

Improving the quality of internal audit by applying the (six sigma) approach using the implementation stages (DMAIC) in the banking sector: a sample of banks listed on the Iraqi Stock Exchange

Maytham Bader Bawie Al-Sfan

miaytham.alsfan@qu.edu.iq

Abdallah Abdulnabi Waheed

acco.stp23.12@qu.edu.iq

University of Al-Qadisiyah

Received: 10/7/2024

Accepted: 27/8/2024

Available online: 25 /12 /2024

Corresponding Author : Abdallah Abdulnabi Waheed

Abstract : The research aims to study, analyze and explain the relationship between the six sigma approach and improving the quality of internal auditing. An applied study for a sample of banks listed on the Iraqi securities market. The research sample included eight banks for the time period from (2023 - 2024), where the researcher relied on two lists. An examination of the two basic variables in the research. The first aspect is the independent variable represented by the Six Sigma approach using the implementation stages known as (DMAIC) and the aspects that lead to improving the quality of internal auditing. Commitment to applying the standards of professional practice issued by the Institute of Internal Auditors (IIA). The study found that there is a direct, direct effect of the variable Six Sigma on the variable internal audit, and that increasing Six Sigma by one unit leads to an increase in internal audit by 0.984. That is, applying the Six Sigma approach as a management approach in the banking sector in a way In general, the internal audit department in particular contributes significantly to improving the quality of internal auditing in the banks sampled by the research, through applying the professional practice standards for the internal audit function issued by the Institute of Internal Auditors (IIA) and its standards (attribute standards and performance standards), which helps in performing the audit function and tasks. Internal auditing has a high level of quality. Accordingly, the researcher recommends that the banks in the research sample apply the Six Sigma methodology as an effective mechanism to achieve a high level of quality, such as improving the quality level of internal auditing and achieving accurate and reliable financial outputs.

Keywords: six sigma, Implementation stages (DMAIC) ,Quality, Quality of internal audit, the banking sector.

Introduction: As a result of the great development in the economic field and the increased growth of the activities of the banking sectors, there must therefore be an effective supervisory activity for auditing operations and discovering errors and manipulation operations in economic units in order to provide services with a high level of quality to meet the needs of users and as a result of the damage caused to economic units due to the weak quality of internal auditing. During the manipulation or concealment of data by the management of the economic unit, part of it is due to the limited independence of the internal auditor in performing the audit function. To limit manipulation operations and control the management of the economic unit, the researcher believes in order to advance and raise the quality of internal auditing in the economic units, the research sample, and to find new methods and methods. It is developed for the purpose of reducing errors and defects by applying one of the contemporary approaches, which is the six sigma approach, through the use of implementation stages known as (DMAIC), represented by the process of (definition, analysis, measurement, improvement, control). This approach helps economic units to reach High degrees of quality and accuracy using statistical tools and techniques. This approach is based on monitoring the performance, activities, and daily work of economic units in order to reach advanced levels of quality, and the chances of defects that may reach a level where there are no defects are reduced. By applying the six sigma approach, it leads to continuous improvement. And increasing the quality of internal auditing because the internal auditing function is one of the important oversight functions in economic units. Of course, for the internal auditing function to be effective and achieve the desired goals, it must be of high quality in accordance with international standards for internal auditing, and applying the six sigma approach is possible. It achieves significant progress in improving performance and raising the level of quality in auditing operations in the banking sector. To achieve the objectives of the research, it was divided into several axes, as shown below:

The first topic: research methodology and previous studies

First: the research problem

The business environment requires that the accounting information provided by the economic unit management be reliable information that is neutral and useful to parties with internal and external interests, which gives it the character of appropriateness in making decisions, thus achieving the goals of the economic unit management related to expansion, growth, and obtaining money from investors. However, the management of the economic unit sometimes strives to provide information with a positive image of the company that is far from the economic reality, such as failure to adhere to a level of disclosure of information about the economic unit and thus as a result of the management disclosing incomplete information resulting from the weak performance of the internal audit function, especially independence. Ltd. for the internal auditor. The researcher believes that by applying the six sigma approach to control management, raise the quality of internal audit, continuously improve its operations, reduce costs, and reduce defects, it can help improve the quality of internal audit with a high percentage of accuracy. According to the above, the research problem can be formulated with the following main question:

- **Does applying the six sigma approach help improve the quality of internal auditing in the banking sector?**

Through the main question above, the following sub-questions are raised:

A- Is the six sigma diffraction approach applied to the economic unit of the research sample?

B- Is internal audit characterized by a level of quality in the economic unit of the research sample?

C- Is there a relationship between improving the quality level of internal auditing and the six sigma approach in the economic units in the research sample?

Second: The importance of research:

The importance of the research stems from the following:

1. Internal audit is considered of great importance to the economic unit by improving operations, efficiency, monitoring risk management, ensuring transparency, and enhancing confidence, which contributes effectively to reducing information asymmetry, which requires high adherence to internal audit standards and limiting management actions, which are sometimes described as opportunistic.
2. In order to raise the quality level of internal auditing, one should strive to activate one or more methods, including applying the six sigma approach, which aims to continuously improve operations, reduce defects, and raise the level of performance of the internal audit function.
3. This topic is considered one of the important topics that complement the framework of knowledge in the field of scientific accounting research, especially in the local environment and complements the path of previous researchers in studying the factors that can contribute to improving the quality of internal auditing in economic units.

Third: Research objectives:

The research seeks to achieve the following goals:

- 1- Study, analyze and interpret the relationship between the six sigma approach and improving the quality of internal auditing.
- 2- Highlighting the six sigma approach as a management approach to achieving quality.
- 3- A theoretical introduction to studying internal auditing, quality standards and how to measure them.

Fourth: Research hypotheses:

Based on the research problem, the following main hypothesis was formulated:

(Applying the six sigma approach contributes to improving the quality of internal auditing).

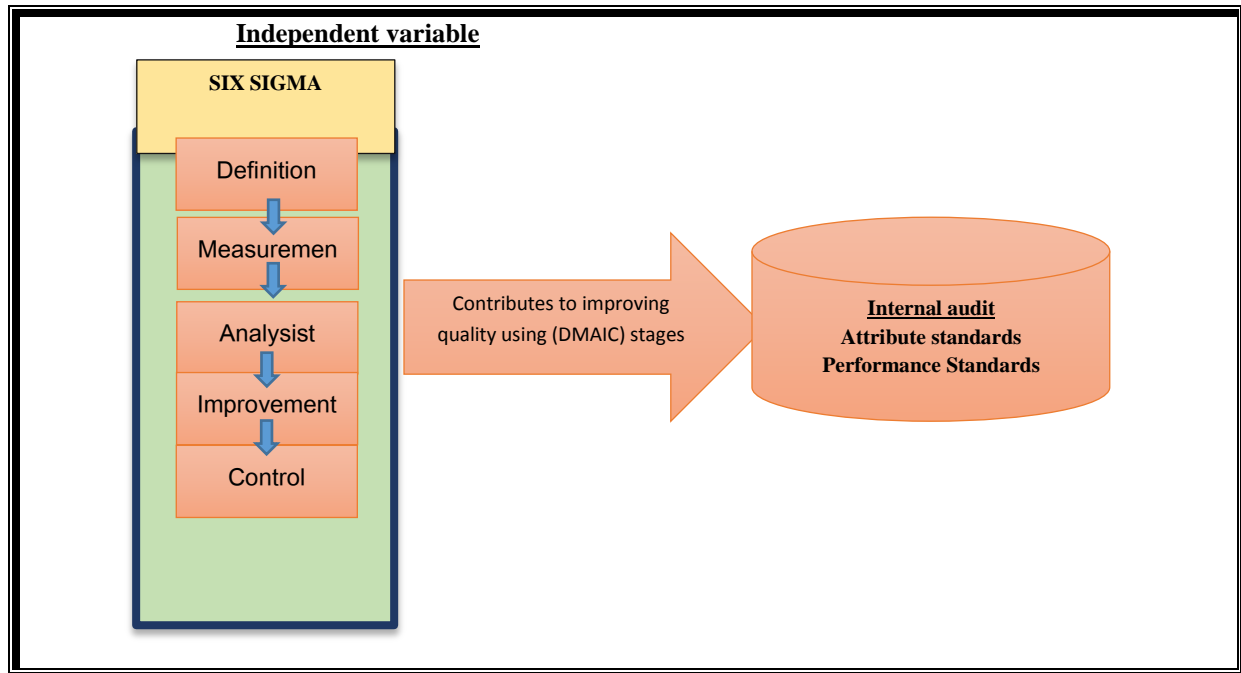
The relationship can be expressed statistically about the six sigma diffraction methodology and the quality of internal audit (H0: H1).

