AUDIT COMMITTEE EFFECTIVENESS AND COMPANY PERFORMANCE: EVIDENCE FROM EGYPT

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Abstract

The purpose of this paper is to investigate the impact of audit committee characteristics (size, independence, experience, gender diversity, and frequency of meetings) on the company's financial performance (ROA and ROE) in Egypt. In 2016, the Egyptian Stock Exchange announced a new listing requirement for the audit committee members' characteristics to enhance its effectiveness. Data are gathered from the board of directors (BOD) and annual reports of the EGX 30 index non-financial listed companies in Egypt for the period of 2016–2018. Data is analyzed by using panel data cross-section data analysis and correlation analysis. The findings reveal that the audit committee size has a significant relationship with ROA only and committee members' experience is significantly related with ROE only. The other characteristics (independence, meetings, and gender diversity) have no impact on ROA and ROE. Such findings contribute to the literature by providing new understandings regarding the audit committee as a key component of corporate governance and its impact on financial performance. It could also guide and improve the boards' selection of the audit committee members and gives Egyptian regulators a better understanding of the impact of their latest listing requirements on protecting the shareholders' interests and increasing their confidence through having transparent financial statements.

Keywords: Corporate Governance, Audit Committee, Auditor Independence, Experience, Firm Performance, Egyptian Stock Exchange

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1. INTRODUCTION

Corporate governance includes some external and internal instruments to reduce the agency costs inside any corporation for an improvement in its financial performance (Munisi & Randøy, 2013; Peni, 2014; Tuan, 2014; Ghofar & Islam, 2015; Azar, Sayyar, Zakaria, & Sulaiman, 2018). It involves numerous policies, procedures and ideal practises that assist the board of any company to manage any business challenges they may face. All the systems put in place are there to ensure that the company achieves their goals with best practise, as well as maintaining trust with stakeholders (Masmoudi, 2021).

Incorporation legislation in all countries requires the appointment of boards of directors to monitor and guide executives on important firm decisions (Baldenius, Melumad, & Meng, 2014). In other words, the board has a vital role in ensuring all decisions are made in line with their corporate governance for protecting all the stakeholders' interests. The board should set up some committees like audit, nomination, and compensation committees, to contribute to improving governance efficiency. Such committees will work to make sure that the firm is working in compliance with the laws, the internal procedures and that all corporate governance regulations are met. Not only will this enhance the corporate governance and potentially stop the bad practice of a company occurring, but it will also boost financial performance because all investors will have confidence that their trust in the company is being looked after (FRC, 2014, 2016).

High firm performance is paramount in making sure that investors are confident in continuing their investments (Harrison & Wicks, 2013). A range of indicators, such as corporate governance characteristics, can be used to notify performance improvements. This has motivated many accounting and finance academics to pay more attention to the need to identify which corporate governance characteristics are the most effective for improving firm performance.

The audit committee's effectiveness has become increasingly important in the global corporate governance agenda and in the emerging markets too. The audit committee has a vital role in choosing, managing, and directing the work of all the companies' auditors, which is essential in revising and reporting financial data (Shbeilat, 2018). Accordingly, the audit committee has an advisory function and enhances investors' expectations of receiving more reliable financial reports. Financial reporting transparency allows investors to better monitor management and improve investment efficiency.

There have been well-known corporate scandals, e.g., Enron and WorldCom, USA; Satyam, India; and Chuo-Aoyama PricewaterhouseCoopers, Japan, who have shredded investors' confidence within capital markets and corporate management. Regulators and professionals mostly agreed that such corporate governance failures resulted from weak audit committees, low corporate governance, and a lack of responsibility (Baatwah, Ahmad, & Salleh, 2016; Bajra & Cadez, 2018). More rigorous legislations were enacted that mainly aims to attract and protect investors and other stakeholders and enhance company value. The US Sarbanes Oxley Act, and other similar laws worldwide, including the 8th European Company Law Directive, the Jordanian Stock Exchange rules (2002), the Australian Stock Exchange (ASX) Corporate Governance Council (2003, 2007, 2010, and 2014), the Dutch Corporate Governance Code (2016), the Capital Market Authority of Saudi Arabia, the Securities and Commodities Authority of the UAE (2018) and the Egyptian Corporate Governance Law (2016), addressed corporate governance failures by giving more power to audit committees and by setting some criteria in selecting these committee members.

In Egypt, corporate governance within companies has been an emerging issue, especially after the 2011 revolution. In 2003, the Egyptian Institute of Directors (EIoD) developed guidelines and rules for applying company corporate governance in line with the laws that regulate businesses in Egypt. Such guidelines and rules were based on international best practices. Egypt's Ministry of Investment and the General Authority for Investment and Free Zones issued the first release of the Egyptian Code of Corporate Governance (ECCG), 2005, written in Arabic. Such code was written for the interest of all shareholders and investors and was aimed at achieving the highest level of efficiency and sustainability within companies. It directed all listed companies to comply with governance and disclosure requirements.

Later, the EIoD issued the Corporate Governance Code, 2006, for publicly owned corporations, which aimed at improving the controls and supervision of the public sector.

In addition, in 2011, the Egyptian government further adopted a new code of corporate governance for listed companies and banks, which was in line with international practises as well regional (Cigna, Djuric, & Sigheartau, 2017). The Corporate Governance Code recommendations are like the G20/OECD Principles of Corporate Governance (OECD, 2015), which are adopted by several countries, including South Africa, Malaysia, and the Philippines. However, they are not mandatory: in other words, it is optional if companies comply with them or not. Within the corporate governance code, the "comply or explain" approach is applied; in case of non-compliance, companies should have a valid reason as to why. Since the recommendations are not mandatory, it seemed to lack application. In 2014, only a limited number of large companies provided a "comply or explain" statement with their annual report; moreover, they had weak audit committees that lack the necessary independence to make them effective. As a result, in 2016, the Egyptian Financial Supervision Authority (EFSA) issued another updated corporate governance guideline, which was to be adopted by all listed companies, including banks and financial intuitions. It introduced a new requirement that the audit committees should consist of a minimum of three board of directors: two members should be independent (meaning they work outside of the corporation) and one member must have financial or accounting experience (Cigna et al., 2017).

According to the literature, the audit committee effectiveness and firm performance has been studied in developed countries, as in the UK by Agyemang-Mintah and Schadewitz (2018), Masmoudi (2021) in the Netherlands and in other developing countries as in Saudi Arabia and the UAE by Alzeban (2020), and in Jordan by Dakhlallh, Rashid, Wan Abdullah, and Al Shehab (2020). As a matter of fact, to the best of our knowledge, the Egyptian context has not been explored yet. In the Egyptian literature, the impact of the audit committee effectiveness studied for early periods (2007–2010) by Soliman and Raghab (2014) and up until 2012 by Amer, Ragab, and Shehata (2014), which means before the issuance of the new Egyptian audit committee requirement of 2016. Accordingly, this study can be distinguished from the other previous studies, in fact, it will contribute to the literature by examining Egypt's new requirement with regards to the audit committee, and its performance impact within companies listed in Egypt.

Another objective of this study is to guide the professional accountancy bodies and Egyptian regulators if such new added requirement can enhance the financial reporting quality and investors' confidence that, in turn, reflected in good financial performance within the listed companies, which represent the economic asset and contributor of the Egyptian government.

For achieving such objectives, some research questions are raised and examined, within this paper, to find out which of the audit committee characteristics has a significant impact on the financial performance, for the selected listed non-financial companies in a three years' period from 2016 to 2018. The study measures the audit committee characteristics collectively (the independent variable) in terms of audit committee size, independence, experience, gender diversity, and frequency of meetings. Return on assets (ROA) and return on equity (ROE) are used to measure the company's financial performance (the dependent variables). Previous studies have suggested the firm size, firm age, leverage ratio, and industry type as variables used for controlling the influence of the company characteristics on the firm performance. This study used such suggested control variables. The published annual financial and board of directors (BOD) reports of these EGX 30 selected listed companies for 2016, 2017, and 2018 are examined and used for secondary data collection. The data collected is then analyzed by panel data cross-section data analysis and correlation analysis. Panel data cross-section data analysis is used to examine changes in the variables over the three years and differences in variables between selected companies.

The findings reveal that the audit committee size is positively significant with ROA only and audit committee members' financial experience is positively significant with ROE only. The other audit committee characteristics (independence, frequency of meetings, and gender diversity) have no significant relationship with ROA and ROE.

The remainder of this paper starts by presenting an overview of previous studies in the literature, the audit committee and corporate governance in Egypt, and hypotheses development in Section 2. The data collection and research methodology are described in Section 3 and then data analysis and the results are illustrated in Section 4. Finally, our findings are summarized and concluded in Section 5.

2. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

Over the last decade, there has been an uprise in literature with regards to corporate governance in accounting and auditing. As well as it being discussed from different perspectives, it has been researched and studied through the application of different theoretical frameworks: the agency theory (Ross, 1973; Mitnick, 1975), the stakeholder theory (Freeman, 1984), the stewardship theory (Donaldson & Davis, 1991) and the resource theory (Pfeffer & Salancik, 1978).

The agency theory emphasises the relationship between the principal (stockholder) and the agent (management). The agency theory stated that a well-functioning firm is able to reduce agency costs

(Deegan & Unerman, 2008). Agency problems may occur when there is a separation between the owner and management. A conflict of interests may arise between management and principal, and asymmetric information also may be present. These agency problems subsequently lead to agency costs, which become additional costs for companies in operating their businesses and can affect firm performance. Modern corporate governance deals with agency problems and information asymmetry by controlling and directing the relationship between managers and the company's auditors, board directors, and owners (Shbeilat, 2018). A good mechanism to achieve this is having an independent audit committee, which is responsible for monitoring all such relationships, their communications and properly applying the accounting and auditing standards (Shbeilat & Harasees, 2018).

