**Isaac Deng Akway**
Msc Student

**Dr/ Maha M. Ramadan**
Associate Professor
Accounting Dept.

Faculty of Commerce
Alexandria University

# The Role of Audit Quality in Reducing Agency Costs and Cost of Equity Capital
**An Empirical Study on Companies listed in the Egyptian Stock Exchange**

## Abstract

The purpose of this study is to examine the role of audit quality proxied by auditor's firm size and auditor's industry specialization in reducing agency costs and cost of equity capital. The study further contributes to prior literature by investigating whether these two roles will differ according to size of the audit client by classifying sampled firms based on their market capitalization. The study utilized regression model analysis using 111 for a sample of non-financial firms listed in the Egyptian Stock Exchange for the period from 2013 to 2016, comprising 444 firm-year observations. Results show a positive and significant relationship between audit quality (auditor's firm size, auditor's industry specialization) and asset utilization ratio as the proxy for agency costs, providing evidence that audit quality can contribute in reducing agency costs. However, results did not show statistical significance for the effect of audit quality proxied by auditor's firm size on cost of equity capital. In contrast, results show statistical significance for the effect of audit quality proxied by auditor's industry specialization on the cost of equity capital. Finally, the study provided that the role of audit quality is more pronounced in smaller clients than in larger clients.

**Keywords:** Audit Quality, Agency Costs, Cost of Equity capital, Big 4, Auditor Industry Specialization

# دور جودة المراجعة في تخفيض تكاليف الوكالة وتكلفة رأس المال

## دراسة تطبيقية علي الشركات المسجلة في البورصة المصرية

## ملخص البحث

تهدف هذه الدراسة الي اختبار دور جودة المراجعة في تخفيض كلا من تكاليف الوكالة وتكلفة رأس المال للشركات المسجلة في البورصة المصرية بالاضافة الي اختبار ما اذا كان هذا الدور يختلف باختلاف حجم امكتب المراجعة بعد ان تم تصنيف الشركات موضع الدراسة الي شركات كبيرة وأخري صغيرة الحجم حسب القيمة السوقية لراس مال كل شركة .

وقد تم قياس جودة المراجعة من خلال استخدام مؤشرين هما حجم مكتب المراجعة وتخصص المراجع في مجال عمل العميل، بينما تم قياس تكاليف الوكالة باستخدام معدل دوران الأصول. وقد استخدمت الدراسة نموذج الانحدار الخطي المتعدد في اختبار الفروض. وباستخدام عينة تتكون من ١١١ شركة مسجلة في البورصة المصرية من الفترة ٢٠١٣ الي ٢٠١٦ ، توصلت الدراسة الي وجود تاثير ايجابي معنوي لجودة المراجعة المقاسة بكل من حجم مكتب المراجعة والتخصص الصناعي علي معدل دوران الأصول وهو المقياس المستخدم لقياس تكاليف الوكالة. ولم تستطع الدراسة أن تتوصل الي وجود تاثير معنوي لجودة المراجعة المقاسة بحجم مكتب المراجعة، علي تكلفة رأس المال. في حين توصلت الدراسة الي وجود تاثير سلبي معنوي لجودة المراجعة، معبرعنها بالتخصص الصناعي للمراجع علي تكلفة رأس المال، مما يعني أنه يمكن للتخصص الصناعي للمراجع أن يلعب دورا جوهريا في تخفيض تكلفة رأس المال للشركة التي يقوم بمراجعتها. وأخيرا، توصلت الدراسة لوجود تأثيرأقوي لجودة المراجعة علي كل من تكاليف الوكالة وتكلفة راس المال في الشركات الصغيرة عن نظيراتها من الشركات الكبيرة.

**الكلمات المفتاحية** : جودة المراجعة ، تكاليف الوكالة ، تكلفة راس المال ، Big4 ، التخصص الصناعي للمراجع

# 1. Introduction

The separation of ownership and control has led to an agency relationship resulting from the contractual agreement between two parties; the shareholders (principals) and the managers (agents). According to Agency theory, the shareholders engage the managers to perform some services on their behalf, which implies delegating some decision making authority to the agent (Jensen and Meckling; 1976). Watts and Zimmerman (1983) suggested in this context that firms are comprised of sets of contractual arrangements among parties resulting in different incentives for opportunistic behavior by those parties causing several agency problems.

An Agency problem arises when the relationship between principal (shareholder) and agent (manager) involves diverged acts where the agents are involved in activities that satisfy their own interests, not the principal's interests (Jensen and Meckling 1976; Ang et al 2000; Chrisman et al. 2004; Chen and Souginnis 2012). This might be associated hidden actions (moral hazard) and the hidden information (information asymmetry) (Arrow 1989) on the part of agents. The presence of such information asymmetry and self-interest between principals and agents, causes the principal to lack reasons to place confidence on their agents,   resulting in increasing concerns about the reliability of information provided by the agent and the degree of confidence placed by the principals on their agents ending with increases in agency costs (Jensen and Meckling 1976).

The principal pursue to resolve these concerns through a set of mechanisms that aligns the interest of agent with principal and reduce the possibility for information asymmetry and opportunistic behavior. Prior studies that examined the role of corporate governance mechanisms emphasized the role of different mechanisms such as ownership structure, managerial ownership, ownership concentration, board of directors, debt financing, growth opportunities, quality of financial information in mitigating agency problems (Ang et al.2000; Singh and Davidson 2003; Florackis 2008; McKnight  Weir 2009).  However, these studies have undermined the role that can be played by auditing as an effective mechanism that can be used in mitigating agency conflicts and associated information asymmetries between the principal

and the agent; hence reduces agency costs (Watt and Zimmerman 1986; Corten et.al 2017). Corten et.al (2017) argued that by verifying financial statements' validity, the auditor is concerned with reducing related agency costs, as this verification reduces information asymmetries between agent and principal.

Prior studies have shown that the increase of agency problem between principals and agents raised the demand for audits and its quality due to the vital role it plays in mitigating agency problem through promoting confidence and reinforcing information which reduces information asymmetry between principals and agents (Jensen and Meckling 1976, Watts and Zimmerman 1983, Lai et.al 2017).

Audit quality has been defined in literature as "as the market-assessed joint probability that a given auditor will both discover a breach in the client's accounting system and report the breach". (p.186, DeAngelo 1981). Prior studies have extensively examined the demand for audit quality at different degrees of agency problem and cost of equity capital (Chow 1982; Francis and Wilson 1988; Khurana and Raman 2004; Fernando et al. 2010; Azizkhani et al. 2012; Cassel et al. 2013; David and Reynold 2016; Lai and Liu 2016). They provided evidence that audit quality improves the quality of financial reporting information, reduces information risk and information asymmetry and consequently, lower the cost of equity capital (Khurana and Raman 2004; Fan and Wong 2005; Fernando et al.2010; Chen et al.2011; Clinch et al.2012; Houqe et al. 2017). In addition, Boone et al. (2008) noted that the poor financial information results in the increasing in the cost of equity capital.

The problem is that most of these studies had been conducted in developed markets economies which are characterized to have strong legal investor protection with few studies had been performed in emerging markets (Dang and Fang 2011; Chen et al. 2011; Houque et al. 2017). These markets- unlike developed countries- are characterized by weak legal investor protection which make the results of these studies can't be generalizable to emerging markets like Egypt due to different institutional setting, regulations, rules and economic environment.

Egyptian rules, regulations, and laws provide an environment that motivates the researcher to investigate the role of audit quality in re-

ducing agency costs and cost of equity capital for several reasons; first, the presence of international and national audit firms operating in the Egyptian audit market. Second, Egypt has observed an increase and expansion of listed firms in few recent years that might contribute to the rise of agency problems, and finally the adoption of Egyptian corporate governance code which led the Egyptian laws to require listed firms to provide audited financial statements(El-Dyasty, M-.2017).Therefore, this study is an attempt to fill these voids in the literature by examining the role of audit quality in reducing agency costs and cost of equity capital and analyzing whether this role varies according to the firm size as being large or small for the firms listed in the Egyptian Stock Exchange.

## 2. Research problem

There is a scarcity of literature that examined the role of audit quality in reducing agency costs and the cost of equity capital in an emerging market as Egypt. This study attempts to fill the gap in the literature by examining this role of audit quality on firms listed in the Egyptian Stock Exchange. Accordingly, the research problem can be formulated in the following questions:

*Q1: Does Audit Quality reduce Agency Costs for companies listed in the Egyptian Stock exchange?*

*Q2: Does Audit Quality reduce the Cost of Equity Capital for companies listed in the Egyptian Stock exchange?*

*Q3: Does the effect of Audit Quality on Agency Costs and Cost of Equity capital vary between Small Firms than large firms for companies listed in the Egyptian Stock exchange?*

## 3. Research Objectives

The study aims to realize theoretical and empirical objectives. From a theoretical viewpoint, the study aims to present and analyze the previous research studies that addressed the role of audit quality in mitigating agency problems and costs of equity in developed as well as in emerging economies. From an empirical viewpoint; the study attempts to fill the gap in literature concerned with the lack of the empirical evidence about the role of audit quality in reducing agency costs and cost of equity capital in emerging market as Egypt through testing the effect of audit quality on agency costs cost of equity capital and examining whether this effect varies between small firms and large firms.

Results of the study can greatly contribute to the accounting and auditing literature by providing a further understanding of the role of audit quality in reducing agency costs and the cost of equity capital in Egypt. This in turn could benefit the interests of different stakeholders such as regulators, academics, and investors in Egypt.

The remainder of this paper is organized as follows: section 4 presents the literature review and hypotheses development, section 5 describes the data and research methodology, section 6 presents empirical results, section 7 presents the research limitations and finally section 8 ends with the conclusion, limitations, recommendations, and implications for future research.