- 1- **H0:** There is no significant, statistically significant relationship between the application of the six sigma approach and the quality of internal auditing.
- 2- **H1:** There is a statistically significant correlation and influence between the application of the six sigma approach and the quality of internal auditing.

Fifth: The default search scheme

Figure No. (1)

The following figure represents the research model that shows the independent variable and the dependent variable



Reference: Prepared by the researcher

Sixth: The research population and sample

- 1- The research community: The research community is represented by a group of Iraqi banks listed on the Iraq Stock Exchange during the research period for the year (2023-2024).
- 2- Research sample: The research sample represents various banks chosen from among the best Iraqi banks based on the highest capital with the availability of financial data listed on the Iraqi Stock Exchange.

Seventh: Previous studies

1- Study (Ahmed, 2017, Iraq)	
Study Title	The role of using the Six Sigma approach to activate and improve internal auditing and its implications for the quality of accounting information.
Purpose of the study	The study aims to produce high-quality information that supports long-term administrative decisions, and one of the successful methods is to apply the Cigna approach and method. Six exploratory research in a sample of commercial banks in Sulaymaniyah Governorate. The size of the research sample reached (63) individuals, and the questionnaire was distributed to all members of the sample. In commercial banks in Sulaymaniyah Governorate.
The most important conclusions and recommendations	<ol style="list-style-type: none"> 1. There is a significant correlation between the application of Six Sigma principles and internal auditing. 2. There is a statistically significant relationship to the role of using the Six Sigma approach and internal auditing on the quality of accounting information, which means that using the Six Sigma approach will improve the internal audit function, and this in turn leads to its role in providing the quality of accounting information. 3. The study recommended that employees participate in systems operations and pay attention to human resources and their suggestions submitted by employees.
2- Study (Ghaleb, Abdullah: 2022, Iraq)	
Study Title	The improving of Internal Auditing Quality Performance by the Use of Six Sigma Methodology Standards

Purpose of the study	An applied study was conducted at the General Company for Ports of Iraq, where (41) questionnaire forms were distributed to collect relevant information. It aims to identify the extent of the impact of adherence to Six Sigma standards on the control and quality of internal audit performance. To maintain this goal, the descriptive analytical approach was applied in the General Company for Ports of Iraq.
The most important conclusions and recommendations	There is a correlation between adherence to Six Sigma standards and controlling the quality of internal audit performance through the correlation coefficient, including the serious direction of the company's senior management to adopt the application of the SS methodology to control the quality of performance, especially in the field of internal audit and supporting the work environment using the quality concepts applied in the unit. The recommendations were important in this regard, the most important of which suggested that "senior management should make every effort by adopting the application of the Six Sigma methodology and using DMAIC to achieve quality performance, especially in internal auditing and supporting the work environment with the quality concepts applied in the unit.

3- Study (Abdel Aziz, 2022, Sudan)	
Study Title	The impact of applying Six Sigma standards in improving the quality of internal auditing in Sudanese banks: an applied study
Purpose of the study	A field study aimed at testing the effect of applying Six Sigma standards in improving the quality of internal auditing in Sudanese banks. The study was based on a questionnaire list on a random sample consisting of (175) individuals from internal auditors, committee members in banks, and public administration employees.
The most important conclusions and recommendations	The results of the study indicated that there was a statistically significant positive moral effect on improving their quality, and this gives a positive indication of the possibility of benefiting from the application of these standards in different companies in the Sudanese business environment. This study recommended the need to raise Sudanese banks' awareness of the importance of applying the Six Sigma standards because of its importance in improving the quality of banking services, and this reflects positively on improving the quality of internal auditing.
4-(Yousef, Thuneibat,2019, Jordan)	
Study Title	Effect of Using Six Sigma Methodolgy in Improving Quality Control over External Audit in Jordan
Purpose of the study	This study aimed to contribute to the knowledge of the use of Six Sigma in improving external quality control in Jordan and to achieve the objectives of the study. The researchers prepared a questionnaire consisting of: Data was first collected from (65) paragraphs of the study drawing, successfully from (156) proficient people. To analyze and test the study hypotheses, use descriptive statistics, analysis, and discriminant analysis (ANOVA). Multiple linear regression.
The most important conclusions and recommendations	The study of the results showed that all Six Sigma standards (supporting leadership models, improving leadership, processes and systems, feeding into the review and professional measurement of the individual) are of high importance to external supervisors in Jordan. He also added that all elements of quality differentiation (requirements for independence, acceptance and continuity of relationships with clients, appointment of engagement and monitoring teams) are of high importance to external auditors in Jordan. There are also statistically significant results for Six Sigma standards on controlling quality elements in auditing financial statements. Based on the results of the study, the researchers propose several recommendations, including enhancing the skills of external auditors regarding Six Sigma standards by holding workshops and training courses. The researchers also recommend that audit offices provide the necessary human, material and technical resources for the practical application of the Six Sigma methodology.

The second topic: The theoretical framework of the research

First: The concept of the six-sigma (SS) diffraction approach

1. Definition of the hexagonal diffraction (SS) method

The six sigma approach is a strategic approach to achieving excellence in operations and service performance through the effective use of statistical tools and techniques. It requires a transformative change in building the economic unit's culture, structure, and operations, as looking at the organizational cultures that are described by the values and beliefs of the unit's members Economic, which is viewed by the unit as the correct way to perceive, find solutions, and address problems, and through this, the goals of the economic unit are achieved (Abdullah and Al-

Khalaf, 2021: 148). In addition, the application of the (six sigma) approach is considered a strategy that seeks to identify the causes of errors, defects, or negligence that occur during the performance of tasks and to overcome these errors and defects by focusing on the outputs that are of material importance to customers. Therefore, the (six sigma) approach is considered one of The important methodologies are to reduce the size of errors to the maximum possible extent, that is, to reduce the percentage of defects and errors to the smallest possible amount, reaching a level in which there are no defects (Ghalib & Abdullah, 2022:3). Hafez believes that the concept of the (six sigma) approach is a set of tools that control and enable economic units to achieve more accuracy and a quantitative approach to identifying and correcting the basis that causes problems, and this helps in achieving the greatest benefit by applying the (six sigma) approach in reducing costs and achieving high quality. (Hafez, 2015:2). From the researcher's point of view, (six sigma) is a methodology, technique, or strategy that seeks to achieve high quality and lower cost for production and service operations, and its primary goal is to achieve customer satisfaction. This is achieved by reducing errors and deviations to a level in which there are no defects and errors, that is, with a high degree of accuracy and perfection. Using a set of statistical principles, tools and techniques to identify problems and analyze data.

2. Objectives of applying the six sigma methodology

The economic unit seeks to achieve many goals by applying the (six sigma) methodology, and among these goals are (Al-Haif, 6: 2023) (Hassan, 2017: 69):

- 1- Continuous improvement in the quality of production and service operations in all quality elements of the economic unit.
- 2- Transforming and changing the organizational culture from the mode of combating errors to the mode of preventing errors from occurring and performing work correctly.
- 3- The Six Sigma methodology aims to provide products of high quality and meet customer expectations at the lowest cost and with the fewest defects.
- 4- Follow the (SS) strategy to improve the ability of workers, raise their skills, pay attention to them, and solve their problems.
- 5- Six Sigma technology aims to increase awareness and productive culture among employees, achieve growth and increase the company's competitive advantage. Raising the level of customer satisfaction and increasing their loyalty to the company, which reflects positively on the company's market share and increased income growth.

