

The Effect of Audit Client Assets Tangibility on Audit Risk: An Empirical Study on Nonfinancial Firms Listed on the EGX

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Abstract

Purpose – The objective of this research is to study and examine the association between the audit risk assessment and the degree of audit client assets tangibility. Additionally, it investigates the moderating influence of the audit firm's reputation on the aforementioned relationship.

Design/Methodology – The underlying research hypotheses are tested using a sample of 90 nonfinancial firms listed on the Egyptian Stock Exchange (EGX), resulting in a total of 270 firm-year observations throughout 2017-2019, and using simple and multiple regressions.

Findings – The audit client's assets tangibility has a substantial impact on the assessment of audit risk, as indicated by a score out of 6 indicators obtained from the auditees' financial statements. The tangibility degree of assets is evaluated as a percentage of the total assets. This significant influence differs depending on the audit firm's reputation, which is ranked into 4 tiers, with the Big 4 making up the first. Moreover, the association between the tangibility degree of assets and the assessed audit risk remains substantial and positive after doing further analyses that include control variables. Additionally, it is deduced that the reputation of the audit firm still moderates the strong association between the tangibility degree of assets and the estimated audit risk by separating the sample into clients audited by Big4 and those audited by non-Big 4. Accordingly, these conclusions are valid because they are supported by the results of other analyses that used various techniques to measure the research variables.

Research Limitations – The research is restricted **geographically** by utilizing a sample of nonfinancial firms listed on the EGX. Hence, the generalizability of the research results is conditioned by the criteria for defining the study population and sample. Concerning the **time-frame** boundaries, the researcher has taken into account that the study period is after the introduction of IFRS in Egypt in 2015 and before the widespread of Covid 19. Regarding the **technical limitations**, the research is limited to investigating a specific type of audit client complexity which is related to assets tangibility.

Originality/value – To the extent that the researcher is aware, there is relatively little research on assets tangibility as a factor influencing the estimation of audit risk, as determined by an index score of the main

business risk indicators of auditees, and its relationship with the audit firm's reputation in the Egyptian historical context. The results of this research also have various implications for academics, auditors, and legislative bodies who desire to improve the overall quality of the audit profession practice environment in developing nations.

Keywords: Assets Tangibility; Audit Risk Index Score; Reputation of Audit Firms; Audit Firms' Ranking Tiers.

أثر درجة ملموسية أصول منشأة عميل المراجعة على مستوى خطر المراجعة: دراسة تطبيقية على الشركات غير المالية المقيدة بالبورصة المصرية

ملخص البحث

الهدف - يستهدف هذا البحث دراسة واختبار العلاقة بين تقدير مخاطر المراجعة ودرجة ملموسية أصول عميل المراجعة. بالإضافة إلى ذلك، فإنه يبحث في التأثير المُعدّل لسمعة مكتب المراجعة على هذه العلاقة محل الدراسة.

المنهجية - تم اختبار فروض البحث الأساسية باستخدام عينة مكونة من ٩٠ شركة غير مالية مدرجة في البورصة المصرية، بإجمالي عدد مشاهدات ٢٧٠ مشاهدة سنوية خلال الفترة ٢٠١٧-٢٠١٩، وباستخدام تحليلات الانحدار البسيطة والمتعددة.

النتائج - توصل البحث، في ظل التحليل الأساسي، إلى أن درجة ملموسية أصول عميل المراجعة لها تأثير جوهري على تقدير خطر المراجعة، باستخدام مؤشر من ٦ مؤشرات ذات صلة بمخاطر عميل المراجعة تم الحصول عليها من القوائم المالية لعملاء المراجعة. وقد تم تقييم درجة الملموسية كنسبة مئوية من إجمالي الأصول. ويختلف هذا التأثير الجوهري اعتمادًا على سمعة مكتب المراجعة، والتي يتم تصنيفها إلى ٤ مستويات، حيث تمثل المكاتب الأربع الكبرى المستوى الأول. علاوة على ذلك، فإن الارتباط بين درجة الملموسية ومخاطر المراجعة المقدره يظل جوهريًا وإيجابيًا بعد إجراء المزيد من التحليلات التي تشمل الأخذ في الاعتبار تأثير بعض المتغيرات الرقابية. بالإضافة إلى ذلك، تم استنتاج أن سمعة مكتب المراجعة تحد من تأثير درجة ملموسية أصول عميل المراجعة على تقدير خطر المراجعة، وذلك من خلال تقسيم العينة إلى عملاء يتم مراجعتهم من قبل المكاتب الأربع الكبرى وأولئك الذين يتم مراجعتهم من قبل المكاتب غير الأربعة الكبرى.

وعليه فإن ما تم التوصل إليه من استنتاجات تم التأكد من صحتها بنتائج التحليلات الأخرى التي استخدمت تقنيات مختلفة لقياس متغيرات البحث.

حدود البحث - تتمثل الحدود المكانية للبحث في الاقتصار على الاستعانة بعينة من الشركات غير المالية المدرجة في البورصة المصرية. ومن ثم فإن تعميم نتائج البحث مشروط بمعايير تحديد مجتمع وعينة الدراسة. وفيما يتعلق بالحدود الزمنية، فقد راعت الباحثة اقتصار فترة الدراسة بعد تطبيق المعايير الدولية لإعداد التقارير المالية في مصر عام ٢٠١٥ وقبل انتشار فيروس كوفيد من أجل استبعاد أي آثار محتملة لتطبيق المعايير المحاسبية الجديدة والمخاطر المتعلقة بتداعيات كوفيد ١٩ على العلاقة محل الدراسة والاختبار. وفيما يتعلق بالقيود الفنية، فقد اقتصر البحث على دراسة نوع محدد من درجة تعقد التقارير المالية لعميل المراجعة والذي يرتبط بدرجة ملموسية الأصول.

المساهمة العلمية - في حدود علم الباحثة، توجد ندرة نسبية في البحوث التي تناولت درجة الملموسية كعامل يؤثر على تقدير خطر المراجعة، على النحو المستخدم في هذا البحث والمكون من مقياس يشمل ٦ مؤشرات، وعلاقتها بسعة مكتب المراجعة في سياق البحوث المصرية. كما أن نتائج هذا البحث لها العديد من التداعيات التي قد تكون محل اهتمام كل من الأكاديميين، ومراقبي الحسابات والهيئات التشريعية الذين يرغبون في تحسين جودة بيئة ممارسة مهنة المراجعة في الدول النامية.

الكلمات المفتاحية: ملموسية الأصول، مؤشر قياس خطر المراجعة، سمعة مكاتب المراجعة، مستويات تصنيف مكاتب المراجعة.

1. Introduction

The process of identifying and evaluating risks used by the auditor is dynamic and depends on his understanding of the audit client business, internal control structure, and the appropriate framework for financial reporting. In the digital era, most firms utilize IT tools and resources to support their business operations including IT infrastructure, IT applications, and the people who work on those tools and resources. This leads to increased concerns about the reliability of information in terms of the accuracy, completeness, and legitimacy of transactions in the audit client's information system. The auditor, in turn, must develop and carry out the appropriate audit procedures to recognize and evaluate the risks of material misstatement (RMM) taking into account the increased complexity associated with using the technological tools (IAASB, 2019).

Two types of risks compose the RMM at the assertion level: inherent risk (IR) and control risk (CR). Before taking into account any associated controls, IR is defined as the vulnerability of an assertion regarding a group of transactions, account balance, or disclosure to a misrepresentation that could be material, either singly or when combined with additional misstatements. However, CR is defined as the possibility that an assertion about a group of transactions, an account balance, or a disclosure could be deceptive and that it would not be promptly prevented, discovered, and corrected (IAASB, 2019).

The International Auditing and Assurance Standards Board (IAASB) updated the International Standard on Auditing (ISA) No. 315 in 2019, which has been effective since 2021, as well as, the American Institute of Certified Public Accountants (AICPA) issued the Statement on Auditing Standards (SAS) No. 145 that supersedes AU-C Section 315, along with updated standards that deal with the accounting estimations and the utilization of specialists, to be effective starting from December 2023, to address auditor's responsibilities toward risk assessment under the more complex business environment. According to the ISA 315 (Revised), the IR

indicators include features of situations or circumstances that influence the likelihood of an assertion regarding an account balance, a group of transactions, or a disclosure being incorrect before controls are taken into account, whether as a result of fraud or error. **Complexity**, uncertainty, subjectivity, or vulnerability to misstatement owing to managerial bias, are examples of qualitative IR indicators. For example, a complex IT environment might come from an entity having many IT systems in different subsidiaries that are not adequately linked, or a new IT system being deployed that will have an impact on financial reporting (IAASB, 2019; AICPA, 2021).