## 4. Literature Review and Hypotheses Formulation

The agency relationship and agency costs had attracted the attention of many researchers over the past few decades due to their effect on the firm's value. This agency relationship exists when there is a contract that one party (the principal) delegates another party (the agent) to perform some services and take the decision making responsibility on behalf of the principal (Jensen and Meckling 1976; Wallace1980).

Watts and Zimmerman (1983) demonstrated that firms are comprised of different sets of contractual arrangements that provide different incentives for opportunistic behavior by contracting parties. Such opportunistic behavior resulted in the reduction in the firm's value. Beaver (1989) had demonstrated two types of agency problems which are the moral hazard (hidden actions) and information asymmetry (hidden information). According to Beaver (1989), the monitoring theory strives to solve these two types of agency problems that arise between the agent and the principal.

Jensen and Meckling (1976) also noticed that the separation of ownership and control in the firm leads to information asymmetry between the principal (owner) and the agent (manager) of the firm. However, the rise of agency problem is due to misalignment of the interests of the principal and the agent which results in agency costs. Jensen and Meckling (1976) also demonstrated three types of conflicts that might occur in a firm structure; first, conflicts of interests between shareholders (principals) and managers (agents). Second, conflicts of interests between minority shareholders (principals) and controlling shareholders (agents) and third, conflicts of interests between creditors (principals) and shareholders (agents). All these three conflicts result in agency problems. However, the development of agency theory has

led to two strands of literature which address the same problems; positive agency theory and principal-agent theory (Ittonen, K., 2010).

Positivist agency theory emphasizes the relationship between the principal (shareholder) and the agent (manager) in public firms (Jensen1983; Eisenhardt 1989). Moreover, positivist literature is concerned with determining those situations of conflict interests between the principals (shareholders) and the agents (managers) and therefore describes the mechanisms that can restrict the agent's opportunistic behavior (Ittonen, K.,2010). Consequently, three sets of studies influenced positivist agency theory literature; the first of which are those studies that focused on the ownership structure of the firm(Jensen 1976), studies that focused on the role of efficient capital markets in controlling managers (Fama 1980) and finally, studies that concentrated on the role of the board of directors as a monitoring mechanism. Corporate governance is a set of mechanisms that intended to reduce agency costs that arise due to the information asymmetry between the agents and the principals (Ashbaugh et al. 2004). Prior studies have applied variety set of corporate governance such as Board structure, ownership structure and audit function (Mohamed et al. 2013; Nasr and Ntim 2018),Board independence, institutional investors , managerial ownership and audit committee (Soliman and Abd Elsalam 2012) , managerial ownership, outside block ownership, Board Size, and Board compensation(Singh and Davidson 2003), Board size, duality, audit committee, remuneration committee , managerial ownership, and institutional ownership (Owusu and Weir 2018), debt financing ,managerial ownership, ownership concentration, board of directors, and managerial compensation (Florackis 2008), board independence, board gender diversity, directors' share ownership and audit quality (Waweru and Port 2018).

Furthermore, Agency theory identifies a range of corporate governance mechanisms intended to mitigate the interests of agents and principals in order to reduce agency costs. Accordingly, extensive empirical studies have examined the effect of corporate governance mechanisms on agency costs. For example, Ang et al. (2000) examined the effects of corporate governance mechanisms such as ownership structure and external monitoring (as banks or financial institutions) on agency costs and found that ownership structure and external monitoring negatively affects agency costs. These finding implies that corpo-

rate governance mechanisms reduce agency costs for the USA small firms. However, these findings were extended by Singh and Davidson (2003) who investigated the impact of corporate governance mechanisms such as ownership structure (inside ownership, and outside Block ownership), Board size, and board compensation on agency cost for the USA large firms and the results and find that the higher inside ownership lower agency costs.

Florackis (2008) examined the impact of corporate governance mechanisms such as debt maturity and managerial compensation on agency costs for the UK listed firms and found that debt maturity and managerial compensation are playing an important role in mitigating agency problem, hence, reduce agency costs. McKnight and Weir (2009) examined the effects of corporate governance mechanisms on agency costs for the UK listed firms and concluded that corporate governance mechanisms mitigate agency problem. They also noticed that increase board ownership of the firm's equity can more significantly reduce agency costs.

As noticed, most of these studies had been conducted in developed countries characterized by stronger corporate governance mechanisms and placed more emphasis on governance mechanisms such as  board size , board composition, ownership structure (Desoky and Mousa 2013; Ebrahim and Fattah,2015; Mohamed 2015; Elamer et al.2017). Even those prior studies that examined the role of audit quality in mitigating agency problem and hence, reduce agency costs or lower cost of equity capital, had been more concentrated in the Anglo-American countries (Chow 1982; Francis and Wilson 1988; Khurana and Raman 2004; Fernando et al. 2010; Azizkhani et al. 2012; Cassel et al. 2013; David and Reynold 2016; Lai and Liu 2016) and in Asian economies (Fan and Wong 2005; Dang and Fang 2011; Chen et al.2011; Houqe et al.2017).

Choi and Wong, (2007) demonstrated two competing views on the role of auditors in the weak legal systems. The first suggests that auditors may play a stronger governance role in weak legal systems than in strong legal systems because they assist as a corporate governance alternative mechanism for the legal protection of capital providers. This view assumed that capital providers are more likely to hire audit quality to mitigate agency problem. The second view suggests that weak legal systems neglect to provide credible disciplinary means in assur-

ing that auditors fulfill the governance role. Thus, capital providers in weak legal systems are less expected to hire audit quality to mitigate agency problem. This view had supported by the finding of Gul et al. 2013 who provided evidence that in weak legal systems (characterized by poor investor protection), Big X auditors do not play a role in reducing costs of debt, while Choi and Wong 2007 supported the view that auditors had a governance role in the weak legal system.

## *Audit Quality and Agency Costs*

Implementation of the contract requires monitoring of agent's activities (Jensen and Meckling 1976). This monitoring role can best be performed by the auditor and can  help in increasing the value of the firm (Jensen and Meckling 1976). Furthermore, Watts & Zimmerman (1983) noticed that "an audit will be successful in changing expectations and hence reducing the opportunistic behavior (agency costs) borne by the manager only if it is expected that the auditor will report some discovered breaches of contract". The misalignment of interests between principal and agent (agent is considered to involve in activities that are not for the interest of principal) results in agency problems and increases agency costs hence, the demand for audit quality increases (Chow, 1982; Francis and Wilson, 1988).

Lai and Liu (2016) argued that audit quality mitigates agency problems in two ways; first by increasing financial reporting quality, and so provides investors with more reliable information to monitor agents' investment and operating decision. Second, audit quality leads to an increase in disclosure quality which increases investors' prospects to analyze and evaluate firm's performance to assure that managers utilize resources efficiently. This supports Behn et.al (2008) argument that audit quality increases financial reporting reliability. On the other hand, auditing has fundamental purposes in promoting confidence and reinforcing trust in financial information; hence "auditors provide independent verification of managers' prepared financial statements and can discover and report breaches in a client's accounting system" (Watts and Zimmerman 1983, p 615).

Watts and Zimmerman (1983) also noticed that large audit firms provide a higher quality audit due to greater monitoring ability, whereas (DeAngelo 1981) attributed this effect to the fact that larger audit firms have "more to lose" if they fail to report breaches in a client's records. Agency theory predicts that firms with more severe agency problems are more likely to demand audit quality.

Fan and Wong (2005) provided evidence that in emerging market, firms with higher agency problems are likely to hire Big5 audit (here-after Big4). In contrast, firms with lower agency problems are less likely to hire Big 5 audit. This result implies that audit quality plays role in alleviating agency problems, hence reduce agency costs.

Dang and Fang (2011) also provided evidence that audit quality proxied by audit firm size and audit fees reduce agency costs. Khan et al. (2016) found that audit quality moderates the relationship between the political connection and the agency costs in an emerging market that is characterized by poor investor protection and weak rule of law. Khan et al. (2016) also suggested that as corporate governance mech-anisms are not effective in most emerging economies, the audit quality plays a vital role as an alternative monitoring mechanism in the agen-cy relationship.

According to the above discussion, **the first research hypothesis could be formulated as follows:**

$H_1$: *Audit Quality is expected to negatively affect agency costs.*

## *Audit Quality and the Cost of Equity Capital*

In capital market, auditing works as a bridge between capital pro-viders and management through adding credibility to the financial in-formation provided by managers and therefore used by capital provid-ers, to increase their confidence and enhance the decisions they make (Mansi et al.2004: Soliman and Ragab 2014). The theoretical work in finance assumes that improving the quality of financial information reduces the cost of equity capital either by increasing market liquidity, thereby, reducing transactions costs or increasing the demand a firms' securities (Amihud and Mendelson, 1986   or by reducing investors' information risk(Coles,Lwenstien and Suay 1995;Easley and O'H-ara,2004; Leuz and Verrecchia 2004).

Wallace, (1980) proposed three roles of auditing: a monitoring role (by monitoring management's behavior), an information role (spread-ing a better information environment), and an insurance role (by providing a secondary source of insurance against corporate failures). This suggestion was empirically supported by Fernando et al. (2010) who argued that the cost of equity capital of a client audited by BIG X auditor could be lower due to the monitoring role, information role, and/ or the insurance role of auditing. In addition, Houque et al. (2017) demonstrated that higher audit quality is considered as a strong

monitoring mechanism and provides a positive signal to the capital market.