3. Stages of applying the SS (six sigma) methodology

The (SS) approach applies five grouped stages known as (DMAIC), which is abbreviated in English. It is a set of the first letters for these stages: Define, Measure, Analyze, Improve, and Control. It is usually referred to as the problem-solving model, as this model is the most common framework in applying the (SS) approach, as in Figure (2) which is as follows:

- **Define:** In the first stage, the main goal of improvement is determined, as the SS team identifies the projects that need improvement based on the goals of the economic units, their needs, and consumer requirements, and identifies the critical quality characteristics that have an impact on the quality of products and processes, which leads to Creating an image of the processes that need to be improved. The goal of the SS approach is to reduce defects by solving the problems that cause it. Identifying the problem is important for applying the approach, and the main reason for this stage is identifying the problem and the changes that have an impact on the problem (Ahmed, 2017:353).
- **Measure:** In this stage, the causes that affect the process outcomes in the current reality are identified, measured, and the practical capabilities are determined using many techniques and tools in order to reach the selection of the appropriate quality for the processes and outputs that achieve the desires of customers, and identify the defects resulting from the processes and inputs that It contributes to the occurrence of such defects and knowing the impact accurately to reduce and eliminate defects that affect the profits of the economic unit, reduce costs, and measure defects that affect quality characteristics. Therefore, the level of (SS) is determined. This stage requires defining the problem and measuring what happened accurately so that the problem is transformed into a function. To measure defects so that the economic unit is able to measure the outcomes of operations (Ibrahim, 2022: 118).
- **Analysis:** The work team identifies the causes of the problem by analyzing the data collected in the measurement stage. The focus is on searching for the root cause. Based on the data analysis, opportunities are arranged in order of priority according to their contribution to achieving customer satisfaction and their impact on profitability (Ahmed, 59:2019).
- **Improve:** In this stage, potential solutions are created and the easiest solution to implement is determined based on the cause of the problem. The best solution that has been identified is sent to those with experience. After that, process maps are developed and a high-level plan for the experimental solution is formed, and through the implementation of the final solution, the final solution is implemented. Determine the benefits and effects of improvement (Khader, 2020: 103).

- **Control:** At this stage, standards are developed that help senior management monitor ongoing success, so that the (six sigma) methodology is adaptable and continuous, because the improvement process needs to be under continuous supervision, and the most important thing that should be noted is the guarantee that there will be no return to Old traditional practices that led to problems or errors, and therefore the ultimate goal focuses on the positive effects and ensuring adherence to them, with the necessity of measuring and monitoring the results in parallel (Pham, 2017:15).

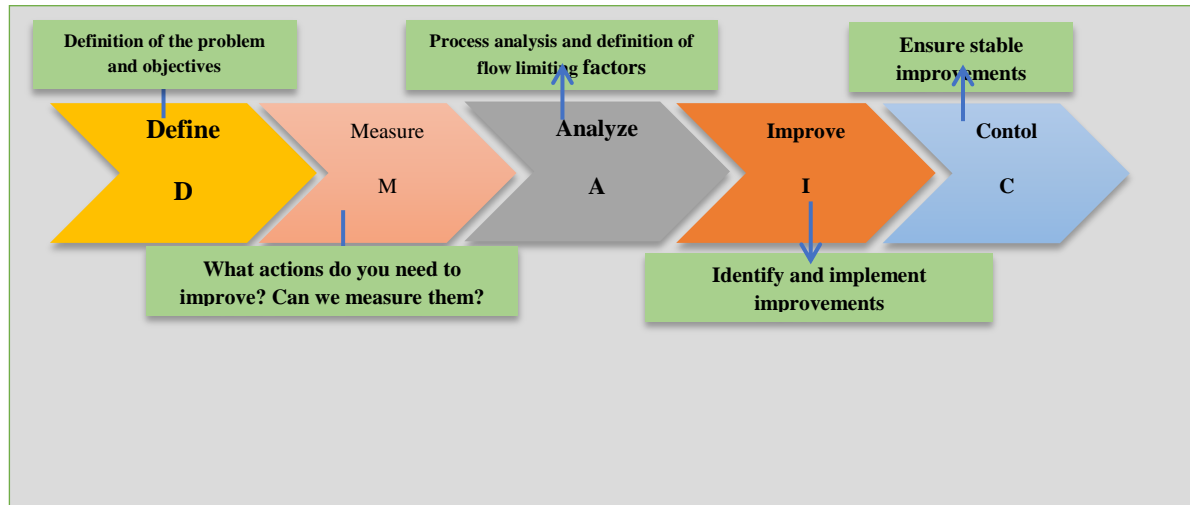


Figure No. (2) Stages of the Six Sigma approach

Reference: Prepared by the researcher based on the source, Krupp, N. & Person, M., (2018), "Continuous Improvement Processes just a trend or a proven success-factor for organizations: The disparity between operational and office employees", Master Thesis, Lund University School of Economics and Management, P: 16

4. The six basic steps for successful implementation of six sigma technology:

There are six basic steps to implement the technology, which are as follows (Ellis, 2016:21):

- 1- Understanding and commitment of senior management.
- 2- Access to current information regarding customer needs.
- 3- The presence of an operations management system that has the ability to measure the current flow of performance and identify areas that need improvement.
- 4- Appropriate human resources that have been adequately trained to help design and improve operations.
- 5- Participate with management in a consistent manner and review them for the purpose of managing, improving and designing operations.

6- Communicate to ensure customer and SS technology focus on methods used throughout the entire economic unit. As for the basic steps that are implemented for the success of the SS technology, the researcher believes that these steps can be applied to the internal audit function for the success of the audit process, which is for senior management to support the audit process and adhere to the procedures and auditing standards followed, as well as collecting sufficient information, especially information related to The economic unit management's expectations, analysis, and knowledge of the information that greatly affects the unit's management, as well as evaluating the results, identifying the necessary opportunities to improve operations, and determining the goals that internal audit should achieve in order to achieve the satisfaction of the economic unit management, providing the necessary resources and how to exploit them economically, as well as providing continuous training courses for the team. Internal auditing so that the team is able to face the challenges when performing the internal auditing profession and achieve it successfully.

5. Determinants or challenges facing the application of the six sigma methodology

When economic units seek to apply the (six sigma) methodology, they face some problems and obstacles. Among these obstacles that the economic unit faces is the lack of effective communication between the various unit departments. This leads to a lack of information among employees and thus leads to their failure when participating in (SS) activities. Another obstacle is the lack of sufficient budgets to implement the (SS) methodology, that is,

training, education, and effective management programs must be activated and full awareness must be created among employees when applying the (SS) methodology successfully (Al-Nazer, 2017: 76).

Others believe that there are some obstacles or limitations facing the implementation of the Six Sigma methodology, which are as follows (Ghania and Farouk, 2020: 29) (Al-Atwi, 2019: 33):

- 1- Employees lack a clear understanding when implementing the Six Sigma methodology and deal with it incorrectly.
- 2- Measuring the performance of economic units using subjective methods.
- 3- Inadequate resources in implementing this technology.
- 4- Insufficient information available due to the lack of participation between the different sections of the unit.
- 5- Not providing sufficient data, especially at the beginning of operations, which leads to the economic unit taking a large amount of time to collect data.

