The relation between corporate governance mechanisms, executive compensation and audit fees

Evidence from Iran

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Abstract

Purpose – This paper aims to investigate the effects of some corporate governance mechanisms and executive compensation on audit fees in an emerging market.

Design/methodology/approach – The study population consists of 540 observations and 90 listed companies on the Tehran Stock Exchange during the years 2009-2014. The statistical model used in this study is a multivariate regression model; besides, the statistical technique used to test the hypotheses proposed in this research is panel data.

Findings – The changes in the value of a CEO's own firm stock option portfolio, in thousands of rials (Iran's currency), for a 0.01 change in stock return volatility and stock price are defined as Vega and Delta, respectively. The results demonstrated that there is a positive association between audit fees and delta, but not Vega; this means that a fee premium is linked to CEO Delta incentives. The findings show that Iranian companies pay more audit fees when they give managers more rewards. In addition, the results show that there is not a significant relationship between fees resulting from audit risk and Delta and Vega incentives of the board. Inconsistent with agency theory, the authors found that the independence of board members did not have any effect on audit fees. As a final point, the outcomes of the paper demonstrate that managers who invest in companies under their own management do not have any impact on the amount of audit fee. To put it another way, there is not any significant connection between the board ownership and audit fees.

Practical implications – This is one of the most important studies that simultaneously surveys the impacts of corporate governance mechanisms and executive compensation in the Iranian audit market. The results of this study will reveal more than the role of corporate governance mechanisms for society and users of financial statements because as tools on the CEO actions, they always have to pay attention to the implementation of corporate principles in the economic entity' operation.

Originality/value – The present study has examined the relationship between two cases of corporate governance mechanisms named the board independence and the board ownership with audit fees in a country where, to the authors' knowledge as in most other developing markets, such a relationship has not been a subject of empirical research. Moreover, the use of a two-dimensional measure of executive compensation, namely, Delta and Vega incentives, primarily considering research undertaken in an emerging market, as a valuable contribution may be observed.

Keywords Corporate finance, Emerging market, Audit fees, Tehran stock exchange, Executive compensation, Corporate governance mechanisms, Delta and Vega incentives

Paper type Research paper

1. Introduction

As economic activities and development of corporations are expanding, shareholders have entrusted the managerial task of the company to professional managers. As a matter of fact, stockholders and debt holders expect managers to protect their investments against potential risks. Hence, managers use all their own experience and expertise to receive a great reward for their good performance. The separation of a corporation's ownership from its management created agency problems; consequently, agency theory offers a framework for lessening conflict of interests among managers, shareholders and debt holders (Jensen and Meckling, 1976). Audit fees are the product of the number of audit services requested by the managers of the audited firm, which the audit firm provides (Simunic, 1980). Besides, the external audit process is considered as an essential element that affects corporate governance (CG) (Said Suwaidan, and Qasim, 2010). External auditors must be independent; they are also responsible for an independent and unbiased assessment of the corporations' reporting, too. Apparently, the preparation of audited financial statements under agency theory is mainly an optimal contractual response to agency costs (Watts and Zimmerman, 1983). In response to public demands for improving financial reporting, recent studies in the field of auditing have examined the impact of CG on the quality of financial reporting, external auditor's report and the determination of audit fees (Peel and Clatworthy, 2001). The basic concept of these studies suggests that managers have incentives to act in the direction of their own interests, and they deliberately report financial position in the wrong manner because of opportunistic behavior (Jensen and Meckling, 1976); hence, auditors had better take additional audit tests to diagnose any kind of managers' opportunistic behavior (Larcker and Richardson, 2004; Cohen *et al.*, 2008). Auditor effort is measured using audit fees (Davis *et al.*, 1993; Whisenant *et al.*, 2003). Simunic and Stein (1996) found there is a significant positive relationship between agency costs and audit fees so that higher agency costs lead to higher inherent risk and ultimately an increase in audit fees. Actually, in response to such high degree of audit risk, auditors should ask for more money (Beasley *et al.*, 2010) because audit tests further increase the discovery chance of material misstatement (Zhao, 2010). As incentive-based executive compensation raises audit risk, audit firms are very likely to survey executive compensation while defining the risk involved in an audit engagement.

Of the most important monitoring mechanisms is the board, and its main task involves overseeing the work of executives to protect the interests of investors; as a result, it can be argued that the key to success of a company depends on its good conductivity. In this regard, the members of the board of directors try to control the behavior of senior managers to coordinate their actions with the interests of shareholders, creditors and other stakeholders (Dimitropoulos and Asteriou, 2010). Executive compensation and oversight activities else such as board independence as well as board ownership are usually as alternative mechanisms to reduce the agency problems (Hermalin and Weisbach, 1998). The audit process is considered to be useful as a monitoring mechanism in reducing the agency problems; furthermore, the study of the board features such as compensation, board independence and ownership concentration on the boards of directors is effective in tackling such problems. Kannan *et al.* (2014) believed that the current auditing standards have considered bonus as one of fraud risk factors. Generally, it is not clear that how auditors should interpret the managerial rewards; is it an increasing factor or a decreasing factor? For example, Wysocki (2010) not only showed that there is a complex relationship between audit fees and executive compensation but also believed that more research is needed to understand this relationship. Now the question one should ask is, "do corporate governance mechanisms (CGM) and executive compensation affect audit fees in an emerging market?".

Clarke (2007) believes that the evaluation of CG in developed and developing countries is typically building on concepts of accountability and the performance of the companies; moreover, it depends on the way that they obey with CG strategies. In Iran, Securities and Exchange Organization and Trade Promotion Organization oversee the implementation of CG principles, and they are not so strong in comparison with USA Securities and Exchange Commission (SEC). In other words, SEC has enforcement authority, which means that the enforcement of CG principles is compulsory by US firms. As American audit firms follow instructions to avoid fines – more audit fees – better governance reduces audit risk of audit firms and decreases audit fees in the end, whereas Iranian firms that follow the regulations and effect on audit fees is indistinct. Regarding executive compensation, US auditors have to take the additional test to discover financial fraud, for managers have a broader variety of motivations. However, basic salary for a manager is offered in most of the Iranian corporations.

According to what we mentioned above, there are important differences between developing countries like Iran and developed countries like America in the area of the enforcement quality of CG, financial reporting standard, executive compensation and so on. Accordingly, the present paper has motivation for filling the gap and extend the recent line of research on CGM, executive compensation and audit fees in advanced and emerging markets. An evaluation of the relationship between CGM and audit fees should help investors and other stakeholders to understand the importance of such mechanisms for overseeing the management profession; the outcomes of this study will contribute them to figure out which kind of executive compensation is more suitable to reduce agency costs as well. Generally speaking, we are of the opinion that the provision of such empirical evidence in a transition market like Tehran Stock Exchange (TSE) with its unique characteristics could contribute considerably to current literature and establish the external validity of earlier findings.

The remainder of aforementioned research is organized as follows: Next section frames the study into a theoretical framework, hypotheses development and literature. Section 3 presents the research design and outlines, where data are obtained, and the sample selection procedure. Section 4 then presents the main results and implications drawn from statistical analyses. Finally, Section 5 presents the concluding remarks.

2. The theoretical framework, hypotheses development and literature
The most important feature of corporations is the separation of ownership from its management. Hence, confidential information is exclusively available to management, and managers are just responsible for preparing and transferring financial information so that investors and other stakeholders have access only to published financial data by the company's management. On the one hand, the purposes of financial reporting are derived from the demands of the external users of the financial statements. In fact, the main objective of financial reporting is to express financial circumstance for those investors who want to make better economic decisions (Khoshtinat and Khani, 2003). It is noteworthy that agency problems were created by the separation of a firm's ownership from its management because there is a conflict of interest between the manager and owner (Jensen and Meckling, 1976). On the other hand, another objective of financial statements is reflecting the duty of manager's stewardship against using stakeholder's resources. Nevertheless, executives try to do the duties according to their personal financial gains, and that the interests of shareholders will not be a priority when shareholders devolve the decision task to them. Core et al. (1999) found that CEO in firms with greater agency problems receives more compensation; and that firms with greater agency problems have the worst performance.