Fernando et al. (2010) provided evidence that audit firm and auditor's industry specialization are important determinants of perceived audit quality, hence negatively related to the cost of equity capital. Prior studies have provided empirical evidence that audit quality proxied by audit firm size and auditor's specialization lower earning management and lower cost of equity capital (Fernando et al. 2010, Chen et al.2011; Houqe et al. 2017), reduce information asymmetry (Clinch et al.2012; Lai and Liu 2017), lower earnings management and accordingly increase earnings quality (Balsam et al.2003).

Mansi et al. (2004) found a negative relationship between audit quality and return required by investors implying lower cost of capital. Chen et al. (2011) also noticed that auditing reduces information risk faced by investors because it raises the validity of financial statements. It is important to document the effects of audit quality on the cost of equity capital because of the widespread perception that investors have little confidence in firms' financial reports provided by agents (managers). Furthermore, auditing provides assurance that the financial statements prepared by (management) have been prepared in accordance with regulations and accounting principles, hence, reflecting the firm's economic performance (Koren and Valentinicic 2014). Audit quality minimizes the opportunistic behavior as well as reduces the cost of equity capital. Khurana and Raman (2004) noticed that firms that hire Big4 auditors are more likely to lower cost of equity capital than other firms.

In addition, Ahmed et al. (2008) provided evidence that firms hiring auditors specialized in the industry had lower cost of equity capital and debt. He also found that the strength of this relationship increases when the alternative governance mechanisms such as institutional ownership and the independence of the board of directors, are weak. Ashbaugh et al. (2004) also documented that the quality of firms' financial information is negatively related to the firm's cost of equity capital. These findings indicate that audit quality is a substitute for alternative monitoring mechanisms that reduce information asymmetry between agents (managers) and investors (principals); hence enhance investors' confidence.

Soliman (2014) provided evidence that audit quality increases the degree of accounting conservatism. Boubaker et al. (2018) provided evidence that firms which hire Big 4 auditors and engage auditor specialized in the industry to verify their financial statements are more likely to invest more efficiently. This finding indicates that audit quality improves investment decision and adds value to the firms. Alzoubi, (2018) found that earnings management practices are diminished with higher audit quality which improves financial reporting quality.

Therefore, based on the previous discussion, **the second research hypothesis could be stated as follows:**

*H2: Audit quality is expected to negatively affect the cost of equity capital*

## Audit Quality and Agency Costs and Costs of Equity Capital in Small Firms and Large Firms

Prior studies have placed more attention on size of the firm; being small or large and suggested that small firms have more information problems and poor financial reporting than large firms. For example, Fernando et al. (2010) provided evidence that supported the argument that small firms benefit from audit quality better than large firms due to their poor information environment. Additionally, Ang et al (2000) investigated the relationship between ownership structure[1] and agency cost for USA small corporations and found that ownership structure negatively affects agency costs for small USA corporation , while, Singh and Davidson  (2003) extended  the work of Ang et al. (2000) and examined the relationship between ownership structure and agency costs for USA large firms. They provided evidence that higher inside ownership reduces the agency costs which agrees with Ang et al. (2000) findings. Gul et al. (2013) also found that small firms with

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[1] There is a wide variety of definitions of ownership structure. Ang et al. (2000) defined ownership   structure in terms of firm manage by outsider, Manager owns firms' share and the number of non- manager shareholder, while Singh and Davidson, (2003) defined ownership structure in term of insider ownership (share owns by Executives and Board member of the Firm), and outside ownership (share owns by outside block holders). El-Masry, (2010) defined ownership structure as managerial ownership, managerial concentration, and managerial compensations, Ashbaugh et al. 2004 and  Soliman and Abd Elsalam, 2012 defined ownership structure in term of institutional investors and Blackholder. Mohamed et al. 2013 defined ownership structure in term of institutional ownership, directors' ownership, and ownership concentration.

Owsus and Weir, (2018) defined ownership structure in terms of managerial ownership and institutional ownership.

more information problems (Large firms) benefit more from audit quality than firms with less information problems (small firms).

This study follows prior research and includes audit firm size (Small and Large firms) when examining the role of audit quality on agency costs and cost of equity. The role of audit quality on agency costs and cost of equity capital is expected to be more pronounced in small firms compared to large audit firms. Therefore**, the third and last research hypothesis could be formulated as follows:**

*H₃: The negative effect of audit quality on agency costs and cost of equity is expected to be stronger for small firms than large firms.*

*$H_{3a}$: The negative effect of audit quality on agency costs is expected to be stronger for small firms than large firms.*

*H3b: The negative effect of audit quality on the cost of equity capital is expected to be stronger for small firms than large firms.*

## 5. Research Methodology

### 5.1  Study Population and Sample Selection

*Population:* The study population consists of firms from all sectors listed in Egyptian Stock Exchange for the period 2013 to 2016 with exception to firms from the financial sector (Banks and financial services) due to the special nature of these ratios (Singh et al. 2003; Florackis. 2008; Fernando et al.2010; Bryan & Reynolds 2016). The data were obtained from the financial statements disclosed by the firms enclosed in the study through the websites:
www.egx.com.eg, www.mubasher.info website, and website of each firm.

*Study Sample:* The initial sample included 884 firm-year observations (EGX annual report 2017). After excluding 180 observations for firms from the financial sector, 24 observations for firms not using the Egyptian pound as their reporting unit and 236 observations for firms with insufficient data, the final sample became 444 firm-year observations. In addition, the transformation of data to meet the assumptions of normal distribution resulted in excluding 8 observations as outliers. Panel A of Table (1) summarizes sample selection procedure.

### TABLE 1 Presents information on sample selection procedure

| | |
|---|---|
| Total firm-year observations available on Egyptian website from 2013-2016 | 884 |
| **Less** | |
| Observations of firms in the Financial Sectors ( Banks + Financial Services) | (180) |
| Observations of Firms not using the Egyptian pound as their reporting unit | (24) |
| Observations with insufficient data to calculate variables | (236) |
| **Final Sample** | **444** |

## 5.2 Measurement of the study variables

This section is concerned with describing the measurement of the variables used in the study.

**a. Independent variable:** The independent variable of this research study is audit quality measured by auditor's firm size and auditor's industry specialization:

Auditor's firm size (BIG4): is measured by whether the firm is being a Big4 or non-  Big4, and

Auditor's industry specialization (ISPX): measured by market shares (Gul et al.2003; Balsam et al.2003;Behn et al.2008; Ahmed et al.2008;Fernando et al.2010; Dang and Fang 2011;Clinch et al.2012;Houqe et al.2017; Lai and Liu 2017).

**b. Dependent variables:** Two dependent variables which are agency cost and cost of equity capital were used in the study.

Agency Costs ($AGC_{jt}$)  measured by asset utilization ratio (Sales or revenues divided by total assets)  and

Cost of equity capital (COE$jt$):  measured by price-earnings ratio divided by Earnings growth rate (PEG) method proposed by Easton (2004).

**c. Control variables :** The research study used two control variables which are: Firm Size and Leverage that might affect Agency Cost as well as the Cost of Equity capital.

Firm Size ($FS_{jt}$) measured by the natural logarithm of total assets (Dang and Fang 2011; Khan et al. 2016).

Financial leverage (FL$_{jt}$): measured by the natural logarithm of total liabilities (debts) divided by total assets (Ahmed et al.2008 Fernando et al. 2010).

## Table 2: Definitions and measurement of the study Variables

| Variable | Notation | Measurement  of variable |
|---|---|---|
| **Dependents Variables** Agency Costs | $AGC_{jt}$ | Measured by Assets Utilization ratio (average total Sales divided by average total Assets (Ang et.al.2000; Singh and Davidson 2003; Florakis 2008; Mcknight and Weir 2009; Dang et.al. 2011; Khan et. al 2016) |
| Cost of Equity Capital | $COE_{jt}$ | Estimated by price –earnings divided by earnings growth rate which is the PEG Model proposed by (Easton 2004). (Azizkhani et al.2012, Fernando et al. 2010: Chen et al. 2011: Houqe et al 2017) |
| **Independent Variables** Audit Quality | *BIG4* | Big4 is Egyptian audit firm affiliated with global accounting firms known as Big4 and takes the **value 1** if the audit firm is a Big4 firm and **0** otherwise.  (Fernando et al. 2011: Dang and Fang  2011; Gul.et al. 2003; Clinch et al.2011) |
| | *ISPX* | Measured by market share, Takes the value 1 if Big4 equal **1** and INSPEC>20 percent and 0 otherwise (Krishnan, 2003; Ahmed et al.2008; Fernando et al. 2010) |
| **Control Variables** Firm Size | *$FS_{jt}$* | Measured by *natural  Logarithm of Total Assets* (Krishnan 2003; Dang and Fang .2011; Khan et al.2016) |
| Financial Leverage | *$LEV_{jt}$* | Measured by *the natural logarithm of  Total Liabilities divided by Total Assets*, (Krishnan 2003; Ahmed et al.2008; Fernando et al. 2010; Dang and Fang.2011) |

## 5.3 Research Model

   To examine the research hypotheses, multivariate linear regression analysis is used (Chen et.al 2011: Ahmed .et.al 2008:  Brya &Reynolds 2016: Houqe et.al 2017).The regression are run two times for each of the two dependent variables, the first with AQ represented by

Auditor's firm size (Big 4) and the second with AQ represented by auditor's industry specialization (INSP).To test H1 and H2 the regression are run for the entire sample, and then for the small and large firms separately to test H3a, H3b.