The danger of delivering a clean opinion on financial statements that are materially misstated is referred to as audit risk, and it is directly correlated with the business risk of the auditor which is linked to the business risk of his client (Choi et al., 2018; Datta et al., 2020; Fakhfakh & Jarboui, 2022). For IR, significance may be taken into account concerning how and to what extent IR factors influence the possibility of a misstatement occurring as well as the potential size of the misstatement should it occur. Thus, a decision regarding the assessed IR at the assertion level is based on the audit client's complexity, among other factors. The auditor's estimate of CR must be made in such a way that the RMM and IR are equal when there are no plans to verify the operational effectiveness of controls, and, in turn, the auditor would reduce the planned level of audit risk (IAASB, 2019; AICPA, 2021).

In this context, **intangibles** are of assets that require accounting estimates. The importance of intangible assets in determining a firm's worth is rising, and they are quickly overtaking tangible assets as the primary determinant of a firm's competitiveness. To outperform rivals in the ever-changing market, firms concentrate on their intangible assets. However, accounting for intangible assets is an urgent issue of financial accounting, as there is controversy regarding the requirements for their recognition, measurement, presentation, and disclosure. It is also a professional issue because the audit client's recognition of these assets requires the auditor to

take into account the impact of this on the external audit process. The estimating approaches use ambiguous valuations and extremely subjective assumptions that may expose auditors to an unfair litigation risk (Pickerd & Piercey, 2021; Azamat et al., 2023).

In contrast, **tangible** assets play a significant role in the ability of many firms to generate revenue. In addition, the ability of a firm's physical assets to be realized in the event of liquidation to pay creditors makes them a valuable indicator of the firm's creditworthiness. As a result, the type and amount of tangible assets purchased by firms reflect those firms' ability to compete in particular industries. Many studies (e.g., Lu-Andrews & Yu-Thompson, 2015; Chukwu & Egbuhuzor, 2017; Camisón et al., 2022) provided evidence supporting the role of tangible assets in enhancing firms' performance and the ability to get access to finance.

From the audit standpoint, intangibles are different from tangible assets in terms of valuation uncertainty that may raise audit risk. Concerning the impact of the degree of audit client's assets tangibility on the auditor's assessment of the level of audit risk, some studies (e.g., Krishnan & Wang, 2014; Datta et al., 2020; Prabhawa & Nasih, 2021) indicated that the audit client's recognition of **intangibles** has a significant effect on the auditor's assessment of the level of the audit risk. **However**, a considerable amount of a firm's overall assets are **tangible** assets, which can be used to dramatically affect a firm's financial performance and position. To ensure that these assets are reported at the proper cost, the audit of property, plant, and equipment (PP&E) mainly entails collecting and analyzing the original records, recalculating the depreciation costs, and physically examining the available assets. As a result, PP&E is typically thought to have lower IR than other kinds of assets. Thus, if the auditor fails to comprehend the accompanying potential risks in auditing tangible assets, and assessing the related risk as low, this may lead to audit failure (Popovici, 2019; Zhang et al., 2021).

Moreover, beginning in the 2000s, financial scandals, such as WorldCom and Enron, served as a stimulus for significant changes in the USA's audit market. These changes include the downfall of Arthur Andersen, one of the large 5 audit firms at the time, the implementation of SOX, and the introduction of the PCAOB's audit firm inspection program for publicly traded firms. Hence, these events had significant consequences on the evolution of what is referred to as 2nd tier auditing firms given that they helped investors perceive the financial reporting of auditees audited by these firms as more credible (Cassell et al., 2013; El-Dyasty, 2017). Prior research concentrated on industry experience, audit quality, and audit fees when comparing Big 4 versus non-Big 4 auditors. However, little is known about name-brand reputation.

In this context, some research (e.g., Aronmwan et al., 2013; Saito & Takeda, 2014; Pham et al., 2017; Huang et al., 2020; Kurniawati et al., 2020) supported the higher quality audits done by the Big 4, while others (e.g., Cassell et al., 2013; Rudyanto et al., 2017; MohammadRezaei et al., 2018; Lento & Yeung, 2021) found no significant difference between the effectiveness of Big 4 and other audit firms whether those belong to the 2nd tier, or local firms, especially in competitive market of audit services. However, one of the most frequent areas of findings of the Financial Reporting Council (FRC) inspection and supervision over 2nd and 3rd tiers audit quality in 2022 is a lack of skill in using professional judgment and skepticism. It recommended focusing on procedures relating to the assessment of the IT-related controls and utilizing suitable data analytics to enhance their ability to audit complex clients (FRC, 2022).

In auditing, reputation is crucial and auditors are concerned about safeguarding their image. In this context, as manpower is the key element in generating audits, the delivery of audits of high quality is related to the **reputation of the audit firm**, the technology used in conducting the audit, and the level of experience of the auditors appointed to an engagement. It is evidenced that engagements led by specialized partners are linked to improved audit quality since there is a lot of evidence that auditors can

become experts in particular industrial sectors in order to enhance efficiency or benefit from knowledge sharing. Prior research has mostly concentrated on the association between industry specialization and audit quality. However, team dynamics might affect how much an audit team uses its members' industry-specific expertise (Cahan et al., 2022; Deng et al., 2023). Therefore, the **current research** concentrates on the reputation of the audit firm, not the individual partners, because the perceived capabilities of individual auditors are within the audit firm's exclusive control.

According to earlier research, auditors consider client risk factors while managing their client portfolios in response to variations in lawsuit liability. Moreover, audit partners who are specialists in a specific sector are less likely to take risky clients than sector specialists at the audit firm level, indicating that individual auditors are more conservative than the audit firm as a whole. More research efforts demonstrate that large audit firms deliver high-quality audits due to their greater regional assistance networks, experience, and knowledge, and they are more willing to take on risky clients, however, others contend that risky audits harm the audit firm's reputation and negatively impact the firm's capacity to attract and keep clients in the local region (Alareeni, 2019; Beck et al., 2019; Hsieh et al., 2022). **Thus**, whether the reputation of an audit firm influences the auditor's risk assessment is an empirical question.

Moreover, to the researcher's knowledge, there is a relative lack of research that has investigated the auditor's assessment of the level of audit risk in light of the audit client's assets tangibility and whether the **reputation** of the audit firm plays an interactive role with the audit client's assets tangibility in affecting the auditor's risk assessment when planning for an audit of the historical annual financial statements. The aforementioned studies agreed on the positive impact of the reputation of the audit firm on the assessment of the level of the IR of intangible assets, as a result of increasing the efficiency and effectiveness of the performance

of the audit process, and then increasing the ability to reduce the practices of opportunistic behavior of management.

The audit practice environment of Egypt is distinct as there are several distinct kinds of auditors. Therefore, the conventional distinction between large and smaller audit firms may not be accurate. Many Egyptian auditing firms have affiliations with various levels of foreign auditing firms. In the Egyptian market, local auditing firms hold a dominant position. Additionally, the Accountability State Authority (ASA) conducts audits regularly for certain firms (El-Dyasty, 2017). According to El-Dyasty (2017), audit firms linked with global audit firms on the 3rd tier have a significant market share, but those on the 2nd tier have a smaller market share. Local auditing firms, however, have a powerful reputation in the industry. The Egyptian audit market is, therefore, complicated and competitive.

In addition, Egypt's institutional environment is characterized by low levels of lawsuit risk and investor protection (Mostafa, 2017). Additionally, Egyptian auditing standards have been translated from the old ISA since 2008. As a result, past research on the relationship between risk assessment and the reputation of the audit firm in developed nations may not apply to Egypt. Moreover, within the limits of the researcher's knowledge and the findings of studies in the field of audit risk, most prior studies conducted on this issue have focused on the increased audit fees as an indication of the higher risk. **However**, there is a relative lack of studies that measured the audit risk using the audit client's financial indicators, as adopted in the current research, and whether the reputation of the audit firm plays an interactive role in responding to the degree of auditee's assets tangibility when assessing the audit risk.