Firms with a weak CG structure would struggle with higher problems of agency cost (Core et al., 1999), so managers in such firms are fond of their personal financial gains instead of maximizing the stakeholders' worth. Anyway, there is a relation between executive compensation incentives and the manipulation of the financial statements by managers (Bergstresser and Philippon, 2006; Denis et al., 2006; Jayaraman and Milbourn, 2014); however, Armstrong et al. (2010) believe that financial manipulation occurs less normally at companies where CEOs have higher equity incentives. Auditors ought to employ experienced staff to examine incentive structures for the purpose of assessing the inherent risks of managerial compensation. There are generally two types of performance-based bonus and on the basis of accounting standard measurements; thus, executives' performance-based compensation is effective in the evaluation of auditor risk (Kim et al., 2015; Chen et al., 2015b; Fargher et al., 2014; Kannan et al., 2014). It seems that when executive compensation is based on its performance, managers tend to invest on long-term plans. The important point is providing management objectives, which are long-standing and reduce the tempting incentives of management and the need for additional audit services (Vafeas and Waegelein, 2007). Richardson and Waegelein (2002) provide evidence that firms with long-term performance are less engaged in earnings management activities. However, when the bonus is based on profitability, managers are very likely to manipulate the accrual items to achieve higher profit as they want to maximize the value of their rewards (Wang et al., 2009; Jiang et al., 2010). Some managers try to optimize their investment decisions at the highest level possible to get more rewards. In some other cases, the managers also need to receive more rewards by making a friendly relationship with the members of the board of directors. Basically, these managers invite those auditors who issue the audit report according to their liking. In 2014, the results of Zhang and Xian (2014) sounded interesting. They showed that the incidence of non-standard opinions decreases total compensation. In fact, executives receive more impellent compensation relevant to total compensation after issuing the going concern opinions. Generally, Zhang and Xian (2014) argue that the type of audit opinion effects on CEO compensation. Hence, the managers try to hide their poor performance by using more accrual items and convince auditors to accept the accrual items that are highly questionable by means of paying more audit fees (Bebchuk and Fried, 2004). Haß et al. (2015) and Kubick and Masli (2016) believed that big differences between non-CEO and CEO executives' compensations lead to creating a strong incentive that pushes each manager toward showing a perfect performance. In the same vein, Bryan and Mason (2017) find that stronger tournament motivations affect higher audit fees; accordingly, the financial misreporting will be more when the level of tournament incentives is higher (Conrads et al., 2014). It should be noted that executive compensation can effect on investment decisions. Generally, because higher Vega is associated with riskier policies, the riskier policy sets usually result in compensation structures with higher Vega and lower Delta (Coles et al., 2006). In other words, riskier investment policy and higher volatility of stock returns are connected with higher Vega, and a higher Delta is caused by investment decisions which are less risky (Coles et al., 2006). Generally, we cannot conclusively say that how is the relationship between Delta and misreporting. On the one hand, the high delta may motivate managers to increase stock price through manipulating financial statements (Smith and Stulz, 1985). But from the perspective of Armstrong and Vashishtha (2012) this is not true because they believe that high delta increases CEO risk aversion.

After Second World War, the evolution of executive compensation is broadly divided into two distinct periods:

(1) Prior to 1970, there were issues such as low levels of bonus payments and differences in the distribution of compensation among executives.

(2) Since the mid-1970s to early 2000s, bonus levels dramatically rose (Frydman and Jenter, 2010).

In this regard, Frydman and Jenter (2010) state that both managerial potency and competitive market powers are key determinants of CEO pay. In Iran, after the preparation of financial statements, the board will inform shareholders of its own proposal bonuses. Afterward, they will adjust the bonuses according to the performance of the management. Vafeas and Waegelein (2007) state that the payment of executive compensation based on annual earnings (short-term plans) may make problems for firms. If executive compensation is based upon short-term plans, the manager may reject a lot of plans because of their long-term returns. Clearly, companies with long-standing performance plans use fewer earnings management in comparison with companies without that plans. In fact, as long-term plans evaluate the several-year performance of CEO, managers concentrate on long-term earnings instead of manipulating annual earnings. Healy (1985) believed that annual earnings-based bonuses increase the likelihood of manipulating earnings so as to maximize the value of their compensation. It is expressed that managers are likely to manipulate earnings to reach their target, and this is contributing to an increase in audit fees. One good reason for assuming a positive relationship between executive compensation and audit fees would be that external auditors expect the managers, who receive earnings-based bonuses, to have greater incentives to manipulate earnings. Another reason can be that board of directors chooses external auditors with higher quality to decrease the likelihood of manipulating earnings (Vafeas and Waegelein, 2007). Apparently, should managers receive their bonuses on the basis of an appropriate framework, they will have incentives to perform their task of leadership correctly, and the need for independent audit will disappear.

After the scandals of Enron and WorldCom, many studies have done in the field of CG and earnings management (Basiruddin, 2011), and these financial scandals result in the crucial role of CG (DeFond et al., 2000); as a consequence, restoring the confidence of investors in business activities is a necessity. CG practices are not the same among different countries and each country possesses its own unique CG practices. Appropriate CGM contributes to improving the quality of financial statements and this process is done by limiting the opportunities for earnings management (Ruddock et al., 2006). In contrast, the structure of weak CG may give managers, who are lovers of corruption in the business, an opportunity to manipulate earnings (Leventis and Dimitropoulos, 2012; González and García-Meca, 2014). In a recent study from a developed country, Leventis and Dimitropoulos (2012) showed that US banks with better CGM are less engaged in earnings management. Extensive studies have examined the relationship between executive compensation and earnings management, and the obtained results were quite different. On the one hand, some studies have found that executive compensation is tied to the earnings management (Cheng and Warfield, 2005; Bergstresser and Philippon, 2006; Burns and Kedia, 2006; Efendi et al., 2007; Cohen et al., 2008); on the other hand, other researchers have not found evidence of a relationship between executive compensation and earnings management (Erickson et al., 2006; Armstrong et al., 2010). What is worth mentioning is that Iranian audit firms operate in a low-risk situation, and executive compensation incentive plans are not comparable to those are in a developed country called America. In such an environment, the audit firms are very unlikely to consider executive compensation as a potential audit risk in the determination of audit fees.

The prevention of corporate failure and the existence of increasing acknowledgment in the business world leads to establishing CGMs throughout developing and developed countries (Clarke, 2004). CGMs not only are the stakeholder's shield but also improve the country economic development especially for developing countries. As in Poland, Kowalewski and Kowalewski (2016) proved that during the financial crisis, companies that had higher governance standards reported higher returns on assets than did firms that had weak CG. In other words, their results confirm the influence of CG on the firm performance for the period of the crisis. Core et al. (1999) realized that when CGM is weaker, the corporate performance is inappropriate and fragile. Obviously, there are different problems in developing countries which could lead to CG asthenia. In an emerging market as Nigeria, these problems include lack of transparency in financial reporting, misuse of shareholders' rights, lack of law enforcement mechanisms, the nonexistence of obligation on the part of boards of directors and feeble monitoring structures (Okpala, 2012). Anyway, when a firm is located in a county with a high level of economic, its motivations are likely to be less for adopting CGM (Doidge et al., 2007). It is important to note that CG differs across different countries, and this goes back to each country's characteristics such as culture, politics and technology (Mulili, 2011). Culture has a strong relation with earnings smoothing (Doupnik, 2008). In another study, this point is mentioned again; Thanetsunthorn et al. (2016) showed that the variation of the results across countries can be explained by the national cultural features that all are likely to impact the degree to which companies act in CG practices. Of course, the nature of CG will be affected by financial structure and legal system in each region (Anderson and Gupta, 2009). In general, it can be stated that CG systems in developed countries have made more progress than other countries. Bleicher et al. (1989) surveyed by comparing CG relevance in three countries, namely, Germany, the USA and Switzerland. They concluded that these countries possess advanced CGM during the recent years, and this led to improving managers' abilities for monitoring the activities of the corporation. There are several ways to improve CGM such as imposing more duties on the boards, the presence of outside directors on the board, managerial ownership and other cases.

With respect to the board independence, it can be said that the presence of outside directors on the board is the foundation of modern CG, which solves the agency problems (Fama, 1980; Fama and French, 1993). The non-executive members of the board of directors increase the shareholder's wealth and reduce fraud in the financial statements (Agrawal and Knoeber, 1996). In the context of agency theory, the presence of a greater number of independent directors on the board of directors leads to having better performance of the firms. According to this theory, managers are individualistic and opportunistic. Therefore, effective oversight by the independent board of directors is a key factor in protecting the interests of the company's shareholders (Ramdani and Witteloostuijn, 2010). Alves et al. (2015) expressed that an independent board will increase the quality and quantity of information provided to the public, and it ultimately will reduce agency costs.

