability by managing, concentrating on, or resolving bottlenecks or resource limitations." [2] It is defined as "a management philosophy focused on the continuous enhancement of system performance to optimize output and attain objectives by addressing internal constraints and managing them in consideration of external limitations, while assessing the effects of these modifications to ensure the optimal use of the system's resources." [3] The efficacy of any system is dictated by a series of limitations that signify bottlenecks or other production factors that restrict overall output. The Theory of restrictions is a systems management concept that posits management efforts should concentrate on restrictions rather than cost reduction, viewing it as a method for enhancing contribution margins. It is frequently condemned for failing to distinguish between fixed and variable

cost components. [4] The Theory of Constraints can be delineated by three measures that necessitate This document contains details on the application mechanism:

- Output contribution: This is the value of sales minus the direct material costs.
- Investments (Inventory: representing the valuation of inventory expenses) Raw materials, work-in-process inventory, finished goods inventory, research and development expenses, and costs associated with equipment and facilities.
- Other operating costs: encompassing all running expenses excluding direct materials necessary for output contribution, and including salaries, wages, rent, and depreciation. Procedures for implementing the Theory of Constraints: [5]
- Recognizing the limitation: Every system possesses a constraint or bottleneck. This is the most vulnerable component that constrains the system.
- The system's efficacy is contingent upon the characteristics of its weakest link. These may range from physical bottlenecks, such as machines or equipment with the lowest capacity in the system, to policy, behavioral limitations, and external constraints beyond the system.
- Optimizing the utilization of constraints: There are various methods to enhance the efficacy and efficiency of a constraint.
- Implementing the constraint by imposing it on non-constraints: In this phase, the unconstrained machines (i.e., the predominant majority within the system) are subjected to the constrained machine.
- Removing the limitation: The initial three steps mostly concentrate on altering the application of the limitation without incurring expenses. Expenditures.

## 5.2. Internal Auditing

This term signifies that internal auditing serves to support and enhance the entire organization, aligning with its aims and objectives. Internal auditors contribute value to the organization by refining processes, boosting management efficacy in risk mitigation, and ensuring compliance with controls and regulations. [6]

This definition indicates that internal auditing acknowledges the growing significance of guidance and control within the business, and that control mechanisms are implemented to facilitate risk management. The definition also include the trend of internal audit consulting services to address management requirements. [7]

The Accounting and Auditing Standards Board in the Republic of Iraq characterizes internal auditing as an independent evaluative entity within the organizational framework, regarded as a vital internal control instrument instituted by management to ensure the implementation and adequacy of established control mechanisms. This is achieved through a series of controls and procedures aimed at perpetually validating the accuracy of accounting and statistical data, safeguarding the organization's assets and funds, and confirming adherence by employees to the prescribed policies, plans, and administrative procedures. This definition clearly indicates that internal auditing provides two categories of services: [8]

- Preventive services secure the organization's finances and ensure adherence to management plans.
- Provide constructive services to ensure the precision of accounting data essential for developing the organization's overarching policy.

Consequently, internal auditing is a fundamental component of the overall internal control system. An effective internal control system necessitates the presence of an internal audit system. [9]

The International Accounting Standards Committee (ISAC) of the International Federation of Accountants (IFAC) characterizes internal auditing as "the process of assessing activities acknowledged within an organization as a service to it, encompassing the examination, evaluation, and monitoring of the sufficiency and efficacy of internal control and accounting systems." [9]

The Institute of Internal Auditors (IIA) defines it as "an autonomous evaluative function instituted within an organization to scrutinize and assess activities as a service, aimed at aiding individuals within the organization in fulfilling their responsibilities efficiently by offering analyses, evaluations, recommendations, counsel, and pertinent information regarding the examination of activities." The aims of auditing also encompass delivering efficient control at a justifiable expense. [10]

The IIA Working Committee subsequently formulated a definition of internal auditing. It signifies that it is "an autonomous endeavor and an impartial assurance of a consultative nature that seeks to enhance the company's value and optimize its operations." Internal auditing assists the organization in attaining its objectives by employing an impartial methodology to assess and enhance the efficacy of risk management, control, and governance systems. [11]

