

The impact of changes in cash flow statement items on audit fees: evidence from Iran

Cash flow
statement
items

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Abstract

Purpose – The purpose of this study is to determine whether the incremental difference between the actual level of cash from the optimal amount (excess and insufficient cash) to the abnormal amount of cash (abnormal positive and negative changes in cash) leads to an increase in audit fees.

Design/methodology/approach – To investigate the main purpose of this study, first, the authors, respectively, estimate the optimal cash flow and the normal (optimal) changes in cash by Oler and Picconi (2014) and Bates, Kahle and Stulz (2009) models for each period. In this regard, financial information of 116 companies listed on the Tehran Stock Exchange is selected during the period 2011-2016.

Findings – The results of this investigation indicate that holding an excessive amount of cash than optimal size and audit fees are negatively associated. Moreover, it is documented that abnormal changes in cash flow and audit fees are not significantly associated.

Originality/value – The outcomes of the current study contribute to providing an accurate estimation to determine audit fees in emerging markets.

Keywords Business risk, Audit fees, Optimal cash holdings, Abnormal cash changes

Paper type Research paper

Introduction

The cash flow statement reflects the overall purchasing power of a company, which plays an important role for carrying out the operation of companies, as it can easily meet the specific needs of organizations and individuals in economic exchanges. Cash also is easily available to purchase materials, goods and services. According to financial theory, Keynes (1936) suggests that managers should hold an appropriate amount of cash in which three reasons are given as justification:

- (1) to deal with unpredictable probabilities, called precautionary motive;
- (2) providing daily operational needs, known as a transactional motive; and
- (3) applying domestic resources in new projects and investments without financing from external creditors and markets, known as a speculative motive (Gleason *et al.*, 2017).



Being the most liquid asset, cash is very important for the company's operation, resulting in the lowest profitability for companies. In a favorable economic situation, it is not necessary to hold a large amount of cash, whereas in an unfavorable economic situation, holding an appropriate amount of cash seems necessary, facing potential risks arisen from economic ambiguities. The reason being the amount of cash holdings are recognized as a key factor for cash management (Mun and Jan, 2015).

Being a substantial need for any firm, cash management is considered as the best decision-making for the cash or cash resources application in organizations, and should managers make a proper decision about cash resources, the great success will be achieved for the company (U.S. Treasury, 2002, Department of Finance). Therefore, determining the level of cash holding is one of the most important financial decisions of managers. On one hand, some managers may lose the corporate domestic resource that belongs to owners. On the other hand, some others are likely to maximize the company's benefit to ensure the owners that managers' decisions are in line with their benefit. In other words, managers are willing to prove that they are responsible for the interests of shareholders, and are looking to increase the shareholders' equity (Jensen and Meckling, 1976). In the interest of distinction between these two approaches by equity owners and other observer bodies, the cash flow statement is designed, classified as a basic element of financial statements, and presenter of cash resources and the way of cash application in companies during a fiscal year. The provision of such financial statements assists owner equity to estimate the manager's performance, and then such an estimation, besides other leverages including a reduction in salary and bonus, provides criterions for owners to control managers' activities. In this regard, Wallace (2004) argues that providing reliable financial statements and coverage against potential risks is a potential reason to motivate the owner's equity for requiring supervisory operations from an independent auditor. As a consequence, it is suggested that both groups (owners and managers) tend to use independent audit services.

The main task of an independent auditor is providing reasonable assurance about the reliability of financial statements of clients, free from material errors and misstatements. Such an assuring service by auditors provides reasonable confidence for shareholders, potential investors and creditors that the cash flow and income statements and also the balance sheet accurately reflect the state of the client's liquidity, activities and assets (Chung *et al.*, 2005). The value of auditors' services is usually increased throughout the auditors' reputation as quality information providers. To attain a balance where auditor reputation is established, external auditors assess all validation points of view including monitoring and guidance between the contracts of clients. Wysochi (2010) suggests that audit service value is a prerequisite condition for audit quality, besides that the complexity of companies' financial reporting is considered as a measurement for audit fees. Indeed, in the case of extensive and complex operations, a higher demand for monitoring the financial reporting process seems more necessary, bringing about more audit attempts and audit fees. Auditors develop a comprehensive approach for evaluating fees, can adequately compensate themselves for their roles. Moreover, engaging in declining client performance, they usually consider several aspects related to business risks including potential costs of shareholder lawsuits, non-audit-related distress claims and reputational damages (Dye, 1993; Houston *et al.*, 2005).

Analyzing auditors' perspectives on client business risk, related to excess (insufficient) cash holding, motivates us for several reasons to conduct such a study. Firstly, auditors must be noticed that the existence of private information inside the company provides a unique opportunity for auditors to assess the costs and benefits of excess (insufficient) cash holdings in relation to managerial activities, risk taking and monitoring quality. Secondly,

we show managers and equity owners that higher audit fees related to excess (insufficient) cash holdings demonstrate more business risk for auditors, associated with abnormal firm resources, which successively more agency problems. Finally, investigation about auditors' pricing behavior, arisen from potential misuse of excess cash holdings, is in line with shareholders' criticisms. Thus, our findings explore a clear path for investors, corporate policymakers and corporate boards about subsidiary costs, associated with excess (insufficient) cash holdings and firm characteristics that may have an impact on audit risk assessments, monitoring and investment opportunities. Such issues are not taken into full consideration by independent auditors and corporate governors in Iran.

The rest of the paper is presented as follows. In section "literature review and hypotheses development" we review related literature and develop our hypotheses. In section "research methodology and sample selection," we discuss our methodological approach and data. Section "results" present our results and section "conclusion" concludes the article.

Literature review and hypotheses development

Cash is almost applicable in all sectors of economic entities, and directly or indirectly, is involved with most of the economic activities (Guney *et al.*, 2009). In recent years, the high rate of working capital and liquidity shows that not only is cash holding to cover the obligations of daily activities of a firm (Fischer *et al.*, 2014) but also it is considered as one of the most important items of current assets in implementation of operation process of companies and governmental organizations. One of the most important roles of financial managers is to predict the proper inflows and outflows of cash, in other words, cash management is one of the most important tasks in the financial management process (Ozkan and Ozkan, 2004). One of the basic elements of financial statements is the cash flow statement. According to Iran regulation, a cash flow statement typically divides a company's cash sources and uses for a fiscal year into five categories as follows: cash flow from operational activities, cash flow from return of investment and paid interests for financing activities, cash flow from income tax, cash flow from investing activities and cash flow from financing activities. The aim of cash flow statement is to provide useful information for assessing liquidity, financial flexibility, operational capabilities and the business risk of firms, and also intends to provide information related to changes in cash during a financial period. It is noticeable, not only do managers hold the amount of cash intentionally but also they consider it as an important part of their financial strategies, In fact, companies tend to save the optimal amount of cash. The optimal cash level should be at the point where the marginal costs and benefits of cash are equal. Companies can increase their market value by reaching the target optimal cash level. They set cash management strategies on two basic points; firstly providing cash to make payments and minimizing funds that remain stagnant in the company; secondly reflects the idea, should items of assets are not used properly, there will be no returns for the company. Unfortunately, these two goals may be contradictory. Lowering the level of cash and applying all cash may have a negative impact on companies' operation, resulting in a cash shortage of timely payment of the company. Therefore, cash management strategies should be in such a way to create a kind of coordination between these two goals Ferreira and Vilela (2004).

Opler *et al.* (1999) and Bates *et al.* (2009) examine the managers' incentives for cash holdings. They categorized them into four items including:

- (1) transactional costs (meeting daily operating needs);
- (2) guarantee against unexpected contingencies (the precautionary motives);

- (3) payable tax; and
- (4) managers willingness for investing in projects that is in line with their own interest (agency conflicts).

The different motivations for holding cash are applicable to develop a strategy in companies, measures the cost and benefits of cash holdings. This shows that companies have a desirable cash amount to hold, such a desirable ratio is often defined as the target ratio. On one hand, there is an alternative strategy explaining that cash holding serves as a secondary priority for the aims of other companies such as raising equity when share value is excessively growing or minimizing transactional costs through financing cash in new projects instead of using external resources (the speculative motive). Although, firms reserve cash for precautionary motives, high levels of cash holdings often mitigate the demand for raising cash through external capital markets (Lins *et al.*, 2010). The combination of these perspectives indicates that companies may purposefully and desirably deviate from their target ratios and the pace of repairing the gap created between the target and actual cash levels depends on two important relative views that constructing the cash holdings level. If the theory is important for managers, the matching pace will be higher (Jiang and Lie, 2016).