As for Iranian market, one cannot imagine that the market would be efficient. A large number of Iranian companies are government-owned, and the lifetime of TSE is short. Hence, there are not many conditions for an efficient market such as competition and the continuous flow of transparent information. As TSE is more focused on performance measurement criteria based on accounting figures, and the choice of accounting method can affect these measures, it is possible to increase the profits manipulation by the managers of Iranian companies. Another interesting point about TSE is that as Iran country was faced with severe economic sanctions during the study period between 2009 and 2014, most Iranian companies had financial distress. In such economic situation, these firms could not

pay great rewards to their directors. In other words, Iranian managers' rewards are not matched by the economic added value created by them.

2.1 The relationship between CEO equity incentives and audit fees
It remains unclear that whether auditors interpret the executive compensation as a multiplicative factor of audit risk or a reducing factor. Wysocki (2010) expressed that as there is a multifaceted relationship between audit fees and executive compensation, further research is needed to analyze the relationship. Hoitash *et al*. (2007) believed that bonus is an incentive for managers to improve the financial reporting quality and apply high-quality audit firms to discover important errors. A recent study by Armstrong *et al*. (2013) surveyed the relationship between equity incentives and misreporting. They inferred that a strong positive relation between Vega and misreporting. In addition, Kannan *et al*. (2014) examined the association between audit fees and equity incentives. Their results witnessed that there is a positive relation between CEO and CFO Vega incentives and audit fees, but not delta. Fargher *et al*. (2014) also found evidence of a negative (positive) relation between CEO deltas (Vegas) and audit fees. They concluded that when CEO portfolio deltas increase, the issuance of going-concern audit opinions reduces. Chen *et al*. (2015b) showed that there is a positive connotation between the sensitivity of CEO compensation to stock return volatility (Vega) and audit fees, but not delta; moreover, they suggested that this relationship is more prominent for companies that are susceptible to litigation risk and deteriorates in the post-Sarbanes–Oxley Act (SOX) period. In fact, the findings of Kannan *et al*. (2014), Fargher *et al*. (2014) and Chen *et al*. (2015a) for Vega are similar to each other.

Many previous studies have shown that there is a significant and positive relationship between executive compensation incentives and the manipulation of financial statement, which helps to increase in audit fees (Cheng and Warfield, 2005; Bergstresser and Philippon, 2006; Burns and Kedia, 2006; Denis *et al*., 2006; Efendi *et al*., 2007; Harris and Bromiley, 2007; Cohen *et al*., 2008; Johnson *et al*., 2009; Jayaraman and Milbourn, 2014). However, some other scholars did not have evidence that proves this association (Erickson *et al*., 2006; Armstrong *et al*., 2010). In addition, PCAOB (2013) emphasized that types of executive compensation increase the probability of dishonest financial statements. If we look at Iranian context, the results of various studies in Iran testify to this claim; for instance, the studies of Sajadi *et al*. (2015) and Khatiri and Zand (2015) saw a positive relationship between audit fees and managers' motivation. As mentioned earlier, Iranian managers' remuneration is affected by the company's stock value. Hence, profit manipulation is greater in companies where the salaries and benefits of its managers depend on the company's stock value, which results in surging the amount of audit fee. To put it another way, audit risk will soar as these subversive incentives increase. Thus, we expect that there will be a positive association between equity incentives and audit fees in Iranian market.

H1. There is a positive relationship between CEO equity incentives and audit fees.

2.2 The relationship between executive compensation and audit fees
Engel *et al*. (2010) found that companies having higher audit fees, pay more fees to the audit committee. Meanwhile, Bryan and Mason (2016) showed that audit fees are 4.6 per cent higher when there is an extreme CEO pay cut, and they proved the fact that there is a positive and highly significant association between extreme CEO pay cuts and audit fees. Besides, based on a sample of companies in the USA between the years 2000 and 2010, Chen *et al*. (2015a, 2015b) showed that companies with high rewards will pay higher audit fees. In another research from the US market, Wysocki (2010) concluded that there is a strong

significant positive relationship between audit fees and CEO compensation so that a 1 per cent increase in audit fees is connected with a 0.19 per cent average increase in total CEO compensation. In another research, Kim *et al.* (2015) inferred that there is a significant association between CEO equity incentives and audit fees, but CFO equity incentives are not associated with audit fees. By contrast, the findings of Billings *et al.* (2013) went in the opposite direction. In fact, they did not observe a relation between CEO compensation and audit fees. Nonetheless, they realized that there is a positive relationship between CFO equity incentives and audit fees. In Iran, Sajadi *et al.* (2015) concluded that as long as the compensation for director increases, their motivations for manipulating earnings will be greater; as this issue requires a high-quality audit, the payment of audit fee will be higher. It should be noted that the majority of Iranian companies had financial distress over the period between 2009 and 2014 because Iran was faced with severe economic sanctions. In such economic situation, there were a few firms providing short-term and temporary rewards to their managers. As managers knew that financial distress is the main factor in not paying permanent rewards, they try to exaggerate the corporate financial performance, which then, in turn, leads to increasing the audit fee. Thus, we expect that Iranian companies pay more audit fees when they give managers more rewards.

H2. There is a positive relation between executive compensation and audit fees.

2.3 The relationship between fees resulting from audit risk and Delta and Vega incentives of the board

Auditors usually gather more evidence to reduce the risk of not detecting a material misstatement that leads to an increase in audit costs. These costs can be imposed on employers (Simunic, 1980). In the same vein, Krishnan *et al.* (2012) said that should audit risk increase, auditors will ask for higher fees. Many researchers have accepted the theory that states there is a positive relationship between some of the concepts of risk and audit fees (Bedard and Johnstone, 2004; Bell *et al.*, 2001).

Burns and Kedia (2006) found that the sensitivity of different components of CEO compensation, i.e. equity, restricted stock, long-term incentive payouts and salary plus bonus, has no significant impact on the propensity to misreport fees, and audit firms consider them as a risk element (Kannan, 2009). This topic is like a double-edged sword. On the one hand, the existence of greater amounts of long-term incentives and stock options might cause that managers to reduce earnings management, and this leads to decreasing audit fees. On the other hand, Burns and Kedia (2006) state that stock option may encourage managers to manage earnings, and this leads to increasing the audit fees. Because of conflicting effects, short-term and long-term incentives and stock options could either increase or reduce the audit fees.

Kannan *et al.* (2014) carried out a research entitled "The impact of CEO and CFO equity incentives on audit scope and perceived risks as revealed through audit fees". They found strong evidence of a diminishing fee premium for residual auditor business risk in the presence of greater Vega incentives, especially for the CEO, but not Delta. In another research, Kim *et al.* (2015) suggested that CEO Vega is positively linked to audit fees, but CEO Delta, CFO Vega and CFO Delta are not tied to audit fees. Besides, the outcomes of Chen *et al.* (2015a, 2015b) were similar to that of Kannan *et al.* (2014) and Kim *et al.* (2015), but they found the relation between CEO Vega and audit fees is weakened after the SOX Act of 2002. This means that CGMs in this country have been implemented relatively good. Unfortunately, in Iran, a clear and rational mechanism for paying rewards to managers has not been defined yet. When the structure of CGM is weak in a market, managers will easily

manipulate the financial statements (González and García-Meca, 2014). Undoubtedly, when the remunerations are paid in cash and in terms of stock price, Iranian managers will have more incentive to manipulate their financial reports; as a result, the amount of audit fee because of the high audit risk goes up. It is expected that as long as executive compensation is based on the firm's stock price, the majority of Iranian executives evade the investment in long-standing economic plans because of their long-term returns. Hence, we expect that the relationship between CEO Delta incentives and audit fees should be positive. In such a frustrating economic situation, the efficient financial incentives for executives should be considered to make them put more efforts to achieve the company's financial goals, and one of these methods is the Vega incentives. As a matter of fact, executives will be motivated to do their duties properly when the executive compensation is based on the firm's stock returns; so, we think that the association between CEO Vega incentives and audit fees ought to be negative in Iranian market:

H3. There is a positive relationship between fees resulting from audit risk and Delta incentive of the board.

H4. There is a negative relationship between fees resulting from audit risk and Vega incentive of the board.