## 5.3. Sustainable Performance

Organizations pursuing sustainability aim to attain objectives that beyond conventional notions and extend beyond mere operational and financial excellence. They are also a crucial component of environmental and social projects. Outstanding organizational performance is now underpinned not only by financial considerations but also by environmental and social [ISSN 2714-7444 \(online\)](https://doi.org/10.21070/acopen.11.2026.13557), <https://acopen.umsida.ac.id>, published by [Universitas Muhammadiyah Sidoarjo](https://www.muhammadiyah.ac.id)

dimensions. [11]

The notion of sustainability originated when a collective of innovators, spearheaded by Fessa Tennant and Make Companale in the United Kingdom, Peter Kinder in the United States, Marc De Souse in Canada, and Robert Rosen in Australia, formulated the Reed Resolution. This resolution sought to highlight the connection between organizational performance and sustainable development across its economic, social, and environmental facets to global companies. The advent of sustainable development has posed numerous challenges for organizations, particularly in incorporating sustainable development dimensions into their practices and integrating sustainability into their business strategies to achieve essential benefits [12]. This necessitates fundamental alterations in organizational performance concerning economic, social, and environmental attributes. Sustainable performance is authentic performance that signifies the organization is progressing appropriately, since it is continuous, predictable, and integrated into the plan. The organization's proprietors foresee and manage long-term performance (Cuckuyt, D, 2018). Notwithstanding many studies and research on sustainable performance, a broadly accepted definition remains elusive. Al-Abbadi et al. (2023) characterized it as the organization's capacity to maintain exceptional performance for a minimum duration of three years. Another definition characterizes it as the organization's capacity to leverage its existing capabilities and competencies at the individual, group, and organizational levels to fulfill the present and future requirements and aspirations of stakeholders, while attaining the organization's economic, environmental, and social objectives. [13] Another definition posits that it involves fulfilling current and future requirements by addressing economic, environmental, and social dimensions. Aspects of Sustainable Performance: Scholars and researchers categorize the facets of sustainable performance into three dimensions:

- **The Economic Dimension:** This refers to the organization's capacity to fulfill its objectives by enhancing shareholder and stakeholder satisfaction through attaining acceptable investment returns. Financial objectives serve as the foundation for assessing the organization's economic dimension and also disclose the outcomes of The sustainability of organizational performance and the execution of enhancement strategies are essential. The economic dimension assesses sustainable organizational performance by evaluating competitive indicators within a particular industry and identifying its long-term capabilities. Bai and Sarkis (2014) contend that the economic aspect of sustainable performance is the surplus generated by the business through optimizing outcomes while reducing resource consumption. This performance is characterized by five principal dimensions: reliability, responsiveness to client needs, flexibility, financial performance, and quality. The assessment can be conducted through a series of quantitative and qualitative indicators that address the organization's economic transactions and their impact on the economic conditions of stakeholders[14].

- **The Social Dimension:** Social performance denotes the organization's effectiveness in attaining its established social objectives, which enhance a significant facet of society or its interactions with other societies (Cuckuyt et al., 2018). Consequently, corporations must to implement concepts and tactics that incorporate their voluntary social and environmental objectives into their operations. Business social performance is categorized into two components: internal and external. Internal performance pertains to owners and staff, whereas external performance concerns customers, the local community, and the government. [15] Social performance is defined as the assessment of an organization's fulfillment of its obligations to its employees. It assesses the efficacy of human resources inside the organization, emphasizing the adherence to human rights, quality benchmarks, and occupational health and safety regulations that govern the workplace. Occupational health and safety management systems are a crucial component of social performance. A secure organization offers comprehensive employment possibilities for all, equitable labor relations, and just remuneration for employees through wages. It emphasizes individual development through the creation of an incentive structure, diversification of rewards, and the provision of training opportunities (Uysal, 2012). In this regard, Hourneaux Jr., F., et al. (2018) assert that social performance is manifested in the alignment of economic outcomes with the achievements of employees and society, facilitated by the utilization of both renewable and non-renewable natural resources to enhance growing social development. [15]