The precautionary motives suggest that holding an abnormal amount of cash is costly for companies. The low expected return of cash flow is a barrier to the performance of cash resources (Wermers, 2000). An attempt to keep a higher amount of cash (abnormally) when the market is in the recession can also have adverse effects. Previous studies suggest that poor managerial timing skill, documented in the previous studies (Henriksson and Merton, 1981; Daniel *et al.*, 1997), shows that these efforts are likely to be futile and costly (Simutin, 2014). In contrast, it is also recommended that holding abnormal cash, which creates valuable flexibility of cash resources, allows the managers to make quick investments in attractive stocks without extraordinary sales and high-discount, which are favorable for companies and keep the outsider satisfied (Edelen, 1999; Coval and Stafford, 2007; Brunnermeier and Pedersen, 2009). The important point is that there is a desirable level of cash for companies, where management decides to hold based on cost-benefit analyses and increasing the value of the company (Jani *et al.*, 2004). When managers are faced with cash excess, first of all, it is important that they invest the funds mentioned in the appropriate and efficient projects, so they can create value for their stockholders. In fact, the value of each company is not only related to its ability to generate free cash flow (FCF) but also it depends on the way of using these funds (Raeisi and Vaez, 2016).

Proper usage of excess funds by managers in companies, which have appropriate opportunities for developing investment, leads to a positive reaction of the market to these funds, and consequently, increases the stock price. In this order, one view implies to managerial actions related to agency conflicts, and excess cash available to them (Myers and Majluf, 1984). This aspect states that an excess cash holding is related to agency conflicts between managers and shareholders, therefore, in a usual business environment, it is hard to align managers' and shareholders' interests. Excess cash holdings can provide the managerial benefit of entrenchment, where through managers can use excess cash for engagement in increasing the size of the firm, and providing greater power and control for themselves (Faulkender and Wang, 2006; Harford, 1999; Harford *et al.*, 2008; Masulis *et al.*, 2007). Excess cash holding also is in a relationship with both negative future performance and negative market perceptions. Harford (1999) finds a negative market perception of high-cash firms' acquisition relative to low-cash acquirers. Moreover, Oler (2008) finds that the impact of high-cash holdings and post-acquisition returns are negatively associated.

Harford *et al.* (2008) and Dittmar and Mahrt-Smith (2007) also document that excess cash is associated with negative future performance, and Oler and Picconi (2014) find that excess cash holding is associated with decreases in 1-year-ahead returns on net operating assets and cumulative abnormal returns.

Another alternative aspect suggests that managers use excess cash to avoid entering potential takeover bidders, even if an acquisition would enhance shareholder's wealth (Pinkowitz, 2002). Managers are looking for an optimal level of cash inventory to prevent from exposing economic entities to significant damages, loss of potential opportunities and ultimately obtaining the possible maximum value. By reducing information asymmetry, the quality of financial reporting will result in providing equal information for all beneficiaries including executives, shareholders, creditors and other stakeholders. Richardson (2006) found that over-optimal investments seem more considerable in companies with a higher level of FCF. When managerial investment strategies are hard to anticipate future events, holding excess cash can enable managers to extract rents from shareholders, in such a situation, as contracting problems are more serious, the key component of high-quality financial information is the audit report provided by independent auditors.

Taken together, empirical evidence indicates that in points of view of shareholder excess cash holdings and agency costs are positively associated, especially, in case of missuses of cash and lack of favorable investment opportunities for the firm. Accordingly, the literature provides ample reasons for us to investigate whether excess cash is a situation in which agency conflict is getting high and auditors have reason to suspect heightened business risk. Bhuiyan and Hooks (2019) examine the empirical relationship between cash holding and investment behavior when problem directors are on the board. They argue that problem directors provide lower quality (weak) corporate governance, which encourages excess cash holdings. Their findings show consistent evidence that firms with at least one problem director hold more cash. In addition, the evidence is found that firms with higher cash holdings engage in overinvestment and such behavior is more pronounced when problem directors are on the board. In line with existing theory, Harris and Roark (2019) identify a link between cash flow risk, capital structure decisions and operating cash flows. The evidence that firms with higher cash flow volatility have higher debt levels and this positive link is only for firms with the weakest financial performance as measured by operating cash flow. When firms are ranked based on operating cash flows, those in the bottom half increase their use of leverage in the face of increasing cash flow risk. For firms with operating cash flows that are in the upper half, the link between cash flow risk faced by the firm and its use of leverage is not statistically significant. Lei *et al.* (2018) evidence that financial development lowers the sensitivity of cash holdings to tangible assets and promotes firm growth, and also sectors with a smaller proportion of tangible assets grow faster in countries with more developed financial markets. Thakur and Kannadhasan (2019) also examine the effect of corruption on cash holdings and cash value. They find that the cash holdings are positively related to the corruption and by managing their cash holdings upwards, the firms can benefit in the corrupt environment by trading cash. Furthermore, cash holding adds value to the firms. However, it is insignificant when the firms are operating in high corruption environment with low investor protection. Overall, the evidence suggests that corruption plays an important role in shaping the cash policies of firms in emerging markets. In Sri Lanka Wickramasinghe and Gunawardane (2017) explore the impact of risk management practices and how they have applied to accomplish sustainable financial performance. The conclusion of their study presents that risk management practices in operating cash flow have a negative impact on sustainable financial

performances. Their study also reveals that investment cash flow practices are not correlated with sustainable financial performances.

In this section, we discuss the audit perceptions about both excess cash holdings and the variation in abnormal cash holdings as criteria for risky business, and determinant factor for pricing audit services. Financial reporting can reduce information asymmetry between managers and investors, as a result, monitoring costs will be a decline for stockholders. Companies with excess cash have more opportunities to be engaged in inefficient and risky investment activities, which suggests that a company with more investment requirements is more likely to face agency problems. Therefore, financial reporting quality can play an important regulatory role in reducing agency problems for these companies (Wang and Chui, 2015). Auditing provides an independent assessment of the accuracy and fairness of financial information, conformity of operations' results, financial position and cash flows, with accepted accounting standards, therefore, it improves the accuracy of financial information and reduces the information asymmetry and agency problems between managers, shareholders and creditors (Hope *et al.*, 2012). The underlying theory argues that, in one hand, managers show incentives to make an opportunistic decision usually by undertaking earnings management activities, and on the other hand, auditors always try to improve the audit quality to maintain the credibility of the audit profession, their professional reputation, and also preventing the lawsuits against themselves. Similarly, managers' willingness to consider personal interests in earnings management prevents auditors from reaching their goals. Moreover, auditors are allowed to discover the earnings management made by managers in which auditors face many problems to increase audit quality.

In this study, we are also likely to examine the effect of existing business risk arisen from agency conflict on audit fees. For this purpose, we argue the effective items on auditor fees related to business risks, including the possible losses of future, which are not related to undetected misstatements, and the expected deficit of those losses carried out by the auditor. Primary studies suggest that auditors are compensated to conduct the audit, provide insurance for investor losses and incur the cost of risks associated with factors that extend beyond the conduct of the audit (Simunic, 1980). In other investigations, Davis *et al.* (1993) and Whisenant *et al.* (2003) state that the amount of auditor's effort is a measurement for pricing audit's service, they also suggest that the larger agency issue, the more activities are required to assure conformity of client's financial statements to the accepted accounting standards, consequently, the price of auditing will get higher. Nikkinen and Sahlström (2004) examined whether the agency theory provides a general framework for audit pricing or not. In their study, audit pricing is carried out in seven different countries including Denmark, Hong Kong, Malaysia, Singapore, South Africa, Sweden and the UK, which represents various types of economic and accounting environments. Their results indicate a negative relationship between managers' ownership and audit fees and also their findings demonstrate a positive relationship between FCF and audit fees. It means that agency theory can be considered as an effective issue in determining audit fees in some contexts. Chung *et al.* (2005) in a study show that big auditors are more active when the client have a high cash excess. Rusmin *et al.* (2014) in Malaysia document the same conclusion. Further studies demonstrate existing association in this order, Houston *et al.* (2005) characterize non-audit risks as residual litigation risk and non-litigation risk (e.g. losses from damaged reputation, unpaid fees, and a reduction in future audit engagements). Moreover, auditors reduce expected losses by pricing litigation risk into their fees. However, particular types of potential losses, known as residual auditor business risk (Kannan *et al.*, 2014), referred to non-audit risks, which cannot be reduced to acceptable levels, even with putting more effort

in audit resources. Wang and Chui (2015) showed that inflation has a direct impact on the amount of cash holdings by influencing supply and demand of cash. Additionally, inflation has an indirect impact on the company's operating cycle. They also realize that when inflation increases due to the loss of purchasing power, the company's cash holdings are reduced. However, when inflation reaches a certain level, companies will increase their cash to protect themselves from bankruptcy. Thus, companies that face cash shortages are unable to support the growth of profit and income. Insufficient cash can oblige companies to increase their liabilities, hence, management tends to increase earnings management to show better performance (Yudianti, 2008). Martinez-Sola *et al.* (2013) examined the effect of excess cash holdings on the value of the company. Their results show that an optimal cash level leads to maximize the value of the company, and the deviation (positive and negative) from the optimal level of cash reduces the firm value, which is recognized by auditors as a business risk. Thus, in the presence of non-audit risk, auditors increase an audit's scope and assign a fee premium. Moreover, it is assumed that the level of audit fees represents the auditor's perception of making more effort where the agency problem is more severe. Ji *et al.* (2019) also find that audit fees are positively related to disclosing internal control weaknesses. Farooq *et al.* (2018) investigate the effect of board and audit committee quality on the audit fees in the context of the developing country of Pakistan. They explore, firstly, high quality board demands higher quality audit to have further assurance on the quality of financial reporting, and secondly, the high quality audit committee will ensure reliable financial reporting, which reduces external auditor's efforts that result in lower audit fees. Accordingly, their findings reveal that the board and audit committee as two determinants of business risks play a moderating role in auditors' perception. Leventis (2018) provides evidence that the Securities and Exchange Commission's (SEC's) enforcement policies affect audit pricing. The hypothesis of their paper is supported by the findings that audit firms charge companies with a higher enforcement probability significantly higher audit fees. Thus, audit pricing increases when auditors perceive an enhanced audit risk for firms with greater prominence on the SEC's radar. In contrast, Suwaidan *et al.* (2015) empirically investigate the impact of agency costs of FCF on audit fees and to examine the impact of growth level on the FCF and audit fees association. The results showed that there was no significant relationship between agency costs of FCF and audit fees, while the results documented a significant positive relationship between audit fees and both the corporate size and size of the audit firm. Moreover, results revealed that firms' growth levels had no impact on the audit fees and FCF relationship.