2.4 The relationship between the independence of board members and audit fees

Based on agency theory, the board independence would be greater than before by the presence of an upper proportion of outside directors on the board (Abed *et al.*, 2012). The independence of board members is one of the factors that can increase the efficiency of Board of Directors. From agency theory perspective, the presence of independent non-executive directors on the board helps to reduce conflicts of interest between shareholders and managers (Khodamipour and Alipoor, 2013). As far as we know, the board independence provides a better understanding of the financial reporting. Therefore, it is expected to increase the reliability of the accounting reports, and it reduces audit risk (Yatim *et al.*, 2006). Agrawal and Knoeber (1996); Dechow *et al.* (1996); Beasley (1996); Peasnell *et al.* (2000), Klein (2002). Peasnell *et al.* (2005) and Bushman *et al.* (2004) found a negative relationship between earnings management and outside members on the board of directors; for instance, Dechow *et al.* (1996) document that a higher percentage of the board outside members is linked to fewer earnings management, and this in turn led to fewer audit fees. Peasnell *et al.* (2000) and Klein (2002) also believed that the board independence reduces the amount of managerial fraud. However, the results of their research contrast with findings of Osma and Noguer (2007); Wong *et al.* (2009). Perhaps, the difference in results obtained is because of lack of strong regulation in CG Code about selecting outside directors as well as the existence of upper proportion of institutional shareholders. In a developed country like China, Wang (2006) examined the role played by the board of director characteristics and realized there is a meaningful and negative association between the audit fees and the number of independent directors on the board.

On the other hand, the independent directors now are trying to hire better auditors for attracting the satisfaction of all stakeholders in the best way possible (Cohen and Hanno, 2000). The independent non-executive directors on the board request an extensive audit effort from the auditor for confirming their monitoring function, leading to an increase in the audit fees (Basiruddin, 2011). Besides, Solomon (2007) believed that the outside directors indeed forget their key task because of their close relationships with executives. Ilhan Nas *et al.* (2016) examined the effect of the presence of outside directors on export performance in

Turkey. Consistent with their expectations, they found that a higher presence of outside directors on the board is negatively connected with export performance. Besides, Mather and Ramsay (2006) realized that there is a positive relationship between the high numbers of outsiders among the board of director's members and unexpected accruals in Australia, whereas the results of Truong (2006) and Moradi et al. (2013) were not the same. Moradi et al. (2013) examined the relationship between some features of the board and agency costs of companies listed on TSE over a six-year period between 2005 and 2010. They found that there is a significant relationship between board independence and agency costs. Overall, in Iran, the power of decision-making and the determination of company policies are in the hands of factors such as the government, and the board does not play an active role in this case. In addition, the focus of government ownership and different strategies of interest groups for investment may reduce shareholders' incentive to determine the optimal structure of the board of directors. We expect that as these factors weaken the role of the board of directors in determining managerial policies, the independence of the board of directors cannot affect audit fees. Thus, the fifth hypothesis of the research is as follows:

H5. There is not a significant relationship between the independence of board members and audit fees.

2.5 The relationship between the board ownership and audit fees
With regard to board ownership, it can be stated that it is one of the internal mechanisms of CG that reduces the conflict of interest between managers and shareholders, and it ultimately creates value for the company(Hope *et al.*, 2012; Ahmadvand *et al.*, 2011). The greater degree of managerial ownership leads to more executive's motivation (Frydman and Jenter, 2010), and stock ownership by managers results in improving the corporate performance (Mehran, 1995). An appropriate ownership structure can reduce the volume of audit work (Mitra *et al.*, 2007). Experience has shown that the increase in the board ownership is one way of reducing the agency problems (Morck *et al.*, 1988). It is believed that increasing the percentage of managerial ownership will reduce conflicts of interest between managers and shareholders through reducing the information asymmetry. According to Jensen and Meckling (1976), agency problems between managers and shareholders will be reduced because of their interests. This is an incentive that pushes managers into achieving better performance. Jensen and Meckling (1976) showed that managers who invest in companies under their own management avoid making high-risk decisions in comparison with other managers. A large number of studies have surveyed the impact of ownership structure on earnings management. For example, Hope *et al.* (2012) in the Norwegian market proved that when CEO ownership increases, audit fees decrease. Moreover, in Portugal, Alves (2012) tried to examine the effect of ownership structures such as managerial ownership and ownership concentration on earnings management activities. They found that when the level of managerial ownership and ownership concentration is less, earnings management will be more. In 2005, a study based on a sample of 896 firm-year observations over the period of 1996-2000 was conducted by Yang and Krishnan (2005). Their findings witnessed that the ownership structures have an important effect on earnings management among the US companies, while in emerging markets like Jordan, the results were not the same. Al-Fayoumi *et al.* (2010) showed that there is a significant positive relationship between earnings management and managerial ownership.

In an interesting research, Cheng and Warfield (2005) studied the relationship between managers' equity incentives arising from stock-based compensation, stock ownership and

earnings management. The results indicated that managers with high equity incentives are more likely to sell shares in the future, and this motivates these managers to engage in earnings management to upsurge the value of the shares to be sold. They were of the belief that managers with high equity incentives sell more shares in subsequent periods. As mentioned before, because of financial problems caused by economic sanctions in Iran, it is expected that most executives are not hopeful about the future of corporate businesses. Hence, these executives have lots of financial incentives to engage in earnings management to increase the value of their own shares for sale in the future. This makes the managers have enough motivation for misreporting, so the sixth hypothesis of the research is as follows:

H6. There is a positive relationship between the board ownership and audit fees.

3. Research methodology

As the results can be used in the decision-making process, this research is an applied research. The statistical model used in this study was a multivariate regression; the time range of the study was (2009-2014) as long as six years. The total data needed to test the hypotheses in this study were collected directly from the financial statements on TSE website. After collecting the required data from reliable and available resources, the data were analyzed using the R software. Our paper is among correlational studies because this research is about the effect of CGM and executive compensation on audit fees.

3.1 Population and statistical sample

The target population included all companies listed on TSE during the period 2009-2014. Common features of the companies to determine the population are as follow:

- The type of the business activity is productive and thus investment companies, leasing, credit and financial institutions and banks are not included in the sample because of their different natures.

- The financial periods of companies should be finished at the end of the solar year to enhance the comparability and homogeneity of companies in terms of time period.

- According to the research time period (2009-2014), the company is listed on TSE before the year 2009, and its name is not removed from the listed companies by the end of 2014.

- All required information about financial statements and annual reports of the board of directors to the General Assembly must be available to extract the required data (Table I).

Limitations	Companies
Listed companies on TSE by the end of March 2014	517
Investment companies, leasing, credit and financial institutions and banks	(39)
Companies that their fiscal year end is not in March (the end of Persian/solar year)	(98)
Companies that have more than six months trading halt or have changed fiscal year during the period under study	(147)
Companies whose information is not available or have been removed from the stock exchange	(143)
The remaining companies in the sample	*90*

Table I.
Sampling methods
based on the above
limitations

Considering the above conditions, a sample size of 90 companies in TSE has been selected (Table II).

Looking at the details, with regard to sample industry distribution, computer-related facilities and services have the lowest and automotive and the manufacture of automotive parts have the highest number of observation in our statistical sample.

3.2 Variables and measures

In all research models, LAF is defined as a dependent variable. This variable actually is the natural log of audit fees, in Iran's currency (Iranian rial), for the client company for fiscal year. As discussed earlier, Delta and Vega are defined as the independent variables in the first model. Delta is the change in the value of a CEO's own firm stock option and stock portfolio; in thousands of Iranian rial, for a 1 per cent change in stock price, as well as VEGA, is a 1 per cent change in stock return volatility. INVERC is a control variable which represents the sum of accounts receivable and inventory dividing by total assets at fiscal year-end. ROA equals to the ratio of operating income to fiscal year-end assets, and LOSS is an indicator variable which equals to one if the net income is negative and zero otherwise. SGROW shows the sales growth of the firm. In fact, this is the rate of changes in sales from past year to this year. book-to-market (BM) ratio of common equity at beginning of financial year. This variable is considered to represent investment opportunities of companies. REST is an indicator variable that is equal to one if the firm restates its previous year's financial statements, and zero otherwise. CASH indicates the sum of cash and cash equivalents divided by total assets. To put it another way, this variable is used for grading financial flexibility of firm. Earnings per share (EPS) is defined through a company's profit divided by its number of common outstanding shares. Regarding year indicator (YI), we can say that this indicator shows information about the amount of audit fee earned by external auditors in Iran over a six-year period between 2009 and 2014. Bearing in mind that 2009 is considered as the base year.

VOLSEN as an independent variable in the second model is the natural logarithm of Vega. This variable is defined as the money change in the CEO's option holdings in response to 0.01-unit change in stock return volatility. BIG1 as an indicator variable equals one if the auditor is a member of the auditing organization in Iran and zero otherwise. LTNR is the natural logarithm of auditor tenure, and this variable is defined as the length of the auditor-

Industry name	Firm-year observation	(%) of sample
Agriculture and Related Services	12	2.22
Automotive and the manufacture of Automotive Parts	96	17.77
Basic metals	18	3.33
Cement, lime, and plaster	66	12.22
Chemical products	30	5.55
Computer related facilities and services	6	1.11
Food and Beverage products except for sugar	54	10
Machinery and appliances	36	6.66
Other non-metallic mineral products	84	15.55
Pharmacy	60	11.11
Production of metal products	24	4.44
Rubber and plastic	24	4.44
Textiles	12	2.22
Transportation, warehousing and communications	18	3.33
Total	540	≈100

Table II.
Firm-year observations distributed across the industry sectors

client relationship. LEV is calculated through long-term debt scaled by total assets. The ratio of CURR is calculated through current assets divided by total assets. QUICK variable is also defined as (Current assets [ACT] – Inventories [INVT]) / Current liabilities (LCT).