- **The Environmental Dimension:** The environmental dimension is prominently reflected in the sustainability of successful organizations that have endeavored to establish mechanisms for effectively assessing their environmental performance (Panfilo et al., 2022). This necessitates the implementation of efficient environmental management systems aimed at safeguarding the environment, with an emphasis on productive activities to mitigate their adverse impacts on both the environment and society. The environmental policy of any organization serves as its declaration of intent and the guidelines adhered to concerning the environmental orientation of its operations. [16]

## 5.4. Integrating Internal Auditing with the Theory of Constraints (TOC)

Internal auditing is an autonomous and impartial role that offers assurance and counsel, aimed at enhancing value and optimizing an organization's operations. It assists the business in attaining its objectives through a methodical and rigorous evaluation and enhancement of governance, risk management, and internal control effectiveness.

Theory of Constraints (TOC), formulated by Eliyahu Goldratt, is a process management methodology that emphasizes identifying the primary constraint hindering an organization from attaining its objectives, particularly profitability, and subsequently managing that constraint to enhance overall throughput. A restriction may be physical (such as machinery or materials) or political (such as procedures or regulations). The management of a constraint is referred to as the Five Focusing Steps: [17]

- Determine the limitation.
- Leverage the constraint to optimize its advantages.
- Subordinate all other factors to the limitation.

- Enhance the limitation (augment its efficacy).
- Preventing Inertia

## 5.5. Integration of Internal Audit with the Theory of Constraints

The internal audit can be effectively linked with the Theory of Constraints to improve operational efficiency and value addition. Internal auditors can utilize the Theory of Constraints to prioritize their focus on the most significant risks that directly affect the organization's current limitation, rather of adhering to the conventional emphasis on compliance and general risks. [18]

- Assessing and Analyzing the Constraint as a Risk: Auditors might scrutinize management's methodology for identifying the constraint to guarantee its accuracy and objectivity.
- Assessing Exploitation and Controls: The internal auditor evaluates the efficacy of the existing controls to guarantee the full utilization of the constraint and the proper operation of the remaining system to support it (the dual processes of exploitation and control). This guarantees that investments in the constraint produce optimal returns.
- Assessing Inertia Risks: Auditors can determine if the organization has not progressed to the subsequent constraint level after elevating the current constraint level, a significant risk in the Theory of Constraints. The internal auditor can evaluate the appropriateness of employing TOC financial performance criteria (productivity, inventory, operational expenses) in comparison to conventional accounting metrics to ensure that management actions align with the overarching purpose.

This integration elevates internal auditing from a simple retrospective assessment to a consultative ally that enhances productivity and aligns with the organization's strategic objectives.

## 5.6. Influence of Internal Auditing on Sustainable Performance Evaluation

Sustainable performance denotes an organization's capacity to provide enduring value while taking into account economic, environmental, and social (ESG) factors, collectively referred to as the Triple Bottom Line. This concept transcends business to include its effects on the world and humanity. Internal auditing is essential for evaluating and guaranteeing the integrity of sustainable performance via the following mechanisms: [19]

5.6.1. The internal auditor assesses the quality and comprehensiveness of provided non-financial sustainability statistics, including carbon emissions, water usage, occupational safety, and diversity and inclusion metrics. This verification enhances the credibility of sustainability reports issued for the public and investors, mitigating the risk of greenwashing.

5.6.2. Sustainability Risk Assessment: The internal auditor identifies and evaluates risks that jeopardize the organization's capacity to sustain its performance (e.g., climate change risks, social supply chain risks, environmental regulatory compliance risks). Assessing the measures implemented to mitigate these risks enables management to concentrate on essential areas.

5.6.3. Sustainability Governance Assessment: The internal auditor evaluates the adequacy and appropriateness of governance structures (e.g., board committees, policies, procedures) for the integration of sustainability issues into strategic and operational decision-making.