Second: Quality of internal audit

1. The concept and definition of internal audit quality

The quality of internal auditing is considered one of the important topics that has received great attention in accounting literature and thought. It is a tool for verifying, accuracy and objectivity of financial information and increasing confidence in financial statements. Therefore, internal auditing is considered one of the pillars of management success because it represents a source of information. That is, attention is paid to the function of internal auditing to judge professional performance. For internal auditors and increasing confidence in the financial reports prepared by internal auditors to help detect fraud and misuse of resources and eliminate waste. Some define it as the activities, procedures, tasks and professional practices of internal auditors through great commitment to internal auditing standards, objectives, responsibility and policy because the quality of internal auditing It increases the credibility of accounting information and allows management and shareholders to make more accurate estimates of the value of the economic unit (Zaidan & Neamah, 2021:5). While the quality of internal audit is defined as the process of measuring the accuracy of the data and information that have been disclosed, the quality of the audit is determined by the quality of the report and the lack of errors and bias it contains and the increased accuracy of accounting data. The quality of the audit also includes the level of compliance with the standards of the Institute of Internal Auditors and the ability to implement the audit plan and demonstrate The results are positive and communicated to the relevant authorities, meaning that the quality of the audit increases further due to the continuous improvement and efficiency of the auditors (Nurdiono & Gamayuni, 2018:428). That is, the quality of internal audit is independence, objectivity, advisory activity, and assurance designed to provide an accurate picture of the economic unit's performance during the financial period by improving risk management and operations, achieving the intended goals, protecting the assets of the economic unit, and providing accurate information to users of accounting information. In addition, internal audit is responsible for implementing Strategies and their success (Kwabena, 2017:4). As shown in the figure below, to maintain the components of internal audit quality in economic units.

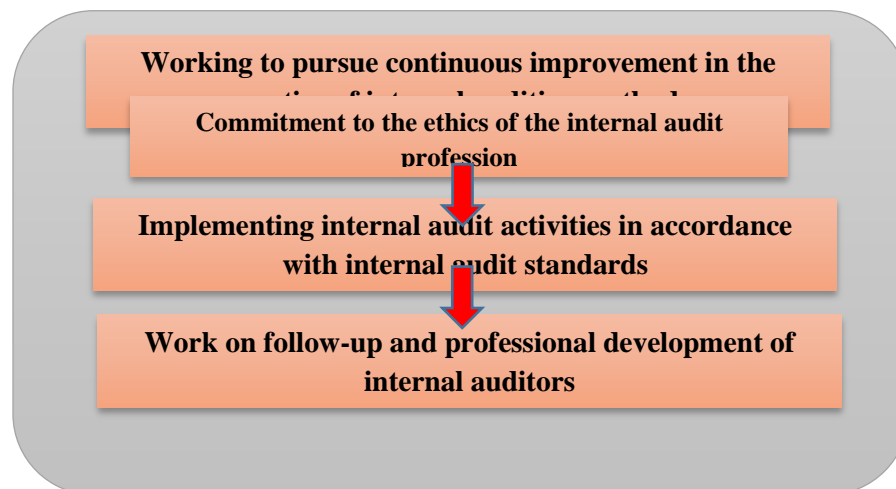


Figure (3)

Components of maintaining the quality of internal auditing in economic units

Source: Ajila, M., & Khaira, Z. (2017). Quality requirements of internal audit services A comprehensive vision. Global Journal of Economic and Business, 2(2), 61-73.

2. Internal audit standards

Internal auditing standards contribute significantly to increasing the efficiency and effectiveness of auditing. Commitment to international standards of professional practices is one of the main conditions that contribute to adding value to internal auditing. These standards have been documented by the Institute of Internal Auditors, which is the international organization that monitors standards, continuing education, and general codes of conduct for internal auditors. As a profession. The Institute of Internal Auditors also sponsors research and development of practices and procedures designed to enhance the work of internal auditors wherever they work. The current auditing standards that are applied by those who also provide other services related to risk management and corporate governance other than financial reports. In addition, these standards require internal auditors to carry out their responsibilities assigned to them in accordance with the ethics of the auditing profession. (Zlneyel, 2018:42).

The international standards for the professional practices of internal auditing consist of two groups:

1- Attribute standards

2- Performance standards

The appropriately named attribute standards address the characteristics of internal auditors (such as independence and objectivity) that apply to internal audit activities. As for the performance standards applied to internal audit activities and providing a quality measure through which the performance of internal audit activities can be measured. The characteristics and performance standards apply to internal audit services in general. The internal audit standards developed by the Institute of Internal Auditors (IIA) are recommended and encouraged, adhered to, accepted, adopted and implemented by internal auditors practicing in economic units (Louwers, 2015:689).

First: Attribute Standards:

1- 1000 Purpose, authority and responsibility: The purpose, authority and responsibility of the internal audit activity must be formally defined in the internal audit charter, in accordance with the internal audit mission and the mandatory elements of the International Framework for Professional Practices (Basic Principles for the Professional Practice of Internal Auditing, Code of Ethics, “Standards” and the Definition of internal audit). The CAE must periodically review the internal audit charter and submit it to senior management and the board of directors for approval (IIA, 2018:14).

❖ **Internal audit charter:** It is an official document through which the purpose, authority, and responsibility of the internal audit activity are determined. The internal audit charter also determines the position of the internal audit activity within the economic unit, including the nature and relationship of the functional reports of the chief audit executive with the company’s board of directors. It also allows access and review of records and access. To employees and physical property, it determines internal audit activities, and final approval of the internal audit charter is the responsibility of the company’s Board of Directors.

2- 1100 Independence and objectivity: The internal audit activity must be independent and internal auditors must perform their work objectively (Gleim, 2020:8).

❖ **Independence:** is freedom from all circumstances that threaten internal audit activity when performing the tasks and responsibilities of internal audit in an unbiased manner by achieving the degree of independence necessary when carrying out the tasks and responsibilities of internal audit effectively. The CEO has access to senior management and the company’s board of directors, and this can be achieved through a dual reporting relationship with management and the company’s board of directors. Threats facing independence must also be managed at the level of the individual auditor, at the audit levels, and at the functional and organizational levels.

❖ **Objectivity:** It is an unbiased mental attitude that allows internal auditors to perform their tasks in a way that makes them believe in the results of their work and that no compromises are made about the quality of their work. Objectivity also requires internal auditors not to subordinate their judgment regarding the audit issue to others. Likewise, threats to objectivity must be managed at the level of the auditor alone. At the internal audit level and at the functional and organizational levels.

3- 1200 Necessary professional skill and care: Contracts must be executed with competence and appropriate professional care (Federal Financial Supervision Debt Guideline, 2019:33).

❖ **Skill:** It is a collective term that refers to the knowledge, skills and other competencies required of internal auditors to carry out their professional responsibilities effectively. It includes consideration of current activities, trends and emerging issues, to enable relevant advice and recommendations. Internal auditors are encouraged to demonstrate their competence by obtaining appropriate professional certifications and qualifications, such as the Certified Internal Auditor designation and other designations offered by the Institute of Internal Auditors and other appropriate professional organizations.

❖ **Necessary Professional Care:** Internal auditors must exercise the care and skill expected of an internal auditor to have a reasonable level of foresight and competence. Due professional care does not mean infallibility and internal auditors must enhance their knowledge, skills and other competencies through continuing professional development.

4- 1300 Quality assurance and improvement program: The chief audit executive must develop and maintain a quality assurance and improvement program that covers all aspects of internal audit activity (AII, 2017:7).

❖ **Quality Assurance and Improvement Program Requirements:** The Quality Assurance and Improvement Program is designed to enable assessment of the conformity of the internal audit activity with the Standards and assess whether internal auditors apply the Code of Ethics. The program also evaluates the efficiency and effectiveness of the internal audit activity and identifies opportunities for improvement. The CAE must encourage The Board of Directors supervises the quality assurance and improvement program. The quality assurance and improvement program must include internal and external evaluations.

Second: Performance Standards:

1- 2000 Managing the internal audit activity :The CAE must effectively manage the internal audit activity to ensure that it adds value to the economic unit (Gleim, 2020:10).

❖ **The internal audit activity is managed effectively when:**

1. It achieves the purpose and responsibility stipulated in the Internal Audit Charter.
2. When it conforms to the standards.
3. Members comply with the rules of ethics and standards.
4. It takes into account emerging trends and issues that could affect the economic unit. The internal audit activity adds value to the company and its stakeholders when it takes into account strategies, objectives and risks, strives to provide ways to enhance governance, risk management and control processes and objectively provides relevant assurances.