In the literature, the agency theory was criticized for providing short-term perspective of the firm purpose. As an alternative to the agency theory, the stakeholder theory suggested that shareholders are merely one of many stakeholders in a company. The company's real success lies in satisfying all its stakeholders, including stockholders, creditors, customers, employees, suppliers, competitors, and not just only the stockholders. Accordingly, the audit committee should work on serving and protecting the interest of all those stakeholders.

In contrast to the agency theory, the stewardship theory believes that agents are egocentric and unorthodox. This theory assumes that firm performance can be improved if the executives and insiders have more control and given more faith in managing the company (Ntim, 2009). Consequently, if most of the audit committee are executive directors, this will increase efficiency and have a better result than having most independent directors from outside the business (Al Mamun, Yasser, & Rahman, 2013). This is thought to increase efficiency because the executive and inside directors are more knowledgeable and familiar because they have had more experience within the company (Ntim, 2009). In this way, the steward can unify the different interests of the stakeholders and protect the long-term interest of the principal (Hernandez, 2012). Here, managers are self-motivated from the intrinsic rewards they can get from performing their own duties, and not extrinsic rewards, as assumed by the agency theory. According to this theory, insiders are more suited to be members of the audit committee than outsiders.

The resource dependence theory studies how the external resources and environment of an organization can affect its behaviour. Accordingly, the audit committee advises and makes recommendations to the board of directors, in order to provide valuable resources to the firms. The board often delegates these responsibilities to its audit committee, but this delegation does not excuse the board of its obligations and accountability to shareholders and other stakeholders.

Nowadays, as per the mentioned theories, one key focus of legislation and regulatory bodies is to enhance the efficiency of corporate governance by improving the audit committee roles and duties. The 8th European Company Law Directive made a requirement, to strengthen the audit committee

role, that there must be a minimum of one member within the audit committee that is an expert in finance. In fact, these new reforms were initiated by developed countries and adopted by most emerging countries like Egypt in 2016. This is because the audit committee has a vital role in a business' financial reporting and audit (Beasley, Carcello, Hermanson, & Neal, 2009; Baatwah et al., 2016; Masmoudi, 2021). It is primarily responsible for ensuring that businesses are reliable within their accounting process, compliant with legal and ethical standards, and are able to maintain their fraud controls (Turley & Zaman, 2004).

With regards to the relation between corporate performance and the audit committee, previous research has found varied results. Collier (1993), Conyon (1994), Wild (1994), Karamanou and Vafeas (2005), and Carcello, Hermanson, and Ye (2011) found that when companies have an effective audit committee, their financial performance is significantly increased, as an effective financial audit committee can analyse financial information in-depth and ensure it is free from errors, thus enhancing the quality of all financial disclosure. Zha (2006), DeFond, Hann, and Xuesong (2005), McKnight, Milonas, Travlos, and Weir (2009), Al-Matari, Al-Swidi, Fadzil, and Al-Matari (2012), Aldamen, Duncan, Kelly, McNamara, and Nagel (2012), Munisi and Randøy (2013), Bruynseels and Cardinaels (2014), Gani, Wijeweera, and Eddie (2017) in Australia, Zábojníková (2016) in the UK, Maina and Oluoch (2018) in Kenia, Shabana (2018), Azar et al. (2018), Bajra and Cadez (2018) in EU, Talpur, Lizam, and Zabri (2018) in Malaysia, and Masmoudi (2021) in the Netherlands reported a significantly positive relationship between the audit committee and corporate performance. They suggested for future research a deep examination of better measures of governance and audit committee characteristics.

In contrast to the studies mentioned above, some other studies previously done found that having an audit committee can have no effect on a business. Turley and Zaman (2004), Bozec (2005), Bradbury, Mak, and Tan (2006), Reddy, Locke, and Scrimgeour (2011), and Jati Wibawaningsih and Primta Surbakti (2020) in Indonesia found that good governance has nothing to do with the audit committee features, such as being a finance expert and independent of the company. Other researchers (DeZoort, 1997; Cohen, Nelson, & Walsh, 2002; Guy & Zeff, 2002) have argued that many members of the audit committee lack critical characteristics, such as independence and experience, and this has had no effect on company performance.

However, given the mixed empirical evidence and results, this research attempts to examine whether the audit committees in Egyptian listed corporations do have a positive impact on its financial performance or not.

Based on all the above literature, the effectiveness of the audit committee can be examined and measured through its members' actions, behaviours, processes, and personality traits (Gendron & Bédard, 2006). Magrane and Malthus (2010) find that the effectiveness of audit committees should be "interpreted cautiously". This is because the definition of effectiveness is a broad spectrum and extremely hard to measure (Spira, 2006; Gendron, Bédard, & Gosselin, 2004). To achieve the study's objective, each attribute of the audit committee will be investigated as follows.

2.1. Audit committee size

The Egyptian corporate governance codes require there should be at least three non-executive members of the board of directors within the audit committee. In accordance with the agency theory, large audit committees tend to be less focused and participate less than smaller size ones. Thus, the monitoring process of these large committees will be eliminated and lower the firm performance (Hillman & Dalziel, 2003; Maina & Oluoch, 2018). Aldamen et al. (2012) in Australia, and Hamdan, Sarea, and Reyad (2013) in Amman found that smaller audit committees that contain qualified members with finance and accounting experience are more likely to improve the firm performance in the market.

In contrast, proponents of resource dependency theory give emphasis to the effect of a larger audit committee. Their view is that large committees can appoint more members with different knowledge and experience that help in improving accurate accounting (Choi, Jeon, & Park, 2004). Large audit committees will have more meetings and result in more effective supervision and recommendations (Raghunandan, Rama, & Read, 2001). Reddy, Locke, and Scrimgeour (2010), Al-Mamun, Yasser, Rahman, Wickramasinghe, and Nathan (2014), and Rezaei and Abbasi (2015) also found that the audit committee size positively affects the firm performance.

On the other hand, Al-Matari, Al-Swidi, and Fadzil (2014), and Oradi, Lari Dashtbayaz, and Salari Forg (2017) found that company performance is not down to the size of the audit committee.

Due to such contrasting results and to test such relationship, the first hypothesis can be expressed in this way:

H1: Profitability has a direct significant relationship with the size of the audit committee.

H1a: ROA has a direct significant relationship with the size of the audit committee.

H1b: ROE has a direct significant relationship with the size of the audit committee.

2.2. Independence of the audit committee

ECCG required that there should be at least three non-executive directors within the audit committee and that their supervisory functions must be as independent individuals because this may reduce conflicts of interest between managers and shareholders. This result can be expected because the committee's independence ensures the monitoring role of the audit committee is enhanced.

If the audit committee is independent of the company, it ensures quality audits and enhances the financial statement users' trust in the financial reporting process. Some researchers have found, among the listed companies, that there is a positive significant relationship between the number of independent members and corporate financial performance, as the financial reporting quality is improved in such companies (e.g., Carcello & Neal, 2003; Felo, Krishnamurthy, & Solieri, 2003; Van der Zahn & Tower, 2004; Jamil & Nelson, 2011). If the audit committee is independent, then fraudulent activity within businesses will be controlled and decreased (Bronson, Carcello, Hollingsworth, & Neal, 2009; O'Connell & Cramer,

2010; Yunos, Ahmad, & Sulaiman, 2014; Li, Lu, Mittoo, & Zhang, 2015; Shorvarzi, Khalili, Soleimani, & Forotan, 2015). Independent members of the committee will be unbiased when investigating all financial statements that affect a firm's financial performance (Saibaba, 2013). On the other side of the argument, Abdul Rahman and Haneem Mohamed Ali (2006), Wang, Lu, and Lin (2012), and Khosa (2017) found that audit committee independence has a negative effect on a company's financial performance.

Allowing outsiders to be members of the audit committees is a debateable point here. Generally, it is believed that the audit committee members' roles are to recommend specific actions for improvement to the board and then to follow up on these actions. The aim is for them to enhance the board's company's objectives. Accordingly, audit committee members will be able to perform their duties more efficiently when they have a comprehensive understanding of the company's business. However, outsiders may lack the full understanding needed to be able to abide by the same duties of loyalty, care, and objectives needed by board members. Since the audit committee is permitted to ask for external advice within specific matters, there is no need to replace the committee members with external advisors (Cigna et al., 2017). Fuzi, Halim, and Julizaerma (2016) found a varied opinion about the relationship between the number of independent members and firm performance. As the results of such relationship are still debatable, the second hypothesis can be as follows:

H2: Audit committee members' independence and profitability have a direct significant relationship.

H2a: Audit committee members' independence and ROA have a direct significant relationship.

H2b: Audit committee members' independence and ROE have a direct significant relationship.

2.3. Audit committee's experience

One significant input of audit committee effectiveness is the audit committee's financial expertise. It is presumed that if the committee's non-executive board members are completely qualified to make financial decisions, they are expected to have the ability to find a resolution for the business' financial issues. In 2003, the Securities and Exchange Commission (SEC) gave a definition of the audit committee members who have financial expertise in which it stated that "an accounting expert is any person who is trained and has the required accounting and auditing expertise, or have special expertise other than accounting like specialization in banking and investment and specialization in financial analysis" (SEC, 2003).