According to the above explanations, it is observed that holding cash deviated from the optimal level implies to risky business. Further discussions also recommend that one of the effective factors on audit fees is audit perception about the existence of business risks in the client's environment. Moreover, types of auditor business risk in according to excess cash holdings and its potential outcomes including: shareholder reaction lawsuits in case of losing wealth, in which both the client and the auditor are considered as defendants, lost audit fees resulting from declining client operation, and reputational damages because of the auditor's association with the client. By considering this reasoning, it is expected that business risks related to excess cash holdings are associated with higher audit fees. In this regard, Stanley (2011) demonstrates that unexpected contemporaneous audit fees are higher when the client has lower future return on assets, suggesting that auditors charge a premium in the presence of increased likelihood of future client losses and future auditor litigation. Further studies indicate that in companies with excess cash holdings managers tend to show greater profitability of the company under their control, hence, they are likely to hidden investment activities in unsuccessful projects. Their results suggest that there is a

need for an independent audit committee as an aligning character between management and investors. Whereas the main role of the audit committee is preventing managers from conducting opportunistic behavior in earnings management, specifically, by excess cash holdings. In other words, the duty of an independent audit committee is weakening the positive relationship between excess cash and earnings management (Bukit and Iskandar, 2009). Martinez-Sola *et al.* (2013) findings imply a positive final value of cash when cash is held below the optimal level and a negative final value of cash vice versa. Oler and Picconi (2014) in research conclude that the future rate of return on operating asset and the ratio of stock returns in the upcoming year of the companies under consideration excess cash holdings begins to decrease. In other words, these rates have a negative relationship when deviating from the estimated optimal cash for both companies with excess cash holdings and under-optimal cash holdings. The results of Nekhili *et al.* (2016) investigation express that external audit quality leads to a reduction in earnings management of companies who are having too much cash. Gleason *et al.* (2017) examined the auditor's business risk by analyzing the relationship between excess cash holding and the auditor's pricing. Their results indicate a positive relationship between excess cash holdings and audit fees. They conclude that the power of equity would reduce the positive relationship between excess cash holdings and audit fees. In companies with intensive investment strategy, lower audit fees are allocated to excess cash holdings.

Leventis and Dimitropoulos (2010) consider key factors in company governance and profit management based on the company scale and financial risk in companies listed on the Athens Stock Exchange. Their empirical analysis indicates that higher company governance levels can reduce company agency costs and audit risk, so the audit fee also reduces. It regards the frequent profit and loss as the operable profit of the company, which can measure a company's profit management level and capability. Their empirical analysis also indicates that higher company profit management levels will increase the uncertain risk, so it will generate a higher audit fee. Therefore, it analyzes the company audit fee in two fields and provides a reference for preparing the market development strategy. Considering the importance of cash deficiency and its consequences, we assume that the audit process will be affected in these companies and as a result, the audit fees will be higher.

In case of experiencing operational losses, companies must consume cash holdings to sustain and improve their position (Fischer *et al.*, 2014). Opler *et al.* (1999) examine the determinants and implications of holdings of cash and marketable securities by publicly traded US firms in the 1971-1994 period. They find evidence supportive of a static tradeoff model of cash holdings. In particular, firms with strong growth opportunities and riskier cash flow, hold relatively high ratios of cash to total non-cash assets. Firms that have the greatest access to the capital markets, such as large firms and those with high credit ratings, tend to hold lower ratios of cash to total non-cash assets. At the same time, they find evidence that successful companies tend to accumulate more cash than predicted by the static tradeoff model. Their findings also indicate the main reason of experiencing large changes in excess cash in firms, is the occurrence of operating losses, and they report a little evidence demonstrating excess cash has a large short-run impact on capital expenditures, acquisition spending, and payouts to shareholders. Denis and Sibilkov (2010) examine:

- why cash holdings are more valuable for financially constrained firms than for unconstrained firms; and
- why some constrained firms appear to hold too little cash.

The results of their investigation indicate that greater cash holdings are associated with higher levels of investment for constrained firms with high hedging needs; moreover, the

association between investment and value is stronger for constrained firms than for unconstrained firms. Their findings imply that higher cash holdings allow constrained firms to undertake value-increasing projects that might otherwise be bypassed. They are further finding that some constrained firms exhibit low cash holdings because of persistently low cash flows. Overall, their findings support the view that greater cash holdings of constrained firms are a value-increasing response to costly external financing. [Faulkender and Wang \(2006\)](#) examine the cross-sectional variation in the marginal value of corporate cash holdings that arises from differences in corporate financial policy. They begin by providing semi-quantitative predictions for the value of an extra dollar of cash depending upon the likely use of that dollar, and derive a set of intuitive hypotheses to testing, empirically. By examining the variation in excess stock returns over the fiscal year, they find that the marginal value of cash declines with larger cash holdings, higher leverage, better access to capital markets, as firms choose greater cash distribution via dividends rather than repurchases. At the same time, [Duchin \(2010\)](#) studies the relationship between corporate liquidity and diversification. The key finding of his investigation is that multidivisional firms hold significantly less cash than stand-alone firms do because they are diversified in their investment opportunities. Lower cross-divisional correlations in an investment opportunity and higher correlations between investment opportunity and cash flow correspond to lower cash holdings, even after controlling for cash flow volatility. He also finds that the effects are strongest in financially constrained firms and in well-governed firms, and correspond to efficient fund transfers from low- to high-productivity divisions. Taken together, his paper's results bring forth an efficient link between diversification and corporate liquidity. However, [Pinkowitz *et al.* \(2006\)](#) explore the association between multinationals and the high cash holdings, they find that the abnormal cash holdings of US firms after the crisis represent on average 1.86 per cent of assets. While US firms held less cash than comparable foreign firms did, in the late 1990s, by 2010 they hold more. However, only US multinational firms experience an increase in abnormal cash holdings during the 2000s. US multinational firms had cash holdings similar to those of purely domestic firms in the late 1990s, but they hold over 3 per cent more assets in cash than comparable purely domestic firms after the crisis. Further, US multinationals increased their cash holdings since the late 1990s relative to foreign multinationals by roughly the same percentage as they increased their cash holdings relative to US domestic firms.

The high volatility of cash implies that the company is more likely to face periods of cash shortage. Companies with cash shortages have a significant reduction in optional investment in the very year relative to their fellows or their past periods, compared to the ones not experiencing cash deficiency. [Minton and Schrand \(1999\)](#) show that higher cash flow volatility is associated with lower average levels of investment in capital expenditures, research and development (R&D) and advertising and the association suggest that firms do not use external capital markets to fully cover cash flow shortfalls but rather permanently forgo investment. They also indicate that cash flow volatility is associated with higher costs of accessing external capital. Moreover, these higher costs, as measured by some proxies, imply a greater sensitivity of investment to cash flow volatility. Thus, cash flow volatility not only increases the likelihood that a firm will need to access capital markets but also it increases the costs of doing so. On the other hand, [Huang \(2009\)](#) shows that historical cash flow volatility is negatively related to future returns. The negative association is large; economically meaningful; long-lasting up to five years. Using the standard deviations of cash flow to sales and of cash flow to book equity as proxies for cash flow volatility, he finds that the least volatile decile portfolio outperforms the most volatile decile portfolio by 13 per cent a year relative to the Fama–French four factors. He also concludes that the cash flow

volatility effect is closely related to the idiosyncratic return volatility effect documented by [Ang et al. \(2006\)](#).

We estimate the normal amount of cash changes for each company through the firm's past information and based on prior studies, we assume that the more abnormal cash changes (negative or positive), the more the audit fees because of auditor's need to put excess effort and spent more time to review to cover the audit risk. Therefore, the hypotheses of the current study are developed as follow:

- H1.* Holding more the actual cash than the optimal, the greater is the audit fees.
- H2.* Holding less the actual cash than the optimal, the more is the audit fees.
- H3.* The more the abnormal negative changes in cash, the greater is the audit fees.
- H4.* The more the abnormal positive changes in cash, the greater is the audit fees.

