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Using Risk – Based Audit Approach for Auditing Accounting Estimates and its impact on the Audit Quality: an Empirical Study

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Abstract

The main objective of this study is to determine the impact of using risk – based audit approach for auditing accounting estimates on the audit quality of the annual financial reports published for a sample of companies registered on the Egyptian Stock Exchange. To do so, quality of discretionary accruals is measured to decide on the audit quality by conducting an applied study on some companies listed on the Egyptian Stock Exchange during the period of 2015 - 2021 in light of a set of control variables which are: auditor's industrial specialization who audits these companies, the size of the company, audit offices size which audits these companies, financial leverage, and the operating cash flow rate. The finding of the study indicated that there is an effect of using risk – based audit approach for auditing accounting estimates effectiveness on the audit quality for the companies under study. The most important study recommendation indicated that: The authorities responsible for setting the Egyptian auditing standards adopt what is stated in the International Standard on Auditing No. (540) for the year of 2019 regarding using risk – based audit approach for auditing accounting estimates, to keep pace with professional developments at the international level, and work to avoid the shortcomings that the current auditing standard suffers from achieving audit quality.

Key words: Risk-Based Audit Approach, Auditing Accounting Estimates, Audit Quality.

الملخص:

يهدف البحث إلى تحديد أثر استخدام منهج المراجعة على أساس المخاطر لمراجعة التقديرات المحاسبية على جودة المراجعة للتقارير المالية السنوية المنشورة لعينة من الشركات المسجلة بالبورصة المصرية خلال الفترة من ٢٠١٥ حتى ٢٠٢١، وذلك بالاعتماد على جودة الاستحقاقات الاختيارية للحكم على جودة المراجعة في ضوء مجموعة من المتغيرات الحاكمة وهي: التخصص الصناعي لمراقب الحسابات الذي قام بمراجعة هذه الشركات، حجم الشركة محل المراجعة، حجم مكتب المراجعة التي قامت بمراجعة هذه الشركات ، الرافعة المالية، ومعدل التدفقات النقدية التشغيلية. وأوضحت نتائج البحث وجود تأثير ذات دلالة إحصائية لفاعلية استخدام منهج المراجعة على أساس المخاطر لمراجعة التقديرات المحاسبية على جودة المراجعة للشركات قيد الدراسة. كما توصلت الدراسة الى مجموعة من التوصيات من أهمها: تتبنى الجهات المسئولة عن وضع معايير المراجعة المصرية ما ورد في معيار المحاسبة الدولي ٥٤٠ لسنة ٢٠١٩ بشأن مراجعة التقديرات المحاسبية، لمواكبة التطورات المهنية على المستوى الدولي، والعمل على تلافي أوجه القصور التي يعاني منها معيار المراجعة الحالي من تحقيق جودة مراجعة التقديرات المحاسبية.

الكلمات الأساسية: منهج المراجعة على أساس المخاطر، مراجعة التقديرات المحاسبية، جودة المراجعة.

1- Introduction and Research Problem

The financial collapses of some American companies with large economic weight, such as World Com, Enron, Global Crossing, and General Motors, which reflected the lack of transparency and manipulation of financial reporting information, created a trust and credibility gap in financial reports in general, as the financial reports of those companies showed the companies performed well financially and despite that were subjected to financial failure.

This is due to the management's use of some procedures, policies and accounting methods in an effort to bring about an unreal improvement in the company's profitability or in its financial position, by taking advantage of the available alternatives in accounting policies and methods, such as inventory evaluation methods, methods of calculating depreciation, in addition to freedom of appreciation regarding future events that require a kind of personal estimation, such as estimating the provision for doubtful debts and estimating the useful life of fixed assets, when preparing financial statements to serve the objectives of management exclusively, which is what is called the term earnings management practices (Meligy, 2013; El-Gendy, 2021).

In addition to the increase in cases of litigation and criminal cases, and the tide The intention filed by the business community against some members of the auditing profession at both the global and local levels, due to the material damage they suffered as a result of the negligence and failure of the auditors to perform their professional duties in the manner and degree required, which affects the satisfaction of the beneficiaries of the profession's services, and this has led to create a trust and credibility gap in financial reports in general, which led to the audit profession being exposed to a lot of pressures to raise the level of professional performance of auditors to high levels of quality in order to improve the quality of the audit process to achieve and maintain the quality and objectivity of financial reports and support the confidence of the business community (El-Gendy, 2022; Othman, 2020; Labib, 2005).

The causes of the crisis have been widely debated, some have thought that the crisis is due to the lack of governance mechanisms and

expansion of lending and borrowing operations, as this is the main manifestation of the credit and mortgage crisis, while others have declared that the crisis is due to the wider use of fair value estimates in the preparation of financial reporting and an excessive use of personal judgment and accounting estimates, as well as the cases of manipulation, financial corruption and the appearance of fraud that did not exist before (Al-Sawah & Badawi, 2009). Financial crisis and accounting scandals undermined investors' and other stakeholders' trust concerning the financial reports, resulted in demand by regulators and other stakeholders to enhance the financial information quality (Mahboub, 2017).

Audit quality refers to the extent to which the auditor adheres to the requirements of generally accepted auditing standards and the rules and ethics of professional conduct issued by professional organizations to increase the possibility of discovering material errors and fraud during the implementation of the audit process and disclosing them to increase the degree of confidence in the financial statements (Francis, 2011). It also expresses the role of the auditor in ensuring the validity and fairness of the financial statements, confirming confidence in the quality of financial reports (Chen & Zhang, 2014).

Audit quality is a necessary requirement for all parties interested in the audit process, as a high level of audit quality leads to the realization of common interests for those parties. Increasing its share in the audit market, increasing its competitiveness and the consequent increase in fees for audit services (Christensen, et al., 2016), while the management is keen to ensure that the audit process is carried out with high quality to give confidence to the financial statements prepared with their knowledge, which reflects positively on its market share, competitiveness, and the stability of its financial and economic conditions. It also leads to increasing the efficiency of financial markets and increasing investor confidence (Barakat, 2018).

The fairness and accuracy of the financial information contained in the audited lists, which they will rely on when making their decisions, and professional organizations seek to improve the atmosphere of The duration of the audit is to preserve the interests of all the different

parties, through the issuance of standards regulating the profession and ensuring their application to overcome and limit problems related to audit quality in order to reach reasonable assurance about the implementation of the audit process in the light of professional standards, legal and regulatory requirements (Al-Ahdal, 2008; Barakat 2018; Dickins, et al., 2018).

In order to strengthen confidence and credibility in the financial statements and the external audit report, attention and improving the quality of the audit has become a necessary requirement to preserve the interests of all the different parties to the audit process, as the quality of the audit process is considered the basis and protection for the rights of investors and improving the efficiency of the capital market.

In addition to the confidence it provides to users of the financial statements and they depend on it in make their own decisions, through the ability of the auditor to detect errors, fraud and material irregularities in the financial statements and report on them, in addition to reduce earnings management practices, reducing information asymmetry between the parties to the agency relationship, and mitigating the state of conflict between management and shareholders, which supports the decision-making process, and is the activation of mechanisms corporate governance, auditor independence, industrial specialization, professional skepticism of the auditor, the use of the joint audit method, and auditing accounting estimates are among the most important mechanisms that increase the quality of the audit process and thus maintain the confidence of the financial community in auditors (Al-Maghrabi, 2015, Noureddine, 2019, Hammad , 2020, Quadackers, et al., 2014)

Preparing accounting estimates is the responsibility of company's management that usually carried out under the conditions of uncertainty to events that have already occurred or are likely to occur and require the use of the personal judgment (Egyptian Standard on Auditing No. 540). Given the potential effect of accounting estimates for certain items in the absence of a precise methods of measuring them in financial statements such as inventory reduction provisions, accounting receivables to the expected value of the asset, the provision of allocating

the cost of fixed assets over their estimated productive lifetimes, accrued revenues, deferred taxes, provision for loss due to litigation, losses of contracts under execution and provision of obligations during the warranty period.

As a result, the risk of significant misrepresentation is higher and may require the auditor to consider particular audit considerations (Egyptian Standard on Auditing No. 540). In 2009, the International Auditing and Assurance Standards Board (IAASB) replace the International Standard on Auditing No. 545 (ISA 545) auditing fair value measurement and related disclosure, and the International Standard on Auditing 540 (ISA 540) auditing the accounting estimates was modified to be auditing accounting estimates, including estimate of fair value and related disclosures.

International Standard on Auditing (540) also revised "auditing accounting estimates and related disclosures" issued by IAASB and published by the International Federation of Accountants (IFAC) for the period after December 15, 2019, this standard addresses the responsibilities of the auditor in relation to accounting estimates and disclosures related to them when auditing financial statements.

On the other hand, since most of the risks of activities have financial implications that would affect the risk of diversion in the financial statements, the modern trend of auditing has therefore begun by requiring the auditor to understand the risks of the activity by understanding the entity and its environment, including the internal control system, which increases the likelihood of identifying significant and influential distortion risks, whether due to fraud or error.

This understanding must also be sufficient to the extent that the auditor can design the additional audit procedures. However, the auditor is not responsible for determining or evaluating all the risks of the activity (Egyptian Standard on Auditing 315 "understanding the entity and its environment and assessment of the risk of material misstatements").

The researchers conducted an exploratory study with the aim of identifying the dimensions and aspects of the study phenomenon and demonstrating its existence and applicability. The researchers relied on

the field study method as a source of preliminary data by directing an initial questionnaire, and interviews of a number of auditors in the special audit offices, the auditors of the Central Auditing Agency and the faculty members of the accounting and auditing departments of some faculties of commerce in Egypt, where the results of exploratory study indicated:

- ☒ The most important problems related to the measurement of accounting estimates are:
  - ✓ The flexibility of accounting policies and alternatives for the preparation of accounting estimates.
  - ✓ The impact of the reasonableness of the selection and application of a particular accounting policy.
  - ✓ The management's reliance on personal judgment in the preparation and measurement of the accounting estimates.
  - ✓ Increasing number of erroneous accounting practice.
  - ✓ Not relying on experienced persons when preparing the accounting estimates.
  - ✓ The uncertainty of the future expectation of the auditor's assessment which supports the reasonableness of the company's management.
  - ✓ Increasing the risk material misstatements in financial statements.
  - ✓ Affecting the quality of accounting information when the management of the company refuses to modify certain accounting estimates that the auditor determined it unreasonable estimation.
- ☒ The results of pilot study also clarified the agreement of those surveyed that the procedures for auditing accounting estimates were:
  - ✓ Examination and testing of the procedures used by the management to reach to the estimation.
  - ✓ Use of neutral estimate to compare it with this prepared by the management.

✓ Examination of subsequent events that provide audit evidence of the reasonableness of the estimates made, which are the procedures

for auditing estimates according to the Egyptian standard, which does not take into account the risks of the business surrounding the accounting estimates.

Furthermore, the agreement of those surveyed that business risks in relation to accounting estimates affect the fair and accurate measurement of those estimates, so the auditor should therefore take them into account when auditing those estimates.