2- 2100 Nature of work The internal audit activity: should evaluate and contribute to improving the organisation's governance, risk management and control processes using a systematic, disciplined and risk-based approach. The credibility and value of internal auditing is enhanced when auditors are proactive and their evaluations provide new insights and consider future impact (Pitt, 2014:320).

3- 2200 Planning and participation: Internal auditors must develop and document a plan for each engagement, including the engagement's objectives, scope, timing, and resource allocation. The plan must take into account the economic unit's strategies, objectives and risks related to participation (IIA, 2018:28).

4- 2300 Implementing the internal audit: mission Internal auditors must identify, analyse, evaluate, and document sufficient information to achieve the engagement objectives (Gleim, 2020:12).

5- Interpretation: The sufficient information must be true, adequate and convincing so that a wise and informed person can reach the same conclusions reached by the auditor. Reliable information is the best information that can be obtained through the use of appropriate sharing techniques. Relevant information supports mission observations and recommendations and is consistent with mission objectives. Useful information helps the organization achieve its goals. Internal auditors must base their conclusions and engagement results on appropriate analyzes and evaluations. **2400 Communicating results:** Internal auditors must communicate the results of engagements, and the communications must include the objectives, scope, and results of the engagement. Communications must be accurate, objective, clear, concise, constructive, complete, and timely (IIA, 2018:32).

6- 2500 Workflow monitoring: The chief audit executive must establish and maintain a system to monitor the disposition of findings that are reported to management (IIA, 2018:35).

7- 2600 Communicating Risk Appetite: When the chief audit executive concludes that management has accepted a level of risk that may be unacceptable to the organization, the chief audit executive must discuss the matter with senior management. If the chief audit executive determines that the matter is not resolved, the chief audit executive must report the matter to the board (Federal Financial Oversight Debt Guideline, 2019:35).

3. Quality dimensions of the internal audit function:

The American Institute of Certified Public Accountants (AICPA) in 1991 identifies the important and necessary elements to ensure the quality of internal audit, which are as shown below.

1- Efficiency

The internal audit function must be highly effective when the internal auditors have sufficient experience, knowledge, and skills to perform the internal audit function with high quality. Efficiency can be linked to the individual's ability to perform his task in the audit function properly based on the professional and educational level, as the experience and efforts of employees and continuous professional development and efficiency contribute to improving the effectiveness of internal audit through the ability of employees to perform this task with high quality (Zaidan & Neamah, 2022). :6).

2- Independence

The internal audit function must be an independent function that performs its work objectively without any interference from external parties when carrying out a process to audit and communicate the results. Therefore, the independence of the internal auditor is considered an important factor of quality in performing the internal audit function and must be at an appropriate hierarchical level within the economic unit to be. From exercising its responsibilities, the independence of the internal auditor is only achieved when he submits his report to the Board of Directors (Krichene & Bakrichene, 2016:6).

3- Independence in performing tasks

Quality of task performance The quality of internal audit refers to how the tasks of operational activities are performed and then evaluated according to standards and procedures, as the quality of performance is also a review of the planning and supervision processes, field work, preparing reports, results and recommendations, and following up on the internal activities of the economic unit (Zaidan & Neamah, 2022:7).

Third: The relationship of the hexagonal diffraction approach to the quality of internal auditing

In light of the challenges witnessed by the activities of the economic units, in addition to the methods of fraud and manipulation of financial operations, great responsibilities have been placed on the shoulders of internal audit to maintain the performance of the economic unit and the validity of its financial operations and the fairness of its results, because these results are important to other parties and the path of the internal audit function requires development to keep pace. Operations and raising the level of internal audit quality. Accordingly, the Six Sigma methodology was used, which is considered one of the most important methods used in achieving quality and monitoring performance, as well as adhering to the standards of the Six Sigma methodology because it is considered one of the means that is used to raise the level of quality, maintain it, and monitor. Developing internal audit performance to reach the required level. This methodology begins with its five stages, known as (DMAIC). It begins with identifying the problem and then contributes to measurement and analysis, and finally to the improvement stage to find solutions to this problem, and then applies control over the implemented performance to provide defect-free services for that purpose. We find that these five stages correspond to the stages of implementing the internal audit function, and to explain that relationship more clearly, we display the following figure (Ghaleb & Abdulahad, 2022:2):

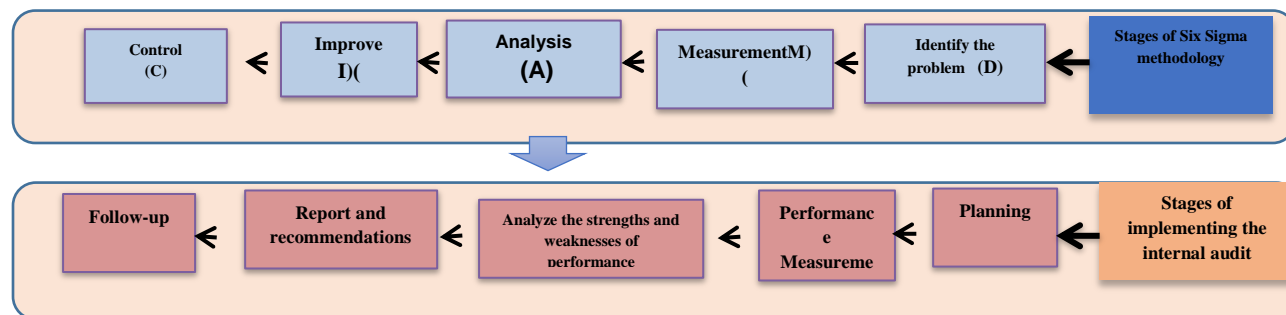


Figure (4): The relationship between the hexagonal diffraction approach and the quality of internal auditing
Reference: Prepared by the researcher based on (Sharba, Ali Abdul Hussein Hatf, 2015, improving the quality of internal auditing in government units using technical standards - six sigma, an applied study in a sample of service units in the Najaf Governorate, Al-Mustansiriya University, p. 81) adapted by the researcher.

In view of the large and rapid growth of economic units, the diversity of their activities, and the complexity of their financial operations, which leads to an increase in the tasks and responsibilities of internal auditing, in addition to the intense competition between similar economic units, in order to successfully achieve the goals of the economic unit, maintain its market value, and attract investments to it, this requires achieving high levels of quality. When conducting an audit of financial statements and raising the level of quality of professional performance of the auditing profession in general and internal auditing in particular. Although the Institute of Internal Auditors (IIA) has issued standards for performing the internal audit function, we find a deficiency in their application in most economic units. To address this deficiency, we find the possibility of using the application of the Six Sigma approach to raise the quality of internal audit, since this approach is one of the approaches that is characterized by quality. And its ability to develop and improve performance at high levels and free of errors (defects), because the internal audit function is one of the most important basic functions in economic units that helps management achieve quality, ensure the correctness of operations, and follow up on performance (Youssef and Al-Thunibat, 2019: 422). The application of the Six Sigma approach is a tool to raise the quality of internal auditing and continuously improve auditing processes in economic units by improving the functional aspects related to the people working in the internal audit unit, which reflects positively on achieving and enhancing the quality of internal auditing, which is

represented by the internal auditors' commitment to auditing standards. Internal and job codes of conduct, as well as keeping pace with developments in the field of audit work, participation and coordination among all people working in the internal audit unit to complete audit work at a high level of quality by providing accurate and documented information that can be relied upon in making decisions (Issa, 2022: 61- 60).

The Six Sigma approach is evaluated according to quality costs. This approach aims to reduce costs and continuously improve operations whose quality is poor due to competition factors between economic units and the traditional quality management methods used. Therefore, there has been no appearance of sufficient success being achieved by economic units. And long-term acquisition or the ability to maintain the level that achieves success, the emergence of the Six Sigma approach has a significant and positive impact when applied to the internal audit unit in terms of raising the level of internal audit quality, continuous improvement of operations, and achieving successful operations performance through the provision of high-quality services. Which primarily achieves customer satisfaction (Erturk.et.at, 2016:446).