Research methodology and sample selection

Research method

The research method is descriptive – correlation. A descriptive study examines and expresses only the events and their quality regardless of the causes, in the study of correlation the aim is to determine whether there is a relationship between two or more variables or not, and then what are the values and limits? The present study is such a linear analysis, as it is conducted over a period of six years, in addition, this is a post-event type survey because of the application of actual and historical data.

Sample selection

In this study, the underlying data of variable measurements are collected through audited financial statements of listed companies on the Tehran Stock Exchange Market for the period 2011-2016. The main reason for adopting such a period is the data availability of companies. The data are obtained from the official site of R&D and Islamic studies, and the official site of the Tehran Stock Exchange. Based on the subject matter, all companies are included, except those with following features:

- companies should not be a member of the financial intermediary, holdings and banks industries. This is because of the fact that such companies differ in terms of the nature of activities and the classification of financial statements items from other companies;
- companies' transactions should not be completely stopped during the study period (the company symbol should be open in all study years);
- companies should be listed on Tehran Stock Exchange Market, from the beginning of 2010; and
- All required data for these companies should be available during the research period.

Considering the above conditions, a total of 116 companies remained, which in fact represents the actual statistical population.

Variable measurement

In this study, the amount of optimal cash and the optimal (normal) changes in cash is calculated according to the models. Finally, the hypotheses are tested by the proposed

models. To measure the optimal cash flow we began with the adjusted model of [Oler and Picconi \(2014\)](#) as follow:

$$\begin{aligned} \text{Ln}(\text{cash})_{i,t} = & a_0 + a_1(\text{Book-to-Market})_{i,t} + a_2(\text{Sales Growth})_{i,t} + \alpha_3(\text{Firm Size})_{i,t} \\ & + \alpha_4(\text{Cash Form Operation})_{i,t} + \alpha_5(\text{Net Working Capital})_{i,t} \\ & + \alpha_6(\text{Capital Expenditure})_{i,t} + \alpha_7(\text{leverage})_{i,t} + \alpha_8(\text{Dividend Dummy})_{i,t} \\ & + \alpha_9(\text{Firm Age})_{i,t} + \alpha_{10}(\text{Tax})_{i,t} + \varepsilon_{i,t} \end{aligned} \quad (1)$$

where:

Ln (Cash)	= Ln (Cash and cash equivalents, as reported on balance sheet);
Book-to-Market	= The ratio of book value to market value of equity;
Sales Growth	= The rate of sales growth;
Firm Size	= Ln (Total assets);
Cash from Operation	= Cash flow from operations/(Total assets–Cash);
Net Working Capital	= (Net working capital–Cash)/(Total assets–Cash);
Capital Expenditure	= (Capital Expenditures; as reported on Cash Flows Statement)/ (Cash – Total Assets);
Leverage	= Total liabilities/(Total assets–Cash);
Dividend Dummy	= If the company paid a dividend to shareholders last year equals one, otherwise is zero;
Firm Age	= Ln (The number of years that the firm has been publicly traded);
Tax	= Yearly Tax/(Total assets–Cash); and
$\varepsilon_{i,t}$	= The remainder of the regression that represents non-optimal cash.

In this study, the above model is used to calculate the optimal cash for each year. By calculating the regression, the coefficients of each variable are obtained then through the product of regression coefficients into the actual values of variables, we can reach the optimal cash.

After calculating the optimal cash based on the [equation \(1\)](#) for each year, the optimal cash is compared to the actual cash and makes the excess or insufficient cash holdings.

After calculating the optimal cash holdings according to the [equation \(1\)](#), we examine the effect of the difference between actual and optimal cash holdings (the positive (negative) deviation presents the excess (insufficient) cash holdings) on audit fees using the following [equation \(2\)](#):

$$\text{LnFEE} = \beta_0 + \beta_1(\text{Ex_Cash})_{i,t} + \beta_2(\text{In_Cash})_{i,t} \quad (2)$$

where:

$$\text{Ex_Cash} : \text{Excess cash} = \text{Max} (0, \text{insufficient/excess cash});$$

and

$$\text{In_Cash} : \text{Insufficient cash} = \text{Min} (0, \text{insufficient/excess } \beta \text{ cash}) \times (-1)$$

In [equation \(3\)](#) we calculate the optimal (normal) changes in cash based on the adjusted model of [Bates et al. \(2009\)](#) as follow:

$$\begin{aligned} \Delta CASH_{i,t} = & \alpha_0 + \alpha_1 CASH_{i,t-1} + \alpha_2 \Delta CASH_{i,t-1} + \alpha_3 INDSIGMA_{i,t} + \alpha_4 \Delta BTM_{i,t} \\ & + \alpha_5 \Delta SIZE_{i,t} + \alpha_6 \Delta FCF_{i,t} + \alpha_7 \Delta NWC_{i,t} + \alpha_8 \Delta CAPEXP_{i,t} + \alpha_9 \Delta LEV_{i,t} \\ & + \alpha_{10} \Delta DIV_{i,t} + \epsilon_{i,t} \end{aligned} \quad (3)$$

where:

- CASH_{i,t-1} and ΔCASH_{i,t-1} = Residual of cash and changes in adjusted cash based on the average of total assets of company i in the year t-1, respectively;
- INDSIGMA_{i,t} = Standard deviation of operating cash flows of company i during the year t;
- ΔBTM_{i,t} = The ratio of book value to market value of equity is calculated based on the average of the total assets of the company. Also, the market value of equity is derived from the product of the number of shares to the ending price;
- ΔSIZE_{i,t} = Changes in natural logarithm of book value of total assets of company i in the year t;
- ΔFCF_{i,t} = The change in adjusted FCF on the basis of the average of total assets of company i in the year t. FCFs are derived from the difference between net profit and accruals;
- ΔNWC_{i,t} = The change in adjusted non-cash working capital on the basis of the average of total assets of company i in the year t;
- ΔCAPEXP_{i,t} = Changes in adjusted capital expenditures on the basis of the average of total assets of company i in the year t;
- ΔLEV_{i,t} = The change in the adjusted leverage based on the average of total assets of company i in the year t equals to:
The average of total assets/(long-term financial facilities + current portion of long-term liabilities)
- ΔDIV_{i,t} = It is an index for change in cash dividend, if the company's cash dividend has increased in the year t it equals to 1, otherwise is zero; and
- ε_{i,t} = The remainder of the regression, which indicates the abnormal change in cash.

Finally, the effect of abnormal changes of cash flow on audit fees is examined by using the following model:

$$\text{LnFEE}_t = \beta_0 + \beta_1 \text{NACASH}_{i,t} + \beta_2 \text{ABNACASH}^+_{i,t} + \beta_3 \text{ABNACASH}^-_{i,t} \quad (4)$$

where:

- LnFEE = The natural logarithm of audit fee in the year t;
- NACASH_{i,t} = Normal changes of cash of company i in the year t;
- ABNACASH⁺_{i,t} = Abnormal positive changes of cash of company i in the year t; and therefore
- ABNACASH⁻_{i,t} = Abnormal negative changes of cash of company i in the year t.

Data analysis and hypothesis testing

Descriptive statistics methods are used to learn more about the study population and the collected data and then hypotheses have been analyzed using inferential statistics methods. The goal of inferential statistics is generally to make an inference about society by analyzing the information of sample data, as well as measuring the uncertainty that exists in these inferences. In this regard, the EViews7 Software is applied, the descriptive statistics of variables are calculated separately for each of the models used in the study, and then the hypotheses are tested with appropriate statistical methods using R Software, version 3.1.1.

Results*Descriptive statistics*

The descriptive findings include average, median, standard deviation, minimum and maximum observation are presented in the [Tables I](#) and [II](#), separately.