Thus, the problem of this study is how to improve the audit quality by proposing a framework and providing an indicative guide for auditors using risk-based audit approach when auditing accounting estimates. Therefore, the following study questions could be developed to express nature of the problem:

1. To what extent is there a significant effect of the effectiveness of the procedures for using risk – based audit approach for auditing accounting estimates on the audit quality for the companies under study?
2. To what extent is there a significant effect of the adequacy disclosures in relation to using risk – based audit approach for auditing accounting estimates on the audit quality for the companies under study?
3. To what extent is there a significant effect of reporting the reasonableness of using risk – based audit approach for auditing accounting estimates on the audit quality for the companies under study?
4. To what extent is there a significant effect of using risk – based audit approach for auditing accounting estimates on the audit quality for the companies under study?

2- Research objectives

This research aims to:

1. Determining the effect of the effectiveness of the procedures for using risk – based audit approach for auditing accounting estimates on the audit quality for the companies under study.
2. Determining the effect of the adequacy disclosures in relation to using risk – based audit approach for auditing accounting estimates on the audit quality for the companies under study.

3. Determining the effect of reporting the reasonableness of using risk – based audit approach for auditing accounting estimates on the audit quality for the companies under study.
4. Determining the effect of using risk – based audit approach for auditing accounting estimates on the audit quality for the companies under study.

3- Research importance

The importance of the research is as follows:

1. Identify recent trends in the use of accounting estimates in the preparation of financial statements in light of International financial reporting standards.
2. Identify recent trends for auditing accounting estimates and the extent to which auditors are aware of these trends in the light of International standard on auditing 540.
3. Identify the risks faced by the auditors when auditing accounting estimates.
4. Adopt a risk-based audit approach when auditing accounting estimates.
5. Provide a proposed framework of using risk – based audit approach for auditing accounting estimates for the purpose of improving the audit quality.

4- Research Methodology

The research relied on the scientific method, both deductive and inductive methods. The deductive method was used in building the theoretical framework for the research and developing its hypotheses, however, the inductive method was used in collecting the necessary data to test the research's hypotheses.

5- Research Scope

- The effectiveness of using risk-based audit approach for auditing accounting estimates was evaluated by:
  - The effectiveness of the procedures followed by the auditor when using risk-based audit approach for auditing accounting estimates through a check list of questions distributed to the auditors who audited the study sample companies during the study period.

- The adequacy of disclosures related to the use of risk-based audit approach for auditing accounting estimates by making a content analysis of the financial statements of the study sample companies during the study period.
- Reporting the reasonableness of using risk-based audit approach for auditing accounting estimates by making a content analysis of the auditor's report on the financial statements of the study sample companies during the study period.

- The research relied upon the modified Jones model (1995) on measuring the audit quality.
- The effect of using risk-based audit approach for auditing accounting estimates on the audit quality was determined in light of a set of control variables which are: auditor's industrial specialization who audits these companies, the size of the company, audit offices size which audits these companies, financial leverage, and the operating cash flow rate.

6- Literature review and hypotheses development

In (2013), Mahmoud indicated the using risk-based audit approach as a tool to improve the objectivity of auditors' professional judgment regarding accounting estimates. The results found that risk based audit approach may help in providing sufficient and appropriate evidence, design audit program to audit the financial statements in general and accounting estimates in particular.

In (2016), Abdul-Rahman & Mohammed studied the relationship between accounting estimates and the quality of financial reports, identified the extent to which the accuracy of accounting estimates contributed to the improvement of financial reporting, the concept of accounting estimates, and the determination of considerations contribute to the accuracy of the preparation of these estimates. The results found a correlation between the accuracy of accounting estimates and the quality of financial reports. However, many companies listed in the Khartoum stock exchange still rely on the experience and personal judgment when auditing accounting estimates.

In the same year, Ghosh et al. highlighted the quality of audit stress tests of goodwill, and audit tests of impairments, restructured charges and other types of special charges. Because auditing complex accounting estimates are particularly challenging for the auditor, and given the PCAOB inspections reports indicating audit deficiencies with the valuation tests of goodwill and other complex estimates. The results indicated that: auditors charge a substantial fee premium for testing goodwill account balances and there is an auxiliary fee surcharge for impairments, restructuring and other types of special charges, audit tests of goodwill, impairments and other special charges lead to longer audit report lags, but not for restructuring charges. The likelihood of an impairment or a special charge increases with audit quality, and investors react negatively to all types of complex accounting estimates but the reaction depends on audit quality for impairments only.

The study of Al-Sabbagh et al., (2016) aimed to determine the risk of fair value auditing and other accounting estimates under the application of international financial reporting Standards (IFRS), reaching a proposed framework for the audit of the fair value by reviewing the literatures in this concern. The study found that there was a study gap that none of the previous studies had addressed a proposed introduction to the audit of accounting transactions of fair value estimates in the moving to the IFRS application.

In the same year, Al-Saiyad established a framework for the auditing fair value estimates using the risk-based audit approach. The study demonstrated fair value valuation models, fair value levels, the challenges of auditing fair value estimates and disclosure, and a proposed auditing framework was developed which illustrates the procedures performed by the auditor for auditing accounting estimates of the fair value and related disclosures. The results found that there is a significant relationship between the risks of fair value measurement (market risk, credit risk and liquidity risk) and fair value estimates, there is a significant relationship between the auditor's estimation of the risk of the distortions and the accuracy of fair value accounting estimates, finally proposed framework was accepted by the study sample.

Ayunku & Eweke (2019) examined the effect of accounting estimates on financial reporting quality in Nigerian Banks. Annual data collected from seventeen (17) quoted money deposit banks spanning the period 2008 – 2017 were analyzed using the OLS model. Provisions for bad debt and depreciation were adopted as proxies for accounting estimates, while financial reporting quality was measured using discretionary accruals accounting. The findings revealed that a rise in accounting estimates (provision for bad debts and provision for depreciation) would result to greater accounting discretion which translates to lower financial reporting quality. The need for accounting estimates continue to exist in the accounting profession, the need for harmonization of the various methods used by accountants in accessing such estimates and the adoption of International best practices is pivotal to a high financial reporting quality .

Mahfouz study, in the same year, aimed to analyze and test the impact of the degree of complexity of accounting estimates on audit planning procedures and the auditor's report. The study concluded that there is a significant effect of the degree of complexity of accounting estimates on the planning of audit procedures, and the additional analysis has shown that this effect on the audit planning procedures extends to include both the assessment of the associated risk, the expansion of the sample size. The attribution of verification of estimates by the senior assistants, and the extension of the period of time, there is a significant effect of the degree of complexity of the estimates on the auditor's report, whether in terms of the delay in issuing the report, or the type of opinion contained in the report.

In (2021), Hamed et al., identified the risks surrounding the process of auditing accounting estimates and their impact on the audit quality. The study concluded that: accounting estimate is affected by a set of factors, some of which are related to the subject of the estimate and others are related to who prepared it, The risks surrounding auditing accounting estimates may stem from the difficulties and challenges of auditing the estimates, and from the circumstances of uncertainty and risks in the estimates.

In the same year, the main objective of Taghyan study was to measure the impact of accounting estimates on the quality of annual financial reports in the Egyptian environment. To achieve this objective, the study examined the accounting estimates framework, accounting measurement position on accounting estimates, the negative effects of accounting estimates on the quality of financial reports, and means of limiting of the negative effects of accounting estimates. The study showed that accounting estimates have potential negative effects in certain qualitative characteristics (such as poor representation, poor comparability, and verification difficulty). Also they have negative effects on both the accounting earnings quality and the quality of the audit process, which are reflected in the overall negative impact on the quality of financial reports .

Yousefi & ketal, in the same year, found out the effect of the auditing fair value estimates on financial reports, by measuring their impact on qualitative characteristics of accounting information, through a sample of 32 auditors in the Algerian East. The study confirmed the existence of a statistically significant relationship of auditing fair value estimates on the quality of financial reports.

Comment on this group of previous studies: These studies were concerned to determine:-

- Auditor's responsibility for accounting estimates to improve the quality of the external auditing.
- The most important problems of accounting estimates and their impact on the fairness of the financial statements.
- The responsibility of the auditors in assessing the reasonableness of the accounting estimates.
- The effect of the auditors on improving auditing accounting estimates.
- The use of risk-based audit approach as a tool to improve the objectivity of auditors' professional judgment regarding accounting estimates.
- The auditing fair value estimates using the risk-based audit approach.
- The risk of fair value auditing and other accounting estimates.

It's observed that there is a scarcity of studies on that subject, that taking into account the most important risks and the threats surrounding auditing accounting estimates.

To achieve the objective of the empirical study, which is to determine the impact of using risk – based audit approach for auditing accounting estimates on the audit quality, the following hypotheses were formulated:

First hypothesis:-

"There is no significant effect of the effectiveness of the procedures for using risk – based audit approach for auditing accounting estimates on the audit quality for the companies under study"

Second hypothesis:-

"There is no significant effect of the adequacy disclosures about using risk – based audit approach for auditing accounting estimates on the audit quality for the companies under study"

Third hypothesis:-

"There is no significant effect of reporting the reasonableness of using risk – based audit approach for auditing accounting estimates on the audit quality for the companies under study"

Fourth hypothesis:-

"There is no significant effect of using risk – based audit approach for auditing accounting estimates on the audit quality for the companies under study"

7- Using the risk-based audit approach for auditing accounting estimates

The International Standard on Auditing ISA 540 revised **(**auditing accounting estimates and related disclosure) deals with:

- The auditor's responsibilities relating to accounting estimates and related disclosures in an audit of financial statements.
- Specifically, it includes requirements and guidance that refer to, or expand on, how ISA 315 Revised (Identifying and Assessing the Risks of Material Misstatement through understanding the entity and its environment), ISA 330 (The Auditor's Responses to Assessed Risks, ISA 450 (Evaluation of Misstatements Identified during the

Audit), ISA 500 (Audit Evidence) and other relevant ISAs are to be applied in relation to accounting estimates and related disclosures.

- It also includes requirements and guidance on the evaluation of misstatements of accounting estimates and related disclosures, and indicators of possible management bias.

This part will introduce the following item to determine the effectiveness of auditing accounting estimates according to risk-based audit *(IAASB, 2009; IAASB, 2019; SOCPA, 2020)*:

A. The requirements and procedures for auditing accounting estimates according to risk-based audit

The following are the requirements and procedures of auditing accounting estimates according to risk – based audit:

1. *Risk assessment procedures and related activities through understanding the entity and its environment in relation to accounting estimates*: When obtaining an understanding of the entity and its environment, including the entity's internal control, as required by ISA 315 (Revised), the auditor shall obtain an understanding of the following matters related to the entity's accounting estimates. The auditor's procedures to obtain the understanding shall be performed to the extent necessary to provide an appropriate basis for the identification and assessment of risks of material misstatement at the financial statement and assertion levels.

   The auditor performs risk assessment procedures to obtain an understanding of the entity and its environment, including the following on the entity's accounting estimates as a whole:

- Read prior period audit working papers and prior period financial statements
- Examine minutes of board and committee meetings
- Inquire about management with appropriate responsibilities for the financial statements
- Perform simple walk- through of management's process for making the estimate of the provision.