In light of the above discussion, the **research problem** can be expressed in how to answer the following questions theoretically and practically: (i) Does the tangibility degree of the audit client assets significantly affect the auditor's assessment of the level of audit risk? (ii) Does this significant effect differ according to the reputation of the audit

firm, as a moderating variable on this relationship? Finally, if previous studies and the experiences of some countries support these relationships, is there any empirical evidence in the Egyptian professional practice environment? If so, what are its professional implications?.

Therefore, the **objective** of this research is to study and test the effect of the degree of assets tangibility of the audit client on the auditor's assessment of the desired level of audit risk. In addition, it tests the effect of the audit firm's reputation as an interactive variable with the degree of assets tangibility in affecting the audit risk assessment.

The research gains **scientific importance** because it is moving in the direction of narrowing the expectations gap in the audit, by supporting the ability of the professional auditor to estimate the level of audit risk in light of the increase in the IR related to the complexity of the audit client. This research also adds to studies related to auditing tangible assets and improving audit quality, by searching to narrow the gap resulting from not giving sufficient attention in previous studies to the impact of the audit firm's reputation on the relationship between the audit client's assets tangibility and the auditor's assessment of the level of risk associated with it, in a way that serves preparing honest financial statements. The significance of this research is further evidenced by the fact that it contributes to the accounting literature generally and to Egyptian accounting literature specifically.

The research has **practical** importance because it seeks to test its hypotheses through an empirical study, which can lead to outcomes that contribute positively to improving the ability of the auditor to improve the quality of his professional judgments in general and to assess the level of IR of tangible assets in particular, and then estimate the acceptable level of the audit risk when planning audit procedures. Thus, the audit risk is minimized, which lowers the likelihood of lawsuits and increases the ability to persuade the public to trust the audit profession. In addition, the research tests the impact of the audit firm's reputation, as a moderating

variable on this relationship, in the Egyptian professional practice environment, which is a research field that suffers from relative scarcity in Egypt.

Given that audit firms may differ in their internal guidelines and, as a result, have varied attitudes toward risk, the **current research contributes to the literature** in this field by examining if the reputation of an audit firm has an impact on the auditor's assessment of the audit risk when accepting to audit clients with high versus low assets tangibility.

Finally, this empirical research offers more information to policymakers who are trying to increase trust in financial statements and the audit profession in a developing country like Egypt. That is, it emphasizes the audit client's assets tangibility in light of the prevalence of intangibles linked with an increase in the use of digital tools, which would also be advantageous for preparers and users of financial statements, auditors, and academics.

The remaining portion of the research will be scheduled as follows to accomplish its objectives and handle its problem. **Section 2** discusses the relevant literature to derive the research hypotheses. **Section 3** illustrates the empirical study. The results of the hypotheses testing of the main analysis are reported and discussed in **Section 4**. While results of the other additional analyses are presented in **Section 5**. Finally, the summary of research findings, research limitations, and implications are demonstrated in the conclusion **Section 6**.

2. Literature Review and the Development of Hypotheses

To achieve the objectives of the research, the researcher addresses in this part the following aspects: analyzing the relationship between the audit client's assets tangibility and the auditor's assessment of the audit risk to derive the first hypothesis for the research (**H₁**). In addition to analyzing the impact of the audit firm's reputation on this relationship and deriving the second hypothesis for the research (**H₂**), in light of relevant previous studies.

2.1 Analyzing the Association between Audit Client Assets Tangibility and the Auditor's Assessment of Audit Risk

Litigation risk, which is known as the possibility that the auditor would be sued, is frequently cited as the primary cause of auditor resignations. However, there are two other types of risks; namely, the business risk of the audit client, which is the risk related to the client's survival and profitability, and the audit risk, which is the possibility that the auditor would give an incorrect audit opinion if the financial statements include major misstatements (Ghosh & Tang, 2015; Woo & Lim, 2015).

In this context, the IAASB updated ISA No. 315 in 2019, which has been effective since 2021, to address the auditor's responsibilities toward risk assessment under the more complex business environment. According to ISA No. 315 (Revised), accounting estimations that have sophisticated models or substantial estimated uncertainty, quantitative disclosures, or account balances involving complicated computations and accounting principles that may be interpreted differently are all indicators of high IR (IAASB, 2019). Similarly, the AICPA issued the SAS 145 in 2021 to be effective as of December 2023. This standard agrees with its international counterpart ISA No. 315 in enhancing the audit quality under the more complex reporting environment by improving the auditor's risk assessment process by focusing on the IR indicators and IT-related controls (AICPA, 2021). None of the updated ISA No. 315 or SAS 145 changed the audit risk planning model, but the focus is on evaluating the associated IR factors when assessing the RMM. The auditor must now assess CR to the highest possible level of the RMM equal to the assessment of IR if the auditor does not intend to verify the operational effectiveness of controls.

Among the complex procedures that are used in accounting measurements are a broad range of measuring criteria that could be used for estimation purposes in accounting, for instance, depreciation for tangible fixed assets and amortization for intangibles. Accounting estimates and accompanying disclosures, as well as, events or transactions involving high

measurement uncertainty may indicate the possibility of RMM at the assertion level (IAASB, 2019).

According to ISA No. 701, the auditor's function is expanded by the introduction of what is known as the Key Audit Matters (KAM) paragraph, which calls for the disclosure of the client's major risks. KAM are those that, from the professional viewpoint of the auditor, are of greatest significance in the auditing of the financial statements. This suggests that the auditor has to analyze risks in conformity with ISA No. 315 following a risk-based audit methodology. Auditing is thought to be more difficult in some industries than others since some industries have more assets, but they are typically simpler to audit than industries that have substantial knowledge-intensive assets, receivables, or inventories (Sierra-García et al., 2019).

KAM can be classified into two categories: (1) KAM for entity-level risk, or the total number of KAM for client risk relating to litigation, tax, controls, and acquisition accounting, as well as (2) Account-level risk KAM connected to particular financial statement items such as PPE, intangibles, inventory, and asset impairment (Sierra-García et al., 2019; Elsayed et al., 2023). In this context, **asset tangibility** is defined as the degree to which an investment in PP&E relates to the total asset value of a firm. They are capital-intensive items that are used for more than one accounting period and frequently make up most of the value of the entire assets of industrial firms. From the standpoint of users, investments in physical assets have an impact on a firm's profitability. In addition, asset tangibility is quite important to liquidation value in the event of default because firms can use their physical assets as collateral (Lu-Andrews & Yu-Thompson, 2015; Chukwu & Egbuhuzor, 2017; Cardão-Pito et al., 2021).

Tangible assets affect not only the balance sheet that makes up those assets, but also the income statement that includes items such as gain/loss on disposals, depreciation expense, and impairments. **Given the subjective nature of the audit**, absolute assurance is not achievable, but auditors still

can offer a high degree of assurance by exercising necessary professional care. Therefore, auditors must take into account subjective judgments made by management regarding asset usable life, salvage value, depreciation method, fair value, and write-downs while developing the audit plan (Popovici, 2019; Zhang et al., 2021). However, Zhang et al. (2021) provided evidence that to lower audit expenses, auditors may see these assets as low-risk regions and merely draw upon their prior understanding of the PP&E of their clients. That is, an audit client with more tangible assets is more likely to continue operating and less likely to change.

On the other facet, intangible assets are among the key components of success for every firm, so in the modern business environment, firms need them in addition to tangible assets. In most cases, a firm's market value exceeds its book value because the value of intangible assets and intellectual capital is not fully reflected in financial statements, which would result in the asymmetry of information and an increase in audit risk (Mohammadzadeh, 2020). According to the findings of some studies (Sierra-García et al., 2019; Lennox et al., 2023), auditors reveal more RMM for larger, riskier, and more complicated firms which are in line with the goals of risk-based auditing. However, Sierra-García et al. (2019) found that firms audited by EY, Deloitte, and KPMG, as large audit firms, are less risky clients.