Recent survey research found that audit committee chairs are held by directors who are more likely to be accounting experts (e.g., Beasley et al., 2009; Salleh & Stewart, 2012; Engel, Hayes, & Wang, 2010; Schmidt & Wilkins, 2013; Tanyi & Smith, 2015) and provided empirical evidence on how financial expertise can assist in financial reporting quality. On the other hand, only one study (Abernathy, Beyer, Masli, & Stefaniak, 2014) failed to find such a significant association.

Choi et al. (2004) found that audit committees that are larger and include more members with varied expertise are more effective in performing and monitoring financial reporting practices. This result is parallel to the Guidance on Audit Committees (FRC, 2016). Improvements in the financial literacy of audit committee members are associated with stronger stock returns (Coates, Marais, & Weil, 2007). Hermanson, Krishnan, and Ye (2009) mentioned that shareholders' votes for auditors are based on the audit committees' expertise within finance. DeFond et al. (2005) and Engel et al. (2010) found that audit committees that contain qualified members receive higher compensation in comparison to other board directors who are part of such committee.

Aldamen et al. (2012) in Australia, Hamdan et al. (2013) in Amman, Baatwah et al. (2016) in Oman, and Farber, Huang, and Mauldin (2018) in the USA provided evidence that audit committees that contain experts in finance and accounting indeed enhances firms' information environment, financial reporting quality, and analysts' forecast properties. Thus, increasing the investors' confidence, which results in higher trading volume and lower liquidity risk. This improves the firm's financial performance. In Kenya, Maina and Oluoch (2018) found that most of the manufacturing firms had employed audit committee members highly experienced in financial management to ensure that they execute their duties as required.

However, this literature focused on data from the USA and other countries where the legal system may be extremely strict and different. Therefore, extending this literature to other settings, such as the Egyptian one, would have increased the reliability of these findings, especially in 2016 when the regulatory bodies started to pay greater attention to the features of an audit committee and recommended that audit committees must have at least one member who is an expert within finance.

Therefore, it is expected that an audit committee that has financial experts as its members can provide good recommendations and improve the company's financial status. Thus, the third hypothesis is as follows:

H3: Qualified audit committee members significantly influence profitability.

H3a: Qualified audit committee members significantly influence ROA.

H3b: Qualified audit committee members significantly influence ROE.

2.4. Gender diversity

There has been a global debate about policies that mandate women to join the board. Within the recent period, more people have researched the impact of female board members, and their impact on firm performance. However, the evidence remains questionable (Abdelzaher & Abdelzaher, 2019). In Egypt, the women's role in the society is a sophisticated component of the nation's culture and beliefs. In Egyptian society, gender has a significant social and economic influence.

The Egyptian corporate governance laws and regulations are silent on the board's gender diversity. Only four out of the ten largest listed companies in Egypt disclosed their board composition, and they appear to have women as part of their board members, which is on average about 15.33%. For all the ten companies, the average

female representation percentage in their boards is 6.13% (Cigna et al., 2017). However, the Egyptian Stock Exchange has started to pay more attention to the female employment of the board and has now included the gender diversity issue within the broader topic of sustainability, the promotion of which is now a part of the stock exchange's strategy.

In Egypt, Abdelzaher and Abdelzaher (2019) investigated 114 Egyptian firms and the effect of firm performance with regards to having female board members. They found that there was a positive impact on the firm value (ROE) due to female participation. In the UK, Agyemang-Mintah and Schadewitz (2019) show that the presence of females on boards indeed has a positive outcome in terms of firm value.

Many executives stated that having a female member on the board changed board behaviour, which impacted their monitoring role (Sonnabend, 2015). Females have monitoring skills that are superior to their male counterparts, which can cause boards to be more accountable (Triana, Miller, & Trzebiatowski, 2014). Females also have a unique management style that shapes the board's dynamics and enhances its negotiations and communication style. This leads to a more participative environment and accordingly, enhances a positive firm value (Hillman, Shropshire, & Cannella, 2007; Carter, D'Souza, Simkins, & Simpson, 2010; Dargnies, 2012; Barbulescu & Bidwell, 2013). Some studies suggest that greater females have stricter compliance and ethical values: therefore, they indirectly increase firm value.

On the contrary, Isidro and Sobral (2015) found no evidence to back up the statement that female participation on the board directly affects a firm's value. Ahern and Dittmar (2012) found that due to employing female board members in Norwegian firms, their firm performance decreased because such females had a lack of experience (Kogut, Colomer, & Belinky, 2014). Due to these mixed results, the fourth hypothesis will be as follows:

H4: Gender diversity on the audit committee has a significant impact on profitability.

H4a: Gender diversity on the audit committee has a significant impact on ROA.

H4b: Gender diversity on the audit committee has a significant impact on ROE.

2.5. Frequency of meetings

The audit committee chairman consults with the company's secretary in deciding on the timing and frequency of its meetings. The more effective monitoring and controlling bodies are those who meet frequently. In the UK, audit committees must congregate no less than three times annually, and this was recommended by the Financial Reporting Council's Guide on Audit Committees. The Egyptian Corporate Governance Code also requires that the audit committee should meet every quarter, and it should follow specific agenda.

Several studies have investigated whether the frequency of audit committee meetings affects firm performance, and they have revealed mixed results. Khanchel (2007) and Kyereboah-Coleman (2008) found that the more often an audit committee meets, the more successful a firm's performance is. Abbott, Parker, and Peters (2004) and Zhang, Zhou,

and Zhou (2007) argue that audit committees may only increase the number of meetings when there are problems in control. DeZoort, Hermanson, Archambeault, and Reed (2002) and Al-Mamun et al. (2014) found that regular meetings of audit committees could help reduce agency problems and information asymmetry of a firm because there will be consistent communication to investors, which will safeguard their interests. Maina and Oluoch (2018) found that such regular audit committee meetings helped in ensuring that the organizational finance department consistently complies with accounting guidelines and other accounting actions.

On the other hand, Abdul Rahman and Haneem Mohamed Ali (2006), Stewart and Munro (2007), and Mohd Saleh, Mohd Iskandar, and Mohid Rahmat (2007) provided evidence that lessening audit committee meetings reduces additional expenses accumulated from the meeting. This, in turn, can improve the firm's financial performance. Such mixed results in terms of this subject should be tested, so the fifth hypothesis will be as follows:

H5: The frequency of audit committee meetings significantly influences profitability

H5a: The frequency of audit committee meetings significantly influences ROA.

H5b: The frequency of audit committee meetings significantly influences ROE.

3. RESEARCH METHODOLOGY

The research involves both inductive and deductive reasoning processes. The theoretical principles and literature have been deducted through using library research, articles, and internet sources. The needed information for testing the research hypotheses was collected inductively. The quantitative research method and panel design are used in this study as other studies (e.g., Dakhlallh et al., 2020; Puni & Anlesinya, 2020). Panel design is the "pooling of observations on a cross-section of units over several time periods and provides results that are simply not detectable in pure cross-sections or pure time-series studies (Baltagi, 2005). In this study, a number of variables are investigated for 25 companies over 3 consecutive years to test the research hypotheses. Other studies use ordinary least squares (OLS) regression (Alzeban, 2020; Masmoudi, 2021) and multiple regression model (Ado, Rashid, Mustapha, & Ademola, 2020) in testing the variables for different sample sizes.

3.1. Data collection

The time period starting from 2016 till 2018 is selected for this study because, in 2016, the Egyptian listed firms, most likely, have started applying the recommendations of the Egyptian Stock Exchange updating listing rules regarding the composition of the audit committee. These recently updated rules added some requirements for including members with accounting or financial experience. Each audit committee should also have as a minimum three non-executive board members, two of whom are independent and should meet on a quarterly basis.

The selected sample is based on the EGX 30, the 30 most active companies listed in the Egyptian

stock market. These companies are perfectly reflecting the Egyptian market. The regulatory bodies set some rules and standards for listed firms in operating their business activities. The firms, to be listed, should abide by such rules, prepare and publish their financial information in compliance with the Egyptian Accounting Standards. The studied sample covers different sectors including entertainment and tourism, communication, building material and construction, manufacturing goods and services, automobiles, food and beverage, housing and real estate, and information technology. The banks and investment and financial institutions sector is omitted from the sample as this one has different governance issues.

The selected companies are as follows:
1) Palm Hills Developments Company SAE;
2) El Sewedy Electric Co SAE;
3) GB Auto SAE;
4) Talaat Mostafa Group Holding Co SAE;
5) Alexandria Mineral Oils Co SAE;
6) Oriental Weavers Carpet Co SAE;
7) Egyptian Resorts Co SAE;
8) Heliopolis Company for Housing and Development SAE;
9) Madinet Nasr for Housing and Development SAE;
10) Egyptian Iron and Steel Co SAE;
11) Global Telecom Holding SAE;
12) Telecom Egypt Co SAE;
13) Emaar Misr for Development SAE;
14) Juhayna Food Industries SAE;
15) Cairo for Investment and Real Estate Development SAE;
16) CI Capital Holding Company SAE;
17) Orascom Investment Holding SAE;
18) Egyptian Chemical Industries SAE;
19) Eastern Company SAE;
20) Arabia Cotton Ginning Co SAE;
21) Ezz Steel Co SAE;
22) Egypt Kuwait Holding Co SAE;
23) Orascom Development Egypt SAE;
24) Sixth of October Development and Investment Co SAE;
25) Arabia Investments Holding SAE.

Therefore, the final sample includes 75 observations (Hair, Black, Babin, & Anderson, 2013). Table 1 summarises the final sample size.