With respect to *H3* and *H4*, as negative and positive accruals are controlled by auditors, we use the absolute value of discretionary accruals as a proxy for audit risk (Francis *et al.*, 1999; Krishnan, 2003; Kannan *et al.*, 2014). AUDRISK is calculated by the absolute value of a firm's discretionary total accruals using the cross-sectional Jones (1991) model. It is expected that on the condition that Delta incentives increase (reduce) an auditor's perception of the probability of earnings management, the coefficient on the interaction term (Audrisk*Delta) should be positive (negative) to reveal a larger (smaller) increase in audit fees (Kannan *et al.*, 2014). Similarly, as robust Vega incentives are positively connected with the increase in discretionary accruals, providing that Vega incentives increase (decrease) an auditor's perception of the likelihood of earnings management, the coefficient on the interaction term (Audrisk*Vega) should be positive (negative).

Because OUTSIDE DIRECTOR RATIO is our independent variable in the fifth model, we measured the independence of directors by dividing the total number of outside directors to the total number of board members (Moradi *et al.*, 2012; Rustam *et al.*, 2013). BOARD SIZE as a control variable is measured by the number of directors on the board and SALES variable represents the firm size, which is obtained by the sum of net sales (Rustam *et al.*, 2013). COMMITTEE SIZE explains the number of executive directors in the audit committee. COMMITTEE ACTIVITY variable also represents the activities of the audit committee and is defined as the number of board meetings during a year. COMMITTEE INDEPENDENCE is a dummy variable that equals to one if at least one of the independent directors is on the audit committee and zero otherwise. Moreover, COMMITTEE EXPERTISE variable is measured by the number of the audit committee members who have financial knowledge scaled by the total number of the audit committee members (Rustam *et al.*, 2013). In *H6* of this study, we evaluate ownership concentration (OWNER_CONC) using the Herfindahl index. Our choice of control variables is guided by the study of Hope *et al.* (2012). INCPIC equals to 1 if the firm's share capital increases from $(t-1)$ to (t), 0 otherwise. CHAUDITOR also equals to 1 if the firm changes auditor in year t, and 0 otherwise. Finally, INVESTMENTS variable is the sum of long-term and short-term investments in securities, bank deposits and cash scaled by sales.

3.3 Research models
In this study, the multiple regression models were used to evaluate the research hypotheses. In the initial step, we set the first model to examine whether there is a positive association between audit fees and CEO equity incentives. Most important point about this research model is that it is expected that $\beta1$ and $\beta2 > 0$ as long as audit firms increase the volume of audit work because of a positive association between audit risk with DELTA and VEGA incentives (Kannan *et al.*, 2014).

- *Model (1)*:

$$LN(AUDIT FEE) = \beta0 + \beta1\,DELTA + \beta2\,VEGA + \beta3\,INVERC \\ + \beta4\,ROA + \beta5\,LOSS + \beta6\,SGROW + \beta7\,BM \\ + \beta8\,REST + \beta9\,CASH + \beta10\,EPS \\ + YEAR\,INDICATOR + \varepsilon.$$

Similar to the study of Chen *et al.* (2015a, 2015b), we test the second hypothesis to examine whether companies with high Vega will pay higher audit fees.

- *Model (2)*:

$$
\begin{aligned}
\mathrm{LN\,(AUDIT\,FEE)} = {} & \beta 0 + \beta 1\,\mathrm{VOLSEN} + \beta 2\,\mathrm{BIG1} + \beta 3\,\mathrm{LTNR} \\
& + \beta 4\,\mathrm{BM} + \beta 5\,\mathrm{LEV} + \beta 6\,\mathrm{CURR} + \beta 7\,\mathrm{QUICK} \\
& + \beta 8\,\mathrm{ROA} + \mathrm{YEAR\,INDICATOR} + \varepsilon
\end{aligned}
$$

According to the research of Kannan *et al.* (2014), we test *H3* and *H4* to survey whether fee premiums for audit risk are sensitive to CEO Delta incentives and whether fee premiums for auditor business risk are sensitive to CEO Vega incentives.

- *Model (3)*:

$$
\begin{aligned}
\mathrm{LN\,(AUDIT\,FEE)} = {} & \beta 0 + \beta 1\,\mathrm{DELTA} + \beta 2\,\mathrm{VEGA} + \beta 3\,\mathrm{AUDRISK} \\
& + \beta 4\,(\mathrm{DELTA*AUDRISK}) + \beta 5\,\mathrm{INVERC} \\
& + \beta 6\,\mathrm{ROA} + \beta 7\,\mathrm{LOSS} + \beta 8\,\mathrm{SGROW} \\
& + \beta 9\,\mathrm{BM} + \beta 10\,\mathrm{REST} + \beta 11\,\mathrm{CASH} \\
& + \beta 12\,\mathrm{EPS} + \mathrm{YEAR\,INDICATOR} + \varepsilon
\end{aligned}
$$

- *Model (4)*:

$$
\begin{aligned}
\mathrm{LN\,(AUDIT\,FEE)} = {} & \beta 0 + \beta 1\,\mathrm{DELTA} + \beta 2\,\mathrm{VEGA} + \beta 3\,\mathrm{AUDRISK} \\
& + \beta 4\,(\mathrm{VEGA*AUDRISK}) + \beta 5\,\mathrm{INVERC} \\
& + \beta 6\,\mathrm{ROA} + \beta 7\,\mathrm{LOSS} + \beta 8\,\mathrm{SGROW} \\
& + \beta 9\,\mathrm{BM} + \beta 10\,\mathrm{REST} + \beta 11\,\mathrm{CASH} \\
& + \beta 12\,\mathrm{EPS} + \mathrm{YEAR\,INDICATOR} + \varepsilon
\end{aligned}
$$

Based on the agency theory, it is expected that outside director as a corporate mechanism decreases agency costs arising from conflicts of interest between management and owner. According to the study of Rustam *et al.* (2013), we test the fifth hypothesis to examine whether outside directors on the board increase or decrease audit fees.

- *Model (5)*:

$$
\begin{aligned}
\mathrm{LN\,(AUDIT\,FEE)} = {} & \beta 0 + \beta 1\,\mathrm{OUTSIDE\,DIRECTOR\,RATIO} + \beta 2\,\mathrm{BOARD\,SIZE} \\
& + \beta 3\,\mathrm{ROA} + \beta 4\,\mathrm{SALES} + \beta 5\,\mathrm{LOSS} \\
& + \beta 6\,\mathrm{COMMITTEE\,SIZE} + \beta 7\,\mathrm{COMMITTEE\,ACTIVITY} \\
& + \beta 8\,\mathrm{COMMITTEE\,INDEPENDENCE} \\
& + \beta 9\,\mathrm{COMMITTEE\,EXPERTISE} + \mathrm{YEAR\,INDICATOR} + \varepsilon
\end{aligned}
$$

According to the research of Hope *et al.* (2012), we are going to know whether CEO ownership increase or decrease audit fees. Based on the agency theory, we expect that there

exists a negative association between our independent variable and agency costs. To put it another way, should ownership concentration increase, audit fees will decrease.

- *Model (6)*:

$$
\begin{aligned}
\text{LN (AUDIT FEE)} =\ & \beta 0 + \beta 1\,\text{OWNER} - \text{CONC} + \beta 2\,\text{LN SALES} \\
& + \beta 3\,\text{LEV} + \beta 4\,\text{INVERC} + \beta 5\,\text{SGROW} + \beta 6\,\text{ROA} \\
& + \beta 7\,\text{INCPIC} + \beta 8\,\text{INVESTMENTS} + \beta 9\,\text{LOSS} \\
& + \beta 10\,\text{CURR} + \beta 11\,\text{BIG1} + \beta 12\,\text{CHAUDITOR} \\
& + \text{YEAR INDICATOR} + \varepsilon
\end{aligned}
$$

4. Data analysis and hypothesis test
4.1 Descriptive statistics
The descriptive statistics show values of dispersion and central indices. The knowledge about the descriptive statistics is a phase toward understanding the mean data procedure and correlation between them, as well as examining the distribution status. The mean is the main central index, which reflects balance point and center of distribution gravity, and the median is a good index for indicating the data centrality. For example, the mean of DELTA and VEGA incentives are 806.8 and 0.565, respectively, which implies that our sample firms have more Delta than Vega. On average, approximately 0.3 per cent of the total number of board members are from the outside directors. We cannot deny this fact that all audit committee members have financial knowledge since the mean of AUDEXP variable is 99 per cent. In addition, since the mean of COMACT and COMSIZE variables is 2.14 and 1.19, respectively, approximately two meetings were held on the board during a year and there is at least one executive director on the board.