The internal auditor ensures that the sustainability performance measurements (KPIs) are suitable, dependable, and consistent with the organization's strategic goals and international standards, such as GRI or SASB.

## 5.7. The Influence of the Theory of Constraints (TOC) on Sustainable Performance Evaluation

Theory of Constraints (TOC) is conventionally recognized as a methodology for enhancing productivity and financial profitability. Nonetheless, its methodology, which systematically emphasizes the most crucial element of a system, has significant implications for evaluating and enhancing sustainable performance. The influence of TOC is evident in the application of the Five-Step Focusing Principle to sustainability challenges: [20]

## 5.8. Identifying the "Sustainability Constraint"

The organization seeks the paramount constraint that hinders the attainment of its sustainability objectives, rather than focusing on a physical limitation. This limitation may be: [21]

- Environmental: Efficiency in energy or water usage.
- Social: Elevated employee attrition at a specific location.
- Governance: Absence of transparency within the supply chain.

5.8.1. Exploiting and Enhancing the Constraint: Upon identifying the sustainability constraint (e.g., excessive water

consumption), the organization concentrates all its resources and efforts on optimizing water use efficiency (exploitation) and potentially investing in recycling technologies (enhancement).

5.8.2. A Sustainable Productivity Perspective: The Theory of Constraints (TOC) emphasizes throughput, defined as the velocity at which a system produces revenue via sales. Within the framework of sustainability, productivity can be redefined to include the sustainable value generated by the system (e.g., diminishing environmental costs or enhancing brand value). By managing constraints, an organization guarantees that each action it undertakes enhances overall sustainable performance, rather than merely advancing performance in one department to the detriment of the entire system.

5.8.3. Performance Metrics: TOC advocates for the utilization of comprehensive system metrics. In sustainability assessment, this entails shifting from potentially conflicting local metrics to metrics that reflect comprehensive enhancement across the three dimensions, By employing TOC, an organization not only assesses sustainable performance but also establishes a definitive and actionable framework for expediting enhancements in the most vital domains. This guarantees that sustainability efforts are integrated into a holistic strategy aimed at enhancing long-term value.

5.8.4. Influence of Integration: Internal Audit and Theory of Constraints on Sustainable Performance: Integration, in the realm of sustainable performance, denotes the degree to which sustainability considerations (environmental, social, and governance) are thoroughly embedded within the core strategy, operational processes, and organizational culture, rather than being regarded as distinct or ancillary initiatives. This integration is the fundamental catalyst for enduring sustainable value. [22]

## 5.9. Influence on the three facets of sustainable performance

5.9.1. Operational and environmental efficiency (economic-ecological integration): Effective integration is attained when environmental factors are incorporated into design and production processes, such as through the adoption of circular economy principles or lean manufacturing techniques. This results in diminished waste, enhanced energy and resource efficiency, decreased operational costs, and concurrently improved environmental outcomes. [23]

5.9.2. Resilient and social supply chain (operational-social integration): Incorporating social standards (including workers' rights, equitable compensation, and safety) into procurement decisions and supplier selection guarantees a sustainable supply chain. This integration mitigates reputational and legal compliance risks while enhancing the organization's operational reliability.

5.9.3. Governance of risk and opportunity (integration of strategic governance): Incorporating sustainability concerns into corporate governance entails that the board and senior management regard these issues as essential value and risk determinants. Resources are distributed according to this vision, and sustainability objectives are integrated into the compensation and performance evaluation framework. The comprehensive impact of integration is a transition from "executing tasks correctly" (compliance) to "executing the appropriate tasks" (value creation). Integrated organizations obtain a competitive edge by means of: [24]

- Innovation: Fostering innovation to create more sustainable products and services.
- Capital Appeal: Engaging investors with an emphasis on sustainability (ESG).
- Business Resilience: Enhanced preparedness for regulatory and environmental alterations.
- Enhanced Brand Equity: Establishing trust with consumers and stakeholders.