Table 1. The final sample

Description	*Number of observations*
Initial sample (3 years)	90
Less: Financial institutions (4 financial intuitions and 1 bank)	15
Final size	75

There are three types of data are collected as follows:
● *Audit committee's data:* the data required for identifying the audit committee's characteristics are collected using the "BOD reports" of these selected companies for the period of 2016–2018. These BOD reports were obtained from an Egyptian company for information dissemination (EGID). The BOD reports include the audit committee number of members, their role and responsibilities, the committee composition, its member's independence, qualifications, experienced members, and the number of meetings held annually. Sometimes the number of audit committee members differed throughout the year as they are usually changed or replaced by the year-end. Accordingly, the number of members at year-end is only considered.
● *Firm performance data:* ROE and ROA calculations require data collected from Thompson Reuters Datastream as well as the published financial statements for the period of 2016–2018.
● *Control variables data:* the total assets of the company data is needed to measure the firm size. Firm leverage is calculated using the debt-to-equity ratio. These figures are extracted from the published financial statements. The industry type is mentioned in the BOD reports.

3.2. Measurement of variables

3.2.1. Dependent variable

Firm performance is measured, in this study, using ROE and ROA. Previous researchers (Kim & Rasiah, 2010; Al-Saidi & Al-Shammari, 2013; San Ong & Gan, 2013; Moh'd Al-Tamimi & Obeidat, 2013; Kallamu & Saat, 2015) used different firm performance measurements such as ROA, ROE, Tobin's Q, dividend payable and stock price (Zabri, Ahmad, & Wah, 2016) or market share (Alabdullah, 2018). With no agreement on the best performance measurement (Ntim & Osei, 2011), the present study uses ROA, as it is the most accepted profitability measurement used by regulators (Kallamu & Saat, 2015), and it reflects the company's management efficiency in using all its assets to generate profits (Sufian & Habibullah, 2010). ROE is also a good measure as it reflects the management efficiency and ability in using the company's investments to improve earnings growth.

Prior studies use many measures of the performance of the firm, such as ROA, ROE (Moh'd Al-Tamimi & Obeidat, 2013), or used Tobin's Q as a measure of the dependent variable to evaluate the company's performance.

3.2.2. Independent and control variables

The size of the audit committee, their gender, how often they meet, along with them being independent of the company and having expertise, all are independent variables. This study measures the audit committee size variable as the total number of committee members at the end of the year (Abbott et al., 2004; Al-Matari, Al-Swidi, & Fadzil, 2013; Alqatamin, 2018). The audit committee independence variable is measured by the percentage of independent members from the total number of members (Kallamu & Saat, 2015). The committee experience variable is measured as the percentage of members who have accounting or finance experience (Mangena & Pike, 2005; Rochmah Ika & Mohd Ghazali, 2012). The gender diversity

variable is measured as the percentage of female members out of the total audit committee members (Bear, Rahman, & Post, 2010; Frias-Aceituno, Rodriguez-Ariza, & Garcia-Sanchez, 2013). The frequency of meetings variable is measured by the number of meetings held during the year as mentioned in the BOD reports (Rochmah Ika & Mohd Ghazali, 2012).

Previous studies (Al-Matari et al, 2014; Kallamu & Saat, 2015; Bansal & Sharma, 2016; Masmoudi, 2021) have suggested the firm size, firm age, and leverage ratio as variables used for controlling the influence of the company characteristics on the firm performance. This study used such suggested control variables.

Firm leverage is measured, here, by the total debt to total equity ratio. Many authors, as Olokoyo (2013), Gondrige, Clemente, and Espejo (2012), Fauzi and Locke (2012), Lama (2012), found that high firm leverage can lead to lower ROA. If the higher levels of debt the firm decreases its agency costs, then its capital structure will have a significant relationship with its financial performance (Jensen, 1986).

Firm age represents the time passed since the firm's incorporation. The relationship between firm age and firm performance is ambiguous. There is a view that mature firm performance is better than that of newly established ones due to the goodwill they have gained over time (Mousa & Desoky, 2012). Others believe that due to the rigidness and the satisfaction of old firms, they do not easily adopt new technologies and changes (Anderson & Reeb, 2003). Thus, to control such

an effect on firm performance, firm age is used as one of the control variables in this study.

As per the literature, corporate governance can be influenced by the firm size. Large companies are less effective than the smaller ones because of their higher agency issues (Patro, Lehn, & Zhao, 2003). Other researchers found that big firms have good internal controls, and better information systems, that improve the quality of reporting and, in turn, the firm performance (Zábojníková, 2016). The research results are mixed regarding the influence of the firm size in the corporate governance context.

3.2.3. Empirical model

The empirical model used here to examine the relation between the characteristics of the audit committee and the company performance is as follows. The definitions and measurements of all variables are shown in Table 2.

$$\begin{aligned} PERFORM_{it} = \ &\beta_0 + \beta_1 ACMSIZE_{it} + \\ &\beta_2 ACINDE_{it} + \beta_3 ACEXP_{it} + \beta_4 ACMEET_{it} + \\ &\beta_5 ACFEMA_{it} + \beta_6 FSIZE_{it} + \beta_7 FAGE_{it} + \\ &\beta_8 FLEVER_{it} + \beta_9 INDTYP + \varepsilon_i \end{aligned} \quad (1)$$

where *PERFORM* is a measure of firm performance taken as ROA and ROE for firm *i* at time *t*, and ε_i is the error term.

Table 2. Variables definitions and measurements

Variables	Definition	Measurement
Dependent variables		
ROE	Return on equity	Measured as a percentage of net income to common equity.
ROA	Return on assets	Measured as a percentage of net income to total assets.
Independent variables		
ACMSIZE	Audit committee size	A dummy variable that takes the value of 1 if the audit committee consists of at least 3 members, 0 otherwise.
ACINDE	Audit committee independence	A dummy variable that takes the value of 1 if all audit committee members are independent, 0 otherwise.
ACEXP	Audit committee financial expertise	A dummy variable that takes the value of 1 if there is one or more experts and 0 if none.
ACMEET	Audit committee meeting frequency	A dummy variable that takes the value of 1 if the number of meetings is more than 4 times and 0 if none.
ACFEMA	Gender diversity	A dummy variable that takes the value of 1 if there is one or more female and 0 if no female member.
Control variables		
FSIZE	Firm size	The total assets owned by the firm measured as the natural logarithm of total assets.
FAGE	Firm age	Measured as the number of years since its incorporation in its logarithm.
FLEVER	Firm leverage	Measured as a percentage of total debt to total equity.
INDTYP	Industry type	A dummy variable that takes a value of 1 if the company an industrial firm and 0 if it is a service company.

4. DISCUSSION OF THE RESULTS

4.1. Jarque-Bera test

For measuring the normal distribution of all research panel data, in terms of dependent and independent variables, Jarque-Bera (JB) normality test is used in this research.

According to Table 3, the research variables in terms of ROE, ROA, firm age, firm size, and firm leverage are normally distributed as the probability associated with their JB test is significantly greater than (0.05).

Table 3. Descriptive analysis

	ROE	*ROA*	*FSIZE*	*FAGE*	*FLEVER*
Mean	0.165897	0.057887	23.24604	20.01200	0.659600
Median	0.132109	0.056434	23.27903	20.00000	0.660000
Maximum	0.519893	0.204172	25.33608	39.00000	1.130000
Minimum	-0.220032	-0.091815	20.43501	2.000000	0.180000
Std. Dev.	0.152536	0.061285	1.262128	8.509467	0.184004
Skewness	0.221281	-0.014534	-0.252740	0.120775	-0.307306
Kurtosis	3.059072	2.804249	2.208876	2.746196	3.107752
Jarque-Bera	0.622973	0.122386	2.754340	0.383635	1.216744
Probability	0.732358	0.940642	0.252292	0.825458	0.544236
Observations	75	75	75	75	75

The dependent variables here are the ROE and the ROA used to measure the company's performance. From Table 3 results, it is shown that the measured ROA and ROE of the selected companies are financially on average during the investigated three-year period (2016–2018). The mean value is used here to identify the high and low levels of ROA and ROE. The ROA minimum value is found to be -9.18% and the maximum is 20.4%, which indicates a significant range, while the 5.7% ROA mean value shows a generally low ROA ratio across these companies. For the other dependent variable, ROE, the minimum value is -22% and the maximum is 51.9%, which also indicates a considerable range, and its 16.5% mean value shows a high ROE ratio generally across the Egyptian companies. These figures are consistent with the findings of Amer et al. (2014) in Egypt and Rahman, Meah, and Chaudhory (2019) in Bangladesh.

Regarding the control variables, the firm size variable has a range, minimum from 20.43 to 25.33 maximum, with a standard deviation (SD) of 1.26. The firm leverage variable has a 0.66 mean value and ranges from a minimum of 0.18 to 1.13 maximum. For the firm age, it is shown that its mean value is 20 years; minimum 2 years and maximum value 39 years. The industry type statistics will be shown in the next table (Table 4), as it is measured as a dummy variable that takes 0 if the company is working in the service sector or 1 if in the industrial sector.

The Egyptian Corporate Governance Code requires that audit committees should include a minimum of three non-executive board members, two of whom are independent and one of them should have accounting or financial experience. The audit committee should also meet at least every quarter. Table 4 shows to what extent the selected Egyptian companies abide by such requirement through presenting some statistics for all the audit committee characteristics which represent the research independent variables as follows:

● *Audit committee size:* 72% of the companies included in this study abide by the Egyptian Corporate Governance Code and maintain not less than three members on their audit committee.