Fit model related to calculating optimal cash

The necessary tests to fit the aforementioned model is explained as follows:

Variable	Firm-year	Average	Median	SD	Minimum	Maximum
LnFEE	696	6.4369	6.437	0.838	3.367	9.660
Ex_Cash	447	0.496	0.453	0.377	0.001	3.181
In_Cash	249	0.890	0.617	0.967	0.0005	7.840
NDCASH _i	696	0.0196	0.0183	0.013	-0.026	0.098
ABNDCASH ⁺	226	0.0200	0.009	0.0252	0.0001	0.146
ABNDCASH ⁻	470	-0.009	0.008	0.007	-0.053	0.000

Table I.
Descriptive statistics
of the variables
related to the models
of hypothesis testing

Variables	Firm-year	Average	Median	SD	Minimum	Maximum
Cash logarithm	696	11.110	10.039	2.200	1.945	15.514
Book-to-market	696	0.346	0.526	1.631	-17.036	4.838
Sale growth	696	0.145	0.008	1.126	-0.1000	19.978
Firm size	696	13.989	13.717	1.700	10.031	18.739
Cash form operation	696	0.114	0.0906	0.158	-0.339	0.980
Net working capital	696	0.297	0.324	0.362	-2.213	0.991
Capital expenditure	696	0.158	0.124	0.171	-0.557	1.563
Leverage	696	0.678	0.654	0.359	0.007	3.060
Dividend dummy	696	0.873	1.000	0.332	0.000	1.000
Firm age	696	2.864	2.890	0.429	1.098	3.663
Tax	696	0.015	0.003	0.022	0.000	0.146
ΔCASH	696	0.0194	0.0115	0.0262	0.000	0.198
INDSIGMA	696	3.753	0.882	7.731	0.000	71.183
ΔSIZE	696	14.755	14.464	1.665	10.794	19.268
ΔFCF	696	-0.014	-0.007	0.0777	-0.497	0.373
ΔNWC	696	0.157	0.159	0.187	-1.316	0.729
ΔCAPEXP	696	0.074	0.049	0.083	-0.271	2.274
ΔLEV	696	0.332	0.300	0.209	0.0028	2.274
ΔDIV	696	0.873	1.000	0.332	0.000	1.000

Table II.
The descriptive
statistics of
calculating optimal
cash and optimal
changes in cash

F-Limer (chow) test of the model related to calculating optimal cash

Given the fact that data analysis and hypothesis are tested by R software, the results of the F-Limer test for the above model (Table III) indicate that the panel method is the preferential regression.

Hausman test of the model related to calculating optimal cash

As the panel data method is determined, we need to specify fixed or random effects on the panel model. For this purpose, the results of Hausman test are summarized in Table IV.

According to the acceptance of the *H1* of Hausman test for the above model, it is concluded that the model parameters are estimated based on panel method with random effects.

Lagrange coefficient test for the model of calculating optimal cash amount

Before fitting the panel method with random effects, it is necessary to check whether the time and place factors can be merged in this model or not. To prove this, the Lagrange coefficient (LM) test of Pagan is used and the results are summarized in Table V.

According to the value of chi-square statistics derived from the LM test of Pagan reported in the Table V, it is concluded that the merged method of time factors is appropriate for fitting the model of calculating optimal cash.

Autocorrelation of residuals

The most important condition for using the integrated panel models is a lack of autocorrelation between the error sentences. The Breusch–Godfrey test is used to check this condition. The results of this test are shown in Table VI.

Table III.
F-Limer test results

Hypothesis <i>H0</i>	<i>F</i> -statistics	<i>p</i> -value	Test result
OLS model	5.148	<0.001	Reject <i>H0</i> : The panel method is more suitable
OLS time series model	5.305	<0.001	Reject <i>H0</i> : The panel method is more suitable

Table IV.
Hausman test results

Hypothesis <i>H0</i>	χ^2 statistics	<i>p</i> -value	Test result
Random effects method	15.516	0.114	<i>H0</i> : panel method with random effects is more appropriate

Table V.
Merge possibility test results

Hypothesis <i>H0</i>	χ^2 statistics	<i>p</i> -value	Test result
The possibility of place merge	226.763	<0.001	Rejected <i>H0</i> : There is no possibility of place merge
The possibility of time merge	0.166	0.683	Not rejected <i>H0</i> : There is a possibility of time merge
The possibility of time and place merge simultaneously	226.929	<0.001	Rejected <i>H0</i> : There is no possibility of time and place merge simultaneously

Given that the p -value of the Breusch–Godfrey test is less than 0.001, thus null hypothesis will be rejected, as the absence of serial autocorrelation between error terms. Hence, the error sentences have serial autocorrelation. The existence of autocorrelation between the residuals of the model will cause bias in the model estimation. To solve this problem and have a better estimation of model parameters, the generalized panel method (PGLM) is used for the final fitting of the model.

Estimation of the model parameters related to calculating optimal cash

According to the previous section, the most suitable method for estimating the model related to the hypothesis test is using the PGLM to fit the model. The results of estimating the model parameters are shown in Table VII.

Table VII demonstrates existing statistical correlations between variables. According to reported findings, firm size has a positive impact on the amount of cash and cash equivalents because of the positive t -statistics (28.694) and p -value ($<0.001^{***}$). Further analyses, t -statistics (-20.211) and p -value ($<0.001^{***}$), suggest that networking capital is negatively associated with the number of cash holdings. It means that companies with higher working capital use cash and its equivalents in their operations. Finally, the t -statistics (-23.626) and p -value ($<0.001^{***}$) of the variable leverage suggests a negative and significant impact on cash holdings. It also means that increases in leverage result in a reduction in cash holdings' amount. Our findings in this context is consistent with the findings of Oler and Picconi (2014) and Opler *et al.* (1999).

Primary results of the first and second hypotheses

According to the models presented in the third chapter of this study, we examine the effect of the difference between actual cash and the optimal over audit fees using the equation (2).

Hypothesis H_0	χ^2 statistics	p -value	Test result
There is no autocorrelation between error sentences	24.406	<0.001	Rejected H_0 : There is autocorrelation between model error sentences

Table VI.
Breusch–Godfrey test results

Variables	Coefficients	SD	t -statistics	p -value
Fixed amount a_0	19.067	1.266	15.060	$**<0.001$
Book-to-market	-0.016	0.031	-0.513	0.608
Sale growth	-0.002	0.025	-0.112	0.911
Firm size	0.990	0.034	28.694	$**<0.001$
Cash form operation	0.410	0.240	1.709	0.087
Net working capital	-22.755	1.125	-20.211	$**<0.001$
Capital expenditure	-0.299	0.208	-1.435	0.151
leverage	-23.626	1.170	-20.181	$**<0.001$
Dividend dummy	0.259	0.116	2.219	*0.026
Firm age	-0.098	0.130	-0.758	0.448
Tax	3.164	1.916	1.651	0.0988

Table VII.
The results of calculating the optimal amount of cash

Notes: ** and * represent significance level at 99% and 95%, respectively

As already discussed in previous chapters, the $H1$ and $H2$ are based on the effect of the difference between actual and optimal cash holdings on the audit fees, which is also tested in the following.

F-Limer (chow) test of the model related to the first and second hypotheses

According to results of the F -test for the $H1$ and $H2$ are presented in [Table VIII](#).

The results of the F -Limer test of the model related to the $H1$ and $H2$ indicate that the data panel method is suitable to test the hypothesis.

Hausman test of the model related to the first and second hypotheses

As the panel data method is determined, it is necessary to specify whether the panel model used has fixed or random effects. Hausman test is used for this purpose and the results are summarized in [Table IX](#).

Given the acceptance of the null hypothesis of the Hausman test for the above model, it is concluded that the panel method with random effects is the proper method of estimating the parameters.

Lagrange coefficient test of the model related to the first and second hypotheses

Before fitting the panel method with random effects, it is necessary to check whether the time and place factors can be merged in this model or not. To prove this, the LM test of Pagan is used and the results are summarized in [Table X](#).

According to the value of chi-square statistics derived from the LM test of Pagan in the above table, it can be concluded that the merged method of time factors is appropriate for fitting the model of examining the $H1$ and $H2$.

Table VIII.

F-Limer (Chow) test results

Hypothesis $H0$	F -statistics	p -value	Test result
OLS model	11.828	<0.001	Reject $H0$: The panel method is more suitable
OLS time series model	11.404	<0.001	Reject $H0$: The panel method is more suitable

Table IX.

Hausman test results

Hypothesis $H0$	χ^2 statistics	p -value	Test result
Random effects method	4.514	0.105	Not rejected $H0$: The panel method with random effects is more appropriate

Table X.

Merge possibility test results

Hypothesis $H0$	χ^2 statistics	p -value	Test result
The possibility of place merge	674.882	<0.001	Rejected $H0$: There is no possibility of place merge
The possibility of time merge	85.511	0.090	Not rejected $H0$: There is a possibility of time merge
The possibility of time and place merge simultaneously	760.393	<0.001	Rejected $H0$: There is no possibility of time and place merge simultaneously

Autocorrelation of residuals

The most important condition for using merged panel models is the lack of autocorrelation between the error sentences. Breusch–Godfrey test is used to check this condition. The results of this test on error terms of the model are presented in [Table XI](#).

Given that the p -value of the Breusch–Godfrey test is less than 0.001, thus null hypothesis will be rejected according to the absence of serial autocorrelation between error terms. Hence, the error sentences are serially correlated. The existence of autocorrelation between the residuals of the model will cause a bias in the model estimation. To solve this problem and have a better estimation for the model PGLM is used for the final fitting of the model.

Estimation of the model parameters related to the first and second hypotheses

According to the previous section, the most suitable method for estimating the model of the hypothesis test is using the PGLM. The results of estimating the model parameters are as follows:

As reported in [Table XII](#), according to t statistic at the significant level of coefficients and the sign of t -statistics of variables, it is concluded that excess cash holdings and audit fees are negatively associated because of t -statistics, 1.970 and p -value 0.048*, it is noticeable that the direction of the relationship is not in accordance with our expectations. Moreover, we find no significant relationship between the amount of insufficient cash and audit fees. The suggested results are inconsistent with the findings of [Chung et al. \(2005\)](#).