## 6. Practical Aspect

### 1.1. methodology Statistical methods

After reviewing previous studies, the questionnaire was developed, consisting of personal information and three sections. The main questionnaire consists of ( 15 ) items distributed across the axes and dimensions to which they belong, as shown in Table (1). The descriptive survey method was used as it is the appropriate method for research. The questionnaire was analyzed using the statistical programSPSS Ver.27.

**Table (1):** Questionnaire topics and statements

the total	Number of phrases	Distance	axis
6	6	Internal auditing and the theory of constraints	
3	3	social dimension	
	3	Economic dimension	
	3	Environmental dimension	
paragraphs 15		Total number of questionnaire items	

### 1.2. Demographic variables

The study sample consists of accountants in the clothing manufacturing industry , where a simple random sample was selected totaling ( 128) Table (2) shows the demographic characteristics of the study sample

# Academia Open

Vol. 11 No. 1 (2026): June  
DOI: 10.21070/acopen.11.2026.13557

**Table (2):** Demographic characteristics of the study sample

%	Number of individuals in the sample	Category	variable	Number
87.5	112	From 31-40 years old	age group	3
10.9	14	years old 50-41		
1.6	2	More than 50 years		
100	128	the total		
4.7	6	diploma	Academic qualification	4
51.6	66	Bachelor's		
43.8	56	Master's		
100	128	the total		
82.8	106	From 10-20 years old	Years of experience	5
12.5	16	years old 30-21		
4.7	6	More than 30 years		
100	128	the total		

- Validity of the research instrument

is demonstrated by ensuring its ability to measure what it was designed to measure, as well as measuring the quality and reliability of the study. Validity was confirmed through the following:

- Apparent truthfulness

The questionnaire, in its initial form, was presented to experienced and specialized reviewers who were asked to provide feedback on the questionnaire items in terms of linguistic accuracy, clarity, and appropriateness, as well as the relevance of each item to its designated theme. This feedback was sought to ensure the questionnaire met the study's objectives, in addition to any necessary comments or modifications. Based on the reviewers' feedback, the proposed modifications were implemented to improve the questionnaire and ensure its suitability for the study's defined objectives.

- Reliability of the study instrument

The reliability of the study instrument, which is the questionnaire, was calculated using Cronbach's alpha coefficient. Table (4) shows the values of the reliability coefficients for the three axes and the number of items belonging to each axis. It is evident from the values of Cronbach's alpha coefficients that all the values are greater than (0.7), and this indicates that the study instrument is characterized by reliability, and that the study instrument has been constructed, prepared and reviewed in an acceptable manner and achieves the objectives of the study.

Axis stability (Alpha Kronba Kh )	Number of phrases	Distance	axis
0.797	6	Internal auditing and the theory of constraints	Sustainable performance
0.710	3	social dimension	
0.700	3	Economic dimension	
0.720	3	Environmental dimension	
0.712	15	Total number of questionnaire items	

**Table (4):** Cronbach's Alpha coefficient for measuring the study instrument

## 1.3. Results

**Table ( 5 ):** Arithmetic means and standard deviations for the internal audit axis and the theory of constraints

Rank	standard deviation	arithmetic mean	Paragraphs	T
5	0.541	3.84	Logical thinking helps in identifying and resolving constraints and bottlenecks resulting from administrative policies	1
2	0.872	4.03	of the Theory of Constraints and internal auditing provides support for an effective information system that contributes to increased efficiency in delivering sustainable results.	2
6	0.806	3.78	The existence of restrictions or bottlenecks is not taken into account during the planning process in order to avoid them through internal auditing.	3
3	0.706	3.91	The laboratory's human resources are sufficient to perform its tasks in relation to the sustainable performance community, and this is aided by the internal audit process to monitor it.	4
1	0.774	4.14	integration of internal auditing and the theory of constraints contributes to qualifying and developing the skills of employees.	5
4	0.710	3.86	Adopting the theory of constraints leads to achieving the goals of sustainable operations. For the factory, internal auditing helps to monitor and evaluate those objectives.	6
	0.734	3.92	Mean and standard deviation	