Our sample consists of large firms, for on average, our sample has total assets of 1473214.59. Additionally, the mean (median) value of current ratio (CURR), is 0.66 (0.70). One interpretation of this result is that in spite of having the high amounts of total assets, these companies were probably faced with some problems in paying off the current debts. To acquire more accurate analysis results, we need to investigate the QUICK ratio. The mean of this ratio is 1.26, which means that firms are able to pay off its current liabilities using its liquid assets. Another important issue is that the mean of the QUICK ratio is more than INVERC ratio. In such cases, the liquid assets in comparison with Inventory and accounts receivable are more reliable for creditors. The mean growth in sales is 0.83 per cent for our sample, which this figure is considerable. The mean (median) value of AUDRISK (DCA), is −2.2128 (−0.1324). Because of the existence of these figures, it can be noted that firms were reluctant to report discretionary accruals in their financial statements. Moreover, around 0.8 per cent of the CEO sample reported financial statement restatement to correct intentional twisting (Table III).

4.2 Correlation matrix
In Table IV, we investigate the Pearson correlation coefficients which show the association between dependent, independent, and control variables. The diagonal cells having value 1 shows the correlation between variables and themselves.

The Table IV shows that there is a positive and significant relationship between the independence of Iranian directors on the board (OUTB) and the number of directors on the

Variable	No. of year-observation	Mean	Median	SD	Minimum	Maximum
LNAF	540	6.2782	6.245	1.0159	2.265	9.3
DELTA	540	806.8851	510	1055.3480	0	7200
VEGA	540	0.5651	0.68	0.3179	0	0.99
AUDRISK	540	−2.2128	−0.1324	2.5249	−18.9219	56.8370
OWN	540	2.6202	2.6295	0.2460	2.0062	3.6231
INVERC	540	0.5090	0.4851	0.4762	0	7.6173
ROA	540	0.0957	0.0835	0.1646	−1.3226	0.7458
LOSS	540	0.1259	0	0.3320	0	1
SGROW	540	0.8327	0.1927	4.3019	−1.9673	57.2726
BM	540	0.5693	0.4894	1.5014	−10.5790	15.2334
REST	540	0.8351	1	0.3713	0	1
CASH	540	0.0478	0.0290	0.0843	0	1.1934
EPS	540	697.6108	433.836	1069.3428	−2904.2512	7987.6
BIG	540	0.2037	433.836	1069.3428	0	1
LTNR	540	1.2972	1.3862	0.9236	0	3.0910
TA	540	1473214.59	512814	6114054.862	22725	73705891
LEV	540	0.7045	0.6659	0.3454	0.1451	3.0604
CURR	540	0.6636	0.7043	0.1910	0.1120	0.9751
QUICK	540	1.2673	1.1713	0.5999	0.1314	5.1213
CHAUDIT	540	0.1888	0	0.3917	0	1
INCP	540	0.1833	0	0.3872	0	1
LVOL	540	806.8852	510	1055.348	0	7200
OUTBOAR	540	0.3091	0	0.3280	0	0.8
BOARSIZE	540	0.8032	0.3465	0.8055	0	1.9459
COMSIZE	540	1.1944	0	1.5876	0	5
COMACT	540	2.1462	1	2.3956	0	7
INDCOM	540	0.2767	0	0.3734	0	1
AUDEXP	540	0.9944	0	1.3668	0	5
INV	540	0.1140	0.0268	0.9818	0	22.7392

Table III.
Descriptive indices of
the variables

board (BSIZE), while the OUTB proportion has a positive and insignificant with the number of board meetings during a year (CACT). This finding indicates that companies with the independent board are connected with not only the number of directors but also board meetings. Moreover, there exists a relatively weak positive relationship between INDC and CACT and AUDE, which suggests the presence of at least one of the independent directors in the audit committee improves the number of board meetings and the financial knowledge level of the audit committee.

Another point is that CACT, AUDE and INDC are positively and significantly correlated with the CSIZE. This means that the presence of executive directors has effects on the financial knowledge level of the audit committee and results in holding more board meetings. We also find that insignificantly though the number of board meetings during a year is tied to the size of the board, CACT can considerably improve the quality of committee members' knowledge.

4.2.1 Conclusive statistics. Panel data talks about a data set based on which observations are surveyed by a large number of sectional variables often selected randomly during a given period. Because the panel data contain both aspects of time series data and sectional ones, using appropriate statistical explanatory models whose describe the specifications of the variables is more difficult than the models used in sectional and time series data.

4.2.1.1 F-Limer test. In the initial step, the F-Limer test is used for the sake of identifying whether the model is fitted to the ordinary least squares (OLS) or panel data method. The

	BIG	TNR	TA	LEV	CUR	Q	CHA	INCP	LVOL	OUTB	BSIZE	CSIZE	CACT	INDC	AUDE	INV
LAF	0.28	0.14	0.27	0.02	0.03	−0.01	−0.02	0.18	0.014	0.04	0.08	0.09	0.09	0.13	0.06	0.09
DELT	0.4	−0.02	−0.01	−0.32	0.04	0.30	−0.01	0.23	1	−0.06	−0.05	−0.04	−0.05	−0.02	−0.05	−0.03
VEG	0.1	−0.02	0.01	0.1	0.03	−0.05	0.04	0.01	0.006	−0.02	−0.03	0.005	−0.01	0.005	0.001	0.008
AUDR	−0.03	−0.02	−0.007	0.4	0.03	−0.05	0.06	−0.001	−0.06	0.02	0.02	0.08	0.06	0.08	0.10	−0.01
OWN	0.27	0.10	0.52	−0.5	0.01	−0.09	0.04	0.16	0.31	0.10	0.15	0.15	0.16	0.17	0.10	0.05
INVC	0.01	0.10	−0.07	0.01	0.35	0.13	−0.04	0.04	0.03	0.004	0.02	−0.01	0.01	0.03	−0.001	0.62
ROA	0.04	−0.04	−0.03	−0.54	−0.08	0.41	0.002	0.15	0.38	−0.10	−0.08	−0.08	−0.10	−0.09	−0.08	−0.04
LOSS	−0.06	−0.05	0.01	0.47	0.02	−0.23	0.04	−0.09	−0.28	0.08	0.07	0.05	0.07	0.06	0.07	0.11
SGRO	−0.06	−0.05	−0.01	−0.05	0.05	0.09	−0.06	0.002	0.06	−0.002	−0.005	0.008	0.005	−0.02	−0.01	−0.01
BM	0.10	0.10	0.03	−0.47	0.01	0.15	−0.04	0.10	0.17	−0.09	−0.07	−0.08	−0.08	−0.07	−0.09	0.005
REST	−0.03	−0.07	0.04	0.02	0.007	0.001	0.04	0.004	0.05	0.08	0.09	0.04	0.07	0.05	0.04	0.02
CASH	−0.008	0.008	−0.01	−0.12	0.13	0.24	−0.02	0.09	0.06	−0.03	−0.02	−0.01	−0.01	−0.002	−0.02	0.58
EPS	0.13	−0.04	0.23	−0.34	0.01	0.25	−0.02	0.17	0.39	−0.01	−0.02	−0.04	−0.04	−0.02	−0.05	−0.04
BIG	1	0.46	0.15	−0.02	−0.15	−0.16	−0.12	0.009	0.04	−0.07	−0.04	−0.01	−0.03	−0.01	−0.02	0.09
TNR	0.46	1	0.15	0.03	−0.04	−0.13	−0.04	0.003	−0.02	0.11	0.11	0.04	0.08	0.03	0.02	0.07
TA	0.23	0.15	1	0.005	−0.11	−0.11	−0.03	0.04	−0.01	0.05	0.12	0.10	0.12	0.10	0.07	0.03
LEV	−0.02	0.03	0.005	1	0.07	−0.57	0.01	−0.15	−0.32	0.11	0.10	0.09	0.11	0.10	0.10	0.01
CUR	−0.15	−0.04	−0.11	0.07	1	0.38	0.05	0.03	0.04	0.03	0.05	0.03	0.03	0.05	0.005	−0.01
Q	−0.16	−0.13	−0.11	−0.57	0.38	1	0.01	0.11	0.30	−0.6	−0.5	−0.7	−0.7	−0.7	−0.7	−0.3
CHA	−0.12	−0.04	−0.03	0.01	0.05	0.01	1	0.04	−0.01	0.04	0.03	−0.008	0.01	−0.002	−0.001	−0.02
INCP	0.009	0.003	0.04	−0.15	0.03	0.11	0.04	1	0.23	0.01	0.004	0.03	0.01	0.01	0.002	−0.01
LVOL	0.04	−0.02	−0.01	−0.32	0.04	0.30	−0.01	0.23	1	−0.06	−0.05	−0.04	−0.05	−0.02	−0.05	−0.03
OUTB	−0.07	0.11	0.05	0.11	0.03	−0.6	0.04	0.01	−0.06	1	0.94*	0.70	0.84*	0.68	0.68	0.008
BSIZE	−0.04	0.11	0.12	0.10	0.05	−0.5	0.03	0.004	−0.05	0.94*	1	0.75	0.89	0.74	0.72	0.04
CSIZE	−0.01	0.04	0.10	0.09	0.03	−0.7	−0.008	0.03	−0.04	0.70	0.75	1	0.95**	0.92*	0.96**	0.05
CACT	−0.03	0.08	0.12	0.11	0.03	−0.7	0.01	0.01	−0.05	0.89	0.89	0.95**	1	0.89	0.92*	0.05
INDC	−0.01	0.03	0.10	0.10	0.05	−0.7	−0.002	0.01	−0.02	0.84	0.74	0.92*	0.89	1	0.87	0.04
AUDE	−0.02	0.02	0.07	0.10	0.005	−0.7	−0.001	0.002	−0.05	0.68	0.72	0.96**	0.92*	0.87	1	0.03
INV	0.09	0.07	0.03	0.01	−0.01	−0.3	−0.02	−0.01	−0.03	0.008	0.04	0.05	0.05	0.04	0.03	1