Understanding the entity and its environment in relation to accounting estimates through:

- The entity's transactions and other events and conditions that may give rise to the need for, or changes in, accounting estimates to be recognized or disclosed in the financial statements.
- The requirements of the applicable financial reporting framework related to accounting estimates including
  - ✓ The recognition criteria
  - ✓ Measurement bases
  - ✓ The related presentation and disclosure requirements
  - ✓ How they apply in the context of the nature and circumstances of the entity and its environment
  - ✓ How transactions and other events or conditions are subject to, or affected by, inherent risk factors.
- Regulatory factors relevant to the entity's accounting estimates including: when applicable, regulatory frameworks related to prudential supervision.
- The nature of the accounting estimates and related disclosures that the auditor expects to be included in the entity's financial statements.
- How management identifies those transactions, events and conditions that may give rise to the need for accounting estimates to be recognized or disclosed in the financial statements. In obtaining this understanding, the auditor shall make inquiries of management about changes in circumstances that may give rise to new, or the need to revise existing, accounting estimates.
- How management makes the accounting estimates, and an understanding of the data on which they are based, including:
  - ✓ The method, including where applicable the model, used in making the accounting estimate
  - ✓ Relevant controls
  - ✓ Whether management has used an expert
  - ✓ The assumptions underlying the accounting estimates
  - ✓ Whether there has been or ought to have been a change from the prior period in the methods for making the accounting estimates.
  - ✓ Whether and, if so, how management has assessed the effect of estimation uncertainty

- The nature and extent of oversight and governance that the entity has in place over management's financial reporting process relevant to accounting estimates.
- How management identifies the need for, and applies, specialized skills or knowledge related to accounting estimates, including with respect to the use of a management's expert.
- How the entity's risk assessment process identifies and addresses risks relating to accounting estimates.
- The entity's information system as it relates to accounting estimates.
- Control activities relevant to the audit over management's process for making accounting estimates.
- How management audits the outcome(s) of previous accounting estimates and responds to the results of that audited.

2. *Identifying and assessing the risks of material misstatement:* In identifying and assessing the risks of material misstatement relating to an accounting estimate and related disclosures at the assertion level, as required by ISA 315 (Revised), the auditor shall:

- Evaluate the degree of estimation uncertainty associated with an accounting estimate.
- Determine whether, in the auditor's judgment, any of those accounting estimates that have been identified as having high estimation uncertainty give rise to significant risks.
- Separately assess inherent risk and control risk. The auditor shall take the following into account in identifying the risks of material misstatement and in assessing inherent risk:
  - ✓ The degree to which the accounting estimate is subject to estimation uncertainty.
  - ✓ The degree to which the following are affected by complexity, subjectivity, or other inherent risk factors:

➢ The selection and application of the method, assumptions and data in making the accounting estimate.

➢ The selection of management's point estimate and related disclosures for inclusion in the financial statements.

3. *Responses to the assessed risks of material misstatements:* Based on the assessed risks of material misstatement, the auditor shall determine:

- Whether management has appropriately applied the requirements of the applicable financial reporting framework relevant to the accounting estimate.
- Whether the methods for making the accounting estimates are appropriate and have been applied consistently.
- Whether changes, if any, in accounting estimates or in the method for making those from the prior period are appropriate in the circumstances.

In responding to the assessed risks of material misstatement, as required by ISA 330, the auditor shall undertake one or more of the following, taking account of the nature of the accounting estimate:

- Determine whether events occurring up to the date of the auditor's report provide audit evidence regarding the accounting estimate.
- Test how management made the accounting estimate and the data on which it is based.
- Test the operating effectiveness of the controls over how management made the accounting estimate, together with appropriate substantive procedures.
- Develop a point estimate or a range to evaluate management's point estimate.

4. *Other additional audit procedures:* For accounting estimates that give rise to significant risks, in addition to other substantive procedures performed to meet the requirements of ISA 330. the auditor shall evaluate the following:

- How management has considered alternative assumptions or outcomes, and why it has rejected them, or how management has otherwise addressed estimation uncertainty in making the accounting estimate.
- Whether the significant assumptions used by management are reasonable.
- Where relevant to the reasonableness of the significant assumptions used by management or the appropriate application of the

applicable financial reporting framework, management's intent to carry out specific courses of action and its ability to do so.

- The reasonableness of the accounting estimates, and determining misstatements
- Communication with those charged with governance or other relevant parties to inform them of the auditor's views on the important qualitative aspects of accounting practices related to accounting estimates.

B. ***Disclosures related to accounting estimates:*** The auditor shall obtain sufficient appropriate audit evidence about whether the disclosures in the financial statements related to accounting estimates are in accordance with the requirements of the applicable financial reporting framework. For accounting estimates that give rise to significant risks, the auditor shall also evaluate the adequacy of the disclosure of their estimation uncertainty in the financial statements in the context of the applicable financial reporting framework. The auditor shall design and perform further audit procedures to obtain sufficient appropriate audit evidence regarding the assessed risks of material misstatement at the assertion level for disclosures related to an accounting estimate. These disclosures may include, for example:

- The management's responsibility for preparing accounting estimates.
- The auditor's responsibility for evaluating accounting estimates.
- Disclosure of accounting estimates in the supplementary notes of the financial statements.
- The auditor's conclusion about the reasonableness of estimates that give rise to significant risks.
- The assumptions used in preparing accounting estimates..
- The method of estimation used, including any applicable model.
- The basis for the selection of the method of estimation.
- The effect of any changes to the method of estimation from the prior period.

- The sources and implications of estimation uncertainty.

C. Reporting the reasonableness of accounting estimates includes:

- Indicators of possible management bias: The auditor shall review the judgments and decisions made by management in the making of accounting estimates to identify whether there are indicators of possible management bias. Indicators of possible management bias do not themselves constitute misstatements for the purposes of drawing conclusions on the reasonableness of individual accounting estimates.
- Written representations: The auditor shall obtain written representations from management and, where appropriate, those charged with governance whether they believe significant assumptions used in making accounting estimates are reasonable.
- Documentation: The auditor shall include in the audit documentation:
  - The basis for the auditor's conclusions about the reasonableness of accounting estimates and their disclosure that gives rise to significant risks.
  - Indicators of possible management bias, if any.

8- An Empirical Study

8-1 Research Population and Sample

The research population consists of listed companies whose shares are traded in the Egyptian stock market in three sectors: The food, beverages and tobacco sector (a total of 24 companies), The real estate sector (a total of 33 companies), and The building materials sector (a total of 11 companies), which are different sectors in terms of the nature of employment as well as for their substantial contribution to national income. A sample of 10 companies within each sector was selected. The sample was selected according to the following conditions:

- Continuing listing and trading of companies in the stock market during the period from 2015 to 2021 for the possibility of obtaining data related to the research variables.
- These companies have financial statements for the period under study (7 years).
- The companies should be active in trading during the chosen study period.
- The company's shares be circulating during the period covered by the study, and that its fiscal year ends on 12/31 of each year.

- The financial statements be attached to the auditor's report, and the Central Auditing Organization does not participate in their review.
- Not to belong to the banking sector or the financial services sector and insurance companies.

The study period was determined to cover the years 2015 - 2021. The selection of the current study period, which includes annual financial reports data, is due to several reasons, which are as follows:

- This period is considered a period of financial and economic reform, during which the Egyptian government launched its program to reform the Egyptian economy, which achieved financial and economic stability, and real growth rates.
- This period is considered a period of political and social stability, because it comes after the June 30, 2013 revolution.

8-2 Empirical study variables and ways to measure them

A- Effectiveness of using risk-based audit approach for auditing accounting estimates (Independent variable X):

The authors measured the effectiveness of using risk-based audit approach for auditing accounting estimates through:

- ❖ Verifying the effectiveness of the procedures of using risk-based audit approach for auditing accounting estimates.
- ❖ Verifying the adequacy of disclosures related to accounting estimates.
- ❖ The reasonableness of reporting in relation to accounting estimates.

❖ Verifying the effectiveness of the procedures of using risk-based audit approach for auditing accounting estimates (X_1): by using a check list of questions[1] that were directed to the auditors who audited the financial reports of the study sample companies during the years of study. The questions of the list were limited to the expressions that measure the extent to which the procedures of using risk-based audit approach for auditing accounting estimates.

Table (1) illustrates the questions included in the check list of questions distributed to the auditors who audited the financial reports of the study sample companies to verify the effectiveness of the procedures of using risk-based audit approach for auditing accounting estimates.

[1] Check list of questions evaluated and reviewed by:
Prof. Dr/ Al Refaee Mobarak, Professor of Accounting, Faculty of Commerce, Tanta University
Prof. Dr/ Ahmed Abo Mousa, Professor of Accounting, Faculty of Commerce, Tanta University
Prof. Dr/ Mohamed Wahdan, Professor of Accounting, Faculty of Commerce, Menofia University
Ernst & Young (EY) office
KPMG (Hazem Hassan) office

Table (1)
List of questions to verify the effectiveness of the procedures of using risk-based audit approach for auditing accounting estimates

X_1	**Verifying the effectiveness of the procedures of using risk-based audit approach for auditing accounting estimates**
X_{11}	**Understanding the entity and its environment in relation to accounting estimates through understanding the following:**
	The entity's transactions and other events and circumstances that may give rise to the need to prove an accounting estimate and related disclosures, or the need to make a change in the accounting estimate.
	The materiality of accounting estimates for the financial statements as a whole.
	The requirements of the applicable financial reporting framework, which serves as a basis for discussion by management and those charged with governance of how to appropriately apply those requirements related to accounting estimates.
	Regulatory factors related to accounting estimates, if any.
	How to determine the risk assessment mechanism for accounting estimates and how to responds to them.
	Information systems applied in the firm in relation to accounting estimates.
	The extent to which the management applies the appropriate specialized skills and knowledge or the use of appropriate experts.
	The nature of accounting estimates and disclosures related to them, which the auditor expects to be included in the financial statements.
	The nature and extent of control and governance applied by the firm to the management mechanism in preparing accounting estimates.
	How management audited the outcomes of previous assessments and how it responds to the results of that auditing.
X_{12}	**Identifying and assessing the risks of material misstatement at the assertion level in relation to accounting estimates which may arise from:**
	Management's lack of understanding of the nature of accounting estimates and the risks associated with them (identifying risk factors for misstatement: inherent risk or control risk).
	The degree to which accounting estimates are subject to estimation uncertainty (identifying risk factors for misstatement: inherent risk or control risk).
	The degree of complexity's impact on the choice of method used in making and applying accounting estimates (identifying risk factors for misstatement: inherent risk or control risk).