Fit model related to calculating optimal changes in cash

Based on the adjusted model of [Bates et al. \(2009\)](#), optimal (normal) changes in cash are calculated [[Equation \(3\)](#)]. Therefore, the necessary tests to fit the above model are expressed as follow:

Hypothesis H_0	χ^2 statistics	p -value	Test result
There is no autocorrelation between error	95.397	<0.001	Rejected H_0 : There is autocorrelation between model error sentences

Table XI.
Breusch–Godfrey test results

Variables	Regression coefficients	SD	t -statistics	p -value
Fixed amount	6.490	0.072	0.268	**<0.001
Ex_Cash	−0.151	0.076	−1.970	*0.048
In_Cash	−0.006	0.037	−0.186	0.852

Table XII.
Final fitting model results

Notes: **and * represent the significance levels at 99% and 95%, respectively

Hypothesis H_0	F -statistics	p -value	Test result
OLS model	1.901	<0.001	Reject H_0 : The panel method is more suitable
OLS time series model	1.588	<0.001	Reject H_0 : The panel method is more suitable

Table XIII.
F-Limer (Chow) test results

F-Limer (chow) test of the model related to calculating optimal changes in cash

The results of *F*-test of the model related to estimating the optimal changes in cash are as follows [Table XIII](#).

The results of the *F*-Limer test of the model related to the *H1* and *H2* indicate that the data panel method is suitable to test the hypothesis.

Hausman test of the model related to calculating optimal changes in cash

As the panel data method is determined, it is necessary to specify whether the panel model used has fixed or random effects. Hausman test is used for this purpose and the results are summarized in [Table XIV](#):

Given the rejection of the null hypothesis of the Hausman test for the above model, it is concluded that the panel method with fixed effects is a proper method for estimating the parameters.

Lagrange coefficient test of the model related to calculating optimal changes in cash

Before fitting the panel method with random effects, it is necessary to check whether the time and place factors can be merged in this model or not. To prove this, the LM test of Pagan is used and the results are summarized in [Table XV](#):

According to the value of chi-square statistics derived from the LM test of Pagan presented in [Table XV](#), it is concluded that the merged method of time factors is appropriate for fitting.

Autocorrelation of residuals

The most important condition for using merged panel models is a lack of autocorrelation between the error sentences. Breusch–Godfrey test was used to check this condition. The results of this test on error terms of the model presented as follows [Table XVI](#):

Table XIV.
Hausman test results

Hypothesis <i>H0</i>	χ^2 statistics	<i>p</i> -value	Test result
Random effects method	35.822	<0.001	Not rejected <i>H0</i> : The panel method with fixed effects is more appropriate

Table XV.
Merge possibility test results

Hypothesis <i>H0</i>	χ^2 statistics	<i>p</i> -value	Test result
The possibility of place merge	80.098	<0.001	Rejected <i>H0</i> : There is no possibility of place merge
The possibility of time merge	0.698	0.403	Not rejected <i>H0</i> : There is a possibility of time merge
The possibility of time and place merge simultaneously	80.796	<0.001	Rejected <i>H0</i> : There is no possibility of time and place merge simultaneously

Table XVI.
Breusch–Godfrey test results

Hypothesis <i>H0</i>	χ^2 statistics	<i>p</i> -value	Test result
There is no autocorrelation between error sentences	22.801	<0.001	Rejected <i>H0</i> : There is autocorrelation between model error sentences

Given that the p -value of the Breusch–Godfrey test equals to 0.0008, the null hypothesis is rejected according to the absence of serial autocorrelation between error terms. Hence, the error sentences are serially correlated. The existence of autocorrelation between the residuals of the model will cause a bias in the model estimation. To solve this problem and have a better estimation for the model PGLM is used for the final fitting of the model.

Estimation of the model parameters related to calculating optimal changes in cash

According to the previous section, the most suitable method for estimating the model of hypothesis testing is using the PGLM to fit the model. The results of estimating the model parameters are as follows:

According to reported results in [Table XVII](#), it is suggested that the cash change (-7.146), and the cash holding (8.418) in the prior year have, respectively, negative and positive impact on cash change in the current year. The analyses also show that changes in FCF (as a proxy of FCF), and CAPEXP (as a proxy of capital expenditures) are negatively associated with a change in cash amount. Furthermore, it is recommended that change in non-cash working capital (NWC) and leverage (LEV) are positively correlated with change in cash holdings. It means that increasing NWC and leverage, during a fiscal year, resulting in increasing the cash holding in the same period.

Fit model related to the third and fourth hypotheses

We examine the effect of abnormal changes in cash over audit fees using [equation \(4\)](#). As mentioned in previous chapters, $H3$ and $H4$ are developed to examine the effect of abnormal and normal changes in cash over audit fees. These hypotheses are tested in the next section.

F-Limer (chow) test of the model related to the third and fourth hypotheses

The results of F -test of the model related to examining the $H3$ and $H4$ are as follows [Table XVIII](#).

Variables	Regression coefficients	SD	Statistics t	p -value
Fixed amount a_0	0.0119	0.0158	0.714	0.475
$\Delta \text{CASH}_i, t-1$	-1.192	0.166	-7.146	* <0.001
$\text{CASH}_i, t-1$	0.664	0.078	8.418	* <0.001
INDSIGMA	-0.0001	0.0002	-0.681	0.496
ΔBTM	-0.0005	0.0007	-0.691	0.489
ΔSIZE	-0.0009	0.0009	-0.976	0.329
ΔFCF	-0.050	0.011	-4.557	* <0.001
ΔNWC	0.0589	0.007	8.133	* <0.001
ΔCAPEXP	-0.0431	0.0117	-3.670	* <0.001
ΔLEV	0.0248	0.006	4.068	* <0.001
ΔDIV	0.003	0.002	0.914	0.361

Table XVII.
Final fitting model
results

Note: *denotes significance level at 99%

Hypothesis H_0	F -statistics	p -value	Test result
OLS model	12.182	<0.001	Reject H_0 : The panel method is more suitable
OLS time series model	11.651	<0.001	Reject H_0 : The panel method is more suitable

Table XVIII.
F-Limer (Chow) test
results

The results of the F-Limer test of the model related to the $H3$ and $H4$ indicate that the data panel method is proper.

Hausman test of the model related to the third and fourth hypotheses

As the panel data method is determined, it is necessary to specify whether the panel model used has fixed or random effects. Hausman test is used for this purpose and the results are summarized in [Table XIX](#).

Given the acceptance of the null hypothesis of the Hausman test for the above model, it is concluded that the parameters are estimated based on the panel method with random effects.

Lagrange coefficient test of the model related to the third and fourth hypotheses

Before fitting panel method with random effects, we need to check whether the time and place factors can be merged in this model or not. To prove this, the LM test of Pagan has been used and the results are summarized in [Table XX](#) as follow.

According to the value of chi-square statistics derived from the LM test of Pagan in [Table XIX](#), it is concluded that it is not possible to use time and place factors to merge the model of the $H3$ and $H4$.

Autocorrelation of residuals

The most important condition for using merged panel models is a lack of autocorrelation between the error sentences. Breusch–Godfrey test is used to check this condition. The results of this test on error terms of the model presented in [Table XXI](#) as follow.

Given that p -value of Breusch–Godfrey test is less than 0.001, null hypothesis is rejected according to the absence of serial autocorrelation between error terms. Hence, the error sentences are serially correlated. The existence of autocorrelation between the residuals of the model will cause a bias in the model estimation. To solve this problem and to better estimate, the model PGLM is used for the final fitting of the model.

Table XIX.
Hausman test results of the model related to the third and fourth hypotheses

Hypothesis $H0$	χ^2 statistics	p -value	Test result
Random effects method	4.695	0.195	Not rejected $H0$: The panel method with random effects is more appropriate

Table XX.
Merge possibility test results

Hypothesis $H0$	χ^2 statistics	p -value	Test result
The possibility of place merge	691.149	<0.001	Rejected $H0$: There is no possibility of place merge
The possibility of time merge	104.623	<0.001	Rejected $H0$: There is a possibility of time merge
The possibility of time and place merge simultaneously	795.773	<0.001	Rejected $H0$: There is no possibility of time and place merge simultaneously

Estimation of the model parameters related to the third and fourth hypotheses

According to the previous section, the most suitable method for estimating the model of the hypothesis test is using the PGLM to fit the model. The results of estimating the model parameters are reported in Table XXI.

The reported results in Table XXII, according to *t*-statistic at the significant level of coefficients and the sign of the regression coefficient of each variables, conclude that similar to the findings of Suwaidan *et al.* (2015), abnormal positive (negative) change in cash holdings by companies is not significantly associated with the audit fees. It means that professional auditors in Iran do not consider the abnormal cash holdings as a business risk.