The relationship between audit risk and fees when auditing intangibles has been extensively studied in the literature providing strong evidence that audit risk and fees are positively correlated. According to earlier studies (e.g., Krishnan & Wang, 2014; Datta et al., 2020), the business risk of a client is tied to the business risk of the auditor, which in turn is related to audit risk. On one side, the flexibility in accounting for estimates enables managers to share confidential information about the potential economic success of their products. This signals lower business risk for the audit client, and hence lower audit risk. According to this line of reasoning, audit fees and intangibles have an adverse relationship. On the other side, intangibles raise the audit risk by increasing the risk of managing earnings

which motivates the auditor to put up a greater effort to make sure that the recognition of intangible assets is accurate to make up for the increased audit risk. This includes obtaining more evidence and undertaking more testing.

In general, the goal of auditing is to lower the information risk for those using the financial statements to a level that is socially acceptable. Numerous actions taken by auditors are intended to lower audit risk. They gather information with great care and verify the assertions claimed in financial statements. When there is negative information, they also take action to make sure that they have thoroughly investigated the suspected accounts. If earnings management is suspected, then the audit risk is high, and auditors expend more time and effort performing the audit processes. The fundamental idea of estimates made by management is strongly associated with these auditing practices. If there is a stronger internal control in place, this may minimize the danger of major distortion and, as a result, auditing risk (Choi et al., 2018; Fakhfakh & Jarboui, 2022).

In this context, previous research has emphasized the connection between audit risk and earnings management. For instance, Fakhfakh & Jarboui (2020) showed that auditors plan a lower level of audit risk for firms distinguished with greater discretionary accruals. For financially distressed firms, Choi et al. (2018) demonstrated a positive relationship between audit fees, as a measure of the audit risk, and real earnings management.

Concerning Egypt's institutional environment, it is characterized by low levels of lawsuit risk and investor protection. Additionally, Egyptian Standards on Auditing (ESA) are translated from the old ISA since the Minister of Investment Decree No. 166 of 2008 was issued to adopt Egyptian standards on auditing, limited review, and other assurance services, in line with international professional standards at that time provided that reference is made to international standards in respect of which Egyptian standards have not been issued. According to the requirements of listing on the Egyptian Stock Exchange (EGX), listed firms

must provide financial statements audited annually (FRA, 2023). Hence, auditors must comply with ESA No. 315 to understand the environment of their client and assess the RMM besides the other standards and regulations related to conducting an audit. As a result, past research on the relationship between the tangibility of the audit client's assets, risk assessment, and the reputation of the audit firm in developed countries may not apply to the Egyptian professional environment.

Accordingly, the researcher concludes that, among factors that affect the auditor's assessment of the audit risk, when planning for an audit of the historical annual financial statements, the degree of the client's accounting complexity as represented by the required estimates for some items related to tangible assets. Despite being an indicator of the good financial position of a firm and safety margin for creditors in case of solvency, tangible assets include estimates to calculate the depreciation which makes them subject to manipulation. Therefore, if the auditor becomes familiar with his client and considers that the fixed assets have no change in their values, he can plan the acceptable audit risk level to be high. However, if the auditor recognizes that the related IR as high, in the absence of effective control, the RMM will be high, and therefore the auditor needs to plan a low level of audit risk. Given the conflicting findings regarding the effect of the audit client's assets tangibility on the auditor's assessment of audit risk, the researcher formulates the following first hypothesis of this research in an alternative undirected form:

H₁: The audit client's assets tangibility significantly affects the assessed audit risk as reflected by the historical financial statements of nonfinancial firms listed on the EGX.

2.2 Analyzing the Moderating Role of the Audit Firm Reputation on the Association between Audit Client Assets Tangibility and the Auditor's Assessment of Audit Risk

According to earlier research, among the factors that have the greatest influence on the quality of an audit are the **reputation** of the audit firm and

the expertise of the auditor. The image of an audit firm that develops over time constitutes its reputation. It can be due to the variety of auditors the firm employs, its name reputation in the market, the perceived quality of its audits, and the fees it charges. Reputation has also been a consequence of the technical and functional excellence of audit firms (Aronmwan et al., 2013).

The **reputation** of an auditing firm is thought to be correlated with the overall quality of the financial report. Two distinct classifications can be used to categorize auditing firms: (i) the big auditing firms, which are the top four professional services firms in the world; namely KPMG, PwC, EY, and Deloitte, and (ii) the other local audit firms as the non-Big 4. Due to their expertise, wide base of clients, and international network, the Big 4 are thought to be of higher quality than nonbig4 and have the incentives to keep the attained powerful reputation. In addition, Big 4 is thought to possess more resources, both operationally and financially, they can spend money on technology, hiring and training staff, standardizing audit procedures, and other things that will improve the audit quality. However, there are certain points of view in favor of the smaller audit firms due to their advantages in regional markets and the close connection with their clients. However, there is another viewpoint that contends that the closer ties between non-Big 4 firms and their clients could impair the auditing process. Moreover, the influence of reputational harm may be less severe in economies with insufficient investor protection than it is in other economies, leading to a tiny distinction between the quality of non-Big 4 and Big 4 audits when operating under the same legislation (Hsieh & Lin, 2016; Alareeni, 2019; Beck et al., 2019; Hsieh et al., 2022; Tran & Tran, 2023).

Auditors who preserve their reputations could increase their share of the market and their ability to demand higher fees. Moreover, their motivations to exercise caution will increase as a result of reputational impacts even under circumstances of the absence of a liability system due to the possibility of being held accountable and losing clients (Bigus, 2015;

Bergner et al., 2020). However, the results of prior studies are conflicting. Some research (e.g., Aronmwan et al., 2013; Saito & Takeda, 2014; Pham et al., 2017; Huang et al., 2020; Kurniawati et al., 2020) supported the higher quality audits done by the Big 4, while others (e.g., Cassell et al., 2013; Rudyanto et al., 2017; MohammadRezaei et al., 2018; Lento & Yeung, 2021) found no significant difference between the effectiveness of Big 4 and other audit firms whether those belong to the 2nd tier, or local firms, especially in a competitive market of audit services.

In this context, a big audit firm has more to lose by failing to report a major misstatement found in a client's records, which is why there is a positive correlation between the size of an audit firm and audit quality. Some studies (e.g., Aronmwan et al., 2013; Saito & Takeda, 2014; Pham et al., 2017) demonstrate that judgments given by large auditing firms are trustworthy and offer more insightful signs of financial collapse, than those given by auditors have little training, because they employ globally standardized audit procedures and training programs. Additionally, Kurniawati et al. (2020) indicated that firms audited by a local Big 4-affiliated auditing firm exhibit reduced debt levels, however, the relationship with 2nd tier auditing firms has no such impact. Similarly, according to the study of Huang et al. (2020), the Big 4 outperform 2nd tier auditors in preventing managerial misappropriation of business liquidity since they indicate that auditors from the Big 4 tend to play a considerably bigger role in discouraging management from misappropriating outside shareholders' cash resources than their non-Big 4 competitors. Therefore, it is evidenced by Lyubimov (2019) that the Big 4 charges their clients higher fees, while the 2nd tier raises their charged fees in case of risky auditees.

Contrarily, the size of an audit firm may have no appreciable impact on audit quality. According to some studies applied to emerging economies (e.g., Rudyanto et al., 2017; MohammadRezaei et al., 2018), financial statements that have been audited by audit firms of high reputation include similar accruals of discretion as those that were audited by other firms which implies that audit quality is unaffected by the reputation of the audit

firm. Moreover, Cassell et al. (2013) found that 2nd tier clients' financial reporting reliability is in line with large four audit firms' clients and is superior to other audit firms' clients. These results are significant because they may decrease regulators' concerns over the level of competition in the audit market. In China, Lento and Yeung (2021) find that the 2nd tier, international Big 4, and the larger local audit firms are all of equal perceived quality, despite the higher real quality provided by the international Big 4.