● *Audit committee experience:* the statistics show 69% of these companies have not less than one member having accounting or financial experience in the audit committee.

● *Independence of audit committee members:* 77% of the companies have an audit committee including three or more independent members.

● *Number of meetings:* 69% of the selected companies have audit committees that meet every quarter (i.e., four times) as required by the ECCG and 31% meet five or more times.

● *Gender diversity:* 81.3% of the sample have no female members in their audit committee. Only 18.7% of the companies have one female in their committee. This low percentage can be expected in Egypt as the Egyptian Corporate Governance Law and codes are silent on women's participation at the audit committee.

● *Industry type* (as a control variable): it is noticed that 52% of the sample are from the manufacturing sector and 48% are in the service sector as telecommunication and real estate and development.

Table 4. Frequency table for the independent variables and industry type

Variables	Dummy variable	Frequency	Percent
ADUIT_COMMITTEE SIZE	0 (less than 3 members)	21.0	28.0
	1 (equal or more than 3 members)	54.0	72.0
AUD_EXPERIENCE	0 (no financial experts)	23.0	30.7
	1 (one financial expert)	52.0	69.3
F_MEETING	0 (less than or equal 4)	52	69.3
	1 (greater than 4)	23	30.7
GENDER_DIVERSITY	0 (male)	61	81.3
	1 (female)	14	18.7
IND_TYPE	0 (service)	36	48.0
	1 (manufacturing)	39	52.0
INDEPEND_AUDIT	0 (less than 3)	17	22.7
	1 (equal to or more than 3)	58	77.3

4.2. Group unit root test

Time series are stationary if they do not have a trend or seasonal effects. The stationary in a time series is studied by using the unit root test. The reason is to ensure that the mean and variance are constant and do not change over time, and also that covariance value between two time periods does not depend on the actual time, but rather depends only on the distance between the two time periods. The covariance is computed for ROE, firm age, firm size, and firm leverage in Table 5, and for ROA, firm age, firm size, and firm leverage in Table 6.

Table 5. Group unit root test for ROE, firm size, firm age, and firm leverage

Method	Statistic	Prob.***	Cross-sections	Obs.
Null: Unit root (assumes common unit root process)				
Levin-Lin-Chu*	-6.08383	0.0000	4	296
Null: Unit root (assumes individual unit root process)				
Im-Pesaran-Shin**	-6.19990	0.0000	4	296
ADF — Fisher Chi-square	53.8913	0.0000	4	296
PP — Fisher Chi-square	51.8877	0.0000	4	296"

*Notes: * Levin, Lin, and Chu (2002). ** Im, Pesaran, and Shin (2003). *** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.*

Table 6. Group unit root test for ROA, firm size, firm age, and firm leverage

Method	Statistic	Prob.***	Cross-sections	Obs.
Null: Unit root (assumes common unit root process)				
Levin-Lin-Chu*	-6.51556	0.0000	4	296
Null: Unit root (assumes individual unit root process)				
Im-Pesaran-Shin**	-6.60746	0.0000	4	296
ADF — Fisher Chi-square	58.8026	0.0000	4	296
PP — Fisher Chi-square	55.9277	0.0000	4	296

*Notes: * Levin, Lin, and Chu (2002). ** Im, Pesaran, and Shin (2003). *** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.*

Table 5 results revealed the stationary of the time series of the ROE, firm age, firm size, and firm leverage at level 1 ~ (0) based on the constant level, due to the following criteria: Levin-Lin-Chu, Im-Pesaran-Shin, PP, ADF, at a significance level less than (0.05).

Table 6 also shows the stationary of the time series of the ROA, firm age, firm size, and firm leverage at level 1 ~ (0) based on the constant level, due to the following criteria: Levin-Lin-Chu, Im-Pesaran-Shin, PP, ADF, at a significance level less than (0.05).

4.3. Cointegrating equation model

Engle-Granger cointegration test indicates that the residual of the cointegrating regression should be stationary if the variables are cointegrated. Accordingly, it is used here to measure if there are long-run equilibrium relationships between the nonstationary time series variables in terms of ROE, firm age, firm size, and firm leverage in Table 7 and in terms of ROA, firm age, firm size, and firm leverage in Table 8 as follows.

Table 7. Cointegration test for the dependent variables (ROE, firm size, firm age, and firm leverage)

Dependent variable	Tau-statistic	Prob.*	Z-statistic	Prob.*
ROE	-5.227991	0.0039	-40.46061	0.0028
FSIZE	-4.351956	0.0395	-28.07737	0.0543
FAGE	**-3.707804**	**0.1509**	**-19.57881**	**0.2566**
FLEVER	-4.729325	0.0155	-34.88274	0.0116

*Note: * MacKinnon (1996) p-values.*

Table 8. Cointegration test for the dependent variables (ROA, firm size, firm age, and firm leverage)

Dependent variable	Tau-statistic	Prob.*	Z-statistic	Prob.*
ROA	-5.919591	0.0005	-48.04708	0.0003
FSIZE	-4.358363	0.0389	-28.25360	0.0524
FAGE	**-3.892882**	**0.1064**	**-21.61390**	**0.1845**
FLEVER	-4.394769	0.0357	-30.95225	0.0292

*Note: * MacKinnon (1996) p-values.*

From Table 7 and Table 8, it is found that there are long-term equilibrium relationships between the variables ROE, firm size, and firm leverage, and ROA, firm size, and firm leverage, based on the Tau-statistic and z-statistic, at a significance level less than (0.05). In contrast, the firm age variable, for both groups, is not co-integrated since the significance level is more than (0.05).

4.4. Correlation analysis

This study uses the Chi-square test and the Pearson correlation to measure the correlations between the audit committee characteristics and firm performance variables. The correlation coefficients

are checked to find out if there is high multi-collinearity among variables or not. The Chi-square test is commonly used for testing relationships on categorical variables as the independent variables here and the industry type, are measured as dummy variables (0 or 1). Table 9a presents the Pearson correlations of the control variables (firm age, size, and leverage) with the ROA, and Table 9b presents the Chi-square tests of the independent variables (audit committee characteristics) and industry type with the ROA. Table 10a presents the Pearson correlations of the control variables with the ROE, and Table 10b presents the Chi-square tests of the independent variables (audit committee characteristics) and industry type with the ROE.

Table 9a. Pearson correlation matrix to measure a significant linear relationship between the control variables and ROA

Variables	ROA	FSIZE	FAGE	FLEVER
ROA	1			
FSIZE	-0.205501	1		
FAGE	**0.228569***	-0.257966	1	
FLEVER	**-0.288959***	0.215336	-0.066843	1

*Note: * Significant at a level less than (0.05).*

Table 9b. Chi-square test to measure the significant relationships between the independent variables and ROA

Pearson Chi-square	Value	D.F.	Asymp. Sig. (2-sided)
ACMSIZE	18.404	1	0.001***
ACINDE	1.032	1	0.310
ACEXP	0.232	1	0.630
ACFEMA	0.182	1	0.669
ACMEET_1	0.000	1	0.984
INDTYP	5.966	1	0.015*

*Note: * Significant at a level less than (0.1).*

Table 10a. Pearson correlation matrix to measure a significant linear relationship between the control variables and ROE

Variables	ROE	FSIZE	FAGE	FLEVER
ROE	1			
FSIZE	-0.017551	1		
FAGE	0.016859	-0.257966	1	
FLEVER	**0.212592***	0.215336	-0.066843	1

*Note: * Significant at a level less than (0.05).*

Table 10b. Chi-square test to measure the significant relationships between the independent variables and ROE

Pearson Chi-square	Value	D.F.	Asymp. Sig. (2-sided)
ACMSIZE	1.959	1	0.162
ACINDE	1.221	1	0.269
ACEXP	9.839	1	0.002**
ACFEMA	0.16	1	0.898
ACMEET_1	0.63	1	0.802
INDTYP	3.316	1	0.069*

Note: * Significant at a level less than (0.1).

According to Tables 9a and 10a correlation coefficients, no high correlation is found among the variables. From the Pearson correlation matrix, the highest coefficient is 0.28 (i.e., less than 80%) between *FLEVER* and *ROA*. Thus, there is no multicollinearity problem that can affect the interpretation of regression coefficients of the independent variables in this model (Murtagh & Heck, 2012).

To test the research hypotheses, the correlation results from Tables 9a and 9b (*ROA*) and 10a and 10b (ROE) can be used as follows:

1. There is a significant relationship between *audit committee size* and *ROA* at a significant level less than (0.01). This result is consistent with the findings of Pearce and Zahra (1992), Reddy et al. (2010), Jamil and Nelson (2011) in Malaysia, Al-Mamun et al. (2014), Al-Matari et al. (2014) in Oman, Rezaei and Abbasi (2015) and Talpur et al. (2018) in Malaysia, and Alqatamin (2018) in Jordan. The resource dependence theory, which suggests that when the larger the audit committee, the larger to effectiveness, also backs up this result. This is because it will therefore have more resources to assist company issues. This result can also be supported by the statistical results previously shown in Table 4 that 72% of the companies included in

this study follow the Egyptian Corporate Governance Code and have not less than three audit committee members. However, this finding is inconsistent with Herdjiono and Sari (2017) in Indonesia who find that the audit committee size does not affect the ROA of the listed companies.