Conclusions

The main objective of this study is examining the effect of cash holdings and change in the items of cash flow statements on audit fees. The population of the current paper includes listed companies in Tehran Stock Exchange Market including 116 firms for the period 2010-2015. To meet the aim of the investigation, cash is considered from two perspectives, firstly, in terms of cash holding amount, and then changing in cash amount.

The results of this study suggest a negative and significant association between excess cash holdings and audit fees. Such a conclusion reveals that excess cash holding is considered a business risk by auditors, and hence, they are likely to put more effort to cover audit risk, which finally results in higher audit fees. The investigations of Chung *et al.* (2005), Bukit and Iskandar (2009), Griffin *et al.* (2010), Rusmin *et al.* (2014) and Gleason *et al.* (2017) report inconsistent evidence. Additionally, the results of domestic studies including Raeisi and Vaez (2016) and Nekhili *et al.* (2016) show that improving audit quality may cause problems for managers who tend to use opportunistic reporting in line with their personal interests related to excess cash holdings. Further analyses also indicate no significant relationship between insufficient cash holdings and audit fees. This is also inconsistent with the studies of Yudianti (2008) and Leventis and Dimitropoulos (2010), who show insufficient cash holding ultimately leads to an increase in audit fees. Finally, we find that there is no significant relationship between abnormal positive (negative) changes in the level of cash holdings and audit fees. Our findings are in line with the results of Suwaidan *et al.* (2015) in this regard. The inconsistency of reported results in comparison with prior findings can be attributed to competitiveness of audit market in Iran and its negative impact on audit

Table XXI.Breusch–Godfrey
test results

Hypothesis H_0	χ^2 statistics	<i>p</i> -value	Test result
There is no autocorrelation between error sentences	97.508	<0.001	Rejected H_0 : There is autocorrelation between model error sentences

Table XXII.Final fitting of the
model results

Variables	Regression coefficients	SD	<i>t</i> -statistics	<i>p</i> -value
Fixed amount a_0	6.490	0.072	0.268	*<0.001
NACASH	0.815	2.382	0.342	0.732
ABN Δ CASH ⁺	0.579	1.492	0.386	0.699
ABN Δ CASH ⁻	-4.239	3.429	-1.236	0.216

Note: *denotes significance level at 99%

services quality, which may be the outcome of insufficient programing, analyzing and auditing for cash flow statement's items.

The documents of this study provide some contributions for auditors, managers and equity owners. It is recommended for auditors that abnormal numbers of cash flow statements may present unfair information, and consequently, more business risk and effort are required to mitigate potential misstatements. For managers and equity owners, we provide evidence that auditors consider abnormal cash holdings as a business risk, therefore, they may charge more fees for their services.

In this study, we examine the abnormal cash holdings, as the proxies of agency conflicts between beneficiaries, influence on audit fees. The future researchers, in emerging markets, can use other proxies such as earning management, abnormal fluctuations in stock and operational return of companies as other proxies for business risks, thus this could be as a criterion for determining audit fees.

References

- Ang, A., Hodrick, R.J., Xing, Y. and Zhang, X. (2006), "The cross-section of volatility and expected returns", *The Journal of Finance*, Vol. 51, pp. 259-299.
- Bates, T.W., Kahle, K.M. and Stulz, R.M. (2009), "Why do US firms hold so much more cash than they used to?", *The Journal of Finance*, Vol. 64 No. 5, pp. 1985-2021.
- Bhuiyan, U.B.M. and Hooks, J. (2019), "Cash holding and over-investment behavior in firms with problem directors", *International Review of Economics and Finance*, Vol. 61, pp. 35-51.
- Brunnermeier, M.K. and Pedersen, L.H. (2009), "Market liquidity and funding liquidity", *Review of Financial Studies*, Vol. 22 No. 6, pp. 2201-2238.
- Bukit, R.B. and Iskandar, T.M. (2009), "Surplus free cash flow, earnings management and audit committee", *International Journal of Economics and Management*, Vol. 3 No. 1, pp. 204-233.
- Chung, R., Firth, M. and Kim, J.B. (2005), "Earnings management, surplus free cash flow and external monitoring", *Journal of Business Research*, Vol. 58 No. 6, pp. 766-776.
- Coval, J. and Stafford, E. (2007), "Asset fire sales (and purchases) in equity markets", *Journal of Financial Economics*, Vol. 86 No. 2, pp. 479-512.
- Daniel, K., Grinblatt, M., Titman, S. and Wermers, R. (1997), "Measuring mutual fund performance with characteristic-based benchmarks", *The Journal of Finance*, Vol. 52 No. 3, pp. 1035-1058.
- Davis, L.R., Ricchiute, D.N. and Trompeter, G. (1993), "Audit effort, audit fees and the provision of nonaudit services to audit clients", *The Accounting Review*, Vol. 68 No. 1, pp. 135-150.
- Denis, D.J. and Sibilkov, V. (2010), "Financial constraints, investments and the value of cash holdings", *Review of Financial Studies*, Vol. 23 No. 1, pp. 247-269.
- Dittmar, A. and Mahrt-Smith, J. (2007), "Corporate governance and the value of cash holdings", *Journal of Financial Economics*, Vol. 83 No. 3, pp. 599-634.
- Duchin, R. (2010), "Cash holdings and corporate diversification", *The Journal of Finance*, Vol. 65 No. 3, pp. 955-992.
- Dye, R.A. (1993), "Auditing standards, legal liability, and auditor wealth", *Journal of Political Economy*, Vol. 101 No. 5, pp. 887-914.
- Edelen, R.M. (1999), "Investor flows and the assessed performance of open-end mutual funds", *Journal of Financial Economics*, Vol. 53 No. 3, pp. 439-466.
- Farooq, M.U., Kazim, I., Usman, M. and Latif, I. (2018), "Corporate governance and audit fees: evidence from a developing country", *Pakistan Journal of Commerce and Social Sciences*, Vol. 12 No. 1, pp. 94-110.
- Faulkender, M. and Wang, R. (2006), "Corporate financial policy and the value of cash", *The Journal of Finance*, Vol. 61 No. 4, pp. 1957-1990.

- Ferreira, M.A. and Vilela, A.S. (2004), "Why do firms hold cash? Evidence from EMU countries", *European Financial Management*, Vol. 10 No. 2, pp. 295-319.
- Fischer, M., Marsh, T. and Brown, T. (2014), "Cash holdings of S&P firms over the past decade", *Accounting and Finance Research*, Vol. 3 No. 3, pp. 143-150.
- Gleason, K.C., Greiner, A.J. and Kannan, Y.H. (2017), "Auditor pricing of excess cash holdings", *Journal of Accounting, Auditing and Finance*, Vol. 32 No. 3, pp. 423-443.
- Griffin, P.A., Lont, D.H. and Sun, Y. (2010), "Agency problems and audit fees: further tests of the free cash flow hypothesis", *Accounting and Finance*, Vol. 50 No. 2, pp. 321-350.
- Guney, Y., Ozkan, A. and Ozkan, N. (2009), "International evidence on the non-linear impact of leverage on corporate cash holdings", *Journal of Multinational Financial Management*, Vol. 1 No. 1, pp. 157-192.
- Harford, J. (1999), "Corporate cash reserves and acquisitions", *The Journal of Finance*, Vol. 54 No. 6, pp. 1969-1997.
- Harford, J., Mansi, S.A. and Maxwell, W.F. (2008), "Corporate governance and firm cash holdings", *Journal of Financial Economics*, Vol. 87 No. 3, pp. 535-555.
- Harris, C. and Roark, S. (2019), "Cash flow risk and capital structure decisions", *Finance Research Letters*, Vol. 29 No. 1, pp. 393-397
- Henriksson, R.D. and Merton, R.C. (1981), "On market timing and investment performance II: statistical procedures for evaluating forecasting skills", *The Journal of Business*, Vol. 54 No. 4, pp. 513-534.
- Hope, O.K., Langli, J.C. and Wayne, B.T. (2012), "Agency conflicts and auditing in private firms", *Accounting, Organizations and Society*, Vol. 37 No. 7, pp. 500-517.
- Houston, R.W., Peters, M.F. and Pratt, J.H. (2005), "Non-litigation risk and pricing audit services", *Auditing: A Journal of Practice and Theory*, Vol. 24, pp. 37-53.
- Huang, A.G. (2009), "The cross section of cash flow volatility and expected stock returns", *Journal of Empirical Finance*, Vol. 16 No. 3, pp. 409-429.
- Jani, E., Hoesli, M. and Bender, A. (2004), "Corporate cash holding and agency conflicts", Working Paper, pp. 1-30.
- Jensen, M.C. and Meckling, W.H. (1976), "Theory of the firm: managerial behavior, agency costs and ownership structure", *Journal of Financial Economics*, Vol. 3 No. 4, pp. 305-360.
- Ji, X., Lu, W. and Qu, W. (2019), "Internal control risk and audit fees: evidence from China", *Journal of Contemporary Accounting and Economics*, Vol. 14 No. 3, pp. 266-287.
- Jiang, Z. and Lie, E. (2016), "Cash holding adjustments and managerial entrenchment", *Journal of Corporate Finance*, Vol. 36, pp. 190-205.
- Kannan, Y., Skantz, T. and Higgs, J. (2014), "The impact of CEO and CFO equity incentives on audit scope and perceived risks as revealed through audit fees", *Auditing A Journal of Practice & Theory*, Vol. 33 No. 2, pp. 111-139.
- Keynes, J.M. (1936), *The General Theory of Employment, Interest and Money*, Harcourt, Brace, New York, NY.
- Lei, J., Qiu, J. and Wan, C. (2018), "Asset tangibility, cash holdings, and financial development", *Journal of Corporate Finance*, Vol. 50, pp. 223-242.
- Leventis, S. (2018), "An empirical test of SEC enforcement in the audit market", *Journal of International Accounting, Auditing and Taxation*, Vol. 30, pp. 106-116.
- Leventis, S. and Dimitropoulos, P.E. (2010), "Audit pricing, quality of earning and board independence: the case of the Athens stock exchange", *Advances in Accounting*, Vol. 26 No. 2, pp. 325-332.
- Lins, K.V., Servaes, H. and Tufano, P. (2010), "What drives corporate liquidity? An international survey of cash holdings and lines of credit", *Journal of Financial Economics*, Vol. 98 No. 1, pp. 160-176.