X_1	**Verifying the effectiveness of the procedures of using risk-based audit approach for auditing accounting estimates**
	Degree of influence of subjectivity on the choice and application of method, assumptions or policies (identification of risk factors for misrepresentation: inherent risk or control risk)
	The degree to which accounting estimates are subject to misstatement due to management bias or fraud (identifying risk factors for misstatement: inherent risk or control risk).
	Determining whether any of the identified and assessed risks of material misstatement is a material risk (assessment of the risk of material misstatement).
	Determining the extent to which the audit team needs specialized skills and knowledge to identify, assess and respond to risks through appropriate audit evidence.
X_{13}	**In light of the assessed material risks, to what extent should the following responses be applied:**
	Whether management has appropriately applied the applicable financial reporting requirements related to accounting estimates.
	Whether the methods used to prepare accounting estimates are appropriate.
	Whether these methods have been consistently applied.
	The nature and effects of significant assumptions used in accounting estimates.
	Whether those significant assumptions are consistent with each other and with those used in other estimates or with assumptions used in other areas of the entity's business activities.
	Whether the changes in accounting estimates or the methods used to prepare the estimates, if any, are appropriate in the circumstances.
	The potential effects on the financial statements due to the material risks and presentation forms that need to be disclosed.
	Testing the operational effectiveness of control tools on how management prepares accounting estimates.
X_{14}	**Other additional audit procedures are applied and include:**
	Assessment of how management treats uncertainty estimates (assessment uncertainty controls).
	Evaluation of the reasonableness of relevant assumptions (estimated uncertainty controls).
	Obtaining enough appropriate audit evidence regarding the management's decision to prove or not to prove accounting estimates in the financial statements (recognition and measurement controls).
	Obtaining sufficient appropriate audit evidence regarding whether the basis for measuring the selected accounting estimates was made in accordance with the applicable financial reporting requirements (recognition and measurement controls).

X_1	Verifying the effectiveness of the procedures of using risk-based audit approach for auditing accounting estimates
	Significant differences in judgments with the management or the expert that the management used in the evaluation processes.
	Determining the relevance of the information obtained from an external information source and the possibility of reliance on it.
	Determining the reasonableness of estimates and identifying material misstatements.
	Communicate with those charged with governance or other relevant parties to inform them of the auditor's views on the important qualitative aspects of accounting practices related to accounting estimates.

Source: prepared by the authors

❖ Verifying the adequacy of disclosures related to accounting estimates (X_2): The authors determined the adequacy of disclosures related to accounting estimates by making a content analysis of the financial statements for the following items shown in Table (2):

Table (2)

The adequacy of disclosures related to accounting estimates

X_2	Verifying the adequacy of disclosures related to accounting estimates	
	Disclosure of management's responsibility for preparing accounting estimates.	**A dummy variable equal to (one) if the company disclosed disclosures related to accounting estimates in the financial statements, the supplementary notes, the auditor's report for the companies under study, and it is equal to (zero) otherwise**
	Disclosure of the auditor's responsibility for evaluating accounting estimates.	
	Disclosure of accounting estimates in the supplementary notes of the financial statements.	
	Disclosure of the auditor's conclusion about the reasonableness of estimates that give rise to significant risks.	
	Disclosure of the assumptions used in preparing the estimates.	
	Disclosure of the estimation method used.	
	Disclosure of the basis for choosing the estimation method.	
	Disclosure of the applicable form for calculating the estimate.	
	Disclosure of the effect of any changes to the grading method.	
	Disclosure of the consequences of the uncertainty of the estimate	

Source: prepared by the authors

❖ The reasonableness of reporting in relation to accounting estimates (X_3): a dummy variable equal to (one) if the auditor's report is:

- ✓ Unqualified in the case of the reasonableness of the estimates and the adequacy of disclosures,
- ✓ Unqualified with a paragraph to draw attention in the case of unreasonable estimates and the adequacy of disclosures,
- ✓ Unqualified with a paragraph to focus on A matter in the event of the unreasonableness of the estimates and insufficient disclosures, but the effect is immaterial

OR (zero) otherwise,

- ✓ A qualified opinion in the case of unreasonable estimates and insufficient disclosures and the effect is material,
- ✓ A reverse opinion in the case of unreasonable estimates and insufficient disclosures and the impact is highly material.

B- Audit Quality (The dependent variable Y):

Earnings management represents the basis that can be used to judge the audit quality, as the management can, through the application of the accrual basis, to manipulate accounting profits and thus affect the quality of accounting information contained in financial reports and audit quality. This, in turn, affects the quality of decisions based on this information, as the audit quality means compliance with the requirements of full disclosure and transparency, and this in turn affects the usefulness of accounting information for decision makers.

The accounting thought has dealt with many models for measuring the audit quality. In the current study, the authors relied to measure the audit quality on measuring the quality of discretionary accruals (Y) in order to discover the extent of the existence of management practices of earnings management and therefore the extent to which there is audit quality as the following studied had indicated *(Brazel & Dang, 2008; Morris & Laksmana, 2010; Aryani & Kriismiaji, 2014; Shafakheibari & oladi, 2015; Wahdan, 2018; Pittman et al., 2019; Gee and Zhang, 2017; Lee et al., 2017; Dao et al., 2019; Kwon & Yi, 2018; Taghyan, 2020)*. The study relied on the modified Jones model to measure the quality of discretionary accruals, which is

the most accurate and used model in accounting studies, as: *(Wahdan, 2018; Taghyan, 2020*)

- It reflects accuracy in measuring the quality of discretionary accruals, especially after the amendments made by *(Dechow et al, 1995)*, which increased its effectiveness in measuring earnings management practices.
- The model's high ability to explain the change in the company's total accruals.
- The majority of studies that measured discretionary accruals in annual financial reports used this model.
- It is one of the most important measures of accrual assessment and made it avoid the shortcomings of other models.
- The data required for its application in the Egyptian environment is available.

The quality of discretionary accruals is measured according to the following steps:

1. Measure the total accruals: by the difference between net income before unusual items and cash flows from operating activities through the following equation:

$$\mathbf{TA_{it} = E_{it} - OCF_{it}}$$

Where:

- $\mathbf{TA_{it}}$ = Total accruals of the company (i) during period (t)
- $\mathbf{E_{it}}$ = Net income before unusual items of the company (i) during period (t)
- $\mathbf{OCF_{it}}$ = Cash flows from operating activities of the company (i) during period (t)

2. Estimating the parameters of the model **β1, β2, β3**, by which the non-discretionary accruals (NDA_{it}) are calculated through the following regression equation for the sample group of companies for each year separately.

$$\mathbf{TA_{it} / A_{it-1} = \beta_1 (1/ A_{it}) + \beta_2\{(\Delta REV_{it} - \Delta REC_{it}) / A_{it-1}\} + \beta_3 (PPE_{it} / A_{it-1}) + E_{it}}$$

Where:

- $\mathbf{TA_{it}}$ = Total accruals of the company (i) during period (t)
- Δ $\mathbf{REV_{it}}$ = Change in the company's revenue (i) during the period (t-1) to period (t)

- ΔREC_{it} = Change in company's accounts receivable (i) from period (t-1) to period (t)
- PPE_{it} = Total real estate, property and plant (fixed assets) of the company (i) during period (t)
- A_{it-1} = Total assets of the company (i) at the beginning of period (t)
- E_{it} = Random error.

3. Determine the normal non-discretionary accruals **(NDA_{it})** for each company (i) in period (t) through the following equation:

$$NDA_{it} = \beta_0 + \beta_1(1/A_{it-1}) + \beta_2\{(\Delta REV_{it} - \Delta REC_{it}) / A_{it-1}\} + \beta_3(PPE_{it}/A_{it-1}) + E_{it}$$

Where:

- NDA_{it} = Non-discretionary accruals of the company (i) during period (t)
- A_{it-1} = Total assets of the company (i) at the beginning of period (t)
- ΔREV_{it} = Change in the company's revenue (i) during the period (t-1) to period (t)
- ΔREC_{it} = Change in company's accounts receivable (i) from period (t-1) to period (t)
- PPE_{it} = Total real estate, property and plant (fixed assets) of the company (i) during period (t)
- E_{it} = Random error.

4. Discretionary accruals (DA_{it}) are calculated for each company, which is the difference between total accruals and non-discretionary accruals.

$$DA_{it} = TA_{it} - NDA_{it}$$

5. Calculating the absolute value of the discretionary accruals of the sample companies during the study period and the average of this value, If the absolute value of the annual discretionary accruals is less than the average of the discretionary accruals, this indicates that the company has not practiced earnings management during this year, which indicates audit quality, and consequently a high quality of accounting information provided to users of financial statements. But if the absolute value of the

annual discretionary accruals is higher than the average of the discretionary accruals, this indicates the company practiced earnings management during this year, which indicates a low audit quality, and consequently a low quality of accounting information provided to users of financial statements.

It should be noted that the value of the discretionary accruals may be positive (leading to an increase in profits) or it may be negative (leading to a decrease in profits), and that what concerns us is the extent to which the management exercises the discretionary accruals, which indicates the extent to which earnings management is practicing, and therefore the value will be used The value of the discretionary accruals as a measure of the quality of accruals, the higher the value of the discretionary accruals, the lower the quality of the accruals, the higher the earnings management, the lower audit quality and vice versa.

C- Control Variables: The research relied on a set of factors affecting the effectiveness of using risk – based audit for auditing accounting estimates, as well as the factors affecting the audit quality. These factors were identified and described in the light of previous studies. These variables and how to measure them can be clarified as in the following table:-

Table (3)
Control variables and ways to measure

Variable code	Variable Name	Method of measurement and justification	Source
Z_1	Auditor's Industrial specialization	A dummy variable equal to (one) if the company is audited by an industry-specialist auditor, or (zero) otherwise. The industrial specialization has been defined as follows: • Calculating the market share of the audit partner, it is calculated through the total assets of customers in the industry being audited by the partner divided by the total assets of companies in the same industry. • Calculate the comparison ratio as follows: (1/Number of sector companies) x 0.5 It is assumed that it positively affects the effectiveness of using risk – based audit for auditing accounting estimates and the audit quality.	Soliman, 2014; Butar-Buter & Indarto, 2018; Gee & Zhang, 2017; Goodwin et al., 2017; Hardies et al., 2020; Lee et al., 2017; Wahdan, 2018; Hamoda, 2018.
Z_2	The size of the company under auditing	The natural logarithm of total assets The size of the company is assumed to have a positive impact on the effectiveness of using risk – based audit for auditing accounting estimates and the audit quality. due to the availability of the material capabilities and the pressures of financial analysts and the media due to the presence of a large number of users of financial reporting information for large companies	Brazel & dang, 2008; Chen & Zhang, 2014; Lenard et al., 2016; Amoah et al., 2017; Ji et al, 2017; Zhang et al., 2017; Wahdan, 2018.
Z_3	Audit office size	A dummy variable equal to (one) if the auditing office is one of Big 4, or (zero) otherwise. It is assumed that it is positively correlated with the effectiveness of using risk – based audit for auditing accounting estimates and the audit quality due to the availability of experienced auditors.	Chi et al ., 2011; Chen & Zhang,2014; Lenard et al., 2016; Hardies et al., 2020; Wahdan, 2018.
Z_4	Net Operating Cash Flow Rate	Net operating cash flow / Total assets As it affects the maximization of discretionary accruals, and then negatively affects the audit quality.	Doyle et al., 2007; Brazel & Dang, 2008; Aryani & krismia, 2013; Wahdan, 2018
Z_5	Financial Leverage	Total Liabilities/Total Assets It is assumed that it is negatively associated with the audit quality., as it leads to a rise in discretionary accruals as a result of reliance on external funding	Brazel & Dang, 2008; Li et al., 2012; Chen & Zhang, 2014; Gee and Zhang, 2017; Omer et al., 2016; Wahdan, 2018.