However, there is no relationship between *audit committee size* and *ROE* at a significant level less than (0.01). This is consistent with the findings of Mak and Kusnadi (2005) in Malaysia and Singapore, Aanu, Odianonsen, and Foyeke (2014) in Nigeria, Al-Matari et al. (2014) in Oman, and Salehi, Tahervafaei, and Tarighi (2018) in Iran that the audit committee size may not affect the financial performance (ROE) as in accordance with the agency theory view that the larger auditing committee will eliminate the monitoring process and lower the firm performance. On the other hand, Zábojníková (2016) in the UK and Bauer et al. (2009) find that the audit committee size can positively influence the ROE.

Accordingly, the *H1a* can be accepted for the ROA only and *H1b* rejected for ROE.

2. There is no relationship between the *audit committee independence* and both *ROA* and *ROE* at a significant level less (0.01). These findings are matched with the findings of Al-Matari et al. (2012) in Saudi Arabia, Leung, Richardson, and Jaggi (2014),

Bansal and Sharma (2016) in India, Zábojníková (2016) in the UK, and Mohammed (2018) that audit committee independence does not affect the firm performance. It supports the stewardship theory assumptions that the independent directors may be unfamiliar with the firm and not have more knowledge about its current condition and are not participating effectively in the daily decision-making process of the organization. This creates problems in the implementation of their plans and decisions that may negatively affect the firm profitability. Therefore, if the size of the independent directors increases, this might mislead the decision-making process.

On the other hand, Chan and Li (2008), Jamil and Nelson (2011) in Malaysia, Aanu et al. (2014) in Nigeria, Kallamu and Saat (2015), Salehi et al. (2018) in Iran, and Alqatamin (2018) in Jordan, find a significant relationship between independence and ROA and Yasser, Entebang, and Mansor (2011) find a relation between independence and ROE that supports the agency theory perspective. In addition, the Egyptian regulators believe that the greater degree of the audit committee independence can reduce the frauds in the financial statement reporting and improve the firm performance.

Since it is found that audit committee independence is insignificantly related to both ROE and ROA, the *H2* can be rejected for both ROA and ROE.

3. There is no relationship between *audit committee expertise* and *ROA*. This finding is consistent with Jamil and Nelson (2011) in Malaysia and Alqatamin (2018) in Jordan who find that audit committee members' experience has no effect on company performance (ROA). However, this is inconsistent with Maina and Oluoch (2018) in Kenia, who find that there is a significant relationship between the frequency of audit committee meetings and firm performance (ROA).

However, there is a significant relationship between *audit committee expertise* and *ROE* at a significant level less than (0.01) which is consistent with Aanu et al. (2014) in Nigeria, Abdul Rahman and Haneem Mohamed Ali (2006) in Malaysia, Zábojníková (2016) in the UK, Salehi et al. (2018) in Iran, and Baatwah et al. (2016) in emerging markets who find that more committee members with sufficient financial experience can enhance the timeliness and the financial reporting quality that lead to better financial performance. The previous statistics in quality (Table 4) support this result by showing that 69% of the selected companies include, as a minimum, one member in the audit committee having accounting or financial or experience. This also justifies the Egyptian new requirements for including one audit committee member with accounting or financial experience.

Accordingly, the *H3a* can be rejected for the ROA only and *H3b* accepted for ROE.

4. For *gender diversity,* there is no relationship with both *ROA* and *ROE* respectively. The insignificant effect can be expected, in Egypt, as there is low female participation found in the Egyptian audit committees. This result is consistent with Isidro and Sobral (2015), Ahern and Dittmar (2012), and Kogut et al. (2014) who find that

a higher female representation in the committee has no direct impact on the firm's value. On the other hand, this is inconsistent with Miller and del Carmen Triana (2009), Alqatamin (2018) in Jordan, Abdelzaher and Abdelzaher (2019) in Egypt, and Agyemang-Mintah and Schadewitz (2019) in the UK who find a significant relation between women participation and firm value (ROE). This also supports the silence of the Egyptian Governance Code regarding gender diversity requirements in the audit committee structure. The descriptive statistics discussed above in Table 4 show that 18.7% of the studied companies have only one female member in their audit committees.

Accordingly, the *H4* will be rejected for both ROA and ROE.

5. Whereas there is no relationship between the *audit committee's frequency of meetings* and both *ROA* and *ROE*. This finding is consistent with the findings of Mohd Rahmat, Mohd Iskandar, and Mohd Saleh (2009), Aanu et al. (2014) in Nigeria, Bansal and Sharma (2016) in India, and Alqatamin (2018) in Jordan that the number of meetings has no effect on the firm financial performance. Having more than four meetings could be wasteful to some firms while for other organizations could be sufficient. However, regardless of meeting frequencies, the content to be discussed at these meetings is more important than their frequency. This explains what Table 4 shows that 60% of the selected companies have audit committees that meet every quarter of the year. This result is also in accordance with that requirement of the Egyptian Corporate Governance Code that the audit committee should meet quarterly. More meetings may have no effect.

However, this finding is inconsistent with that of Jamil and Nelson (2011) in Malaysia, Zábojníková (2016) in the UK, Maina and Oluoch (2018) in Kenia, Alqatamin (2018) in Jordan, and Talpur et al. (2018) in Malaysia that when the audit committee meets more regularly, this could help in reducing the agency problems and information asymmetry by presenting fair and timely information to investors.

The finding regarding the insignificance of the relationship found between the number of audit committee meetings and ROE and ROA does not support the *H5*. Thus, *H5* can be rejected for both *ROA* and *ROE*.

Finally, for all the research hypotheses, *H1a* and *H3b* are only accepted and provide evidence on the positive and significant relationship between audit committee size and ROA, and between audit committee experience and ROE.

The control variables correlation results show the following:

1. *Firm age* is positively and significantly correlated with *ROA* (0.22). This is consistent with the finding of Mousa and Desoky (2012) as when the firm gets older, they should have higher profits due to the goodwill they have developed over time.

While the *firm age* is insignificantly correlated with *ROE* (0.016) at a significant level greater than (0.05). This is consistent with findings of Anderson and Reeb (2003) that old firm not easily adopted the new technologies.

2. *Firm leverage* is negatively and significantly correlated with *ROA* (-0.28) at a significant level less than (0.05). This is consistent with the findings of Olokoyo (2013), Gondrige et al. (2012), Fauzi and Locke (2012), Lama (2012), and Jati Wibawaningsih and Primta Surbakti (2020) that high leverage resulted in lower ROA. Olokoyo (2013) in Nigeria and Al-Matari et al. (2014) in Oman, show that high level of debt decreased returns of firms.

Firm leverage is also positively and significantly correlated with *ROE* (0.212) at a significant level less than (0.05). This is inconsistent with Zábojníková (2016) in the UK and Alqatamin (2018) in Jordan who find insignificant relationship with ROE, as due to the small firm effect theory — the small firms have bigger amount of growth opportunities than large companies.

3. There is a significant relationship between the *industry type* and both *ROA* and *ROE* at a significant level less than (0.1) This is inconsistent with Alqatamin (2018) in Jordan who finds that industry type has a positive impact on the firm's performance.

4. Lastly, *firm size* is negatively and insignificantly correlated with both *ROA* by (-0.20) and *ROE* by (-0.017). This is consistent with Alqatamin (2018) in Jordan, while it is inconsistent with Al-Matari et al. (2014) in Oman, Zábojníková

(2016) in the UK who find a negative significant relationship with ROE. Jati Wibawaningsih and Primta Surbakti (2020) in Indonesia find a positive significant correlation with ROA.

Finally, firm age and industry type are significantly related to ROA and firm leverage is negatively significant with ROA. Firm leverage and industry type are positively significant with ROE.

4.5. Hausman test for correlated random effects

The main assumption for random effects estimation that there is no correlation between the random effects and the explanatory variables. Hausman (1978) test is commonly used for testing this assumption and to compare the fixed and random effect estimates of coefficients.

In the Hausman test, the null hypothesis is that the fixed effect model and random effect model estimators do not differ significantly. The test statistic developed by Hausman has an asymptotic χ^2 distribution. If the null hypothesis is rejected, the conclusion is that fixed effect model is better to be used and the random effect model is not appropriate.

When the Hausman test is performed here, a model for ROA and ROE is first estimated with random effects' specification as shown in Tables 11 and 12.

Table 11. Correlated random effects — Hausman test for ROA

Test cross-section random effects			
Test summary	*Chi-sq. statistic*	*Chi-sq. D.F.*	*Prob.*
Cross-section random	2.492406	8	0.9621

Table 12. Correlated random effects — Hausman test for ROE

Test cross-section random effects			
Test summary	*Chi-sq. statistic*	*Chi-sq. D.F.*	*Prob.*
Cross-section random	10.075384	8	0.2598

From Tables 11 and 12, the Hausman test statistic calculated value, is insignificant at a significant level greater than (0.05), thus, accepting the null hypothesis that supporting the appropriateness of the random effects model and rejecting the alternative hypothesis of the fixed effects model.

4.6. Panel EGLS (Cross-section random effects)

To test the hypotheses and investigate the relationship between the audit committee characteristics and ROA and ROE (i.e., company

performance), the correlation results from Table 9 (ROA) and 10 (ROE) are previously used in addition to the results of the panel estimation model using least squares for determining the effect of independent variables on ROA in Table 13 and the effect of independent variables on ROE in Table 14 as follows.