The audit practice environment of Egypt is distinct, by analyzing data for firms that were listed on the EGX in 2016, it is revealed by El-Dyasty (2017) that the four major auditing firms do not dominate the Egyptian market. Both the local audit firm and the 3rd tier affiliates of multinational audit firms have sizable market shares. The findings indicate that while Big4 gets larger audit fees than other audit firms, they do not deliver an audit of greater quality. In addition, the management of earnings could not be limited by any audit firm. In terms of litigation risk, information transparency, and the efficacy of regulatory control, the Egyptian audit market performs worse than mature audit markets like those in the UK and the US. However, it represents a suitable research environment for revisiting certain problems from earlier work is the Egyptian audit market. Additionally, Egyptian audit firms often have a small number of branches. This unique institutional context offers an opportunity to investigate the influence of the audit firm's reputation on risk assessment results at the audit firm level.

Hence, increasing the degree of competitiveness in the audit services market is a double-edged sword. On the one hand, this may lead to an increase in accuracy in planning audit work to improve the quality of service provided to preserve the reputation gained. On the other hand, it may lead to tolerance with clients and reduce the degree of professional skepticism, thus, reducing the level of quality of the audit service (Pan et al., 2023).

In light of the above, it is clear that the reputation of the audit firm may play a role in limiting management manipulations, and of course, among them are manipulations in estimates related to fixed assets. However, there is no agreement among studies concerning the fact that auditors belonging to the four major audit firms or other audit firms of different sizes have different responses to the degree of asset tangibility of the audit client when planning the assessed audit risk. Therefore, the researcher formulates the following second hypothesis of this research in an alternative undirected form:

H₂: The audit firm's reputation moderates the significant effect of the audit client's assets tangibility on the assessed audit risk as reflected by the historical financial statements of nonfinancial firms listed on the EGX.

3. The Empirical Study

This part aims to empirically test the research hypotheses to determine whether the audit client's assets tangibility influences the auditor's assessment of AR in the Egyptian professional environment (H₁). In addition to testing whether this expected influential relationship is moderated by the reputation of the audit firm (H₂). The research model that is used to test H₁ and H₂, and the proxies utilized to measure research variables are described in the below subsections.

3.1 The Basic Analysis Research Model

Figure 1 demonstrates the research model indicating that the research dependent variable (**DV**) is the degree of the audit client's assets tangibility which is expected to significantly affect the auditor's assessment of the AR, as the research independent variable (**IndV**). This expected relationship (H₁) has no specific direction since the tangibility of assets has the advantage of stability and safety in case of liquidation, and the disadvantage of estimates related to the calculations of the related depreciation. Accordingly, if the auditor uses his previous experience in auditing the fixed assets of his client, then assesses the IR as low which implies an increase in the assessed AR. However, if the auditor uses his professional skepticism, then he would

assess IR as high which implies reducing the assessed AR. Next, this influential association is tested while considering the reputation of the audit firm as a **moderator variable** with the audit client’s assets tangibility in affecting the assessed AR (H₂). That is, if the audit firm is ranked 1st tier, then it would be keen on preserving its rank and gained reputation, however, it is not clear whether the quality of audits provided by 2nd or 3rd tiers audit firms differ from the 1st tier ones.

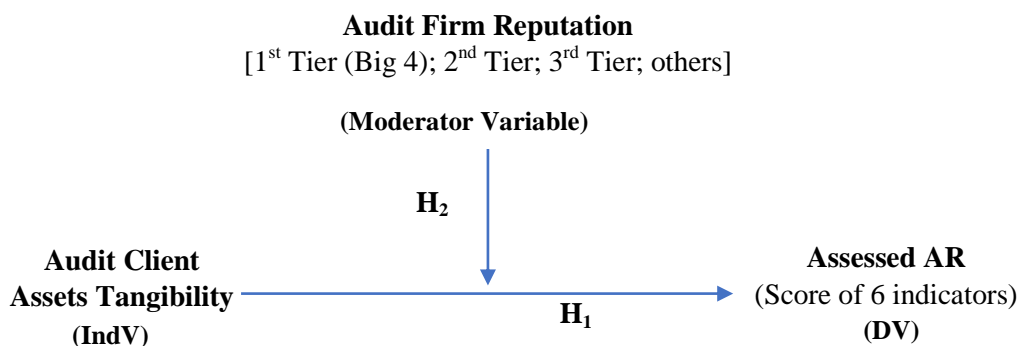


Figure 1: The Research Model

Source: Prepared by the researcher

3.2 Audit Client Assets Tangibility and the Auditor’s Assessment of Audit Risk: Testing Model of H₁

To test H₁ empirically, the effect of the audit client’s assets tangibility on the assessed AR, a simple regression model is run as follows:

$$AR_{it} = \beta_0 + \beta_1 Tang_End_{it} + \varepsilon_{it} \quad \text{Model (1)}$$

Where **Tang_End_{it}** is the net book value of PP&E as a percentage of ending total assets (TA) (Camisón et al., 2022; Chen et al. 2023); β_1 , is the coefficient of the IndV; and **AR_{it}** is the assessed audit risk. **Table 1** includes a list of the research variables, their statistical analysis symbols, and the methods utilized to measure each of them. Following the study of Ghosh and Tang (2015) in the way of **measuring the AR by an index score**, the researcher measures the AR in the current research by an index consisting of 6 measures related to indicators that represent key red flags for increased audit risk as follows:

1. **Quick ratio:** First the calculation of the ratio as current assets (CA) less inventories divided by current liabilities (CL) at the end of year (t). Next, if the auditee has a ratio of less than the median of the sample, it codes the value of “1” since less liquidity indicates more risk, and “0” otherwise (Duong et al., 2022; Feng et al., 2022).
2. **Current ratio:** First the calculation of the ratio as CA divided by CL at the end of year (t). Next, if the auditee has a ratio of less than the median of the sample, it codes the value of “1”, and “0” otherwise (Lyubimov, 2019; Duong et al., 2022; Chen et al. 2023).
3. **Debt ratio:** First the calculation of the ratio as total liabilities divided by TA. Next, if the auditee has a ratio greater than the median of the sample, it codes the value of “1” since more debt implies more risk, and “0” otherwise (Lyubimov, 2019; Datta et al. 2020; Duong et al., 2022; Chen et al. 2023).
4. **Complexity IR:** Receivables and inventory as a percentage of the TA. If the auditee has a ratio greater than the median of the sample, it codes the value of “1” since more accounting complexity measures of the auditee indicate more risk, and “0” otherwise (Datta et al. 2020; Duong et al., 2022; Feng et al., 2022; Chen et al. 2023).
5. **Audit opinion:** coded the value of “1” if the auditee received a modified opinion in the preceding year (t-1), and “0” otherwise (Lyubimov, 2019; Datta et al. 2020; Feng et al., 2022; Chen et al. 2023).
6. **Loss:** coded the value of “1” if in the preceding year to audit (t-1) the auditee reported losses, and “0” otherwise (Lyubimov, 2019; Feng et al., 2022; Chen et al. 2023).

Based upon these six indicators, a measure for AR is determined as a score between 0 and 6; that is each of the 6 indicators is scored as “1” as an indication of high AR, and “0” as an indication of low AR so that each observation takes a total score ranges from zero to six, then divided by the total of 6 to be expressed as a percentage.

Table 1: Proxies of Research Variables

Variable	Symbol	Proxies
The assessed audit risk “DV”	AR _{it}	<p>Proxied as a score out of a total of 6 since it indexed by the following 6 indicators:</p> <ol style="list-style-type: none"> 1. Quick ratio (QR): First the calculation of the ratio as CA less inventories divided by CL at the end of year (t). Next, if the auditee has a ratio of less than the median of the sample, it codes the value of “1”, and “0” otherwise (Duong et al., 2022; Feng et al., 2022). 2. Current ratio (CR): First the calculation of the ratio as CA divided by CL at the end of year (t). Next, if the auditee has a ratio of less than the median of the sample, it codes the value of “1”, and “0” otherwise (Lyubimov, 2019; Duong et al., 2022; Chen et al. 2023). 3. Debt ratio (DR): First the calculation of the ratio as total liabilities divided by TA. Next, if the auditee has a ratio of greater than the median of the sample, it codes the value of “1”, and “0” otherwise (Datta et al. 2020; Chen et al. 2023). 4. Complexity IR (Comx): Receivables and inventory as a percentage of the TA. If the auditee has a ratio greater than the median of the sample, it codes the value of “1”, and “0” otherwise (Datta et al. 2020; Feng et al., 2022; Chen et al. 2023). 5. Audit opinion (AUOP): coded the value of “1” if the auditee received a modified opinion in the preceding year (t-1), and “0” otherwise (Feng et al., 2022; Chen et al. 2023). 6. Loss: coded the value of “1” if in the preceding year to audit (t-1) the auditee reported losses, and “0” otherwise (Feng et al., 2022; Chen et al. 2023).
Audit Client Assets Tangibility “IndV”	Tang_End _{it}	The net book value of PP&E as a percentage of ending TA, for the basic analysis (Camisón et al., 2022; Chen et al. 2023).
Audit firm reputation “Moderator”	AF_Rank _{it}	Categorical variable with the value of “1” if the AF is one of the Big 4; the value of “2” if belongs to the 2 nd tier firms; “3” if belongs to the 3 rd tier firms; and the value of “4” for other local firms (Lyubimov, 2019; Huang et al., 2020; Lento & Yeung, 2021).