Source: prepared by the authors

The dependent variable (the audit quality Y) is measured by the following models:

- Measuring the effect of the procedures for using risk – based audit approach for auditing accounting estimates on the audit quality using the following model:

$$Y= \beta_0 + \beta_1 X_1 + \beta_2 Z_1 + \beta_3 Z_2 + \beta_4 Z_3 + \beta_5 Z_4 + \beta_6 Z_5 + E$$

- Measuring the effect of the adequacy of disclosures related to the use of risk – based audit approach for auditing accounting estimates on the audit quality by the following model:

$$Y= \beta_0 + \beta_1 X_2 + \beta_2 Z_1 + \beta_3 Z_2 + \beta_4 Z_3 + \beta_5 Z_4 + \beta_6 Z_5 + E$$

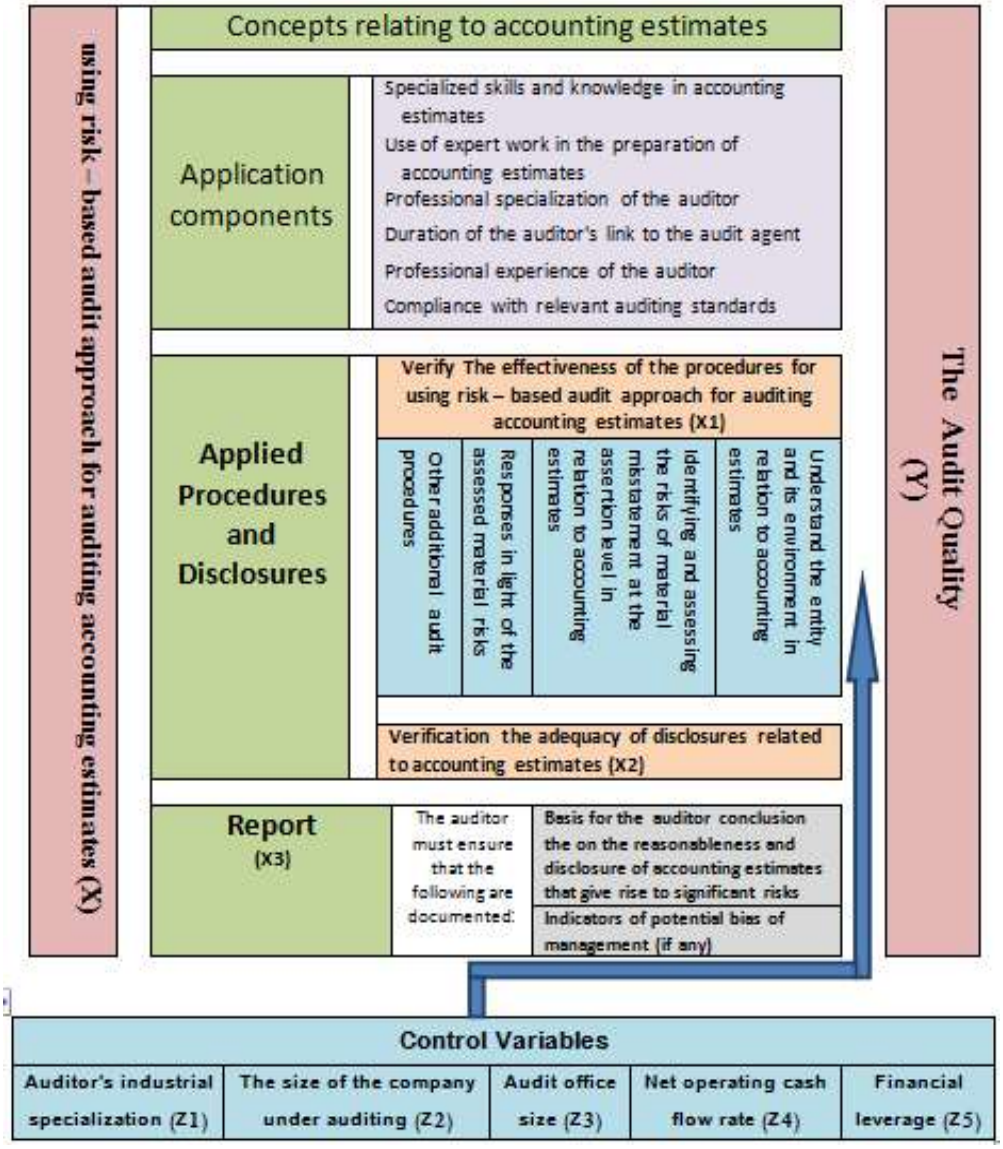
- Measuring the effect of the reporting regarding to the use of risk – based audit approach for auditing accounting estimates on the audit quality by the following model:

$$Y= \beta_0 + \beta_1 X_3 + \beta_2 Z_1 + \beta_3 Z_2 + \beta_4 Z_3 + \beta_5 Z_4 + \beta_6 Z_5 + E$$

- Measuring the effect of using risk – based audit approach for auditing accounting estimates on the audit quality by the following model:

$$Y= \beta_0 + \beta_1 X_1 + \beta 2\, X_2 + \beta_3 X_3 + \beta_4 Z_1 + \beta_5 Z_2 + \beta_6 Z_3 + \beta_7 Z_4 + \beta_8 Z_5 + E$$

The following figure represents the proposed model of the research:



Source: Prepared by the authors

Figure (1)
The proposed model of the research

8-3 Data Collections Method

- The research followed the method of field study as a source of primary data by preparing a check list of questions, personal interviews (with audit offices that audited the financial reports of the study sample companies, in order to measure the reasonableness of using risk – based audit approach for auditing accounting estimates).
- The research relied on the published data and annual reports of the study sample companies to assess the impact of using risk – based audit approach for auditing accounting estimates on the audit quality through the following sources:-
  - The Egyptian Stock Exchange website: to obtain from it a list of the listed companies and their various sectors, and the dates of issuing the financial statements of the sample companies. www.egx.com.eg
  - Mubasher information website (Egypt): in order to obtain the annual financial reports of the sample companies. https://www.mubasher.info/countries/eg
  - Websites of the study sample companies: in order to obtain from them the annual financial reports of the study sample companies, which were not provided by mubasher information website.

8-4 Statistical Techniques used in test of hypothesis

To test the validity of the research's hypotheses, the following statistical methods were used:

- **Descriptive analysis of data (mean - standard deviation):** in order to monitor the behavior of the research data, that can be used to determine the attributes of the study samples through recognizing the mean averages in addition to standard deviation to declare the most important variable and the least one.
- **Correlation Analysis (Person)** which estimates the strength and direction of the relationship between using risk – based audit approach for auditing accounting estimates (X) and the audit quality (Y).

- **Statistical tests for the research's hypotheses**: which included:
  - **Panel data using Stata/IC 15**, which combines cross sectional data with time series data
  - **T-test:** used to test the significance of each variable separately.
  - **Multicollinearity Test**: used to explore the existence of the multicollinearity problem and determine the ability of the research model to interpret the impact of using risk – based audit approach for auditing accounting estimates (X) and the audit quality (Y). The research relied on the collinearity diagnostics by determining the values of Variance Inflation Factor (VIF) and Tolerance. The consequences of imperfect multicollinearity can be summarized as follows *(Gujarati, 2003)*:
    - ✓ Estimates of the OLS coefficients may be imprecise in the sense that large standard errors lead to wider confidence intervals.
    - ✓ Affected coefficients may fail to attain statistical significance due to low t-statistics, which may lead us to wrongly drop an influential variable from our regression model.
    - ✓ The signs of the estimated coefficients can be the opposite of those expected.
    - ✓ The addition or deletion of a few observations may result in substantial changes in the estimated coefficients.
  - **Autocorrelation Test:** Wooldridge test for autocorrelation in panel data.

All these tests are considered to be accompanying the analysis methods that were decided to be used and which are available in the Stata/IC 15 methods package.

8-5 Analyzing the results of the empirical research

8-5 -1 Descriptive analysis of the variables related to the study

This sub-section of research will declare the results of descriptive statistical analysis which related to the effect of using risk – based audit approach for auditing accounting estimates on the audit quality. The descriptive statistical analysis which includes (Mean &

Standard deviation) will be applied in determining the trends of the sample; to recognize the most important statements in addition to the least important one. Table (4) illustrates the descriptive analysis of all study variables:

Table (4)
The descriptive analysis of all study variables

	Statement	Mean	Standard Deviation
Y	Audit quality (value of the discretionary accruals)	-.013	.147
X_1	The effectiveness of the procedures of using risk–based audit approach for auditing accounting estimates	.814	.216
X_2	The adequacy of disclosures related to the use of risk– based audit approach for auditing accounting estimates	.89	.09
X_3	Reporting the reasonableness of using risk–based audit approach for auditing accounting estimates	.138	.346
Z_1	Auditor's industrial specialization	.924	.266
Z_2	The size of the company under auditing	9.13	.708
Z_3	Audit office size	.633	.483
Z_4	Net operating cash flow rate	.035	.162
Z_5	Financial leverage	.525	.379

Source: the results of the statistical analysis

The results in Table (4) indicated the following:

- The average of the effectiveness of the procedures of using risk–based audit approach for auditing accounting estimates equal to (0.814), which means that the auditing firms that reviewed the financial reports of these companies have applied procedures of auditing accounting estimates according to risk-based audit during the study period, in other words, about Approximately (81%) of the auditing firms have applied the procedures of auditing accounting estimates according to risk-based audit.
- The average of the adequacy of disclosures related to the use of risk–based audit approach for auditing accounting estimates equal to (0.89), which means that the auditing firms that reviewed the financial reports of these companies have adequacy of disclosures related to the use of risk– based audit approach for auditing accounting estimates during the study period, in other words, about Approximately (89%)

of the auditing firms have adequacy of disclosures related to the use of risk– based audit approach for auditing accounting estimates.

- But, the average of reporting the reasonableness of using risk– based audit approach for auditing accounting estimates equal to (0.138), which means about Approximately (14%) of the auditing firms have reporting the reasonableness of using risk– based audit approach for auditing accounting estimates.
- Furthermore, the average of the value of the discretionary accruals as a measure of the quality of accruals equal to (-0.013) which reflect high audit quality of the study sample during the study period, as the lower the value of the discretionary accruals, the higher the quality of the accruals, the lower the earnings management, the higher the audit quality and vice versa.