Table 13. Panel EGLS (Cross-section random effects) model to determine the effect of independent variables on ROA

Variable	Coefficient	Std. Error	t-statistic	Prob.
ROA(-1)	0.513115	0.078956	6.498769	0.0000
ACMSIZE	0.035819	0.016270	2.201480	0.0313
ACINDE	-0.002903	0.010658	-0.272401	0.7862
ACEXP	-0.036190	0.009169	-3.947000	0.0002
ACMEET_1	0.024220	0.025959	0.933008	0.3543
ACFEMA	-0.001746	0.005971	-0.292467	0.7709
FSIZE	-0.000813	0.003542	-0.229615	0.8191
FAGE	0.001238	0.000581	2.129915	0.0370
FLEVER	-0.060016	0.021392	-2.805505	0.0066
INDTYP	0.035167	0.006115	5.751112	0.0000
C	0.067758	0.089036	0.761012	0.4494
Weighted statistics				
R-squared	0.573155	Mean dependent var.		0.056828
Adjusted R-squared	0.463707	S.D. dependent var.		0.058518
S.E. of regression	0.042854	Sum squared resid.		0.071623
F-statistic	5.236802	Durbin-Watson stat.		2.503393
Prob. (F-statistic)	0.000075			
Unweighted statistics				
R-squared	0.573155	Mean dependent var.		0.056828
Sum squared resid.	0.071623	Durbin-Watson stat.		2.503393

$$ROA = 0.035818985087 * ACMSIZE - 0.00290330952218 * ACINDE - 0.0361897283259 * ACEXP + 0.0242201583621 * ACMEET\_1 - 0.00174630306025 * ACFEMA - 0.000813198179051 * FSIZE + 0.0012381532655 * FAGE - 0.0600156729534 * FLEVER + 0.035167205059 * INDTYP + 0.067757623275 \quad (2)$$

Table 14. Panel EGLS (Cross-section random effects) model to determine the effect of independent variables on ROE

Variable	Coefficient	Std. Error	t-statistic	Prob.
ROE(-1)	0.636049	0.056326	11.29230	0.0000
ACMSIZE	0.055766	0.045365	1.229273	0.2265
ACINDE	-0.028668	0.023788	-1.205171	0.2356
ACEXP	0.061596	0.029883	2.061214	0.0462
ACMEET_1	0.037578	0.024071	1.561133	0.1268
ACFEMA	0.006717	0.013951	0.481489	0.6329
FSIZE	-0.006633	0.012934	-0.512850	0.6110
FAGE	0.001659	0.001664	0.996605	0.3253
FLEVER	0.152562	0.071651	2.129237	0.0332
INDTYP	0.067652	0.016505	4.098840	0.0002
C	0.082329	0.319552	0.257639	0.7981
Weighted statistics				
R-squared	0.581445	Mean dependent var.		0.182699
Adjusted R-squared	0.460284	S.D. dependent var.		0.151664
S.E. of regression	0.111421	Sum squared resid.		0.471754
F-statistic	4.798961	Durbin-Watson stat.		2.170642
Prob. (F-statistic)	0.000133			
Unweighted statistics				
R-squared	0.581445	Mean dependent var.		0.182699
Sum squared resid.	0.471754	Durbin-Watson stat.		2.170642

$$ROE = 0.636049247815 * ROE(-1) + 0.0557661428 * ACMSIZE - 0.0286684987994 * ACINDE + 0.0615959912717 * ACEXP + 0.0375776074053 * ACMEET\_1 + 0.00671749776388 * ACFEMA - 0.00663342462621 * FSIZE + 0.00165855491152 * FAGE + 0.152561728933 * FLEVER + 0.0676515821902 * INDTYP + 0.082329079248 \quad (3)$$

4.6.1. The coefficient of determination: R^2

ROA as a dependent variable

The adjusted R^2 value of the model to determine how the independent variables affect the ROA, shown in Table 13, is equal to 46.3%. This means that the independent variables in terms of audit committee size, independence, experience, frequency of meetings, and gender diversity explain 46.3% of the total variation of the dependent variable (ROA). The remaining 53.7% is due to either

the random error in the regression model or other independent variables excluded from the regression model. When the R^2 value is high, this suggests a better fit for the model.

ROE as a dependent variable

Table 14 shows that the adjusted R^2 value of the model to determine how the independent variables can affect the ROE is equal to 46%. This percentage implies that the independent variables in terms of audit committee size, independence,

experience, no of meetings, and gender diversity explain 46% of the total variation of the dependent variable (ROA). The remaining 54% is due to either the random error in the regression model or other independent variables excluded from the regression model. A high R^2 value may suggest a better fit for the model.

4.6.2. F-test

F-test is generally used to determine if there is a linear relationship between the dependent variable and some independent variables. Since the value of F-test is (5.2) for ROA (Table 13) and (4.7) for ROE (Table 14) at a significant level less than (0.05), then it is concluded that the independent variables have affected the level of ROA and ROE.

4.6.3. T-test

It is important to determine each of the individual independent variables' coefficient significant value in the regression model. Table 13 shows that the most significant independent variables for the ROA model: *ACMSIZE*, *FAGE*, *FLEVER*, and *INDTYP* at a significant level less than (0.05). This result supports the previous Chi-square test discussed above in accordance with Table 9b and helps in testing the research hypotheses regarding the impact of the characteristics of the audit committee on the ROA.

Table 14 shows the most significant independent variables for the ROE model: *ACEXP*, *FLEVER* and *INDTYP* at a significant level less than (0.05). This result supports the previous Chi-square results shown in Table 10b that have been used above in testing the research hypotheses regarding the significance of the effect of the audit committee characteristics on the ROE.

4.6.4. The Jarque-Bera test

Since it is found that the significance value of the test statistic (≥ 0.05) is (0.7302) for ROA (Figure 1 in the Appendix) and (0.14) for ROE (Figure 2 in the Appendix), then the null hypothesis (H_0) that the residuals are normally distributed is not rejected, and it can be concluded that the observed distribution corresponds to or equal the theoretical distribution, i.e., the observed errors are normally distributed.

4.6.5. Theil's U inequality coefficient

Theil's U inequality is used to measure the accuracy of the estimates of the random effects model. Its value is between zero and one, where zero shows a perfect fit. Since a value reaches (0.24) for ROA (Figure 3 in the Appendix) and (0.21) for ROE (Figure 4 in the Appendix) indicating the goodness of fit of the panel model, at a percent of not less than (76%) for ROA and (79%) for ROE, respectively.

4.6.6. The Durbin-Watson test statistic

This test has the null hypothesis that the ordinary least-squares regression has its residuals that are not auto-correlated. This is tested against the alternative hypothesis that the residuals are an autoregressive integrated (AR1), positive first-order autocorrelation process. The Durbin-Watson statistic value ranges from 0 to 4. Non-autocorrelation exists when the value is close to 2; a value toward 0 indicates positive autocorrelation; negative autocorrelation is when the value is toward 4. Since the test statistic value (2.5) for ROA and (2.17) for ROE are greater than *dU*, the null hypothesis would not be rejected.

4.6.7. Residual cross-section dependence test

Table 15 for the ROA and Table 16 for the ROE show the significance of both Breusch-Pagan LM, and Pesaran scaled LM tests as the p-values are less than 0.05. Accordingly, the null hypothesis of no correlation will be rejected at conventional significance levels.

While the last Pesaran CD test is asymptotically standard normal, and the null hypothesis of no correlation is strongly accepted due to the test statistic results at conventional levels, i.e., there is no cross-section dependence (correlation) in residuals.

Table 15. Residual cross-section dependence test for ROA

Test	Statistic	D.F.	Prob.
Breusch-Pagan LM	511.8134	300	0.0000
Pesaran scaled LM	7.626626		0.0000
Pesaran CD	-0.500722		0.6166

Table 16. Residual cross-section dependence test for ROE

Test	Statistic	D.F.	Prob.
Breusch-Pagan LM	600.0000	300	0.0000
Pesaran scaled LM	11.22683		0.0000
Pesaran CD	0.979796		0.3272

5. CONCLUSION

This paper investigated to what extent the requirements of the audit committee can enhance the firm performance among the listed Egyptian companies in different sectors and after excluding the banks and financial intuitions for the period of 2016–2018. The literature reported findings that the audit committee characteristics can help in improving the company performance, which motivated the researcher here for more investigation in Egypt. This investigated period (2016–2018) is after several accounting reforms introduced by the Egyptian Government for strengthening the corporate governance practices especially, the audit committee role and new securities exchange

laws are issued. This new reform took place in 2016 and requires that the audit committee should have a minimum of three non-executive board members, of which one member should have accounting or financial experience. The audit committee should also meet on a quarterly basis at least.

One of the main findings of this study is that audit committee size and their experience, as members, all have a positive impact on firm performance. Furthermore, audit committee size influences ROA, and audit committee experience influences ROE.

The significance of the audit committee size effect is consistent with what the resource dependence theory states that better results are expected to form a bigger audit committee due to the diversity in skills and knowledge its members can have. Actually, this study found that 72% of the selected companies have only three audit committee members and the remaining 28% have four or more committee members. This can justify why the new Egyptian updated governance rules require that the audit committee be comprised of at least three members.

The results regarding the significant impact of the financial expertise are consistent with the Egyptian legislation that required audit committees to include one member with financial experience as a minimum number. Statistics show that 69% of the investigated companies have one financial expert in their audit committee. This finding is also consistent with Aanu et al. (2014) in Nigeria, Rashidah and Fairuzana (2006) in Malaysia, Zábojníková (2016) in the UK, Salehi et al. (2018) in Iran, Alzeban (2020) in Saudi Arabia and the UAE, Dakhlallh et al. (2020) in Jordan, and Baatwah et al. (2016) in emerging markets who find that more committee members with sufficient financial experience can enhance the financial reporting quality and financial performance in turn.