Table IV.
Correlation matrix

null hypothesis (*H0*) displays that there is no difference among the estimated coefficients for individual cross-section and the estimated coefficient for individual mass. This implies that there is no necessity to estimate the model by using the panel data. In other words, OLS model is preferred to the fixed effects model. After conducting the *F*-test, the *F*-statistic is calculated as compared to the critical value of the *F*-statistic. Given the results obtained, it was determined that the values of the statistic of the F-Limer test for *H1-H6* equal 5.058, 4.829, 5.034, 5.034, 7.259 and 3.810, respectively. According to the probability value of *H0* test that is less than 0.05, the preference of the OLS method is rejected for all of the hypotheses, while the panel data methods are accepted.

4.2.1.2 Hausman test. After confirming the use of the panel data method, the Hausman test is used to determine whether a panel data with fixed effects should be used or a panel data with random effect. Hausman test was introduced in 1978 by Hausman, and it is formed based on the presence or absence of correlation between the error of regression and independent variables. Random effects model will apply if such a relationship exists, and if it does not, fixed effects model will be used. The statistic of the test will have a chi-square distribution with k-1 degrees of freedom if the calculated chi-square statistic is greater than the critical value. This means that *p*-value of the test is less than 5 per cent, in this case, the null hypothesis is failed to accept, and the fixed effects model is superior to the random effects model. The results demonstrate that as probability value for each of the six models equals 0.761, 0.575, 0.884, 0.883, 0.988 and 0.997, in turn, the models used are random effects models. In other words, according to the probability value of *H0* which is bigger than 0.05, the preference of the fixed effects model is rejected and the random effects model is accepted on the total data level.

4.2.1.3 Random effects significance test. Breusch and Pagan suggested that the Lagrange Multiplier is used for evaluating the Integrated Data Model (IDM) against the random effects model. In this test, the null hypothesis (H_0) shows that IDM is appropriate, whereas *H1* displays that the random effects model is appropriate. After conducting the Lagrange Multiplier test, in spite of the fact that there is neither the spatial integration nor simultaneously a spatial and time integration, we find that it is possible to integrate time for each of the research hypotheses. The reason is that the χ^2 statistic figures for time factors from *H1-H6* contain 2.468, 112.424, 2.434, 2.477, 0.038 and 0.326, respectively. What is worth mentioning is that as probability value of all our hypotheses is bigger than 0.05, the integrating time factor method is suitable for all of them.

4.2.1.4 Breusch–Godfrey test. The most important condition for using the integrated panel model is a lack of autocorrelation among error terms. "Breusch–Godfrey Test" is used to investigate whether applied data have serial autocorrelation. In the case of ignoring autocorrelation, estimation of coefficients would be without error, but ineffective which may result in incorrect conclusions. Although autocorrelation occurs in cross-sectional data, it is more common in time series data. As far as we know there are different methods to identify the autocorrelation, so our paper will use Godfrey method. In this test, *H0* represents the lack of autocorrelation, and *H1* shows the existence of autocorrelation. Based on the results of all hypotheses and the rejection of *H0* for each of them, it is concluded that there is autocorrelation among residuals in all the research models because *p*-value is smaller than 5 per cent. To tackle this problem, panel generalized linear model (PGLM) should be used for the final fit of the model.

4.2.1.5 Variation inflation factor. In statistics, the variance inflation factor (VIF) measures the severity of multicollinearity in an OLS regression analysis. It provides an index that measures how much the variance (the square of the estimate's standard deviation) of an estimated regression coefficient is increased because of collinearity. Based

on the results of six hypotheses, what figures out from the models of one, two, three, four and six is that VIF for the independent and control variables is less than 10. Hence, there is no indicator of multicollinearity through explanatory variables for each of these research models.

Turning to the other side of the argument, the sixth model analysis is slightly different. The generalized collinearity diagnostics (GVIF) values for committee size and committee activity are greater than 10, which represents the squared ratio of hypervolumes of the joint-confidence ellipsoid for a subset of coefficients to the "utopian" ellipsoid. To make GVIFs comparable across dimensions, $GVIF^{(1/(2*Df))}$ were calculated, where Df is the number of coefficients in the subset. In effect, this reduces the GVIF to a linear measure and for VIF, where Df = 1, is proportional to the inflation because of collinearity in the confidence interval for the coefficient. The calculated $GVIF^{(1/(2*Df))}$ represents that there is no multicollinearity indicator in the independent and control variables. Hence, there is no need to apply ridge regression for the fifth hypothesis.

4.2.1.6 The parameter estimation of all hypotheses. Given what has already been mentioned, PGLM is the most appropriate method for estimating each of the research models. Hence, the results of parameter estimation for each model are as follows (Table V).

Let us start by looking at the details of H1 and H2. As the coefficient on Vega is insignificant and the coefficient on Delta is positive and significant, it can be concluded that there is a positive relationship between Delta and audit fees; still, CEO's Vega could not have effect on audit fees. What is more, H2 is accepted at a significance level of 5 per cent. The results suggest that those Iranian companies that give managers more rewards, will pay more audit fees. As you see, VOLSEN is positively and significantly linked to audit fees, thus indicating that external auditors charge higher fees for firms with higher Vega.

The relationship between fees resulting from audit risk and cash compensation of the board (delta) is not significant. Therefore, H3 is not accepted. Similarly, H4 is rejected. This implies that auditors do not perceive Vega incentives as a source of audit risk. In spite of being insignificant, the results show that Vega incentives decrease in auditor's perception of the likelihood of earnings management in Iranian context.

It is not a strong enough evidence to prove H5, for the amount of the p-value for OURBOR variable is 0.48. To put it another way, the independence of directors does not affect audit fees. As a final point, the coefficient of OWN remains positive and statistically insignificant. Hence, no specific conclusion can be reached regarding the effect of board ownership on audit fees.

5. Conclusion

At the initial step, the current study investigated the relationship between CEO equity incentives and audit fees. We do not find evidence of a relation between CEO Vega and audit fees. This finding is inconsistent with the conclusion of Kannan *et al.* (2014); Fargher *et al.* (2014); and Chen *et al.* (2015b). However, there is a positive association between CEO Delta incentives and audit fees, which is similar to the results of Chen *et al.* (2015a) and Kannan *et al.* (2014). In addition, the study shows that Iranian companies pay more audit fees when they give managers more compensation. In fact, the result obtained is consistent with findings of Chen *et al.* (2015a) and Wysocki (2010) in America and Sajadi *et al.* (2015) In Iran.