8-5 -2 Correlation analysis of the study variables

Table (5) indicates the results of the Person correlation analysis of the study variables in the companies under study:

Table (5)

The Person correlation analysis

Variables	Y	X_1	X_2	X_3	Z_1	Z_2	Z_3	Z_4	Z_5
Y	1.000								
X_1	0.730*	1.000							
	(0.000)								
X_2	0.891*	0.723*	1.000						
	(0.000)	(0.000)							
X_3	0.583*	0.345*	0.491*	1.000					
	(0.000)	(0.000)	(0.000)						
Z_1	0.665*	0.432*	0.729*	0.115	1.000				
	(0.000)	(0.000)	(0.000)	(0.097)					
Z_2	-0.034	0.012	-0.030	-0.127	0.032	1.000			
	(0.623)	(0.860)	(0.668)	(0.067)	(0.646)				
Z_3	0.023	0.003	0.003	-0.039	0.005	0.565*	1.000		
	(0.744)	(0.962)	(0.962)	(0.573)	(0.943)	(0.000)			
Z_4	-0.580*	-0.406*	-0.530*	-0.357*	-0.433*	0.059	-0.069	1.000	
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.397)	(0.319)		
Z_5	0.058	-0.059	0.036	0.063	0.071	0.238*	0.267*	-0.465*	1.000
	(0.404)	(0.394)	(0.601)	(0.365)	(0.303)	(0.001)	(0.000)	(0.000)	
*** $p<0.01$, ** $p<0.05$, * $p<0.1$									

Source: the results of the statistical analysis

The results in Table (5) indicated the following:

- The absence of a linear correlation problem between the independent variables, as the absolute values of the correlation coefficients (R) are less than 80%, which indicates the integrity of the model from the linear correlation problem.
- There is significant positive relationship between the audit quality and (the effectiveness of the procedures of using risk–based audit approach for auditing accounting estimates, the adequacy of disclosures related to the use of risk– based audit approach for auditing accounting estimates, reporting the reasonableness of using risk– based audit approach for auditing accounting estimates, auditor's industrial specialization) where the correlation coefficients between them were (0.730, 0.891, 0.583, 0.665) respectively.
- There is non- significant positive relationship between the audit quality and (audit office size, financial leverage), where the correlation coefficients between them were (0.023, 0.058) respectively.
- There is significant negative relationship between the audit quality and net operating cash flow rate, where the correlation coefficients between them were (0.580).
- There is non-significant negative relationship between the audit quality and the size of the company under auditing, where the correlation coefficients between them were (0.034).

8-5 -3 Testing the hypotheses and concluding the results

In testing its hypotheses, the study relied on appropriate statistical models for analyzing panel data using Stata/IC 15, which combines cross sectional data with time series data, which is done through the application of three main steps:

- Applying three different models to determine the estimated effect: The three models used to analyze Panel Data are; (1) Pooled Regression Model, which looks at the data as observations of one company without taking into account the differences between units (companies) and differences across the time series of the data, (2) Fixed Effects Model, which takes

into account the differences between companies but does not take into account the differences Through time into account, (3) Random Effects Model, which takes into account differences between companies as well as differences over time.

- Choosing the optimal model to represent the data: To determine the optimal model for data representation, the following statistical tests are applied; (1) Wald test for comparison between pooled model and fixed effects model where fixed effects model is best if ((P-Value < 0.05) and vice versa, (2) Breusch & pagan Lagrange Multiplier test is applied for comparison between pooled model and random effects model and accordingly The random effects model is optimal if ((P-Value < 0.05) and vice versa, (3) If it was found from the previous tests that both the fixed and random effects models are better than the pooled model, the Hausman test is applied to compare the two models, and if (P- Value < 0.05) indicates that the fixed effects model is the best to rely on in representing the data, and vice versa.
- Determine the quality and validity of the estimated model: Several validity tests are performed to ensure the reliability of the results. First, the Variance Inflation Factor (VIF) test is used to ensure that the independent variables of the study do not suffer from the problem of multicollinearity, so that if the VIF of a particular independent variable increases from the value (10), this means that this variable causes a problem of collinearity. Secondly, other influencing factors that may affect the results (ruling variables) are taken into account. Third, a Wooldridge test is performed to ensure that there is no autocorrelation problem in panel data for the first-order.

(A) Statistical analyzes for the first hypothesis test:

In order to test the validity of the first hypothesis, which states that: "There is no significant effect of the effectiveness of the procedures for using risk – based audit approach for auditing accounting estimates on the audit quality for the companies under study", the following statistical analyzes were carried out:

1) Apply the three appropriate models according to Panel Data:

Tables (6), (7) and (8) show the results of the statistical analysis according to the Pooled Regression Model, the Fixed-effects Model, and the Random Effect Model.

Table (6)

The statistical analysis according to the Pooled Regression Model

Y	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
X1	.32	.03	10.61	0.000	.261	.38	***
Z1	.198	.024	8.29	0.000	.151	.245	***
Z2	-.01	.01	-1.01	.313	-.029	.009	
Z3	.013	.014	0.98	.329	-.014	.041	
Z4	-.235	.047	-4.99	0.000	-.328	-.142	***
Z5	-.024	.018	-1.30	.194	-.059	.012	
Constant	-.356	.083	-4.30	0.000	-.519	-.193	***

Mean dependent var	-0.013	SD dependent var	0.147
R-squared	0.728	Number of obs	210
F-test	90.526	Prob > F	0.000
Akaike crit. (AIC)	-468.387	Bayesian crit. (BIC)	-444.957

*** $p<.01$, ** $p<.05$, * $p<.1$

Source: the results of the statistical analysis

Table (7)

The statistical analysis according to the Fixed-effects Model

Y	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
X1	.254	.034	7.36	0.000	.186	.322	***
Z1	.151	.027	5.51	0.000	.097	.205	***
Z2	-.002	.037	-0.06	.95	-.075	.07	
Z3	.008	.022	0.35	.726	-.037	.052	
Z4	-.479	.063	-7.63	0.000	-.603	-.355	***
Z5	-.055	.022	-2.45	.015	-.099	-.011	**
Constant	-.298	.335	-0.89	.374	-.958	.362	

Mean dependent var	-0.013	SD dependent var	0.147
R-squared	0.754	Number of obs	210
F-test	88.848	Prob > F	0.000
Akaike crit. (AIC)	-529.191	Bayesian crit. (BIC)	-505.761

*** $p<.01$, ** $p<.05$, * $p<.1$

Source: the results of the statistical analysis

Table (8)
The statistical analysis according to the Random Effects Model

Y	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
X1	.316	.03	10.41	0.000	.257	.376	***
Z1	.195	.024	8.10	0.000	.148	.242	***
Z2	-.009	.01	-0.89	.374	-.029	.011	
Z3	.013	.014	0.91	.361	-.015	.041	
Z4	-.253	.048	-5.26	0.000	-.347	-.158	***
Z5	-.027	.018	-1.45	.146	-.063	.009	
Constant	-.355	.087	-4.09	0.000	-.525	-.185	***

Mean dependent var	-0.013	SD dependent var	0.147
Overall r-squared	0.728	Number of obs	210
Wald- Chi-square	544.921	Prob > Wald-chi2	0.000
R-squared within	0.736	R-squared between	0.709

****p<.01, **p<.05, *p<.1*
Source: the results of the statistical analysis

2) Determine the optimal model:

Table (9) shows the results of the statistical analysis of (Wald Test & Lagrange Multiplier & Hausman Test) for comparison between the three models:

Table (9)
Results of Wald Test & Lagrange Multiplier & Hausman Test

Wald Test		Lagrange Multiplier		Hausman Test	
Test statistic	P-Value	Breusch & pagan	P-Value	χ^2	P-Value
46.928	0.000	39.82	0.000	3.82	0.827

Source: the results of the statistical analysis

According to the Wald Test Comparison between the Pooled Regression Model and the Fixed-effects Model, the Fixed-effects Model is the best as (P-value < 0.05). According to Lagrange Multiplier Test for comparison between the Pooled Regression Model and the Random Effects Model, the Random Effects Model is optimal as (P-value < 0.05). Since it was found from the previous tests that both the Fixed and Random Effects Models are better than the Pooled Regression Model, the Hausman test was applied to compare the two models. Accordingly, the Random Effects Model is the best to rely on in representing the data, as it was (P-Value > 0.05). This indicated that:

- Significance of the model used as a whole in testing the influence relationship, as the Wald - Chi-square reached (544.921) at a

confidence level (95%) and has a significant P-value less than (0.05). It means that the regression model for this hypothesis has a high suitability. Also the model indicated that the value of the determination coefficient is (0.728), which means that the independent variables explain (72.8%) of the changes in the audit quality.

- There is a positive and significant effect (level of significance of 5% or less) for each of (The effectiveness of the procedures of using risk–based audit approach for auditing accounting estimates and auditor's industrial specialization) on the audit quality, while there is a negative and significant effect (level of significance of 5% or less) of net operating cash flow rate on the audit quality, and there is no effect for each of (the size of the company under auditing, audit office size and financial leverage) on the audit quality
- the equation of the regression model is as follows: (Bold Significantly affecting variables)

$$\mathbf{Y= -0.355 + 0.316\ X_1 + 0.195\ Z_1} - 0.009\ Z_2 + 0.013\ Z_3 \mathbf{- 0.253\ Z_4} - 0.027\ Z_5$$

3) Determine the quality and validity of the estimated model:

To determine the quality and validity of the estimated model, the Variance Inflation Factor (VIF) test was performed to ensure that the independent variables of the study do not suffer from the problem of multicollinearity. (2) Conducting the Wooldridge (2002) test to ensure that there is no autocorrelation problem, as shown in Table (10).

Table (10) Examination results (VIF & Wooldridge)

Variable	VIF	1/VIF
X1	**1.303**	**0.768**
Z1	**2.626**	**0.381**
Z2	**1.934**	**0.517**
Z3	**1.981**	**0.505**
Z4	**1.728**	**0.579**
Z5	**1.679**	**0.596**
Wooldridge test for autocorrelation in panel data The null hypothesis: No first-order autocorrelation F (1, 29) = 0.123 P-value = 0.751		

Source: the results of the statistical analysis

The results in Table (10) indicated the following:

- The independent variables of the study do not suffer from the problem of multicollinearity since the vector inflation factor (VIF) for each of the independent variables is less than (10) and the corresponding

tolerance is greater than 0.1. In the same context, the errors are not serially correlated based on the Wooldridge test for autocorrelation in panel data. The presented results indicate that the null hypothesis cannot be rejected because the corresponding p-value is greater than 5 % significance level. Means, there is no autocorrelation from the first order in panel data at 95% confidence level.

Therefore, the first hypothesis is rejected, which is " There is no significant effect of the effectiveness of the procedures for using risk – based audit approach for auditing accounting estimates on the audit quality for the companies under study ", as it turned out that there is an effect of the effectiveness of the procedures for using risk – based audit approach for auditing accounting estimates on the audit quality for the companies under study.

(B) Statistical analyzes for the second hypothesis test:

In order to test the validity of the second hypothesis, which states that: "There is no significant effect of the adequacy disclosures about using risk – based audit approach for auditing accounting estimates on the audit quality for the companies under study" the following statistical analyzes were carried out:

1) Apply the three appropriate models according to Panel Data:

Tables (11), (12) and (13) show the results of the statistical analysis according to the Pooled Regression Model, the Fixed-effects Model, and the Random Effects Model.