Table (5) shows that the arithmetic mean of the Theory of Constraints axis reached (3.92) with a standard deviation of (0.734). The statement that states ( The integration of internal auditing and the Theory of Constraints contributes to qualifying and developing the skills of employees ) came with the highest arithmetic mean, which reached ( 4.14 ) with a standard deviation of (0.774). The statement that states ( The existence of constraints or bottlenecks is not taken into account during the planning process in order to avoid them through internal auditing ) came with the lowest value of the arithmetic mean, which reached ( 3.78 ) with a standard deviation of ( 0.806 ). Therefore, the Theory of Constraints can be considered necessary to improve the performance of organizations and develop the skills of employees.

**Table ( 6 ):** Arithmetic means and standard deviations for the sustainable performance axis

Rank	standard deviation	arithmetic mean	Paragraphs	T
<b>social dimension</b>				
3	0.538	3.89	The factory contributes to the process of improving the community's infrastructure	1
2	0.898	3.95	The factory supports progress in good governance	2
1	0.807	4.13	The factory supports social, human rights, and anti-corruption initiatives	3
	0.747	3.99	Mean and standard deviation	
<b>Economic dimension</b>				
3	0.710	3.83	The factory's business model allows for large purchases, which support the factory's economic value	
1	0.806	4.22	The factory's business model helps in obtaining cheap raw materials	
2	0.785	3.95	The factory's business model allows for building channels with suppliers	
	0.767	4	Mean and standard deviation	
<b>Environmental dimension</b>				
3	0.678	3.78	The factory uses fuel-efficient machinery	
1	0.665	4.55	The commercial activities used in the factory help improve waste management	
2	0.693	4.11	Activities within the factory support waste recycling	
	0.679	4.14	Mean and standard deviation	

**Table (6) shows**

- The average arithmetic mean for the social axis was (3.99) with a standard deviation of (0.747). The paragraph stating ( The factory supports social initiatives, human rights and combating corruption ) had the highest arithmetic mean, which was ( 4.13 ) with a standard deviation of (0.807). The paragraph stating ( The factory contributes to the process of improving the city for society ) had the lowest arithmetic mean value, which was ( 3.89 ) with a standard deviation of ( 0.538 ). Therefore, it can be considered that the factory is one of the best supporters of social initiatives, human rights and combating corruption, but it does not contribute significantly to the process of improving the city .

- The mean score for the economic dimension was (4) with a standard deviation of (0.767). The statement " The factory's business model helps in obtaining cheap raw materials " had the highest mean score at (4.22) with a standard deviation of (0.806), while the statement " The factory's business model allows for large purchases that support the factory's economic value " had the lowest mean score at (3.83) with a standard deviation of (0.710). Therefore, the business model is considered to be effective in obtaining cheap raw materials, but it is not strong enough to support economic value through large purchases.

- The average arithmetic mean for the environmental dimension was (4.14) with a standard deviation of (0.679). The item stating ( The activities used commercially in the factory help improve waste management ) had the highest arithmetic mean, which was (4.55) with a standard deviation of (0.665), while the item stating ( The factory uses fuel-efficient machinery ) had the lowest arithmetic mean, which was (3.78) with a standard deviation of (0.678). Therefore, efforts should be focused on improving fuel consumption in the factory in order to increase its overall efficiency and improve environmental performance.

### 1.4. Hypothesis Testing

The integration of Theory of Constraints (TOC) and internal auditing significantly impacts the sustainable performance of industrial enterprises.

**Table (7)** shows the impact of integrating the theory of constraints and internal auditing on sustainable performance

Internal auditing and the theory of constraints							variable (sustainable performance)
F	P	T	A R <sup>2</sup>	R <sup>2</sup>	β	α	
0.927	0.814	0.237	0.30	0.40	0.032	2.971	social dimension
	0.180	1.358			0.134		Economic dimension
	0.579	0.558			0.061		Environmental dimension

Table (7) shows that the researcher found that the calculated F -test value for the model (0.927) at the significance level ( 0.433 ) is less than its tabulated value (3.877) at the significance level (0.05) and degree of freedom ( 120 ), indicating the insignificance of the model and its lack of statistical acceptance and the overall rejection of the hypothesis .