To test hypothesis $H_1$ concerning the effect of audit quality on agency cost, the research used the following model

$$AGC_{jt} = \beta_0 + \beta_1 AQ_{jt} + \beta_2 FS_{jt} + \beta_3 Lev_{jt} + \varepsilon \qquad (1)$$

Where $AGCj_t$ is Agency costs for firm $j$ at year $t$ calculated using turnover ratio (average total Sales or Revenues divided by average total assets)

$AQ_{jt:}$ audit quality for firm $j$ at year $t$ measured by two proxies: The first is a binary variable taking the value of 1 for audit firms affiliated to the Big4 firms and 0 otherwise. The second is auditor's industry specialization (ISPX) which is also a binary variable which equals 1 if AINDSPEC >20 percent (audit more than 20 percent of the assets of the client' industry) and 0 otherwise. (Krishnan et al.2003; Ahmed et al.2008; Fernando et al. 2010)

$FS_{jt}$ is firm size for firm j at year $t$ measured by the natural logarithm of total assets (Krishnan et al. 2003: Dang et al. 2011),

$Lev_{jt}$ is firm's leverage for firm $j$ at year $t$ measured by the natural logarithm of total liabilities divided by total Assets (Ahmed et al.2008; Fernando et al. 2010).

$$B_0, \beta_1, \beta_2, ….\beta_i \text{ are coefficients,}$$

$\varepsilon$ is error term,

To test hypothesis $H_2$ concerning the effect of audit quality on the cost of equity capital, the research will use the following model

$$COE_{jt} = \beta_0 + \beta_1 AQ_{jt} + \beta_2 FS_{jt} + \beta_3 Lev_{jt} + \varepsilon \qquad (2)$$

Where $COE_{jt}$ is Cost of Equity Capital calculated as ***Price Earnings Ratio divided by earnings growth rate*** (Azizkhani et al. 2012).

$AQ_{jt:}$ Audit Quality for firm $j$ at year $t$ measured by two proxies: The first is a binary variable taking the value of 1 for audit firms affiliated to the Big4 firms and 0 otherwise. The second is auditor' industry specialization (ISPX) which is also a binary variable which is equal to 1 if auditor is auditing more than 20% percent of the assets of the client' industry and 0 Otherwise. (Krishnan et al.2003: Fernando et al. 2010).

*FS<sub>jt</sub>* $FS_{jt}$ is Firm Size for firm j at year t measured by the natural Logarithm of total Assets (Chen et.al 2011: Fernando 2010),

Lev$_{jt}$ is firm's leverage for firm j at year t measured by the natural logarithm of total liabilities divided by total Assets (Fernando et al. 2010).

$$B_0, \beta_1, \beta_2, \ldots.\beta_i \text{ are coefficients}$$

ε is error term,

## 5.4  Test of Multi-collinearity

A multi-collinearity[2] test was performed between research variables; First, the test was performed using AQ(Big 4),FS, Lev ,COE as independent variables and AGC-SA as dependent variables (as shown in table 3 column 1). Second, the test was repeated   with AQ (ISPX), FS, Lev, COE as independent variables and AGC-SA as dependent variables (as shown in table 3 column 2). Third, the test was performed using AQ (Big4), FS, Lev and COE as dependent variable (as shown in table 3 column 3). Fourth, test was performed using AQ (ISPX) FS, Lev as independent variables, shown in table 3 column 4). Over all testing multi-collinearity results revealed that tolerance >0.1 and Variance Inflation Factor (VIF) <10 indicating the absence of multicollinearity among study variables Ho,(2006.p.258).

## Table 3: Testing Multicollinearity

|  | 1 | | 2 | | 3 | | 4 | |
|---|---|---|---|---|---|---|---|---|
|  | Tolerance | VIF | Tolerance | VIF | Tolerance | VIF | Tolerance | VIF |
| **BigX** | 0.967 | 1.035 |  |  | 0.889 | 1.125 |  |  |
| **ISPX** |  |  | 0.958 | 1.044 |  |  | 0.865 | 1.156 |
| **FS** | 0.901 | 1.110 | 0.901 | 1.110 | 0.906 | 1.103 | 0.906 | 1.103 |
| **LEV** | 0.887 | 1.128 | 0.885 | 1.130 | 0.779 | 1.283 | 0.780 | 1.283 |
| **COE** | 0.926 | 1.080 | 0.922 | 1.084 |  |  |  |  |
| **AGC_SA** |  |  |  |  | 0.734 | 1.363 | 0.718 | 1.393 |

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[2] In column 1 and 2 the researcher performed cross-section test using AGC-SA as dependent variable and AQ (Big4, ISPX), COE , FS, LEV as independent variables, columns 3 and 4 using COE as dependent variable against AQ(Big4, ISPX), AGC_SA, FS,LEV as independent variables.

## 5.5    Testing *for normality*

The research data were tested for normality using Kolmogorov-Smirnov and   Shapiro-Wilk's test. The initial results have shown that Kolmogorov- Smirnov and    Shapiro-Wilk's test (0.00:0.00) respectively (p-value < 0.05). The significance of Shapiro-Wilk test indicated that data are not normally distributed (see Appendix D-1 to D-6). Data were then transformed using "A Two-Step Approach as proposed by Templeton, Gary F. (2011)[3].The data were then retested for normal distribution. Results showed Kolmogorov- Smirnov and Shapiro-Wilk of 0.200:2.00 and 0.894:1.00 respectively (p-value > 0.05) (Razali and Wah 2011) providing indication that data are approximately normally distributed with a skewness of 0.015 (SE[4]=0.116) and a Kurtosis of-0.193 (SE=0.231) for the *AGC_SA*  and skewness of -0.015(0.117) and kurtosis of -0.162(SE=0.233) for the *COE* (Doane and Seward,2011).

### Table 4: Tests of Normality

|  | *Kolmogorov-Smirnov* | | | *Shapiro-Wilk* | | |
|---|---|---|---|---|---|---|
|  | Statistic | df | p. value | Statistic | df | p. value |
| AGC-SA | 0.007 | 443 | 0.200[*] | 0.998 | 443 | 0.894 |
| COE | 0.035 | 437 | 0.200* | 0.999 | 437 | 1.000 |

*Lilliefors Significance Correction*

## 5.6  Descriptive Statistics for study variables

Table 5 presents results of descriptive statistics for study variables, the mean (median) of *AGC_SA* is 0.0007 (.0000), the mean (median) *of COE* is 0.09 (0.0143) suggesting that average risk of the sample is 9 percent. Big4 has mean (median) 0.28 (0.00) which indicates that (28) percent of the sample firm-year observations hired Big4. The mean (median) of   ISPX is 0.28(0.00) suggesting that the average industry specialization percentage is about 28 percent. Firm Size (FS) which is the natural logarithm of total assets has a mean (median) 2.66 (2.65).

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[3] First step is transforming the original variables toward uniformity by calculating the fractional rank of variables. however because variables have meet uniformity then researcher proceeds to the second step which is calculating inverse- normal to transform the variables toward normality.

[4] SE= standard Error

The Leverage (LEV) which is the natural logarithm of total liabilities divided by total assets has a mean (median) -0.6917(-0.9700).

## Table (5) Descriptive Statistics

| Variables | Mean | Median | Std. dev. | Min | Max | 25th percentile | 50th percentile | 75th percentile |
|-----------|------|--------|-----------|-----|-----|-----------------|-----------------|-----------------|
| AGC_SA | 0.0007 | 0.0000 | 0.98728 | -2.41 | 2.84 | -0.6745 | 0.0000 | 0.6745 |
| COE | 0.096 | 0.0143 | 0.99095 | -2.84 | 2.84 | -0.6655 | 0.0143 | 0.6872 |
| Big4 | 0.28 | 0.00 | 0.449 | 0 | 1 | 0.00 | 0.00 | 1.00 |
| ISPX | 0.28 | 0.00 | 0.449 | 0 | 1 | 0.00 | 0.00 | 1.00 |
| FS | 2.6607 | 2.6500 | 0.6376 | 2.34 | 3.13 | 2.5500 | 2.6500 | 15.7950 |
| LEV | -0.6917 | -0.9700 | 2.06744 | -4.61 | 6.85.05 | -1.5725 | -0.9700 | -0.4750 |

## 5.7 Pearson Correlation Matrix

Table (6) presents the Pearson correlation matrix among the study variables. The univariate correlation between audit quality represented by (Big4, ISPX) and AGC-SA (measured by Asset turnover ratio) is positive and significant (p_ value 0.00, 0.00) respectively (p-Value <0.05). The correlation between audit quality measured by (Big4, ISPX) and COE is negative and significant (P-value 0.009 and 0.02 respectively < 0-05).

The analysis also showed that firm size (FS) has a significant positive correlation with AGC- SA (p-value <0.001) while it has a negative significant correlation with COE. Leverage (LEV) is positively correlated with AGC-SA and significant at (p-value 0.00) and had a negative significant correlation with COE (p-value <0.00).

## Table 6: Pearson Correlation matrix

|  | AGC_SA | COE | BigX | ISPX | FS | LEV |
|---|---|---|---|---|---|---|
| **AGC_SA** | 1 |  |  |  |  |  |
| **COE** | -0.323** (0.000) | 1 |  |  |  |  |
| **Big4** | 0.336** (0.000) | -0.125** (0.009) | 1 |  |  |  |
| **ISPX** | 0.369** (0.000) | -0.147** (0.002) | 0.978** (0.000) | 1 |  |  |
| **FS** | 0.160** (0.001) | -0.167** (0.000) | 0.119* (0.0.12) | 0.126** (0.008) | 1 |  |
| **LEV** | 0.428** (0.000) | -0.234** (0.000) | 0.121* (0.013) | 0.139** (0.004) | 0.285** (0.000) | 1 |

# 6.Results of testing research hypotheses

## 6.1 Testing research hypothesis (H₁)

To test the research hypothesis ($H_1$) concerning the effect of audit quality on agency costs, a multivariate linear regression analysis of model (1) was applied on the research sample first using audit firm size measured by Big4 as a proxy for audit quality then using auditor's industry specialization as a proxy for the same variable.