Table (11)

The statistical analysis according to the Pooled Regression Model

Y	Coef.	St.Err	t-value	p-value	[95% Conf	Interval]	Sig
X2	1.277	.08	16.02	0.000	1.12	1.434	***
Z1	.012	.025	0.48	.632	-.037	.061	
Z2	0	.008	0.04	.966	-.015	.016	
Z3	.007	.011	0.63	.526	-.015	.03	
Z4	-.171	.039	-4.34	0.000	-.249	-.093	***
Z5	-.026	.015	-1.74	.083	-.055	.003	*
Constant	-1.149	.089	-12.86	0.000	-1.325	-.973	***

Mean dependent var	-0.013	SD dependent var	0.147
R-squared	0.813	Number of obs	210
F-test	147.216	Prob > F	0.000
Akaike crit. (AIC)	-547.262	Bayesian crit. (BIC)	-523.833

****p<.01, **p<.05, *p<.1*

Source: the results of the statistical analysis

Table (12)

The statistical analysis according to the Fixed-effects Model

Y	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
X2	1.112	.101	11.00	0.000	.912	1.311	***
Z1	.008	.028	0.28	.779	-.048	.064	
Z2	.005	.032	0.15	.88	-.059	.069	
Z3	-.001	.02	-0.05	.964	-.04	.038	
Z4	-.329	.059	-5.58	0.000	-.446	-.213	***
Z5	-.047	.02	-2.39	.018	-.086	-.008	**
Constant	-1.018	.307	-3.32	.001	-1.623	-.413	***

Mean dependent var	-0.013	SD dependent var	0.147
R-squared	0.810	Number of obs	210
F-test	123.298	Prob > F	0.000
Akaike crit. (AIC)	-583.044	Bayesian crit. (BIC)	-559.615

*** p<.01, ** p<.05, * p<.1

Source: the results of the statistical analysis

Table (13)

The statistical analysis according to the Random Effect Model

Y	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
X2	1.277	.08	16.02	0.000	1.12	1.433	***
Z1	.012	.025	0.48	.631	-.037	.06	
Z2	0	.008	0.04	.966	-.015	.016	
Z3	.007	.011	0.63	.526	-.015	.03	
Z4	-.171	.039	-4.34	0.000	-.248	-.094	***
Z5	-.026	.015	-1.74	.082	-.054	.003	*
Constant	-1.149	.089	-12.86	0.000	-1.324	-.974	***

Mean dependent var	-0.013	SD dependent var	0.147
Overall r-squared	0.813	Number of obs	210
Wald-Chi-square	883.297	Prob > Wald-chi2	0.000
R-squared within	0.801	R-squared between	0.871

*** p<.01, ** p<.05, * p<.1

Source: the results of the statistical analysis

2) Determine the optimal model:

Table (14) shows the results of the statistical analysis of (Wald Test & Lagrange Multiplier & Hausman Test) for comparison between the three models:

Table (14)
Results of Wald Test & Lagrange Multiplier & Hausman Test

Wald Test		Lagrange Multiplier		Hausman Test	
Test statistic	P-Value	Breusch & pagan	P-Value	χ^2	P-Value
87.92	0.000	60.72	0.000	29.82	0.000

Source: the results of the statistical analysis

According to the Wald Test Comparison between the Pooled Regression Model and the Fixed-effects Model, the Fixed-effects Model is the best as (P-value < 0.05) According to Lagrange Multiplier Test for comparison between the Pooled Regression Model and the Random Effects Model, the Random Effect Model is optimal as (P-value < 0.05). Since it was found from the previous tests that both the Fixed and Random Effects Models are better than the Pooled Regression Model, the Hausman test was applied to compare the two models. Accordingly, the Fixed Effects Model is the best to rely on in representing the data, as it was (P-Value < 0.05). This indicated that:

- Significance of the model used as a whole in testing the influence relationship, as the F-test reached (123.298) at a confidence level (95%) and has a significant P-value less than (0.05). It means that the regression model for this hypothesis has a high suitability. Also the model indicated that the value of the determination coefficient is (0.810), which means that the independent variables explain (81%) of the changes in the audit quality.
- There is a positive and significant effect (level of significance of 5% or less) for the adequacy of disclosures related to the use of risk– based audit approach for auditing accounting estimates on the audit quality, while there is a negative and significant effect (level of significance of 5% or less) for each of net operating cash flow rate and financial leverage on the audit quality, and there is no effect for each of (auditor's industrial specialization, the size of the company under auditing and audit office size) on the audit quality
- the equation of the regression model is as follows: (Bold Significantly affecting variables)

$$Y= -1.018 + 1.112\ X_2 + 0.008\ Z_1 + 0.005\ Z_2 - 0.001\ Z_3 - 0.329\ Z_4 - 0.047\ Z_5$$

3) Determine the quality and validity of the estimated model:

To determine the quality and validity of the estimated model, the Variance Inflation Factor (VIF) test was performed to ensure that the independent variables of the study do not suffer from the problem of multicollinearity. (2) Conducting the Wooldridge (2002) test to ensure that there is no autocorrelation problem, as shown in Table (15).

Table (15) Examination results (VIF & Wooldridge)

Variable	VIF	1/VIF
X2	1.078	0.928
Z1	2.6	0.385
Z2	1.954	0.512
Z3	2.043	0.489
Z4	1.414	0.707
Z5	1.527	0.655
Wooldridge test for autocorrelation in panel data The null hypothesis: No first-order autocorrelation		F (1, 29) = 0.187 P-value = 0.562

Source: the results of the statistical analysis

The results in Table (15) indicated the following:

- The independent variables of the study do not suffer from the problem of multicollinearity since the vector inflation factor (VIF) for each of the independent variables is less than (10) and the corresponding tolerance is greater than 0.1. In the same context, the errors are not serially correlated based on the Wooldridge test for autocorrelation in panel data. The presented results indicate that the null hypothesis cannot be rejected because the corresponding p-value is greater than 5 % significance level. Means, there is no autocorrelation from the first order in panel data at 95% confidence level.

Therefore, the second hypothesis is rejected, which is " There is no significant effect of the adequacy disclosures about using risk – based audit approach for auditing accounting estimates on the audit quality for the companies under study ", as it turned out that there is an effect of the adequacy disclosures about using risk – based audit approach for auditing accounting estimates on the audit quality for the companies under study.

C) Statistical analyzes for the third hypothesis test:

In order to test the validity of the third hypothesis, which states that: "There is no significant effect of reporting the reasonableness of using risk – based audit approach for auditing accounting estimates on the audit quality for the companies under study" the following statistical analyzes were carried out:

1) Apply the three appropriate models according to Panel Data:

Tables (16), (17) and (18) show the results of the statistical analysis according to the Pooled Regression Model, the Fixed-effects Model, and the Random Effects Model.

Table (16)

The statistical analysis according to the Pooled Regression Model

Y	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
X3	.189	.016	11.49	0.000	.156	.221	***
Z1	.28	.022	12.51	0.000	.236	.324	***
Z2	.008	.009	0.81	.42	-.011	.026	
Z3	.012	.013	0.89	.375	-.014	.038	
Z4	-.25	.045	-5.56	0.000	-.338	-.161	***
Z5	-.059	.017	-3.52	.001	-.092	-.026	***
Constant	-.335	.08	-4.18	0.000	-.492	-.177	***

Mean dependent var	-0.013	SD dependent var	0.147
R-squared	0.744	Number of obs	210
F-test	98.179	Prob > F	0.000
Akaike crit. (AIC)	-480.929	Bayesian crit. (BIC)	-457.499

****p<.01, **p<.05, *p<.1*

Source: the results of the statistical analysis

Table (17)

The statistical analysis according to the Fixed-effects Model

Y	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
X3	.166	.018	9.02	0.000	.13	.202	***
Z1	.196	.026	7.57	0.000	.145	.247	***
Z2	.014	.035	0.41	.682	-.055	.083	
Z3	.01	.021	0.47	.637	-.032	.052	
Z4	-.469	.058	-8.09	0.000	-.583	-.355	***
Z5	-.066	.021	-3.17	.002	-.108	-.025	***
Constant	-.303	.316	-0.96	.338	-.926	.32	

Mean dependent var	-0.013	SD dependent var	0.147
R-squared	0.780	Number of obs	210
F-test	102.864	Prob > F	0.000
Akaike crit. (AIC)	-552.790	Bayesian crit. (BIC)	-529.361

****p<.01, **p<.05, *p<.1*

Source: the results of the statistical analysis

Table (18)
The statistical analysis according to the Random Effect Model

Y	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
X3	.186	.017	11.16	0.000	.153	.218	***
Z1	.264	.023	11.58	0.000	.219	.308	***
Z2	.009	.01	0.84	.401	-.012	.029	
Z3	.011	.014	0.74	.459	-.017	.039	
Z4	-.29	.047	-6.16	0.000	-.382	-.197	***
Z5	-.062	.017	-3.55	0.000	-.096	-.028	***
Constant	-.326	.09	-3.64	0.000	-.502	-.151	***

Mean dependent var	-0.013	-0.013	0.147
Overall r-squared	0.742	0.742	210
Wald-Chi-square	604.262	604.262	0.000
R-squared within	0.765	0.765	0.639

****p<.01, **p<.05, *p<.1*
Source: the results of the statistical analysis

2) Determine the optimal model:

Table (19) shows the results of the statistical analysis of (Wald Test & Lagrange Multiplier & Hausman Test) for comparison between the three models:

Table (19)
Results of Wald Test & Lagrange Multiplier & Hausman Test

Wald Test		Lagrange Multiplier		Hausman Test	
Test statistic	P-Value	Breusch & pagan	P-Value	χ^2	P-Value
55.72	0.000	53.82	0.000	51.82	0.000

Source: the results of the statistical analysis

According to the Wald Test Comparison between the Pooled Regression Model and the Fixed-effects Model, the Fixed-effects Model is the best as (P-value < 0.05) According to Lagrange Multiplier Test for comparison between the Pooled Regression Model and the Random Effects Model, the Random Effect Model is optimal as (P-value < 0.05). Since it was found from the previous tests that both the Fixed and Random Effects Models are better than the Pooled Regression Model, the Hausman test was applied to compare the two models. Accordingly, the Fixed Effects Model is the best to rely on in representing the data, as it was (P-Value < 0.05). This indicated that:

- Significance of the model used as a whole in testing the influence relationship, as the F-test reached (102.864) at a confidence level (95%) and has a significant P-value less than (0.05). It means that the regression model for this hypothesis has a high suitability. Also the

model indicated that the value of the determination coefficient is (0.780), which means that the independent variables explain (78%) of the changes in the audit quality.

- There is a positive and significant effect (level of significance of 5% or less) for each of reporting the reasonableness of using risk– based audit approach for auditing accounting estimates and auditor's industrial specialization on the audit quality, while there is a negative and significant effect (level of significance of 5% or less) for each of net operating cash flow rate and financial leverage on the audit quality, and there is no effect for each of the size of the company under auditing and audit office size on the audit quality
- the equation of the regression model is as follows: (Bold Significantly affecting variables)

$$\mathbf{Y}= -0.303 + \mathbf{0.166\ X_3} + 0.196\ Z_1 + 0.014\ Z_2 + 0.01\ Z_3 \mathbf{-\ 0.469\ Z_4 - 0.066\ Z_5}$$

3) Determine the quality and validity of the estimated model:

To determine the quality and validity of the estimated model, the Variance Inflation Factor (VIF) test was performed to ensure that the independent variables of the study do not suffer from the problem of multicollinearity. (2) Conducting the Wooldridge (2002) test to ensure that there is no autocorrelation problem, as shown in Table (20).