- Martinez-Sola, C., Garcia-Teruel, P.J. and Martinez-Solano, P. (2013), "Corporate cash holding and firm value", *Applied Economics*, Vol. 45 No. 2, pp. 161-170.
- Masulis, R., Wang, C. and Xie, F. (2007), "Corporate governance and acquirer returns", *The Journal of Finance*, Vol. 62 No. 4, pp. 1851-1889.
- Minton, B.A. and Schrand, C. (1999), "The impact of cash flow volatility on discretionary investment and the costs of debt and equity financing", *Journal of Financial Economics*, Vol. 54 No. 3, pp. 423-460.
- Mun, S.G. and Jan, S. (2015), "Working capital, cash holding, and profitability of restaurant firms", *International Journal of Hospitality Management*, Vol. 48 No. 14, pp. 1-11.
- Myers, S. and Majluf, N. (1984), "Corporate financing and investment decisions when firms have information that investors do not have", *Journal of Financial Economics*, Vol. 13 No. 2, pp. 187-221.
- Nekhili, M., Ben Amar, I.F., Chtioui, T. and Lakhali, F. (2016), "Free cash flow and earnings management: the moderating role of governance and ownership", *Journal of Applied Business Research (Jabr)*, Vol. 32 No. 1, pp. 255-268.
- Nikkinen, J. and Sahlström, P. (2004), "Does agency theory provide a general framework for audit pricing?", *International Journal of Auditing*, Vol. 8 No. 3, pp. 253-262.
- Oler, D.K. (2008), "Does acquirer cash level predict post-acquisition returns? ", *Review of Accounting Studies*, Vol. 13 No. 4, pp. 479-511.
- Oler, D. and Picconi, M. (2014), "Implications of insufficient and excess cash for future performance", *Contemporary Accounting Research*, Vol. 31 No. 1, pp. 253-283.
- Opler, T., Pinkowitz, L., Stulz, R. and Williamson, R. (1999), "The determinants and implications of corporate cash holdings", *Journal of Financial Economics*, Vol. 52 No. 1, pp. 3-46.
- Ozkan, A. and Ozkan, N. (2004), "Corporate cash holdings: an empirical investigation of UK companies", *Journal of Banking and Finance*, Vol. 28 No. 9, pp. 2103-2134.
- Pinkowitz, L. (2002), "The market for corporate control and corporate cash holdings", Working Paper, DC Georgetown University, Washington, DC.
- Pinkowitz, L., Stulz, R.S. and Williamson, R. (2006), "Do firms in countries with poor protection of investor rights hold more cash?", *The Journal of Finance*, Vol. 61 No. 6, pp. 2725-2751.
- Raeisi, A. and Vaez, S.A. (2016), "An evaluation of the relationships between the corporate governance mechanisms, the free cash flow, and earnings management in Tehran stock exchange listed companies", *International Journal of Humanities and Cultural Studies, March Special Issue*, pp. 122-140.
- Richardson, S. (2006), "Over-investment of free cash flow", *Review of Accounting Studies*, Vol. 11 Nos 2/3, pp. 159-189.
- Rusmin, R., Astami, E.W. and Hartadi, B. (2014), "The impact of surplus free cash flow and audit quality on earnings management: the case of growth triangle countries", *Asian Review of Accounting*, Vol. 22 No. 3, pp. 217-232.
- Simunic, D. (1980), "The pricing of audit services: theory and evidence", *Journal of Accounting Research*, Vol. 18 No. 1, pp. 161-190.
- Simutin, M. (2014), "Cash holdings and mutual fund performance", *Review of Finance*, Vol. 18 No. 4, pp. 1425-1464.
- Stanley, J. (2011), "Is the audit fee disclosure a leading indicator of client's business risk? ", *Auditing: A Journal of Practice and Theory*, Vol. 30, pp. 157-179.
- Suwaidan, M., Rasmi Abed, S. and Melham, S. (2015), "Audit fees and agency costs: an empirical examination of companies listed on the Amman stock exchange", *Jordan Journal of Business Administration*, Vol. 11 No. 1, pp. 215-226.
- Thakur, S.P.B. and Kannadhasan, M. (2019), "Corruption and cash holdings: evidence from emerging market economies", *Emerging Markets Review*, Vol. 38, pp. 1-17.
- U.S. Treasury (2002), *Cash Management Made Easy*, Department of the Treasury Financial Management Service.

- Wallace, W. (2004), "The economic role of the audit in free and regulated markets: a look back and a look forward", *Research in Accounting Regulation*, Vol. 17 No. 1, pp. 267-298
- Wang, Y. and Chui, A.C.W. (2015), "Product market competition and audit fees", *AUDITING: A Journal of Practice and Theory*, Vol. 34 No. 4, pp. 139-156.
- Wermers, R. (2000), "Mutual fund performance: an empirical decomposition into stock picking talent, style, transactions costs, and expenses", *The Journal of Finance*, Vol. 55 No. 4, pp. 1655-1695.
- Whisenant, S., Sankaraguruswamy, S. and Raghunandan, K. (2003), "Evidence on the joint determination of audit and non-audit fees", *Journal of Accounting Research*, Vol. 41 No. 4, pp. 721-744.
- Wickramasinghe, M.B. and Gunawardane, K. (2017), "Cash flow risk management practices on sustainable financial performance in Sri Lanka", *International Journal of Arts and Commerce*, Vol. 6 No. 8, pp. 57-69.
- Wysochi, P. (2010), "Corporate compensation policies and audit fees", *Journal of Accounting and Economics*, Vol. 49 Nos 1/2, pp. 155-160.
- Yudianti, N. (2008), "The effect of investment opportunity set and earnings management to the relationship between free cash flow and shareholder value", *Journal of Business Research*, pp. 193-228.

Further reading

- Baum, C.F., Caglayan, M., Ozkan, N. and Talavera, O. (2006), "The impact of macroeconomic uncertainty on non-financial firms' demand for liquidity", *Review of Financial Economics*, Vol. 15 No. 4, pp. 289-304.
- Christoffersen, S.K., Keim, D.B. and Musto, D.K. (2006), "Valuable information and costly liquidity: evidence from individual mutual fund trades", Unpublished Working Paper, University of Toronto.
- Easley, D. and O'hara, M. (2004), "Information and the cost of capital", *The Journal of Finance*, Vol. 59 No. 4, pp. 1553-1583.
- Foley, C.F., Hartzell, J., Titman, S. and Twite, G. (2007), "Why do firms hold so much cash? A tax-based explanation", *Journal of Financial Economics*, Vol. 86 No. 3, pp. 579-607.
- Fresard, L. (2010), "Financial strength and product market behavior: the real effects of corporate cash holdings", *The Journal of Finance*, Vol. 65 No. 3, pp. 1097-1122.
- Karimi, F., Foladi, M. and Shirazi, N. (2014), "The effect of surplus free cash flow on the relationship between the board structure and earnings quality of companies listed on the Tehran stock exchange", *International Journal of Academic Research in Accounting, Finance and Management Sciences*, Vol. 4 No. 3, pp. 28-35.
- Lawsen, B. and Wang, D. (2011), "Auditor monitoring and dividend payout policy", doi: [10.2139/ssrn.1786948](https://doi.org/10.2139/ssrn.1786948).
- Mohd Noor, N.F., Mohd Sanusia, Z., Heang, L.T., Mohd Iskandar, T. and Mat Isa, Y. (2015), "Fraud motives and opportunities factors on earnings manipulations", *Procedia Economics and Finance*, Vol. 28, pp. 126-135.
- Reichelt, K.J. and Wang, D.C. (2010), "National and office-specific measures of auditor industry expertise and effects on audit quality", *Journal of Accounting Research*, Vol. 48 No. 3, pp. 647-686.

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