## Using auditor's firm size as a proxy for audit quality

As shown in Table (7): Panel A, presents the regression results for model (1) of the agency cost measured by **asset utilization ratio** alongside audit quality represented by Big4 and control variables (FS, LEV).  Panel (A) of Table (7) presents regression results for the sample with positive significant coefficient of (0.586, p-value=0.000 <0.05) for audit quality variable measured by the size of audit firm. **This result provides evidence for accepting research Hypothesis $H_1$**, indicating that audit quality measured by the size of audit firm has a significant positive effect on asset utilization ration ratio of the firm which in turn reduces agency cost for firms listed in the Egyptian stock exchange and these results are consistent with (Dang and Fang, 2011; Owusu and Weir 2018)

## Using auditor's industry specialization (ISPX) as a proxy for audit quality

To test the effect of audit quality on agency costs using auditor's industry specialization (ISPX) as a proxy for audit quality, the regres-

sion model (1) was repeated using the second proxy (ISPX) for audit quality. Panel B shows the results for the full sample with a positive significant coefficient of (0.649, p-value 0.000 < 0.05) of (ISPX) indicating a significant positive effect of this variable on asset utilization ratio hence reduce agency costs. ***This result basically provides evidence for accepting hypothesis H₁*** which is in the line with the researcher's expectations that audit quality reduces agency costs and agrees with the results of prior studies (Clinch et al. 2012; Lai and Liu 2017).

### Table 7:  Testing the effect of audit quality (Big4, ISPX) on Agency Costs

| | | Panel A | | | | | Panel B | | |
|---|---|---|---|---|---|---|---|---|---|
| Vari-able | Pred. Sign | | | | Variable | Pred. sign | | | |
| | | *Coeff.* | *t test* | p-value | | | Coeff. | t test | p-value |
| Inter-cept | ? | -1.209 | -1.702 | 0.09 | Intercept | ? | -1.168 | -1.661 | 0.097 |
| **BIG4** | + | **0.586** | **6.369** | **0.000** | **ISPX** | + | **0.649** | **7.108** | **0.000** |
| FS | + | 0.459 | 1.723 | 0.086 | FS | + | 0.436 | 1.652 | 0.099 |
| LEV | + | 0.17 | 8.505 | 0.000 | LEV | + | 0.175 | 8.403 | 0.000 |
| **Adj.R²** | 26% | | | | **Adj.R²** | 27.6% | | | |
| **F Statistic (Sig)** | 49.809 (0.000) | | | | **F Statistic (Sig)** | 53.924 (0.000) | | | |

a.  Dependent Variable: AGC_SA        b. Predictors: (Constant), Big X, ISPX, FS,LEV

Concerning the control variables including firm size and leverage, results from table 7 show firm size with a positive and insignificant coefficient of (0.459, p-value=0.08 >0.05 and 0.436, P-value= 0.099> 0.05) for ***Big4 and ISPX*** respectively which contradicts with the findings of prior studies such as Singh and Davidson (2003) and Dang and Fang, (2011).  While results showed leverage with a positive significant coefficient of (0.17, p-value 0.000 < 0.05 and 0.175, P-value =0.00< 0.05) for ***Big4 and ISPX*** respectively providing support to studies as Fleming and McCosker, 2005; Dang and Fang, 2011; Owusu 2018).

## 6.2 Testing research hypothesis (H2)

In order to test research hypotheses *(H₂)* regarding the effect of audit quality proxied by (auditor's firm size and auditor's industry specialization) on cost of equity capital, a multiple linear regression analysis of model (2) was used on research sample.

### Using auditor's firm size as a proxy for audit quality

Panel A of Table (8) shows the results of testing regression model (2) of the cost of equity capital alongside with audit quality proxied by Big4 with negative and insignificant coefficient of (-0.200, p-value = 0.061 > 0.05) showing that the type of audit firm had an insignificant effect on the cost of equity capital which contradicted results provided by (Fernando et al.2010; Chen et al .2011; Houqe et al.2017), but agrees with (Yasar, 2013; Habbash and Alghamdi 2017; El-Dyast, 2017; Yasar and Soliman, 2018). The main effect in the model was attributed to firm size and leverage (p-values 0.015 and 0.000 respectively)

### Using auditor's industry specialization (ISPX) as a proxy for audit quality

Panel (B) of Table (8) shows the results of testing regression model (2) of the cost of equity capital alongside with audit quality proxied by ISPX and control variables (FS,Lev). ISPX had a positive significant coefficient of (-0.242, p-value 0.024<0.05) providing *evidence for partially accepting research hypothesis H₂*. This indicates that improving audit quality through auditor's specialization in the industry (ISPX) could lower cost of equity capital for firms listed in the Egyptian Stock Exchange which confirms the findings of prior studies as (Fernando et al. 2010; Chen et al. 2011; Houqe et al. 2017). Firm's size and leverage shows a significant negative effect on cost of equity capital (p-values 0.017 and 0.000 respectively)

Concerning the coefficient determination, the first model showed an adjusted $R^2$ = 7.2%, F statistic = 11.641, p-value 0.00<0.05 when big X is used as a proxy for audit quality compared to an $R^2$ of 7.6% for the second proxy *(ISPX)* F statistic = 12.221, P-value 0.00<0.05 showing an insignificant effect between the effect of the two measures on cost of equity capital.

### Table 8: Testing effect of audit quality (Big4, ISPX) on Cost of Equity Capital

| | | Panel A | | | | | Panel B | | |
|---|---|---|---|---|---|---|---|---|---|
| Parame-ter | Pred. Sign | | | | Parame-ter | Pred. Sign | | | |
| | | Coeff. | t test | p-value | | | Coeff. | t test | p-value |
| Intercept | ? | 1.987 | 2.434 | 0.015 | Intercept | ? | 1.962 | 2.407 | 0.017 |
| BIG4 | - | -0.200 | -1.882 | 0.061 | ISPX | - | -0.242 | -2.271 | 0.024 |
| FS | - | -0.748 | -2.441 | 0.015 | FS | - | -0.733 | -2.398 | 0.017 |
| LEV | + | -0.091 | -3.799 | 0.000 | LEV | + | -0.090 | -3.727 | 0.000 |
| Adj.$R^2$ | 7.2% | | | | Adj.$R^2$ | 7.6% | | | |
| F Statis-tic (Sig) | 11.641 (0.000) | | | | F Statistic (Sig) | 12.221 (0.000) | | | |

a. Dependent Variable: COE    b. Predictors: (Constant), LNLEV, Big4,  ISPX, LNFS

## 7.3. Testing research hypothesis (H3a and H3b)

Concerning the varying effect of audit quality on agency costs according to firm's size, table 9 shows the results of testing hypothesis $H_{3a}$ where the sample was split into small firms and large firms based on their market value of equity.

Panel (A) shows the results of regression analysis for small firms versus large firms using the size of audit firms (BIG X) as a proxy of audit quality (Big4).  As shown in the table, the variable (BIG4) shows a positive significant coefficient of (0.875, p-value=0.000 < 0.05) for small firms and (0.379, p-value = 0.002 < 0.05) for large firms showing a stronger effect for the size of audit firms on agency costs in the small sample compared to the large sample. However, the coefficient of determination (adjusted $R^2$) for small firms is 36.6% F statistic =39.441, P- value = 0.00<0.05 while for large firms is 14% (F Statistic=12.696, p-value= 0.00<0.05 resulting in a difference of 22.6% in the adjusted $R^2$ between the two sample groups and showing that the goodness of fit is better in the small sample group versus the large sample one

These results provides evidence for *accepting research hypothesis H3a* indicating that the effect of audit quality (Big4) on agency costs

for smaller firms than for the corresponding large firms listed in the Egyptian stock exchange.

Table 9: Effect of audit quality (BigX, ISPX) on Agency costs derived by Small, Large Firms

| | | Panel A | | | | | | | | Panel B | | | | | |
| | | BIGX | | | | | | | | ISPX | | | | | |
| Parameter | Pred. sign | Small Firm | | | Large Firm | | | Parameter | Pred. sign | Small Firm | | | Large Firm | | |
| Intercept | ? | Coeff. | t test | p-value | Coeff. | t test | p-value | Intercept | ? | Coeff. | t test | p-value | Coeff. | t test | p-value |
| BIGX | + | 0.875 | 5.759 | 0.0.000 | 0.379 | 3.18 | 0.002 | ISPX | + | 0.934 | 6.246 | 0.00 | 0.441 | 3.723 | 0.00 |
| FS | + | 0.44 | 1.141 | 0.255 | 0.345 | 0.92 | 0.359 | FS | + | 0.326 | 0.851 | 0.396 | 0.373 | 1.003 | 0.317 |
| LEV | + | 0.19 | 6.225 | 0.00 | 0.15 | 5.036 | 0.0.00 | LEV | + | 0.185 | 6.099 | 0.00 | 0.15 | 5.062 | 0.00 |
| Adj.R$^2$ | 36.60% | | | 14% | | | | Adj.R$^2$ | | 38.10% | | | 15.50% | | |
| F Statistic | 39.441 | | | 12.696 | | | | F Statistic | | 42.113 | | | 14.104 | | |
| (Sig) | 0.00 | | | 0.00 | | | | (Sig) | | 0.00 | | | 0.00 | | |

a. Dependent Variable: AGC_SA    b. Predictors: (Constant), LNLEV, BigX, ISPX, LNFS