The internal audit function is considered one of the main and important functions in the economic units due to the expansion of business and the great developments in the various administrative and financial fields and the increase in the strength of competition between the economic units. Consequently, we find the inability of the administration to carry out the supervisory and audit functions. Therefore, there was an urgent need for the internal audit function, and this function emerged. In the economic units with the aim of protecting their assets and investments, discovering errors, improving the quality of services and products they provide, and preventing and discovering cases of fraud and manipulation, which is the same goal that the (SS) methodology seeks to achieve in activating the supervisory role in all areas of the economic unit, including in the internal audit unit to improve audit operations and raise The level of quality so that this job is able to raise the level of the economic unit through the use of the (SS) methodology, modern and advanced scientific and practical methods in order to achieve the goals of the economic unit with a high level of accuracy because the (SS) approach seeks to achieve quality and maintain the level of quality for the goals of the economic unit (Products and services) through the scientific tools used by the SS team that develop possible solutions and identify the basic variables that affect critical quality situations when performing the internal audit function on operations within the economic unit. This study has proven that there is a strong correlation between the (Six Sigma) and internal audit (Suleiman, 2015:198).

The third topic:

(Testing the relationship between the quality of internal auditing and the Six Sigma approach)

The data under research represents a sample of the banks listed on the Iraqi Stock Exchange, numbering (8), namely (Babylon Bank, Assyria Bank, National Bank, Khaleej Commercial Bank, United Bank, Al-Dur Investment Bank, Trans-Iraq Bank, Commercial Bank of Iraq) and they are banks. Its data was collected for the period (2023-2024), and a number of statistical programs were used to obtain the results of the analysis based on the study data. These programs are (SPSS vr. 24, AMOS vr. 24, and Excel). With regard to the statistical methods and methods used, the researcher adopted a number of them to reveal the relationships. Direct and indirect between the study variables. Descriptive statistics were also used, including relative frequencies, arithmetic means, and standard deviations, in addition to illustrative graphs. In addition, the researcher used correlation coefficients and regression analysis to determine the effect, and to determine the indirect effect in the presence of the mediating variable, path analysis was used for this purpose. A set of statistical tests were also used to determine the significance and non-significance of the parameters of the models used.

First: measuring the variables of the research sample

1- Distribution of checklist items for variables (Six Sigma) and internal audit quality:

The researcher relied on two checklists for the two basic variables in the research. The first aspect is the independent variable represented by the Six Sigma approach using the implementation stages known as (DAMIC) and the aspects that lead to improving the quality of internal auditing. Commitment to applying the standards of professional practice issued by the Institute of Internal Auditors. (IIA), where the checklist included (20) questions for the stages of implementing the Six Sigma approach using the (DAMIC) model. It included five axes and each axis had four questions. As for the checklist for the second variable, which is the quality of internal auditing, which is the dependent variable, it may be Of two basic standards (the attributes standard and the performance standard) based on the internal auditing standards issued by the Institute of Internal Auditors (IIA). The first standard on the internal auditor's personal traits included four topics in which (21) questions were asked. The second standard included seven topics in which they were asked. (30) questions. Below is the table showing the distribution of items on the checklist for both variables.

Table No. (1)Distribute the checklist items

Main variables	Sub-domains	Number of paragraphs
(Independent variable) Six Sigma methodology using the DAMIC model, which is known as the implementation	Definition	4
	Analysis	4
	Measurement	4

stages	Improve	4
	Control	4
	total	20

(Dependent variable) Quality of internal auditing using professional standards for internal auditing (characteristics criteria, performance criteria)	Attribute Standards	Number of paragraphs
	Purpose, Authority and Responsibility	4
	Independence and Objectivity	6
	Due Professional Care	7
	Quality Assurance and Improvement Program	4
	Performance Standards	Number of paragraphs
	Management of Internal Audit Activity	6
	Nature of Work	6
	Planning and Participation	5
	Implementation of Internal Audit Task	5
	Communication of Results	4
	Monitoring Workflow	2
	Reporting Risk Acceptance	2
	Total Internal Audit Items	51
Total Variables		71

References : Prepared by the researcher

2- Descriptive analysis of the variable (Six Sigma)

Table No. (2)
Descriptive analysis of the stages of the Six Sigma diffraction methodology

Sample volume	8			Variables for all aspects of the Six Sigma methodology						
	5	4	3	2	1					
(DMAIC)	very high	High	middle	Low	very low	Average	standard deviation	Percent age	Coefficient variation C.V	of Sample orientation
Definition	1.5	4.75	1.75	0	0	3.97	0.68	79.38	17.15	High
Measurement	3	4.25	0.75	0	0	4.28	0.67	85.63	15.59	very high
Analysis	2	5.5	0.5	0	0	4.19	0.56	83.75	13.44	High
Improve	3.25	4.5	0.25	0	0	4.38	0.58	87.50	13.31	very high
control	3.25	4.25	0.5	0	0	4.34	0.63	86.88	14.57	very high
Total	2.6	4.65	0.75	0	0	4.23	0.65	84.63	15.27	very high

Through the table above, we notice the five axes that represent the stages of implementing the Six Sigma methodology, known as (DMAIC). The statistical results indicated that after all the axes were analyzed, we note the standard deviation was achieved at (65%) as a low percentage compared to the coefficient of variation, which achieved a percentage (15.27%) This indicates that the application of this methodology by the banks in the research sample at a rate of (84.63%) is a good percentage based on what was indicated by the trend of the sample (very high), and the average was also achieved at a rate of (4.23%). Therefore, we find these five stages known as (DMAIC) is of fundamental importance and effective role in raising the quality level of internal auditing, which begins with defining the problem or identifying it in a precise manner and describing it from an operational perspective, which facilitates many procedures and further analysis of it and facilitates the process of identifying it and treating it directly. As for the second stage, which is The measurement stage: After the problem has been identified and its causes identified, the measurement stage begins and evaluates the current banking operations in place within the bank and measures the extent of the ability of these operations to meet the needs of customers through statistical indicators about the average performance achieved for this stage at a rate of (4.28%). As for what the stage achieved The third is the analysis stage, which begins with analyzing the data collected in the measurement stage. The focus is on the root cause of the problem. Based on the data analysis, opportunities are arranged in order of priority according to their contribution to achieving customer satisfaction. Also, the average of this stage indicated a high rate of (4.19%), which is With regard to the fourth stage, which is known as the improvement stage or solution innovation, determining the easiest solution to implement based on the cause of the problem. The best solution is studied to those with experience through the formation of a high-level plan for the experimental solution, and then the final implementation takes place. On this basis, the benefits and effects of the improvement stage are

determined through The statistical indicators in the table above: This stage achieved an average percentage of (4.38%), which is a very high percentage based on the classification of the sample trend. The lowest standard deviation between the stages was (58%), a good percentage compared to the coefficient of variation, which achieved a percentage of (13.31%). As for the fifth stage The last stage is the monitoring or follow-up stage, as this stage is important for senior management through monitoring or following up on the continuous improvement or success of this methodology. It achieved a very high average percentage (4.34%) as a classification of the direction of the research sample.

2- Descriptive analysis of the internal audit variable:

Through the above checklist, data was collected from the research sample banks. This data was sorted and transcribed using the Excel program for the purpose of conducting statistical analyzes of those answers. After transcribing, these criteria were divided into several axes. The attributes standard included four axes, which are: (Purpose, authority and responsibility, independence and objectivity, due professional care, assurance and quality improvement programme) As for the performance standard, it included seven axes: (management of the internal audit activity, nature of work, planning and participation, implementing the internal audit mission, communicating results, monitoring Workflow, risk acceptance reporting).