2. The researcher noted the value of the interpretation coefficient ( 0.30 ), and with a corrected interpretation coefficient

(0.40), as the theory of constraints explained (40%) of the changes that occur in sustainable performance, while the remaining percentage (60%) is attributed to other variables that did not enter into the tested model.

3. No positive effect was found for the social dimension, amounting to (0.032) at the significance level of (0.814) and with a calculated value of (T) of (0.237), and no effect was found for the economic dimension, amounting to (0.134) at the significance level of (0.180) and with a calculated value of (T) of (1.358), and no effect was found for the environmental dimension, amounting to (0.061) at the significance level of (0.579) and with a calculated value of T of (0.558).

## 7. Conclusion

Internal auditing (examination procedures carried out to verify the validity of activities or objectives) is considered a broader concept. Professionally, it refers to a systematic method for objectively obtaining evidence and proof regarding what is recorded in the books and records about the economic events of the project, evaluating them to ensure the degree of consistency between what is recorded and these events according to specific criteria, and communicating the results to the relevant parties. The Theory of Constraints is essential for improving organizational performance and developing employee skills. We have explained in previous sections how combining internal auditing with the Theory of Constraints (TOC) and integrating these concepts into the fabric of the organization can form a solid foundation for effectively and efficiently managing and evaluating sustainable performance. Sustainable performance, with its three dimensions (economic, environmental, and social), is no longer a cosmetic option but a fundamental requirement for the survival and long-term value of companies in a changing business environment that demands transparency and accountability.

The essence of successful integration lies in shifting from a compartmentalized to a systems-based approach. Internal auditing provides a neutral function, ensuring that the systems and controls in place to manage sustainability risks and opportunities are functioning effectively. When the internal auditor adopts a theory of constraints lens, they cease scattering their efforts across every aspect of the process and instead focus on the most critical constraint hindering the achievement of strategic sustainability goals. This focus ensures that auditors deliver high-value, targeted recommendations aimed at maximizing the sustainable productivity of the entire system.

The impact of the Theory of Constraints (TOC) on sustainable performance assessment is essentially a "do less to do more" methodology. Instead of engaging in numerous disparate environmental and social initiatives that may be ineffective, TOC enables an organization to identify the critical constraint (whether in energy efficiency, social supply chain management, or environmental governance) and direct scarce resources where they can generate the greatest immediate and sustainable improvement. This ensures that progress reported in sustainability is genuine and stems from strategic operational improvements.

Finally, the actual integration of these components into the company's operational strategy is what unlocks the full potential for sustainable performance. When sustainability criteria become an integral part of decision-making, product design, supplier selection, and risk management (as assumed by internal auditing), and when these processes are managed with the focus methodology imposed by the Theory of Constraints, the result is:

- No disease Sustainable : Reducing operating costs through resource efficiency.
- Operational resilience : Building supply chains that are more resilient to environmental and social shocks.
- Value Marketability : Enhancing the confidence of investors, consumers, and regulators.