While the Egyptian regulators stress that not less than 4 committee meetings should be held in a year, the study found that the audit committee meetings frequency had no effect on ROA and ROE. Accordingly, it can be recommended now that no more than these 4 meetings to be held in a year for reducing any more expenses that can be incurred with every meeting, otherwise these too many meetings can negatively affect the firm performance. Actually, it is found that 69% of the companies included in this study have an audit committee that meets every quarter of the year. This finding is also in contrast to the resource dependence theory that predicts that a high number of audit committee meetings can result in higher firm performance. Thus, Egyptian regulators can be advised not to increase the required number of audit committee meetings by more than 4 meetings per year, seeking higher firm performance.

However, both the audit committee independence and gender diversity have an insignificant relationship with ROA and ROE. This finding is inconsistent with those of Bozec (2005), Bradbury et al. (2006), and Reddy et al. (2011). The result, concerning the insignificant effect of the audit committee independence, supports the stewardship theory that the independent directors, who have insufficient technical knowledge, can consequently lead them to make inconvenient recommendations for the audit committee. However, this finding is inconsistent with the agency theory which emphasizes that the agency costs can be reduced by the audit committee's independence. This result must draw the attention of Egyptian regulators who constantly ask for an increase in the independence of audit committees as the descriptive statistics show that 77% of the selected companies have independent members in their audit committee.

In contrast, the insignificance impact of gender diversity is consistent with the silence of the Egyptian Corporate Governance Code concerning female participation in the audit committee. It is found that only 18.7% of the companies included in this study have only one female member out of all the audit committee members, while the majority have no female member. This finding is also inconsistent with many other researchers (e.g., Isidro & Sobral, 2015; Kogut et al. 2014).

Briefly, the findings of this study regarding the significant impact of the audit committee size and experience can stimulate the government and the policymakers in making the Egyptian corporate governance code recommendations mandatory not optional as it is in the current situation, that results in the limited implementation of the governance code by all the companies.

The study findings also show that firm age can positively and significantly affect both ROA and ROE. This may be as the firm gets older, it becomes more experienced in generating more profits. Firm leverage and size have an impact on ROA only and no effect on ROE. Industry type has no effect on both ROA and ROE.

As in every study, there are some limitations. First, the study focuses only on the audit committee role as only one of the corporate governance pillars. Second, the study is limited to only 25 listed Egyptian companies from various sectors due to the lack of data and the audit-committee-related information is very limited in Egypt. Third, this study finding cannot be generalized to other countries (particularly developed countries) that have different market regulations and high investor protection, less family and concentrated ownership, high reliance on public debt. In developing countries, like Egypt, where the market is inefficient and there are less transparent financial statements and less sophisticated users, the financial statement users are less likely to be able to see through the manipulated earnings. Fourth, the implementation of the Egyptian Corporate Governance Code recommendations is limited as they are not mandatory.

Finally, the study results can help the professional accountancy bodies and Egyptian regulators in improving the effectiveness and the role of the audit committees, and other corporate governance practices for more transparent financial statements, less earnings manipulation, and in turn, more investors' confidence and more foreign investments. This is much needed nowadays in Egypt especially after the adoption of the sustainable development strategy in its new vision 2020–2030, and including it as a part of the stock exchange's strategy. Such results, however, are based mainly on studying the non-financial most active listed firms. Accordingly, it is recommended

that future studies may concentrate on the banking sector, which plays a vital role in emerging economies, particularly Egypt. Future studies can also examine whether the characteristics of the audit committee have an impact on other factors, such as earnings management practices and disclosures quantity and quality, as well as different analytical methods to obtain more accurate research results.

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APPENDIX

Figure 1. Jarque-Bera test for ROA
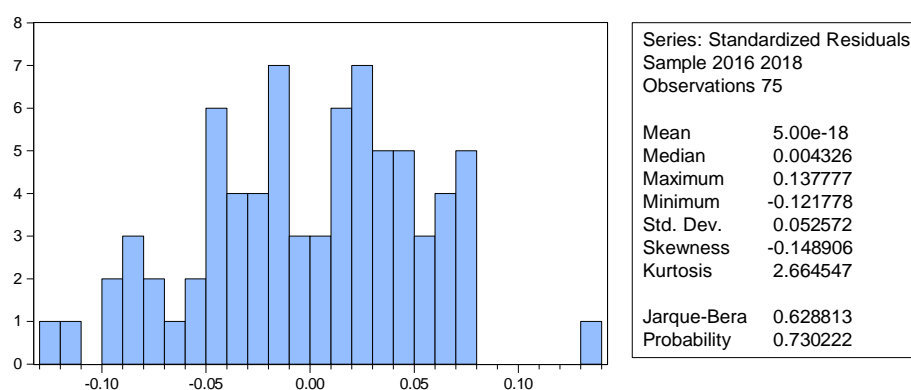
Figure 2. Jarque-Bera test for ROE
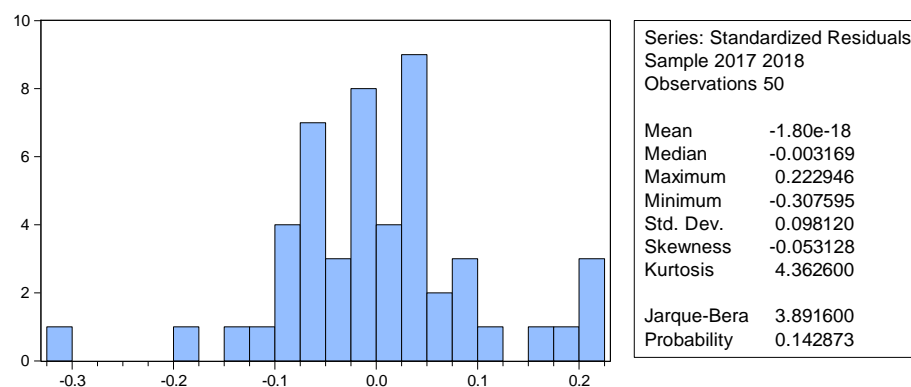
Figure 3. Theil's U inequality coefficient for ROA

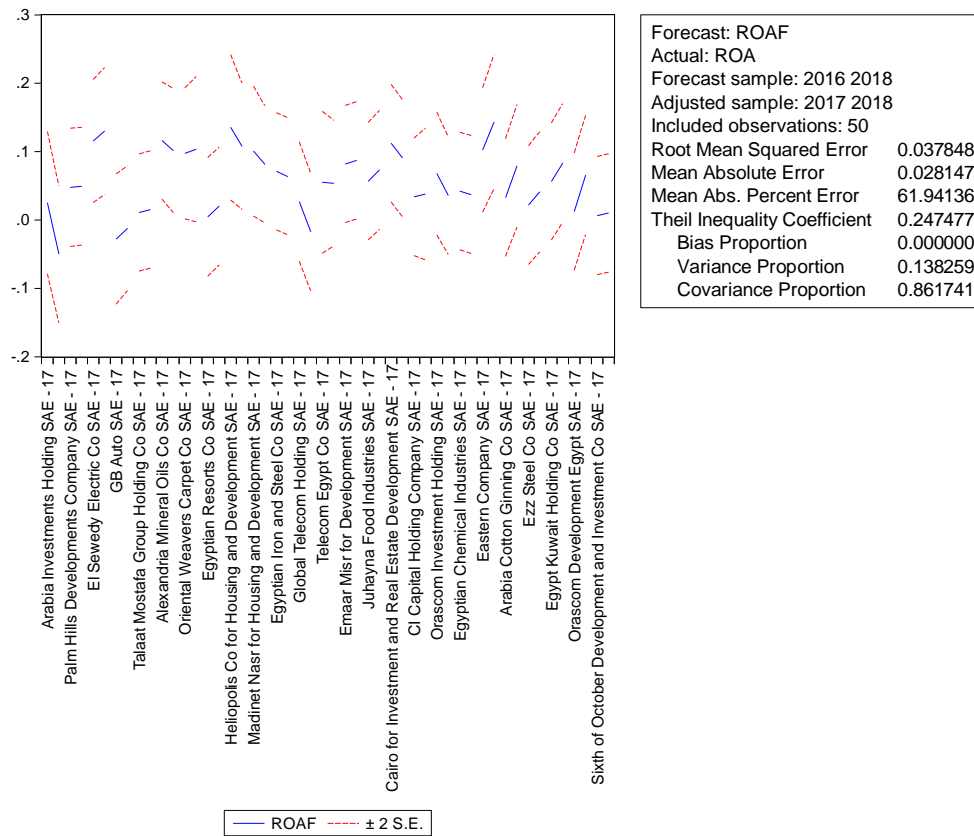| Forecast: ROAF	
Actual: ROA	
Forecast sample: 2016 2018	
Adjusted sample: 2017 2018	
Included observations: 50	
Root Mean Squared Error	0.037848
Mean Absolute Error	0.028147
Mean Abs. Percent Error	61.94136
Theil Inequality Coefficient	0.247477
Bias Proportion	0.000000
Variance Proportion	0.138259
Covariance Proportion	0.861741

Figure 4. Theil's U inequality coefficient for ROE

Forecast: ROEF	
Actual: ROE	
Forecast sample: 2016 2018	
Adjusted sample: 2017 2018	
Included observations: 50	
Root Mean Squared Error	0.097134
Mean Absolute Error	0.071271
Mean Abs. Percent Error	56.82407
Theil Inequality Coefficient	0.214860
Bias Proportion	0.000000
Variance Proportion	0.134735
Covariance Proportion	0.865265