Given that, executive compensation was divided into two categories, namely, Delta and Vega rewards. The findings of this paper proved that there is not a significant association between fees resulting from audit risk and Delta (Delta*DCA). The result is consistent with findings of Kannan *et al.* (2014), Erickson *et al.* (2006) and Armstrong *et al.* (2010), while it is inconsistent with studies of Bergstresser and Philippon (2006); Burns and Kedia (2006);

Table V.
Result of parameters estimation and coefficients significance testing for each of the models

Variables	Results (1)	Results (2)	Results (3)	Results (4)	Results (5)	Results (6)
Intercept	5.794e+00	5.458e+00	5.794e+00	5.795e+00	9.54922	1.954e+00
	(34.219)	(22.188)	(34.176)	(34.163)	(4.553)	(3.827)***
Cash compensation of the board	1.344e-041	–	–	1.346e-04	–	–
	2.938)***			2.937)***		
Non-Cash compensation of the board	−1.427e-02	–	–	−1.446e-02	–	–
	(-0.106)			(-0.107)		
Audit risk (discretionary accruals)	–	–	−3.726e-03	2.541e-03	–	–
			(-0.230)	(0.084)		
Interaction between Delta and audit risk	–	–	7.321e-06	–	–	–
			(0.598)			
Interaction between Vega and audit risk	–	–	–	−3.992e-03	–	–
				(-0.086)		
The independence of the board of directors	–	–	–	–	−0.41268	–
					(-0.692)	
The Amount of The Ownership	–	–	–	–	–	1.437e+00
						(7.453)
the size of the audit committee	–	–	–	–	−0.71278	–
					(-2.536)***	
Committee activity	–	–	–	–	−0.13827	–
					(-0.636)	
The independence of the Audit Committee	–	–	–	–	0.84799	–
					(1.798)*	
Committee expertise	–	–	–	–	0.69797	–
					(4.056)	
Board size	–	–	–	–	−1.82503	–
					(-1.447)	
Firm size	–	–	–	–	0.09983	–
					(1.623)*	
Quick ratio	9.012e-02	–	8.326e-02	8.967e-02	–	2.380e-01
	(0.875)		(0.801)	(0.866)		(1.999)
Return on assets	−4.140e-01	−3.847e-01	−4.238e-01	−4.110e-01	0.47407	−1.728e-02
	(-1.070)	(-1.226)	(-1.090)	(-1.058)	(0.58111)	(-0.056)

(continued)

Variables	Results (1)	Results (2)	Results (3)	Results (4)	Results (5)	Results (6)
Profit (loss)	5.582e-02 (0.338)	–	5.552e-02 (0.336)	5.498e-02 (0.332)	0.40957 (1.281)	1.413e-01 (0.972)
Sale growth	4.243e-03 (0.423)	–	4.316e-03 (0.430)	4.264e-03 (0.424)	–	1.091e-02 (1.228)
The BM ratio of equity	2.316e-02 (0.751)	8.551e-03 (0.266)	2.224e-02 (0.721)	2.255e-02 (0.731)	–	–
Restatement of Financial Statements	5.135e-02 (0.443)	–	5.224e-02 (0.449)	5.101e-02 (0.439)	–	–
Cash	6.863e-01 (1.165)	–	7.286e-01 (1.224)	6.899e-01 (1.165)	–	–
Earnings Per Share	–2.616e-05 (-0.475)	–	–2.554e-05 (-0.463)	–2.690e-05 (-0.488)	–	–
Board compensation	–	1.274e-04 (2.943)***	–	–	–	–
Audit size	–	6.753e-01 (5.698)	–	–	–	4.650e-01 (4.618)
Logarithm of auditor tenure	–	5.498e-02 (1.053)	–	–	–	–
Auditor change	–	–	–	–	–	–1.345e-01 (-1.310)
Capital increase	–	–	–	–	–	2.598e-01 (2.516)**
Logarithm of the book value of assets	–	5.573e-01 (938.9)***	–	–	–	–
Logarithm of total assets	–	–	–	–	–	6.890e-09 (0.931)
Financial leverage	–	1.228e-01 (0.649)	–	–	–	1.184e-01 (0.875)
Investment	–	–	–	–	–	–2.852e-02 (-0.532)
Current ratio	–	2.623e-01 (1.013)	–	–	–	2.581e-02 (0.112)

(*continued*)

Table V.

Variables	Results (1)	Results (2)	Results (3)	Results (4)	Results (5)	Results (6)
Liquidity ratio	–	–1.890e-03 (–0.018)	–	–	–	–
YI for 2010	4.796e-02 (0.324)	8.562e-03 (0.061)	4.731e-02 (0.319)	4.779e-02 (0.322)	0.07314 (0.465)	–2.245e02 (–0.170)
YI for 2011	3.318e-01 (2.241)**	3.016e-01 (2.130)**	3.327e-01 (2.239)**	3.317e-01 (2.232)**	0.11345 (0.512)	2.270e-01 (1.699)*
YI for 2012	3.497e-01 (2.328)**	3.283e-01 (2.305)**	3.540e-01 (2.349)***	3.503e-01 (2.324)**	0.21986 (0.786)	2.438e01 (1.736)*
YI for 2013	4.223e-01 (2.765)***	4.290e-01 (2.977)***	4.216e-01 (2.756)***	4.225e-01 (2.760)***	0.22284 (0.841)	2.854e-01 (2.052)**
YI for 2014	6.258e-01 (4.166)	6.257e-01 (4.298)	6.240e-01 (4.148)	6.255e-01 (4.157)	0.45388 (1.604)	3.893e-01 (2.816)***

Table V.

Denis *et al.* (2006) and Efendi *et al.* (2007). From the viewpoint of CEO Vega incentives, there is no relationship between fees resulting from audit risk and Vega incentives of the board. In other words, we find no evidence that the fee premium for audit risk changes with the level of CEO Vega incentives. Our results contrast with findings of Kannan *et al.* (2014), but are consistent with Armstrong *et al.* (2013).

Inconsistent with our expectation, the outcomes did not show a significant relationship between the independence of board members and audit fees. This result is the opposite of Agrawal and Knoeber (1996); Dechow *et al.* (1996); Beasley (1996); Peasnell *et al.* (2000); Klein (2002); Peasnell, Pope and Young (2005); Bushman *et al.* (2004); Dimitropoulos and Asteriou (2010) and Basiruddin (2011), whereas it is consistent with the study of Wong *et al.* (2009) in Malaysia. One interpretation of having such a relationship is that Iranian auditors do not have knowledge about the concepts of CG, and they are also not able to predict the relationship between earnings quality and audit fees during the year under review. On the other hand, based on the audit theoretical concepts, the audit committee has the role of selecting the independent auditor, but the current conditions in the structure of Iranian companies have caused that the non-formal existence of outside members on the board cannot effect on audit fees because they do not demand an additional audit effort from the audit firm. Along these lines, Solomon (2007) states that outside directors indeed forget their key task because of their relationships with managers.

Related to the CEO, we find that there is not a significant relationship between CEO ownership and audit fees, which results obtained are inconsistent with the results of Jensen and Meckling (1976); Alves (2012) and Hope *et al.* (2012). Perhaps the reason for this difference may be explained that in spite of the privatization of Iranian companies, decision-making power is still under the control of the government. Overall, our findings are opposed to the fact that the independent board and higher CEO ownership are associated with effective monitoring, which in turn helps to improve the quality of financial reporting and reduce audit fees.

In conclusion, there are several solid reasons that our findings in Iranian market are different from other countries. For example, the shareholders of Iranian publicly listed companies on TSE are protesters in their opposition to large salaries, bonuses, and share options granted to high-ranking managers. It is profoundly clear that during recent years, the level of executive compensation paid by Iranian corporations has come under the greater examination of the shareholders. As far as we know, the executive compensation paid by most companies listed on the TSE as compared to the US companies are humbler with base salary and limited incentives, so the audit risk for Iranian auditors is not as similar as US auditors. The US audit firms face more risk because of the increased supervision of the accounting and auditing profession by the PCAOB. Since 2004, the SOX Act has been implemented in developed countries such as America, England, Australia and Canada, but in Iran, there is no similar law. It can be said that the audit market in developed countries is more highly regulated than Iranian emerging market. Moreover, CGMs differ across developed and developing countries. Anyway, CG in each country will be affected by financial structure, the legal system, culture, politics, technology and so on (Anderson and Gupta, 2009; Thanetsunthorn *et al.*, 2016).

In the first place, this study will warn investors and stakeholders that some CGMs might not be effective in eliminating the agency problems in emerging economies, especially those markets struggling with financial sanctions like Iran. Other than that, this paper will make auditors and regulators aware of effects of executive compensation's types on the audit risk, so that they can make a better assessment of financially poor companies.

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