Table No. (3)
Descriptive analysis of internal audit standards (attribute standards, performance standards)

Sample volume	8	Internal audit variables (attribute standards, performance standards)								
	5	4	3	2	1					
Interviewer	very high	Hig h	midd le	Lo w	very low	Avera ge	standa rd deviati on	Percent age	Coefficient of variation C.V	Sample orientation
Attribute standards	4	4	0	0	0	4.50	0.53	90.00	11.88	very high
Performance standards	3.94	3.41	0.65	0	0	4.41	0.68	88.23	15.42	very high
Total	3.97	3.70	0.33	0	0	4.46	0.61	89.11	0.14	very high

After the axes were explained in detail for each of the internal audit standards and performance standards, a statistical analysis was conducted for all the axes related to the internal audit standards, and then a statistical analysis was conducted on the basis of each summary of the axes of the internal audit standards. It became clear to us that the average achieved by the performance standards (4.50%) is a good percentage that indicates the characteristics of the internal auditor and his academic and practical qualifications to work and perform the internal auditing profession. It also achieved a standard deviation of (53%) compared to the coefficient of variation that was achieved by (11.88%). We note the percentage of application in the banks of the research sample for the characteristics standards achieved. The application rate is (90%), which is a very high percentage, according to what was indicated by the trend of the research sample. As for the performance standards for the operational side of banking activities, we note that there is a discrepancy in the performance of banking operations according to the apparent statistical percentages. The performance standards achieved an average percentage of (4.41%) as well. Good, indicating that it is very high. As for the standard deviation, it was achieved at a rate of (68%). We note the dispersion in this percentage from the trait standards, and it indicates that there is a dispersion in performance compared to the coefficient of variation, which achieved a rate of (15.42%). However, the percentage of application of the performance standards indicated To a percentage of (88.23%) also as a good percentage in performance, but it is less than the criteria for the characteristics, but in general, despite the detailed analytical procedure for auditing criteria, we note the overall percentages achieved by the average is a percentage of (4.46%), which is very high according to the classification of the trend of the research sample, and the percentage of application to the criteria indicated The professional practice of internal auditing in the banks of the research sample has achieved both the attribute standards and performance standards with an application rate of (89.11%), and this was followed by the dispersion measures in relation to the standard deviation with a rate of (61%), low compared to the coefficient of variation of (14%), meaning that it is the dispersion in the bank answers for the sample. Research but it is within good level. This percentage is explained by the fact that the banks in the research sample have internal audit departments in accordance with professional standards, which helps to implement and support the independence of the internal auditor in a fundamental way without interference from management when conducting audit operations.

Second: Testing hypotheses and analyzing and interpreting the results:

❖ Research the impact between the Six Sigma approach and internal auditing

Through the statistical program SPSS vr. 24 The researcher found the direct effect between Six Sigma and internal audit, and the researcher obtained the results that are included in Table No. (4), which includes the direct effect and its t-test:

Table No. (4)
Direct effect, T-test and its significance

			Estimate	S.E.	T test	Sig.
Internal audit	<---	Six sigma	.984	.031	30.500	***
Internal audit	<---	Definition	.974	.033	24.023	***
Internal audit	<---	Measurement	.979	.034	26.425	***
Internal audit	<---	Analysis	.897	.076	11.271	***
Internal audit	<---	Improve	.910	.066	12.259	***
Internal audit	<---	control	.829	.088	8.262	***

Where the impact relationship of the variable is found using the Six sigma approach in the variable and internal audit, the hypothesis to be tested here is:

(There is no significant effect of the variable Six sigma) on the variable internal audit.

The results above indicate that there is a direct, direct effect of the variable (Six sigma) on the internal audit variable, where the value of the effect reached (0.984) with a t-test value of (30.500), which is a statistically significant value below the level of significance (5%). This value indicates that a high (Six sigma) by one unit leads to an increase in internal audit by (0.984).

This indicates the rejection of the main null hypothesis and the selection of the alternative hypothesis. There is a direct, direct effect of the definition variable on the internal audit variable, where the effect value reached (0.974) with a t-test value of (24.023), which is a statistically significant value below the significance level (5%). This value indicates that increasing the definition by one unit leads to an increase in auditing. The internal value is 0.974 There is a direct, direct effect of the measurement variable on the internal audit variable, where the effect value reached (0.979,) with a t-test value of (26.425), which is a statistically significant value below the significance level of (5%).

This value indicates that increasing the measurement by one unit leads to an increase in auditing. Interior by . (0.979) There is a direct, direct effect of the analysis variable on the internal audit variable, where the effect value reached (0.897) with a t-test value of (11.271), which is a statistically significant value below the significance level of (5%). This value indicates that increasing the analysis by one unit leads to an increase in auditing.

The internal value is 0.897 There is a direct, direct effect of the improvement variable on the internal audit variable, where the effect value reached (0.910) with a t-test value of (12.259), which is a statistically significant value below the significance level of (5%).

This value indicates that an increase in improvement by one unit leads to an increase in auditing. The internal value is 0.910 There is a direct direct effect of the variable control on the variable internal audit, where the value of the effect reached 0.829, with a t-test value of (8.262), which is a statistically significant value below the level of significance (5%). This value indicates that increasing control by one unit leads to an increase in auditing. Interior by (0.829).

The fourth topic: conclusions and recommendations

First: conclusions:

1- There is a direct, direct effect of the variable (Six Sigma on the variable internal auditing, and an increase in the Six Sigma approach by one unit leads to an increase in internal auditing by (0.984). It is clear from the results achieved above that the coefficient of influence between the Six Sigma approach and auditing The internal audit contributes effectively and clearly to the process of improving and raising the level of internal audit quality, meaning that not applying the Six Sigma approach will lead to a decrease in the quality of internal auditing.

2- There is a positive, significant relationship between the definition and internal auditing, meaning that the axis of the definition, which is one of the axes of the Six Sigma methodology, helps in the process of identifying the problem through applying the Six Sigma approach in identifying the most important areas of weakness that exist in whatever internal auditing has a percentage of influence. (0.974) thus contributing to improving and raising the quality of internal auditing.

3- The presence of a positive, significant relationship between measurement and internal audit, meaning that the measurement axis helps. It is one of the axes of the Six Sigma methodology in measuring the problem and its variables and analyzing its dimensions and the reasons for its emergence when performing internal audit tasks.

Through applying the Six Sigma approach, we notice that the measurement axis affects With a ratio of (0.979) on internal audit, which clearly contributes to improving the quality of internal audit.

4- The presence of a positive, significant relationship between analysis and internal audit, meaning that the focus of analysis is one of the axes of the Six Sigma methodology to analyze the data collected in the measurement stage. Based on the analysis of this data, priority opportunities are arranged according to their contribution by studying each step of the process. Steps for implementing internal audit tasks. We note the impact this axis has achieved on the internal audit function by (0.897). This means that the axis of analysis contributes to improving the quality of internal auditing.

5- There is a direct and significant relationship between improvement and internal audit, meaning that the improvement axis is one of the axes of the Six Sigma methodology to innovate solutions, submit proposals, and determine the optimal solution for implementing the internal audit task through those with experience and previous studies in order to reach a high-level plan. The improvement axis has had an impact on the internal audit function by (0.910).

6- There is a positive, significant relationship between oversight and internal audit, meaning that the oversight axis is one of the axes of the Six Sigma methodology to develop standards that help senior management monitor the continuous success of the internal audit process because the process of improving audit standards needs monitoring and follow-up, which ensures Not returning to previous traditional practices that lead to gaps in the auditing process. This axis achieved a percentage of influence on the internal audit function in improving its tasks by 0.829).

Second: Recommendations:

- Economic units must apply the Six Sigma approach as a knowledgeable approach for continuous improvement, reducing costs, and addressing defects (errors).
- Focus on developing the capabilities and skills of individuals working in the internal audit departments of the banking sector.
- Preparing training programs that are consistent with the improvement processes, which is one of the stages of implementing the Six Sigma methodology in the banking sector to strive to reach the level of the Six Sigma approach.
- Changing the employees' ideas and point of view towards implementing the Six Sigma approach. This was done by motivating and directing the employees, their participation in decision-making, and the encouragement of teamwork.
- Applying the Six Sigma approach as a tool to raise quality by applying standards is necessary in internal audit units, which would reflect positively on the banking services provided to customers.
- The necessity of paying attention to the requirements and needs of customers and providing them with banking services at a high level of quality when applying the Six Sigma approach.