Source: Organized by the researcher.

3.3 The Moderating Role of the Audit Firm Reputation: Testing Model of H₂

To test H₂ which investigates the interactive effect of the audit firm's reputation on the relationship between the audit client's assets tangibility and the assessed AR, the below multiple regression model is run:

$$AR_{it} = \beta_0 + \beta_1 Tang_End_{it} + \beta_2 AF_Rank_{it} + \beta_3 Tang_End_{it} * AF_Rank_{it} + \varepsilon_{it} \quad \text{Model (2)}$$

Where **AF_Rank_{it}** is a categorical variable with the value of "1" if the audit firm (AF) is one of the Big 4, namely, KPMG, EY, PwC, and Deloitte; the value of "2" if belongs to the 2nd tier AF, BDO, RSM, Grant Thornton, Moore Egypt, and Baker Tilly; "3" if belongs to the 3rd tier firms, Mazars Egypt, UHY United, and Crowe Clark; and the value of "4" for other local firms (Lyubimov, 2019; Huang et al., 2020; Lento & Yeung, 2021). β_3 , the moderator variable's coefficient, and **Tang_End_{it}*AF_Rank_{it}** is the moderator variable.

3.4 Sample Selection

The websites of the sample firms and "Mubasher Misr Information" were the sources from which the researcher obtained the necessary information for assessing the underlying research variables. After excluding the financial services industry and firms that do not have the necessary data for the present research variables, the research sample consists of financial statements submitted in the official Egyptian currency for all nonfinancial firms listed on the EGX from 2017 through 2019, with the financial year ending on December 31. Data to measure variables are gathered for 90 firms that are listed from 14 industries with an overall 270 firm-year observations, as described in **Table 2**. This restriction is due to the data being available. The researcher has considered that the study period is after the introduction of IFRS in Egypt in 2015, and before Covid 19 becoming widespread to eliminate any potential effects of adopting the new accounting standards and the risks related to the consequences of Covid 19 on the association under examination.

Table 2: Selection of the research sample

Panel A: Conditions of selecting the research sample	Firms
Listed firms 2017-2019	220
<u>Less:</u>	
Financial services	46
Firms with other than December 31 fiscal year-end	40
Firms with insufficient data of interest	44
Final sampled firms	90
Total Firm-year observations	270

Panel B: Research sample by industry	Population	Sample	%
Basic Resources	16	8	9
Health Care & Pharmaceuticals	17	9	10
Industrial goods, Services, and Automobiles	6	3	3
Real Estate	32	18	20
Travel & Leisure	16	10	11
Utilities	1	1	1
IT, Media & Communication Services	5	2	2
Food, Beverages and Tobacco	28	13	14
Trade & Distributers	4	2	2
Shipping & Transportation Services	4	1	1
Contracting & Construction Engineering	11	6	7
Textile & Durables	9	3	3
Building Materials	13	12	13
Paper & Packaging	5	2	2
Total	167	90	100%

Source: Organized by the researcher.

4. Statistical Results

This section discusses the descriptive statistics for the research variables employed in the regression model and then presents the outcomes of the hypothesis testing.

4.1 Descriptive Statistics

Table 3 displays the descriptive data for each variable included in the empirical model for the sample period of 2017–2019. The data used are homogeneous as shown by the fact that the means of the study variables are between the maximum and minimum values in this table, which is further supported by the fact that the values of the standard deviation (SD) are lower than the mean for the same set of variables, which explains the variation of these variables in the financial statements of the sample firms. In addition, the mean of the DV, AR_{it} , is 0.538 which reflects the mean of the final AR score that ranges from zero and six as a percentage (divided by the total 6) which indicates that the sample firms have a medium risk level during the period 2017-2019. This is, also supported by the median of the AR_score of 4 with a maximum score observed among the research sample of 5 out of a total score of 6. Regarding the IndV, $Tang_End_{it}$, the mean is 0.246 indicating that most sample firms have a low degree of assets tangibility. For the AF_Rank_{it} , moderating variable, the mean (median) is 2.56 (3), indicating that most sampled firms are audited by 2nd and 3rd tiers AF during the covered period.

This finding is also supported when classifying the audit firms as Big 4 and non-Big 4 since the mean is 0.39 and the median is zero, which implies that most firms are audited by audit firms other than Big 4. Moreover, for the auditees audited by the Big 4, it is observed (untabulated) that KPMG has audited 45 observations of the research sample (270 observations), followed by EY auditing 35 (13%), then, 15 (5.5%) for PwC, and finally, 12 (4.4%) audited by Deloitte. This implies that 39.6% of the research sample has been audited by one of the Big 4 with the greatest share for KPMG (16.67%). Regarding the 2nd tier, it is found that Moore Egypt and Baker Tilly have audited 7% of the sample; and Mazars Egypt - Mostafa Shawki has audited 5% of the sample as 3rd tier AF. See the research **Appendix** for the ranking of audit firms in Egypt according to the number of auditees observed in the research sample.

Table 3: Overview of the descriptive statistics for the sample (n=270)

Variables	Min	Median	Max	Mean	SD
AR _{it}	0	0.667	0.833	0.538	0.269
AR_score	0	4	5	3.23	1.62
Tang_End _{it}	0.001	0.205	0.956	0.246	0.226
AF_Rank _{it}	1	3	4	2.56	1.378
Big4	0	0	1	0.39	0.49
Tang_End _{it} *AF_Rank _{it}	0.002	0.374	3.703	0.643	0.738

Source: Organized by the researcher.

The Pearson correlation is utilized to determine the strength of the association between the research variables. There is no multicollinearity issue because all the correlation coefficients between variables, as shown in **Table 4**, are below 0.7. Regression analysis can, therefore, be performed without any problems. In addition, the DV, **AR**, is significantly associated with the IndV **Tang_End** (0.582), indicating that the higher the tangibility degree of assets among sample firms, the higher the AR; and inversely correlated with the **AF_Rank** (-0.777), and **Tang_End*AF_Rank** (-0.658) indicating that the AR is lower for firms with higher assets tangibility and audited by AF other than the large four AF.

Table 4: Correlation among research variables (n=270)

Variables	AR	Tang_End	AF_Rank	Tang_End*AF_Rank
AR	1			
Tang_End	0.582*	1		
AF_Rank	-0.777*	-0.426*	1	
Tang_End*AF_Rank	-0.658*	-0.294*	0.708*	1

* Significant at 0.05 two tails.

Source: Organized by the researcher.

4.2 Empirical Results of Testing Model of H₁

The results of the simple regression that tests the effect of the tangibility of audit clients' assets on the AR, which is proxied by an index score, are summarized in **Table 5**. The findings validate the model (P-value = 0.000), demonstrating its suitability for testing the investigated relationship. Moreover, the adjusted R² reveals that the tangibility of clients' assets accounts for 33.6% of variations in the AR. Besides, the coefficient of the Tang_End (0.693) is positive and significant demonstrating that there is a direct association between the tangibility of audit clients' assets and the AR. This result is consistent with the direct correlation (0.582) between AR and Tang_End described in **Table 4**. **These outcomes support H₁.**

Table 5: Results of the regression model to test H₁*

$AR_{it} = \beta_0 + \beta_1 Tang_End_{it} + \epsilon_{it}$		
<u>Variable</u>	<u>β</u>	<u>P-value (t-statistics)</u>
Intercept	0.368	0.000 (18.603)
Tang_End	0.693	0.000 (11.711)
R ²		0.3385
Adjusted R ²		0.3360
F-statistic (Model Sig.)		137.143 (0.000)

* The model is performed on a sample of 270 firm-year observations for the financial years 2017–2019, with an acceptable level of significance of 5%.