## References

1. A. Al-Abbadi et al., "Sustainable Performance Based on Entrepreneurship, Innovation, and Green HRM in E-Business Firms," *Cogent Business and Management*, vol. 10, no. 1, Art. no. 2189998, 2023.
2. F. Alaba and S. Ghanoum, "Integration of Artificial Intelligence in Auditing: The Effect on the Auditing Process," *Journal of Accounting Automation*, vol. 15, no. 3, pp. 45–62, 2020.
3. M. M. Ali, A. S. Abdullah, and G. S. Khattab, "The Effect of Activating Artificial Intelligence Techniques on Enhancing Internal Auditing Activities," *Alexandria Journal of Accounting Research*, vol. 6, no. 3, pp. 1–40, 2022.
4. F. Ashir and K. Mekonen, "The Impact of Artificial Intelligence on Auditing: Navigating Ethical Challenges," *Journal of Business Ethics*, vol. 189, no. 2, pp. 345–360, 2024.
5. D. Couckuyt, "An Overview of Challenges and Research Avenues for Green Business Process Management," in *On the Move to Meaningful Internet Systems OTM 2017 Workshops*. Cham, Switzerland: Springer, 2018, pp. 270–279.
6. Diana, "Sustainable Performance of Public Organizations," *Studies in Business and Economics*, vol. 9, no. 3, pp. 45–60, 2014.
7. H. W. Lee et al., "Inventory Control Model for Fresh Agricultural Products Under Inflation," *Kybernetes*, vol. 41, no. 8, pp. 1227–1288, 2012.
8. E. Group, "Theory of Constraints in Field Service Operations," Technical Report, 2012.
9. A. Gunasekaran et al., "Optimum Production Schedule and Profit Maximization Using the Theory of Constraints," *International Journal of Manufacturing Technology and Management*, vol. 5, no. 4, pp. 325–337, 2003.
10. Holiawati et al., "Risk Management, Corporate Governance and Corporate Sustainability Performance," *South East Asia Journal of Contemporary Business, Economics and Law*, vol. 21, no. 5, pp. 12–22, 2020.
11. F. Hourneaux Jr. et al., "Triple Bottom Line and Sustainable Performance Measurement," *Revista de Gestão*, vol. 25, no. 4, pp. 413–429, 2018.
12. M. Islam et al., "The Influence of Knowledge Sharing on Sustainable Performance," *Sustainability*, vol. 12, no. 3, Art. ISSN 2714-7444 (online), <https://acopen.umsida.ac.id>, published by [Universitas Muhammadiyah Sidoarjo](https://www.umsida.ac.id)

# Academia Open

Vol. 11 No. 1 (2026): June

DOI: 10.21070/acopen.11.2026.13557

no. 908, 2020.

13. N. R. Khan and F. Ameer, "Manager's Age and Sustainable Entrepreneurial Orientation," *Sustainability*, vol. 12, no. 8, Art. no. 3196, 2020.
14. J. Kline et al., "Managing a Community Mental Health Agency," *Total Quality Management*, vol. 19, no. 3, pp. 156–172, 2018.
15. A. Panfilo et al., "Performance Measurement Tools for Sustainable Business," *Corporate Social Responsibility and Environmental Management*, vol. 29, no. 2, pp. 367–384, 2022.
16. J. Raderbauer, "The Importance of Sustainable Business Practices in the Viennese Accommodation Industry," M.S. thesis, Univ. of Exeter, Exeter, UK, 2011.
17. S. Sadat et al., "Theory of Constraints for Publicly Funded Health Systems," Ph.D. dissertation, Univ. of Toronto, Toronto, Canada, 2018.
18. M. Saric et al., "Sustainability Performance and Capital Structure," Working Paper, 2020.
19. V. A. Sobreiro and M. Nagano, "Constructive Heuristics to Optimize Product Mix," *International Journal of Production Research*, vol. 50, no. 20, pp. 5936–5948, 2012.
20. R. Stewart et al., "Using Excel, TOC, and ABC for Product Mix Decisions," *Management Accounting Quarterly*, vol. 3, no. 3, pp. 112–130, 2018.
21. M. Uysal, "An Integrated Model for Sustainable Performance Measurement," *Procedia Social and Behavioral Sciences*, vol. 62, pp. 689–694, 2012.
22. S. Winata et al., "Sustainability Performance Management Practices," *Journal of Accounting and Organizational Change*, vol. 8, no. 2, pp. 210–235, 2012.
23. R. Zadry et al., "Total Quality Management and Theory of Constraints Implementation," *Total Quality Management*, vol. 17, no. 8, pp. 999–1020, 2006.
24. I. N. Hasan, "Highlight of Tax Accounting Standards Based on International Financial Reporting on Attaining Financial Sustainability," Monograph, 2025.