Panel (B) shows the results of regression analysis for small firms versus large firms using the second proxy for audit quality which is auditor's industry specialization (ISPX). As shown in table (9), the variable (ISPX) shows a positive significant coefficient of (0.934, p-value 0.000 <0.05) for small firms and (0.441, p-value 0.000 <0.05) for large firms respectively showing a stronger effect for the size of audit firms on agency costs in the small sample compared to the large sample. With respect to the coefficient of determination, results show an $R^2$ for small firms obviously higher than large firms. As it can be seen from table 9 that $R^2$ for small firms is 36.6% when using Big X as a proxy for audit quality and 38.1% using ISPX as a proxy for audit quality compared to an $R^2$ for large firms of 14% when audit quality is proxied by Big X and $R^2$ is15.5% when using ISPX. These results provide support for *accepting research hypothesis H₃ₐ* indicating that the effect of audit quality (Big4) on agency costs is stronger for small firms than for large firms and accordingly *accepts hypothesis H3a*

Table 10: Effect of audit quality (BigX, ISPX) on Cost of Equity Capital derived by Small, Large Firms

| Parameter | Pred. sign | Panel A | | | | | | Parameter | Pred. sign | Panel B | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Small Firms | | | Large Firms | | | | | Small Firms | | | Large Firms | | |
| | | Coeff. | t test | p-value | Coeff. | t test | p-value | | | Coeff. | t test | p-value | Coeff. | t test | p-value |
| Intercept | ? | 3.003 | 2.612 | 0.01 | 1.025 | 0.868 | 0.387 | Intercept | ? | 2.92 | 2.536 | 0.012 | 1.093 | 0.927 | 0.355 |
| BIGX | - | -0.214 | -1.265 | 0.207 | -0.276 | -1.939 | 0.054 | ISPX | - | -0.25 | -1.485 | 0.139 | -0.306 | -2.149 | 0.033 |
| FS | - | -1.168 | -2.722 | 0.007 | -0.336 | -0.755 | 0.451 | FS | - | -1.132 | -2.631 | 0.009 | -0.358 | -0.808 | 0.42 |
| LEV | + | -0.078 | -2.283 | 0.023 | -0.098 | -2.78 | 0.006 | LEV | + | -0.075 | -2.214 | 0.028 | -0.097 | -2.774 | 0.006 |
| Adj.R$^2$ | | 11.10% | | | 4.50% | | | Adj.R$^2$ | | 11.40% | | | 4.90% | | |
| F Statistic | | 9.319 | | | 4.324 | | | F Statistic | | 9.547 | | | 4.622 | | |
| (Sig) | | 0.00 | | | 0.006 | | | (Sig) | | 0.00 | | | 0.004 | | |

a.  Dependent Variable: COE   b. Predictors: (Constant), LNLEV, BigX, ISPX, LNFS

With respect to the varying effect of audit quality on cost of equity according to audit firm size, table 10: presents the results of regression analysis of model (2) derived by firm size small and large firms. Panel (A) of Table 10: used the first proxy of audit quality (Big4) and shows a negative and insignificant coefficient of (-0.214, p-value 0.207 > 0.05) for the variable (Big X) with respect to small firms and a negative and insignificant coefficient of (-0.276, P-value 0.054>0.05) for large firms. Panel (B) of Table 10 shows the result using the second proxy of audit quality (ISPX) with a negative and insignificant coefficient of (-0.250, p-value 0.139>0.05) for small firms and a negative and significant coefficient of (-0.306, p-value 0.033<0.05) for large firms providing evidence for ***accepting research hypothesis H$_{3b}$*** indicating that the effect of audit quality proxied by auditor's industry specialization on the cost of equity capital is stronger in small firms than large firms.

Concerning the effect of control variables firm size and leverage have negative significant coefficients of -0.748 and -0.091 with p-values of 0.015 and 0.00 <0.05) for small firms and -0.733, -0.090 with p-values 0.017 and 0.00<0.05 or large firms respectively. This shows that these two variables had a significant inverse effect on the

cost of equity capital consistent with the findings of Fernando et al. (2010).

Concerning the coefficient of determination, Panel (A) of Table (10) shows an adjusted $R^2$ of 11.1% (F statistic = 9.319, P-value =0.00< 0.05) for small firms and 4.5% F statistic = 4.324, P-value =0.006< 0.05 for large firms resulting in a difference of 6.6% in favor small firms. Panel (B) of Table (10) shows the coefficient of determination; adjusted $R^2$ is 11.4% F statistic = 9.547, P-value =0.006< 0.05 for small firms while and $R^2$ is 4.9 F Statistic =4.622, P-value 0.004<0.05 for large firms resulting in a difference of 6.5% in favor of small firms and providing better support for accepting hypothesis $H_{3b}$.

*Summary of research hypotheses and results of statistical analysis*

| Hypotheses | Statement of the hypothesis | Results of statistical analysis |
|---|---|---|
| $H_1$ | *Audit quality negatively affects agency costs.* | **Accepted** |
| $H_2$ | *The audit quality negatively affects cost of equity capital.* | *Accepted* |
| H3 | *$H_3$: The negative effect of audit quality on agency costs and cost of equity is expected to be stronger for small firms than large firms.* | *Accepted* |
| $H_{3a}$ | *The negative effect of audit quality on agency costs is expected to be stronger for small firms than large firms.* | *Accepted* |
| $H_{3b}$ | *The negative effect of audit quality on the cost of equity capital is expected to be stronger for small firms than large firms.* | *Accepted* |

## Additional analysis

In order to perform additional analysis as robustness check for the validity of the variables used in this study, the researcher follows (Houqe et al.2017; Fernando et al.2010) and performed two robustness tests.

*First,* the test of robustness was performed in order to check  for validity of use of binary variables Big4, ISPX as proxies of audit quality, by rerunning the regressions models 1 and 2 with an alternative proxy of Audit Quality which is  $Top_6$[5] (Houqe et al.2017) the results presented in tables 11and 12.

## *Testing the effect of Top$^6$ as proxy of Audit quality on agency costs*

Panel A, B, and C of Table 11 presents the results of the model (4) regarding the effect of audit quality (Top6) on agency costs. Panel (A) of Table 11 shows the result of the entire sample with a positive significant coefficient of (0.207, P-value= 0.023 <0.05) this result is similar to the finding reported in Panel (A) of Table (7). This result provides strong evidence that audit quality is positively associated with asset utilization ratio, hence, reduce agency costs. Concerning small firms Panel B of Table 11 shows the results with a negative and insignificant coefficient of (-0.202, P-value 0.142>0.05), while Panel C of Table 11 shows the result with a positive and significant of (0.553, P-Value 0.000<0.05) for large firms. This result confirmed the previous results reported in Panel A and B of Table (9).

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1.  [5] Apparently, numerous previous studies have used Top 4, Top 8 as alternative measures of Audit quality in Audit Market dominated by domestic Audit Firms, (Chen et al.2011: Houqe et al. 2017), however, the presence of international accounting firms (Big4) in Egyptian audit market  is limited (El-Dyasty 2017), and dominated by domestic audit firm which is similar to prior studies, accordingly, the research defines the Top6 base on Market shares, the Audit firm define as Top6 if it market shares equal or exceeds 50% less than this is defined as non Top6.
2.  This study utilized client's total assets as an alternative for audit fees  for calculating market share (Krishnan 2003)

## Table 11: the effect of $Top^6$ on Agency Costs

| Parameter | Pred sign | Panel A full sample N=415 | | | Panel B Small Firms N=200 | | | Panel C Large firms N=215 | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | *Coeff.* | p-value | t. test | *Coeff.* | *p-value* | *t. test* | *Coeff.* | *p-value* | *t. test* |
| Intercept | ? | -1.510 | 0.042 | -2.045 | -1.697 | 0.129 | -1.526 | -1.435 | 0.148 | -1.451 |
| $Top^6$ | + | 0.207 | 0.023 | 2.275 | -0.202 | 0.142 | -1.476 | 0.553 | 0.000 | 4.069 |
| FS | + | 0.590 | 0.034 | 2.132 | 0.725 | 0.083 | 1.741 | 0.467 | 0.206 | 1.268 |
| LEV | + | 0.178 | 0.000 | 7.982 | 0.235 | 0.000 | 7.005 | 0.132 | 0.148 | 4.455 |
| $Adj.R^2$ | | *19.8%* | | | *26.7%* | | | *16.5%* | | |
| F Statistic (Sig) | | **35.180 (0.000)** | | | **25.290 (0.000)** | | | **15.114 (0.000)** | | |

a.  Dependent Variable: AGC_SA       b. Predictors: (Constant), LNLEV, Top6, LNFS

## Testing the effect of $Top^6$ as proxy of Audit quality on cost of equity capital

Regression model (2) was re-run to test the effect of audit quality ($Top^6$) on the cost of equity capital. Panel A of Table (12) shows the results for an entire sample with a positive and insignificant coefficient of (0.016, P-value= 0.878 > 0.05). This result support the results reported in Panel (A) of Table (9) while contradicts with finding reported in Panel (B) of Table (9). Regarding  small and large firms Panel B  of Table 12  shows  the result with a  negative and insignificant coefficient of (-0.094, P-value 0.512>0.05) for small firms while Panel (C) of Table 12 shows the results with a negative and insignificant coefficient of (-0.002, P-value 0.989>0.05) for large firms. These results support the results reported in Panels (A) and (B) of Table (8).