Source: The SPSS 26's output as organized by the researcher.

Despite being a sign of a firm's sound financial health, tangible assets have estimates built into them that make them vulnerable to manipulation. **Accordingly**, the researcher believes that the level of accounting complexity of the auditee, as shown in the needed estimations for various items of tangible assets, increases the assessed audit risk. The conclusion reached is consistent with what other studies (e.g., Choi et al., 2018; Sierra-García et al., 2019; Fakhfakh & Jarboui, 2020) have concluded.

4.3 Empirical Results of Testing Model of H₂

Testing results of H₂, concerning the moderating effect of the audit firm's reputation on the relationship between the audit client's assets tangibility and the assessed AR, are described in **Table 6**.¹ The p-value of the model is less than 0.05 indicating its significance, and the adjusted R² is enlarged from 33.6% to 70.14%. Moreover, the significant interactive variable's negative coefficient (-0.081), **Tang_End*AF_Rank**, indicates that the degree of asset tangibility's impact on audit risk is moderated by the audit firm's reputation. Additionally, it should be mentioned that the Tang_End coefficient is still positive (0.367) and significant (p-value = 0.000). **Therefore, the outcomes support H₂**. These outcomes are in alignment with other studies (e.g., Huang et al., 2020; Kurniawati et al., 2020) that support the idea that large audit firms are aware of the potential for manipulating tangible assets, which has been found to raise the audit risk for their clients.

¹ Pallant (2016) asserts that if the greatest Variance Inflation Factor (VIF) value is more than 10, the model would be vulnerable to multi-collinearity, or excessive correlations between independent variables. There is no violation of this assumption because Table 6's maximum VIF value is 2.241. As a result, the multi-collinearity problem is absent during the estimation of the multiple regression model.

Table 6: Results of the multiple regression model to test H₂*

$$AR_{it} = \beta_0 + \beta_1 Tang_End_{it} + \beta_2 AF_Rank_{it} + \beta_3 Tang_End_{it} * AF_Rank_{it} + \varepsilon_{it}$$

<u>Variable</u>	<u>β</u>	<u>P-value (t-statistics)</u>	<u>VIF</u>
Intercept	0.745	0.000 (27.359)	
Tang_End	0.367	0.000 (8.374)	1.222
AF_Rank	-0.096	0.000 (-9.805)	2.241
Tang_End*AF_Rank	-0.081	0.000 (-4.679)	2.007
R ²		0.7047	
Adjusted R ²		0.7014	
F-statistic (Model Sig.)		211.634 (0.000)	

* The model is performed on a sample of 270 firm-year observations for the financial years 2017–2019, with an acceptable level of significance of 5%.

Source: The SPSS 26's output as organized by the researcher.

Accordingly, the evidenced significant negative impact of the interaction between the AF_Rank and Tang_End on the assessed AR implies that if firms are audited by the 2nd or 3rd tiers AF, then they are more likely to have lower assessed AR compared to those audited by the large AF. This result is consistent with the correlation coefficient (-0.658) between Tang_End*AF_Rank and the AR reported in **Table 4**.

Therefore, the **researcher** concludes that the positive effect of the degree of assets tangibility on the assessed audit risk, as proxied by an index score of 6 indicators, differs with the ranking of audit firms. More specifically, as audit firms are classified as 2nd or 3rd tiers, they are more likely to be tolerant with their clients in the competitive market, reduce the degree of professional skepticism, and thus ignore the possible manipulation of tangibles, as reflected by the reduced assessed risk implied by measures extracted from the financial statements. These findings agree with others (e.g., Lyubimov, 2019; Kurniawati et al., 2020; Huang et al., 2020) that the large international AF is keen to exercise professional skepticism to provide higher quality audits.

5. Other Analyses

To further confirm the results reached, the researcher conducted further statistical tests. **First**, model (1) is retested including the market-to-book (MTB), growth in sales (GSales), and firm size measured by log. of total assets Log(TA) as control variables related to some auditee’s characteristics (Ghosh & Tang, 2015; Woo & Lim, 2015; Chen et al., 2023). **Table 7** shows that the model is significant, and the adjusted R² is enlarged from 33.6% to 61.13%. Moreover, the **Tang_End** coefficient is still positive (0.430) and significant (p-value = 0.000). The coefficients of both MTB and GSales are significant, while Log(TA) is not significant.

Table 7: Results of the model (1) retested including control variables*

$$AR_{it} = \beta_0 + \beta_1Tang_End_{it} + \beta_2MTB_{it} + \beta_3GSales_{it} + \beta_4Log(TA)_{it} + \varepsilon_{it}$$

<u>Variable</u>	β	P-value (t-statistics)	VIF
Intercept	1.209	0.000 (8.642)	--
Tang_End	0.430	0.000 (8.748)	1.178
MTB	-0.029	0.000 (-7.007)	3.023
GSales	1.010	0.000 (12.703)	3.314
Log(TA)	-0.016	0.259 (-1.130)	1.012
R ²	0.6171		
Adjusted R ²	0.6113		
F-statistic (Model Sig.)	106.775 (0.000)		

* The model is performed on a sample of 270 firm-year observations for the financial years 2017–2019, with an acceptable level of significance of 5%.

Source: The SPSS 26’s output as organized by the researcher.

Second, model (2) is retested using the ranking of audit firms as Big 4 versus non-Big 4, instead of the 4 tiers classification, following some prior research (Lyubimov, 2019; Duong et al., 2022; Feng et al., 2022) where the moderating variable BigAF coded the value of “1” for clients audited by a Big 4 AF, and the value “0” otherwise. As described in **Table 8**, the p-value of the model is less than 0.05 indicating its significance, and the adjusted R² is decreased from 70.14%, under the 4 tiers classification, to 65.68%. Moreover, the significant interactive variable’s negative coefficient (-0.121),

Tang_End* BigAF, indicates that the degree of asset tangibility's impact on audit risk is moderated by the audit firm's reputation. Additionally, it should be mentioned that the Tang_End coefficient is still positive (0.397) and significant (p-value = 0.000). **Consequently, the outcomes support H₂.**

Table 8: Results of testing H₂ using Big 4 versus nonBig 4 classification *

$$AR_{it} = \beta_0 + \beta_1 Tang_End_{it} + \beta_2 BigAF_{it} + \beta_3 Tang_End_{it} * BigAF_{it} + \epsilon_{it}$$

Variable	β	P-value (t-statistics)	VIF
Intercept	0.577	0.000 (29.705)	--
Tang_End	0.397	0.000 (8.498)	1.206
BigAF	-0.318	0.000 (-13.113)	1.517
Tang_End*BigAF	-0.121	0.045 (-2.016)	1.290
R ²		0.6606	
Adjusted R ²		0.6568	
F-statistic (Model Sig.)		172.637 (0.000)	

* The model is performed on a sample of 270 firm-year observations for the financial years 2017–2019, with an acceptable level of significance of 5%.

Source: The SPSS 26's output as organized by the researcher.

Moreover, model (2) is retested using another measure of assets' tangibility as an indication of liquidation value using the equation below following the study of Lu-Andrews and Yu-Thompson (2015). This equation estimates show how much each pound of book value produced by each asset category will be in case of liquidation.

$$Tang_AVG = \frac{(0.715 * Total\ Receivables) + (0.547 * Inventory) + (0.535 * Fixed\ Assets)}{Average\ Total\ Assets}$$

As described in **Table 9**, the p-value of the model is less than 0.05 indicating its significance, and the adjusted R² is decreased from 70.14%, under the 4 tiers classification and assets tangibility as a percentage of total assets, to 69.58%. Moreover, the interactive variable **Tang_AVG*AF_Rank** has a significant negative coefficient (-0.025), inferring that the degree of asset tangibility's impact, as measured by an

indication of liquidation, on the assessed audit risk is moderated by the audit firm's reputation. Additionally, it should be mentioned that the Tang_AVG coefficient is positive (0.03) and significant (p-value = 0.000). Therefore, the outcomes **support H₂**.