Table (20) Examination results (VIF & Wooldridge)

Variable	VIF	1/VIF
X3	**1.258**	**0.795**
Z1	**2.648**	**0.378**
Z2	**1.939**	**0.516**
Z3	**1.977**	**0.506**
Z4	**1.653**	**0.605**
Z5	**1.552**	**0.644**
Wooldridge test for autocorrelation in panel data The null hypothesis: No first-order autocorrelation F (1, 29) = 0.192 P-value = 0.791		

Source: the results of the statistical analysis

The results in Table (20) indicated the following:

- The independent variables of the study do not suffer from the problem of multicollinearity since the vector inflation factor (VIF) for each of the independent variables is less than (10) and the corresponding tolerance is greater than 0.1. In the same context, the errors are not serially correlated based on the Wooldridge test for autocorrelation in panel data. The presented results indicate that the null hypothesis cannot be rejected because the corresponding p-value is greater than 5 % significance level. Means, there is no autocorrelation from the first order in panel data at 95% confidence level.

Therefore, the third hypothesis is rejected, which is "There is no significant effect of reporting the reasonableness of using risk – based audit approach for auditing accounting estimates on the audit quality for the companies under study", as it turned out that there is an effect of reporting the reasonableness of using risk – based audit approach for auditing accounting estimates on the audit quality for the companies under study.

D) Statistical analyzes for the fourth hypothesis test:

In order to test the validity of the fourth hypothesis, which states that: "There is no significant effect of using risk – based audit approach for auditing accounting estimates on the audit quality for the companies under study" the following statistical analyzes were carried out:

1) Apply the three appropriate models according to Panel Data:

Tables (21), (22) and (23) show the results of the statistical analysis according to the Pooled Regression Model, the Fixed-effects Model, and the Random Effects Model.

Table (21)

The statistical analysis according to the Pooled Regression Model

Y	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
X1	.145	.027	5.34	0.000	.092	.199	***
X2	.677	.099	6.81	0.000	.481	.874	***
X3	.105	.014	7.29	0.000	.076	.133	***
Z1	.109	.024	4.50	0.000	.061	.156	***
Z2	0	.007	-0.07	.946	-.014	.013	
Z3	.01	.01	1.00	.318	-.01	.029	
Z4	-.107	.035	-3.07	.002	-.175	-.038	***
Z5	-.014	.013	-1.10	.272	-.04	.011	
Constant	-.84	.085	-9.86	0.000	-1.008	-.672	***

Mean dependent var	-0.013	SD dependent var	0.147
R-squared	0.863	Number of obs	210
F-test	158.614	Prob > F	0.000
Akaike crit. (AIC)	-608.851	Bayesian crit. (BIC)	-578.727

*** $p<.01$, ** $p<.05$, * $p<.1$

Source: the results of the statistical analysis

Table (22)

The statistical analysis according to the Fixed-effects Model

Y	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
X1	.144	.03	4.84	0.000	.085	.203	***
X2	.597	.11	5.44	0.000	.38	.814	***
X3	.11	.017	6.65	0.000	.077	.143	***
Z1	.086	.026	3.25	.001	.034	.138	***
Z2	.021	.028	0.74	.462	-.035	.076	
Z3	.002	.017	0.12	.908	-.032	.036	
Z4	-.218	.053	-4.12	0.000	-.323	-.114	***
Z5	-.035	.017	-2.03	.043	-.069	-.001	**
Constant	-.921	.265	-3.48	.001	-1.443	-.398	***

Mean dependent var	-0.013	SD dependent var	0.147
R-squared	0.860	Number of obs	210
F-test	132.093	Prob > F	0.000
Akaike crit. (AIC)	-643.664	Bayesian crit. (BIC)	-613.540

*** $p<.01$, ** $p<.05$, * $p<.1$

Source: the results of the statistical analysis

Table (23)

The statistical analysis according to the Random Effect Model

Y	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
X1	.145	.027	5.34	0.000	.092	.198	***
X2	.677	.099	6.81	0.000	.483	.872	***
X3	.105	.014	7.29	0.000	.077	.133	***
Z1	.109	.024	4.50	0.000	.061	.156	***
Z2	0	.007	-0.07	.946	-.014	.013	
Z3	.01	.01	1.00	.317	-.009	.029	
Z4	-.107	.035	-3.07	.002	-.175	-.039	***
Z5	-.014	.013	-1.10	.27	-.039	.011	
Constant	-.84	.085	-9.86	0.000	-1.007	-.673	***

Mean dependent var	-0.013	SD dependent var	0.147
Overall r-squared	0.863	Number of obs	210
Wald-Chi-square	1268.910	Prob > Wald-chi2	0.000
R-squared within	0.855	R-squared between	0.904

*** $p<.01$, ** $p<.05$, * $p<.1$

Source: the results of the statistical analysis

2) Determine the optimal model:

Table (24) shows the results of the statistical analysis of (Wald Test & Lagrange Multiplier & Hausman Test) for comparison between the three models:

Table (24) Results of Wald Test & Lagrange Multiplier & Hausman Test

Wald Test		Lagrange Multiplier		Hausman Test	
Test statistic	P-Value	Breusch & pagan	P-Value	χ^2	P-Value
66.52	0.000	39.90	0.000	36.82	0.000

Source: the results of the statistical analysis

According to the Wald Test Comparison between the Pooled Regression Model and the Fixed-effects Model, the Fixed-effects Model is the best as (P-value < 0.05) According to Lagrange Multiplier Test for comparison between the Pooled Regression Model and the Random Effects Model, the Random Effect Model is optimal as (P-value < 0.05). Since it was found from the previous tests that both the Fixed and Random Effects Models are better than the Pooled Regression Model, the Hausman test was applied to compare the two models. Accordingly, the Fixed Effects Model is the best to rely on in representing the data, as it was (P-Value < 0.05). This indicated that:

- Significance of the model used as a whole in testing the influence relationship, as the F-test reached (132.093) at a confidence level (95%) and has a significant P-value less than (0.05). It means that the regression model for this hypothesis has a high suitability. Also the model indicated that the value of the determination coefficient is (0.860), which means that the independent variables explain (86%) of the changes in the audit quality.
- There is a positive and significant effect (level of significance of 5% or less) for each of the effectiveness of the procedures of using risk–based audit approach for auditing accounting estimates, the adequacy of disclosures related to the use of risk–based audit approach for auditing accounting estimates, reporting the reasonableness of using risk– based audit approach for auditing accounting estimates and auditor's industrial specialization on the audit quality, while there is a negative and significant effect (level of significance of 5% or less) for each of net operating cash flow rate and financial leverage on the audit quality, and there is no effect for each of the size of the company under auditing and audit office size) on the audit quality.
- the equation of the regression model is as follows: (Bold Significantly affecting variables)

$$\mathbf{Y= -0.921 + 0.144\ X_1 + 0.597\ X_2 + 0.11\ X_3 + 0.086\ Z_1} + 0.021\ Z_2 + 0.002\ Z_3 \mathbf{- 0.218\ Z_4 - 0.035\ Z_5}$$

3) Determine the quality and validity of the estimated model:

To determine the quality and validity of the estimated model, the Variance Inflation Factor (VIF) test was performed to ensure that the independent variables of the study do not suffer from the problem of multicollinearity. (2) Conducting the Wooldridge (2002) test to ensure that there is no autocorrelation problem, as shown in Table (25).

Table (25)
Examination results (VIF & Wooldridge)

Variable	VIF	1/VIF
X1	**1.441**	**0.694**
X2	**1.095**	**0.914**
X3	**1.377**	**0.726**
Z1	**2.68**	**0.373**
Z2	**1.979**	**0.505**
Z3	**2.045**	**0.489**
Z4	**1.973**	**0.507**
Z5	**1.692**	**0.591**
Wooldridge test for autocorrelation in panel data The null hypothesis: No first-order autocorrelation F (1, 29) = 0.189 P-value = 0.670		

Source: the results of the statistical analysis

The results in Table (25) indicated the following:

- The independent variables of the study do not suffer from the problem of multicollinearity since the vector inflation factor (VIF) for each of the independent variables is less than (10) and the corresponding tolerance is greater than 0.1. In the same context, the errors are not serially correlated based on the Wooldridge test for autocorrelation in panel data. The presented results indicate that the null hypothesis cannot be rejected because the corresponding p-value is greater than 5 % significance level. Means, there is no autocorrelation from the first order in panel data at 95% confidence level.

Therefore, the fourth hypothesis is rejected, which is "There is no significant effect of using risk – based audit approach for auditing accounting estimates on the audit quality for the companies under

study", as it turned out that there is an effect of using risk – based audit approach for auditing accounting estimates on the audit quality for the companies under study.

9- Conclusions, recommendations and future studies

9-1 Conclusions

- There is an effect of the effectiveness of the procedures for using risk – based audit approach for auditing accounting estimates on the audit quality for the companies under study
- There is an effect of the adequacy disclosures about using risk – based audit approach for auditing accounting estimates on the audit quality for the companies under study.
- There is an effect of reporting the reasonableness of using risk – based audit approach for auditing accounting estimates on the audit quality for the companies under study.
- There is an effect of using risk – based audit approach for auditing accounting estimates on the audit quality for the companies under study.

9-2 Recommendations

The following are the most important recommendations of the research:

- The application of the business risk-based audit approach in relation to accounting estimates should be applied to improve the quality of the audit process and the quality of financial reports.
- The authorities responsible for setting the Egyptian standards on auditing adopt what is stated in the International Standard on Auditing No. (540) for the year of 2019 regarding auditing accounting estimates, to keep pace with professional developments at the International level, and work to avoid the shortcomings that the current auditing standard suffers from regarding achieving quality auditing accounting estimates.
- The use of the risk-based audit approach for auditing accounting estimates can provide knowledge that leads:
    - Auditing standards setters: through this knowledge, it is possible to identify the difficulties and risks that may face

auditors when evaluating the reasonableness of accounting estimates, so that standard-setters can make amendments to the requirements and guidelines of the auditing standards related to accounting estimates in an attempt to reduce these difficulties and risks.

- Auditors: through this knowledge, it is possible to evaluate the quality of accounting estimates, and to identify the areas that negatively affect the credibility of the financial statements, and then reporting it with more reliability.
- Regulatory authorities: through this knowledge, they can evaluate the effectiveness of accounting estimates and identify the obstacles that limit them, especially according to the adequacy of disclosure related to these estimates. Also, identify the citizens that the management can exploit to carry out opportunistic behavior, especially the practice of earnings management.
- Investors: through this knowledge, they can improve their ability to analyze accounting information, and then reveal the exploitation of accounting estimates in any opportunistic behavior by the management.

9-3 Suggested future studies

- The effect of using risk – based audit approach for auditing accounting estimates on the quality of accounting information.
- The effect of using risk – based audit approach for auditing accounting estimates on accounting conservatism.
- The effect of using risk – based audit approach for auditing accounting estimates on the quality of audit report.
- A proposed framework for using risk – based audit approach for auditing accounting estimates, including fair value estimates to improve the quality of financial reporting.

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