Reference:

- 1- Ahmed, Jia Karim, (2017), "The role of using the Six Sigma approach to activate and improve internal auditing and its implications for the quality of accounting information": exploratory research on a sample of banks in Sulaymaniyah Governorate, Human Development University Journal, Volume (3), Issue (3).
- 2- Ibrahim, Muhammad Abdel Moneim Muhammad, (2019), "Using the Six Sigma Methodology as an Input to the Competitive Advantage of National Industries in the Kingdom of Saudi Arabia," An Applied Study, Scientific Journal of Economics and Trade, (428-371), Volume (2) Issue (49).
- 3- Abdullah, Hussein Dawwas Saeed, Al-Khalaf, Nidal Muhammad Reda, (2021), "The effect of applying the six-sigma diffraction methodology in improving quality and reducing the costs of internal failure": A case study, Al-Mustansiriyah University, Journal of Management and Economics, (147- 163) Issue (130).
- 4- Al-Haif, Alia Mudhakar Haif, (2023), "Applying the Six Sigma Methodology in Library and Information Science Departments in Universities in the Kingdom of Saudi Arabia," Analytical Study, Journal of Information and Technology Studies, Specialized Library Association, Arabian Gulf Branch, Volume (1), No. (2).
- 5- Hassan, Kifah Jabbar, (2017) "The impact of using the (six sigma) method of reducing costs", an applied study on the General Fertilizer Manufacturing Company - Khor Al-Zubair Plant, University of Basra - College of Administration and Economics - Accounting Department, Gulf Economic Journal, No. (34) December.
- 6- Ahmed, Russell Saad, (2019), "The effect of six sigma diffraction technology in reducing the costs of failure," a case study in the General Company for Vegetable Oils, Administrative Technical College, Heritage University College Journal - Issue Twenty-Eight.
- 7- Khader, Enas Elias, and Taher, Kubra Muhammad, (2020), "Using the six-sigma approach in activating internal control components according to the COSO framework in the banking sector," Master's thesis, Tikrit University - College of Administration and Economics.
- 8- Al-Nazer, Samiha Samih Abdel-Raouf, (2017), "The extent to which the Six Sigma approach can be applied in major food manufacturing companies in the West Bank," Master's thesis, Business Administration - College of Graduate Studies at Hebron University - Palestine.

- 9- Ghania, Abdul Haq, Mishri, Farouk, (2020), "The role of comprehensive quality management in supporting and increasing the effectiveness of employee performance," an analytical study on a sample of institutions, Master's thesis - College of Economic, Commercial and Management Sciences.
- 10- Al-Atawi, Ghadeer Ibrahim Rajab, (2019), "Six Sigma Methodology and its Impact on Financial Performance in Industrial Companies in Palestine," Applied Study, Master's Thesis, Al-Azhar University - Faculty of Economics and Administrative Sciences, Gaza.
- 11- Institute of Internal Auditors, 2018.
- 12- Guide for internal audit units in the Republic of Iraq - Baghdad, (2019), "Federal Office of Financial Supervision."
- 13- Youssef, Ahmed Munir, Al-Thanibat, Ali Abdul Qader, (2019), "The impact of using the Six Sigma approach in improving control over the quality of external auditing in Jordan," The Jordanian Journal of Business Administration, Volume (15), Issue (4).
- 14- Issa, Ali Majeed, (2022), "Continuous improvement of auditing work according to the social dimension of sustainability to enhance the quality of internal auditing," a field study in the Baghdad Municipality, Master's thesis in Accounting Sciences, Al-Mustansiriya University - College of Administration and Economics.
- 15- Suleiman, Nada Abdel Razzaq, (2015), "The impact of using the Six Sigma approach in activating the internal audit function in economic units," exploratory analytical study, Journal of the University of Mosul - College of Administration and Economics, Issue (37).
- 16- Hafez, S. (2015). The integration of six sigma and balanced scorecard in internal auditing. *Integration*, 6(18), 43-54.
- 17- Ghaleb, G. S., & Abdulahad, A. F. (2022). The improving of Internal Auditing Quality Performance by the Use of Six Sigma Methodology Standards: An Applied Study Conducted at the General Company for Ports of Iraq. *resmilitaris*, 12(2), 5398-5412.
- 18- Pham, J., & Chau, T. B. (2017). Application of Lean Six Sigma in engineering enterprises (Doctoral dissertation, Masarykova univerzita, Ekonomicko-správní fakulta).
- 19- Krupp, N. & Person, M., (2018), "Continuous Improvement Processes just a trend or a proven success-factor for organizations: The disparity between operational and office employees", Master Thesis, Lund University School of Economics and Management, P: 16.
- 20- Ellis, S. F. (2016). The application of lean six sigma to improve a business process: A study of the order processing process at an automobile manufacturing facility (Doctoral dissertation, University of South Carolina).
- 21- Zaidan, A. M., & Neamah, I. S. (2022). The Effect of the Quality of Internal Audit Function to Improve the Operational Efficiency of Companies: An Empirical Study. *Webology* (ISSN: 1735-188X), 19(1).
- 22- Nurdiono, N., & Gamayuni, R. R. (2018). The effect of internal auditor competency on internal audit quality and its implication on the accountability of local government. *European Research Studies Journal*, 21(4), 426-434.
- 23- Ajila, M., & Khaira, Z. (2017). Quality requirements of internal audit services A comprehensive vision. *Global Journal of Economic and Business*, 2(2), 61-73.
- 24- Izedonmi, F. I. O., & Olateru-Olagbegi, A. (2021). Internal Audit Quality and Public Sector Management in Nigeria. *European Journal of Social Sciences Studies*, 6(5).
- 25- Edoumiekumo, A. R., & Tiemo, H. (2020). Internal Audit and Fund Misappropriation in the Public Sector of Nigeria.
- 26- Ziniyel, D., Otoo, I. C., & Andzie, T. A. (2018). Effect of internal audit practices on financial management. *European Journal of Business, Economics and Accountancy*, 6(3), 39-48.
- 27- Louwers , T. J, Ramsay , R. J, Sinason , D. H, Strawser , J. R, Thibodeau , J. C, (2015), "Auditing & Assurance Services", Sixth edition, Published by McGraw-Hill Education, 2 Penn Plaza, New York, NY 10121.
- 28- GLEIM, I. N, (2020), "Essentials of Internal Auditing", Copyright © (2020), Gleim Publications, Inc. All rights reserved. Duplication prohibited.
- 29- Institute of Internal Auditors, (2017), "Standards for the professional practice of internal auditing".
- 30- Pitt, S. A. (2014). Internal audit quality: Developing a quality assurance and improvement program. John Wiley & Sons.
- 31- Krichene, A., & Baklouti, E. (2021). Internal audit quality: perceptions of Tunisian internal auditors an explanatory research. *Journal of Financial Reporting and Accounting*, 19(1), 28-54.
- 32- Sharba, Ali Abdul Hussein Hatf, 2015, improving the quality of internal auditing in government units using technical standards - six sigma, an applied study in a sample of service units in the Najaf Governorate, Al-Mustansiriya University, p. 81) adapted by the researcher.
- 33- Ertürk, M., Tuerdi, M., & Wujiabudula, A. (2016). The effects of six sigma approach on business performance: A study of white goods (home appliances) sector in Turkey. *Procedia-Social and Behavioral Sciences*, 229, 444-452.
- 34- Aziz, J. O. A. (2022). The impact of applying Six Sigma standards in improving the quality of internal auditing in Sudanese banks: a field study. *Arab Journal of Administrative Sciences*, 29(3).