Table 9: Results of testing H₂ using an alternative proxy of assets tangibility*

$$AR_{it} = \beta_0 + \beta_1 Tang_AVG_{it} + \beta_2 AF_Rank_{it} + \beta_3 Tang_AVG_{it} * AF_Rank_{it} + \varepsilon_{it}$$

<u>Variable</u>	<u>β</u>	<u>P-value (t-statistics)</u>	<u>VIF</u>
Intercept	0.860	0.000 (41.645)	
Tang_AVG	0.030	0.000 (6.740)	1.014
AF_Rank	-0.123	0.000 (-16.032)	1.365
Tang_AVG*AF_Rank	-0.025	0.000 (-6.031)	1.357
R ²		0.6992	
Adjusted R ²		0.6958	
F-statistic (Model Sig.)		206.191 (0.000)	

* The model is performed on a sample of 270 firm-year observations for the financial years 2017–2019, with an acceptable level of significance of 5%.

Source: The SPSS 26's output as organized by the researcher.

To sum up, about the main research hypotheses, the outcomes of the other analyses approve the outcomes of the basic analysis. That is, the audit client's assets tangibility, whether measured as a percentage of the total assets or average total assets as an indication of liquidation value, has a positive influence on the assessed audit risk, as proxied by 6 indicators from the financial statements. Besides, this positive influence differs with the audit firm's reputation. Overall, the findings from the other analyses affirm those from the basic analysis, supporting the validity of the research findings.

6. Conclusion

Some research suggested that the audit client's recognition of intangibles has a substantial impact on the auditor's evaluation of the level of the audit risk. However, a sizeable portion of a firm's total assets are tangible assets,

which can be leveraged to significantly impact the financial performance of a firm. The audit of PP&E mostly comprises gathering and reviewing the original records, recalculating the depreciation costs, and physically inspecting the accessible assets to confirm that these assets are reported at the appropriate cost. PP&E is therefore often considered to have a smaller IR than other types of assets. This means that if the auditor does not understand the associated possible hazards in auditing tangible assets and considers the linked risk to be minimal, the audit may fail.

Therefore, this research aims to investigate and test how the auditor's evaluation of the required level of audit risk is affected by the audit client's assets tangibility. Additionally, it examines how the tangibility of audit clients' assets interacts with the reputation of the audit firm in influencing the audit risk assessment. Accordingly, data for a sample of 270 firm-year observations of 90 nonfinancial listed firms on EGX during the period 2017-2019 are collected, to control for the effect of both the introduction of IFRS in Egypt in 2015, and the widespread of Covid 19 on the association under examination.

Statistical testing supported the research hypotheses implying that the audit client's assets tangibility, measured as a percentage of the total assets, has a significant influence on the assessed audit risk, as proxied by score out of 6 indicators extracted from the auditees' financial statements. In addition, this significant influence differs with the audit firm's reputation as ranked into 4 tiers with the 1st tier representing the Big 4. Moreover, by conducting other analyses represented by retesting the causal association between the audit client's assets tangibility and the assessed audit risk including control variables, the association remains significant and positive. In addition, by dividing the sample into firms audited by large four audit firms versus those audited by other audit firms, it is inferred that the reputation of the audit firm still moderates the significant association between the tangibility of audit clients' assets and the assessed audit risk.

Overall, the research conclusions come to an agreement with the viewpoint supporting the importance of tangible assets for firms and for auditors to consider their related risks of manipulation when planning an audit. Furthermore, the reputation of the audit firm plays an important role in considering the effect of the audit client's assets tangibility when assessing the audit risk.

The limitations inherent in the research design should be taken into account when concluding this research. Among the **research limitations**, the research is restricted **geographically**, since it aims to examine the effect of the audit client's assets tangibility on the auditor's assessment of the level of audit risk, utilizing a sample of nonfinancial firms listed on the EGX. Therefore, it is outside the scope of the research to test this relationship among financial firms, or unlisted firms. Hence, the generalizability of the research results is conditioned by the criteria for defining the study population and sample. Concerning the **time-frame** boundaries, the research is only focused on investigating the relationship under study from 2017 to 2019, so that being after applying the Egyptian Accounting Standards revised in 2015, and before the Corona pandemic spread. This is done to isolate the impact of any of them on the relationship under investigation.

Regarding the **technical limitations**, the research is limited to investigating a specific type of audit client complexity, which is related to assets tangibility, without addressing other complexity indicators. **Finally**, this research adopts the perspective of using an index score of indicators reflecting the business risk of the auditee, as a proxy for audit risk, however, there are other measures such as auditors-related business risk, and litigation risk of auditees.

There are several notable **implications** of this research. In this context, it has a contribution to the research that focuses on factors affecting audit risk by investigating the effect of the audit client's assets tangibility and audit firm reputation. That is, even though intangible assets are becoming more significant in the modern economy, it is crucial to keep in mind how tangible assets affect firms' financial positions causing the abuse of them and, in turn, influencing the estimated audit risk. Findings reveal that the audit client that

has a low degree of assets tangibility and is audited by audit firms other than the 1st tier, has a low level of assessed audit risk. The **main contribution** to prior research is the quantification of the effect of assets tangibility on audit risk. Additionally, this research provides evidence on the association between audit client's assets tangibility and audit risk using data from Egypt with the existence of the reputation of the audit firm as an interactive variable, whether ranked into 4 tiers or as Big 4 and non-Big 4.

Because the current research finds that firms with minimal assets tangibility and audit risk are audited by non-Big 4 auditors, this research may be valuable to regulators. Egypt's audit market is underdeveloped and needs to be organized. Since 2008, there have been no modifications to the released auditing standards. The audit market lacks a responsible professional body to establish standards and monitor procedures. Perhaps the proposed independent national professional organization undertake some related tasks and **issue an updated Egyptian standard on auditing** (No. 315) about assessing the RMM under the more complex business environment to keep pace with the amendments of its international counterpart. In addition to issuing Egyptian guidelines specifically related to the inherent risk factors on the level of the firm or accounts. Moreover, audit firms operate without fear of being observed as the risk of litigation is minimal. **Therefore**, a quality inspection program needs to be implemented.

Furthermore, it is recommended that auditors exercise greater professional skepticism when assessing the RMM resulting from potential manipulations of estimates related to tangible assets. Additionally, there is a necessity of having a professional organization in Egypt for the accounting and auditing profession that works to activate the legal responsibility of auditors, as well as their professional and social responsibility.

In conclusion, the limitations of the current research ultimately present an **opportunity for additional research** in Egypt to use a larger sample for a longer period, and study the financial sector, in addition to the following research areas: Study and test the impact of the audit client's recognition of

tangible assets on the quality of the auditor's professional judgments and his fees; Study and test the impact of the audit client's recognition of tangible assets on the firm's value and financing costs; A comparative study between sectors with intensive tangible assets and sectors that are dense with intangibles in influencing the planning of an audit; and finally, study and test the impact of the degree of client complexity associated with the use of blockchains and technological tools on assessing audit risk, the influence of FinTech on auditor's risk assessment procedures, and the effect of intangibility of digital assets on the level of audit risk as well.

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Appendix

Ranking of audit firms in Egypt according to the number of auditees observed in the research sample*

1 st Tier (Affiliation with Big 4)	2 nd Tier
KPMG – Hazem Hassan	Baker Tilly - Hilal & Abdel Ghaffar
EY	Moore Egypt
PwC	BDO - Khaled & Co.
Deloitte	RSM Egypt
	Grant Thornton Egypt - Saleh, Barsoum & Abdel Aziz
	3rd Tier
	Mazars Egypt - Mostafa Shawki
	UHY United
	Crowe Dr. Abd El Aziz Hegazy & Co.
	PKF Rashed, Badr & Co.
	Morison Ksi - Nasr A. EL Abbas Ahmed & Co.

* The classification of the three tiers extracted from the 20 top audit firms around the world as updated in 2023 available on the website:
<https://big4accountingfirms.org/the-top-accounting-firms-in-the-world/>