## Table 12: Testing the effect of Top[6] on the Cost of Equity Capital

| Param-eter | Pred sign | Panel A full sample N=415 | | | Panel B Small Firms N=200 | | | Panel C Large firms N=215 | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | *Coeff.* | p-value | t. test | *Coeff.* | p-value | t. test | *Coeff.* | p-value | t. test |
| Inter-cept | ? | 2.089 | 0.011 | 2.553 | 3.034 | 0.009 | 2.630 | 1.140 | 0.342 | 0.953 |
| Top[6] | - | 0.016 | 0.878 | 0.154 | -0.094 | 0.512 | -0.656 | -0.002 | 0.989 | -0.014 |
| FS | - | -0.813 | 0.008 | -2.649 | -1.182 | 0.007 | -2.735 | -0.418 | 0.350 | -0.936 |
| LEV | + | -0.096 | 0.000 | -3.889 | -0.079 | 0.024 | -2.281 | -0.097 | 0.007 | -2.714 |
| *Adj.R²* | | *6.4%* | | | *10.6%* | | | *2.8%* | | |
| F Statistic (Sig) | | **10.379 (0.000)** | | | **8.877 (0.000)** | | | **3.016 (0.031)** | | |

a. Dependent Variable: COE    b. Predictors: (Constant), LNLEV, LNFS, And Top[6]

## The Combined effect of Audit quality proxies (Big4 , ISPX) on Agency costs

**The second test of robustness** had followed (Fernando et al.2010 ) who combined  independent variables in order to check the independence of audit quality proxies from each other and examine the combined effects of these two proxies on agency costs and cost of equity capital. This is done by running the two regression models (1 and 2) by including all independent variables Big4 and ISPX at the same time. The results reported in Tables 13 and 14.

Panel A of Table 13 shows the results for the entire sample the variable Big4 has a negative and significant coefficient of (-0.976, P-value 0.020 <0.05)  indicating that the combined effects of independent variables on agency cost resulted in Big4 to increase the agency costs. This result contradicts the previous findings on the effect of Big4 on agency costs reported in Panel (A) of Table (7).In regard to ISPX, Panel A of Table 13 shows the result with a positive and significant coefficient of (1.604, P-value 0.000 < 0.05) indicating that the combined effects of independent variables on agency costs resulted in ISPX to reduces agency costs. This result confirms the previous findings reported in Panel (B) of Table (7).

Concerning small Firms and large Firms, Panel B of Table 13 shows the result for Big4 with a negative and insignificant coefficient

of (-0.537, P-value 0.376 > 0.05) for Small Firms, while Panel C of Table 13 shows the result for Big4 with a negative and significant coefficient of (-1.386,P-value 0.022< 0.05) for large Firms, although the results have shown a negative coefficient it contradicts the findings reported in Table(8). Panel B of  Table 13 presents the result of ISPX with a positive and significant coefficient of (1.453, P-value 0.017< 0.05) for the small Firms and Panel C of Table 13 shows the result for ISPX with a positive and significant coefficient of (1.804, P-value 0.003<0.5) for large Firms. The results confirmed the findings reported in Table (8).

## Table13: Testing the effect of audit quality on Agency Costs.

| Pa- rameter | Pred sign | Panel A full sample N=415 | | | Panel B Small firms N=200 | | | Panel C Large firms N=215 | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | *Coeff.* | p- value | t. test | *Coeff.* | p- value | t. test | *Coeff.* | p- value | t. test |
| Inter- cept | ? | -1.162 | 0.097 | -1.662 | -0.823 | 0.428 | -0.795 | -1.276 | 0.199 | -1.287 |
| Big X | + | -0.976 | 0.020 | -2.330 | -0.537 | 0.376 | -0.887 | -1.386 | 0.022 | -2.309 |
| ISPX | + | 1.604 | 0.000 | 3.820 | 1.453 | 0.017 | 2.406 | 1.804 | 0.003 | 2.997 |
| FS | + | 0.435 | 0.098 | 1.659 | 0.275 | 0.479 | 0.709 | 0.517 | 0.167 | 1.387 |
| LEV | + | 0.171 | 0.000 | 8.268 | 0.184 | 0.000 | 6.048 | 0.148 | 0.000 | 5.054 |
| *Adj.R²* | | *28.4%* | | | *38.1%* | | | *17.2%* | | |
| F Statis- tic  (Sig) | | 42.234 (0.000) | | | 31.747 (0.000) | | | 12.127 (0.000) | | |

a.    Dependent Variable: AGC_SA    b. Predictors: (Constant), LNLEV, Big4, LNFS, ISPX

## The Combined effect of Audit quality proxies (Big4, ISPX) on cost of equity capital

Panel A of Table 14 reports the results for the full sample the variables Big4 and ISPX to have a positive insignificant coefficient of (0.743, p-value 0.128> 0.05) and a negative significant coefficient of (-0.969, P-value 0.048<0.05) respectively which supports the results presented in Table (8). Panel B of Table 14 shows the results for *Big4* and **ISPX** with a positive insignificant coefficient of (0.470, P-value 0.491> 0.05) and negative insignificant coefficient of (-0.704, P-value 0.302) respectively. Panel (C) of Table 14 shows the results for *Big4* and *ISPX* with a positive insignificant coefficient of (0.604, P-value 0.405> 0.05) and a negative insignificant coefficient of (-0.899,P-

value 0.217>0.05) respectively. These results support the results reported in Table (10).

## Table14: Testing the effect of audit quality on Cost of Equity Capital

| Parameter | Pred. sign | Panel A full sample N=415 | | | Panel B Small Firms N=200 | | | Panel C Large firms N=215 | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | *Coeff.* | p-value | t. test | *Coeff.* | *p-value* | t. test | *Coeff.* | *p-value* | t. test |
| Intercept | ? | 1.959 | 0.017 | 2.407 | 2.803 | .017 | 2.405 | 1.251 | 0.296 | 1.048 |
| Big4 | - | 0.743 | 0.128 | 1.526 | 0.470 | 0.491 | 0.690 | 0.604 | 0.405 | 0.834 |
| ISPX | - | -0.969 | 0.048 | -1.984 | -0.704 | 0.302 | -1.036 | -0.899 | 0.217 | -1.239 |
| FS | - | -0.733 | 0.017 | -2.401 | -1.087 | 0.013 | -2.494 | -0.421 | 0.350 | -.936 |
| LEV | + | -0.087 | 0.000 | -3.620 | -0.074 | -0.031 | -2.176 | -0.096 | 0.007 | -2.749 |
| *Adj.R²* | | *7.9%* | | | *11.2%* | | | *4.8%* | | |
| **F Statistic (Sig)** | | **9.777 (0.000)** | | | **7.260 (0.000)** | | | **3.635 (0.007)** | | |

*Dependent Variable: COE    b. Predictors: (Constant), LNLEV, Big4, LNFS, ISP*

# 7. Research Limitations

The study focused on firms listed in the Egyptian Stock Exchange and therefore unlisted companies are not represented in the sample.
Finance and banking industries are excluded from the study because of the special the nature of capital and investment in these industries that are not comparable to those of non-financial firms. In addition, these institutions are governed under specific laws and have different regulators.

Another limitation is that time constraint and the tasking nature of first-hand data collection did not permitted exhaustive search for data relating to other industries which could have made the result to have a more far-reaching application to encompass more industries. And finally, the study used one measure for agency costs which is the asset utilization ratio.

# 8. Conclusions, Recommendations, and suggestions for future Research

This study aimed to examine the role of audit quality proxied by auditor's firm size and auditor's industry specialization in reducing agency costs and cost of equity capital using a sample for 111 non-financial firms listed in the Egyptian stock exchange market covering the period from 2013 to 2016. The study measures auditor's industry

specialization by market share, measured agency costs by assets utilization ratio, and measured cost of equity capital using price earnings rate divided by earnings growth rate.

Although Egyptian audit market dominated by domestic audit firms with existence of a small number of Egyptian audit firms affiliated with global (international) accounting firms known as Big4, this study found audit quality proxied by (Auditor's firm size and auditor's industry specialization) affect the agency costs. The study didn't find statistical significant effect of audit quality proxied by auditor's firm size on cost of equity capital indicating that size of the audit firm has no effect on cost of equity capital which agrees with (El-Dyasty 2017) who argued that Big4 don't improve audit quality in the Egyptian audit market. However, findings contradict with (Fernando et al.2010; Chen et al .2011; Houqe et al.2017) who asserted that the size of the audit firm used as a measure of audit quality can lower cost of equity capital. In contrast this study found statistical negative significant effect for auditor's industry specialization used as the second measure of audit quality on cost of equity capital.

Concerning the varying effect of audit quality roles on agency costs and cost of equity capital among small firms and large firms, results provided evidence for a more pronounced effect of audit quality in small firms than large firms.

Regarding control variables, results didn't found a significant effect of audit client's size on agency costs, which contradicts prior studies. However, a negative and significant effect of firm size on the cost of equity capital was found which agrees with prior studies. Finally, the study also found a positive and significant effect of financial leverage on agency cost, this result suggests that the higher, the financial leverage, the lower the agency costs while a negative and significant effect on the cost of equity capital was observed, indicating that the higher the financial leverage, the lower the cost of equity capital for firms listed in the Egyptian stock exchange.

Accordingly, the study provided several recommendations among which are firms listed in the Egyptian Stock Exchange market should be required to disclose data about audit fees in order to improve transparency. Also, Egyptian regulators  exert more efforts in professionalizing auditing in Egyptian market as one of the most important emerg-

ing market in the Middle East and North African (MENA) in order to cope with the institutional requirements in developed countries.

Based on the limitations and findings of current research study, the following recommendations can be made for future research as this study opens research to several studies concerning investigating the role of audit quality in reducing cost of debts, examining the impact other corporate governance mechanisms such as cost of equity, different ownership structures, and board compensation on audit quality, investigating the role of audit quality in mitigating interfamily agency conflict in the family firms and finally this research study could be replicated using more proxies for audit quality as audit firm size, auditor's industry specialization, audit tenure, auditor opinion and timeline of auditor report. The researcher needs to include more years of data and more countries in order to extend the study and add other control variables firm listing age and type of industry or sector.

More independent variables (such as selling, general and administrative expenses to sales (SG&A) and asset liquidity) can be included in the formulated tested models in order to investigate their impact on the selected performance ratios. Future research can also be extended by incorporating more explanatory variables (e.g. CEO compensation, board diversity, ownership attributes……).Researchers should consider that using limited number of governance mechanisms or examining these mechanisms in isolation from each other will bring out inconsistent results and could mislead future researchers and policymakers as well. Furthermore, the study needs to be extended to the financial sector to obtain more effective results

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# Appendices

## Appendix (A) Firms Listed at Egyptian Exchange Stock Market included in the study

|   | Company Name | Sector Name |
|---|---|---|
| 1 | Ezz Steel | Basic Resources |
| 2 | Arab Aluminum | Basic Resources |
| 3 | Misr National Steel - Ataqa | Basic Resources |
| 4 | Egypt Aluminum | Basic Resources |
| 5 | Egyptian Iron & Steel | Basic Resources |
| 6 | Rakta Paper Manufacturing | Basic Resources |
| 7 | Asek Company for Mining - Ascom | Basic Resources |
| 8 | EL Ezz Aldekhela Steel - Alexandria | Basic Resources |
| 9 | Egyptian Financial & Industrial | Chemicals |
| 10 | Misr Fretilizers Production Company - Mopco | Chemicals |
| 11 | Kafr El Zayat Pesticides | Chemicals |
| 12 | Samad Misr -EGYFERT | Chemicals |
| 13 | Misr Chemical Industries | Chemicals |
| 14 | Abou Kir Fertilizers | Chemicals |
| 15 | Egyptian Chemical Industries (Kima) | Chemicals |
| 16 | Sidi Kerir Petrochemicals | Chemicals |
| 17 | The Arab Ceramic CO.- Ceramica Remas | Construction and Materials |
| 18 | Misr Cement (Qena) | Construction and Materials |
| 19 | Misr Conditioning (Miraco) | Construction and Materials |
| 20 | Giza General Contracting | Construction and Materials |
| 21 | Egyptian for Developing Building Materials | Construction and Materials |
| 22 | El Ezz Porcelain (Gemma) | Construction and Materials |
| 23 | Suez Cement | Construction and Materials |
| 24 | Torah Cement | Construction and Materials |
| 25 | Misr Beni Suef Cement | Construction and Materials |
| 26 | Acrow Misr | Construction and Materials |
| 27 | Modern Company for water proofing (Bitumode) | Construction and Materials |
| 28 | Elsaeed Contracting& Real Estate Investment Company SCCD | Construction and Materials |
| 29 | Nasr Company for Civil Works | Construction and Materials |
| 30 | Arab Valves Company | Construction and Materials |
| 31 | Paint & Chemicals Industries (Pachin) | Construction and Materials |

| 32 | Rubex International for Plastic and Acrylic Manufacturing | Construction and Materials |
|----|----|----|
| 33 | Lecico Egypt | Construction and Materials |
| 34 | South Valley Cement | Construction and Materials |
| 35 | Alexandria Cement | Construction and Materials |
| 36 | Delta Construction & Rebuilding | Construction and Materials |
| 37 | Egyptian Starch & Glucose | Food and Beverage |
| 38 | AJWA for Food Industries company Egypt | Food and Beverage |
| 39 | Edita Food Industries S.A.E | Food and Beverage |
| 40 | Ismailia Misr Poultry | Food and Beverage |
| 41 | Sharkia National Food | Food and Beverage |
| 42 | Atlas For Land Reclamation and Agricultural Proccssing | Food and Beverage |
| 43 | Juhayna Food Industries | Food and Beverage |
| 44 | Obour Land For Food Industries | Food and Beverage |
| 45 | Mansourah Poultry | Food and Beverage |
| 46 | Egypt for Poultry | Food and Beverage |
| 47 | North Cairo Mills | Food and Beverage |
| 48 | Alexandria Flour Mills | Food and Beverage |
| 49 | El Nasr For Manufacturing Agricultural Crops | Food and Beverage |
| 50 | Minapharm Pharmaceuticals | Healthcare and Pharmaceuticals |
| 51 | Sabaa International Company for Pharmaceutical and Chemical | Healthcare and Pharmaceuticals |
| 52 | Egyptian International Pharmaceuticals (EIPICO) | Healthcare and Pharmaceuticals |
| 53 | Alexandria Pharmaceuticals | Healthcare and Pharmaceuticals |
| 54 | Memphis Pharmaceuticals | Healthcare and Pharmaceuticals |
| 55 | Alexandria New Medical Center | Healthcare and Pharmaceuticals |
| 56 | Engineering Industries (ICON) | Industrial Goods and Services and Automobiles |
| 57 | El Arabia Engineering Industries | Industrial Goods and Services and Automobiles |
| 58 | Electro Cable Egypt | Industrial Goods and Services and Automobiles |
| 59 | ELSWEDY ELECTRIC | Industrial Goods and Services and Automobiles |
| 60 | Suez Bags | Industrial Goods and Services and Automobiles |

| 61 | GB AUTO | Industrial Goods and Services and Automobiles |
|----|---------|-----------------------------------------------|
| 62 | Canal Shipping Agencies | Industrial Goods and Services and Automobiles |
| 63 | Alexandria Containers and goods | Industrial Goods and Services and Automobiles |
| 64 | United Arab Shipping | Industrial Goods and Services and Automobiles |
| 65 | Egyptian Transport (EGYTRANS) | Industrial Goods and Services and Automobiles |
| 66 | Delta For Printing & Packaging | Industrial Goods and Services and Automobiles |
| 67 | Egyptian Media Production City | Media |
| 68 | Oriental Weavers | Personal and Household Products |
| 69 | ARAB POLVARA SPINNING & WEAVING CO. | Personal and Household Products |
| 70 | Alexandria Spinning & Weaving (SPINALEX) | Personal and Household Products |
| 71 | Arab Cotton Ginning | Personal and Household Products |
| 72 | Palm Hills Development Company | Real Estate |
| 73 | Egyptians Housing Development & Reconstruction | Real Estate |
| 74 | Six of October Development & Investment (SODIC) | Real Estate |
| 75 | North Africa Co. for Real Estate Investment | Real Estate |
| 76 | Zahraa Maadi Investment & Development | Real Estate |
| 77 | Gulf Canadian Real Estate Investment Co. | Real Estate |
| 78 | Mena Touristic & Real Estate Investment | Real Estate |
| 79 | Arab Real Estate Investment CO.-ALICO | Real Estate |
| 80 | National Housing for Professional Syndicates | Real Estate |
| 81 | El Shams Housing & Urbanization | Real Estate |
| 82 | Development & Engineering Consultants | Real Estate |
| 83 | Gharbia Islamic Housing Development | Real Estate |
| 84 | Medinet Nasr Housing | Real Estate |
| 85 | El Obour Real Estate Investment | Real Estate |
| 86 | International Co For Investment & Development | Real Estate |
| 87 | Cairo Development and Investment | Real Estate |
| 88 | Emaar Misr for Development | Real Estate |
| 89 | Ismailia Development and Real Estate Co | Real Estate |

| 90 | Egyptians For Investment & Urban Development | Real Estate |
|---|---|---|
| 91 | T M G Holding | Real Estate |
| 92 | Heliopolis Housing | Real Estate |
| 93 | El Arabia for Land Reclamation | Real Estate |
| 94 | General Company For Land Reclamation,Development & Reconstru | Real Estate |
| 95 | Wadi Kom Ombo Land Reclamation | Real Estate |
| 96 | United Housing & Development | Real Estate |
| 97 | MM Group For Industry And International Trade | Retail |
| 98 | Raya Holding For Financial Investments | Technology |
| 99 | Orange Egypt For Telecommunications | Telecommunications |
| 100 | Telecom Egypt | Telecommunications |
| 101 | Orascom Telecom Media And Technology Holding | Telecommunications |
| 102 | Egyptian International Tourism Projects | Travel & Leisure |
| 103 | Rowad Misr Tourism Investment | Travel & Leisure |
| 104 | Golden Coast Company | Travel & Leisure |
| 105 | Rowad Tourism (Al Rowad) | Travel & Leisure |
| 106 | Remco for Touristic Villages Construction | Travel & Leisure |
| 107 | Pyramisa Hotels | Travel & Leisure |
| 108 | Orascom Development Egypt | Travel & Leisure |
| 109 | Egyptian for Tourism Resorts | Travel & Leisure |
| 110 | El Wadi Co. For Touristic Investement | Travel & Leisure |
| 111 | Sharm Dreams Co. for Tourism Investment | Travel & Leisure |

## **Appendix (B)** Egyptian Audit firms affiliated with global accounting firms known as Big4

| Egyptian Audit firm | Global accounting firm (Big4) |
|---|---|
| Mazars –Mostafa Shawki | E&Y |
| Hazem Hassan | KPMG |
| Saleh and Barsoum and Abdel Aziz | Deloitte |
| Mansour | PwC |

## **Appendix (C)** National Egyptian Top6 Audit firms according to market shares

| Audit firm | Market share |
|---|---|
| Allied for Accounting and Auditing | 100% |
| Hazem Hassan | 100% |
| Baker Tilly - Wahid Abdel Ghaffar and Co | 58.41% |
| Moore Stephens - Egypt | 50% |
| Central Auditing Organization | 57.2% |
| Mohamed Sayed Ibrahim Elmahgri | 50% |