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THE EFFECT OF GOVERNANCE MECHANISMS ON SME CASH HOLDINGS: EVIDENCE FROM THE UK

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Abstract

This paper investigates the impact of governance mechanisms on SME cash holdings from 2000 to 2009, employing static and dynamic panel data analyses. We find no evidence that firm governance index and insider ownership affect cash holdings. This might indicate that governance mechanisms in SMEs are relatively weak. We also report that CEO compensation has a positive effect on cash holdings. Firm-specific factors such as firm size, leverage, and liquidity negatively affect cash holdings, whereas the research and development ratio and operating risk are positively associated with them. Finally, SMEs have target cash holdings and adjust to these.

1. Introduction

We aim to shed new light on cash holdings in SMEs. Most previous empirical studies have focused on the reasons behind why large firms hold cash. There are different reasons for firms to accumulate cash reserves, related to transaction costs and precautionary motives. These two reasons are based on the trade-off perspective of cash holdings. Keynes (1936) advanced the transaction cost reason to explain why firms hold cash, suggesting that internal resources are used rather than external financing because of the costs associated with the latter. The second motivation for holding cash is the precautionary motive. As argued by Opler, Pinkowitz and Stulz (1999), when firms have less cash reserves, they reduce their investments and hence, firms hold cash for investment contingences. In determining cash holdings, several theoretical perspectives have been formulated: trade-off, pecking order and agency theory, discussed in Section 2 below.

Several studies have empirically examined the determinants of cash holdings, Opler et al. (1999) investigate these for US firms. They find that firm-specific factors such as growth opportunities, operating risk and size are positively related to cash levels. Concerning corporate governance aspects, they detect weak evidence that managerial entrenchment has an effect on cash holdings. Other studies including Ozkan and Ozkan (2004) and Ferreira and Vilela (2004) also examine the determinants but use different samples. Harford, Mansi and Maxwell (2008) assess how governance index (based on Gompers, Ishii and Metrick (2003)) will impact cash holdings, observing that weak corporate governance practices are associated with less cash reserves. These studies use large firms, with limited evidence regarding SMEs.

We investigate cash holdings in SMEs since the market imperfections (for example, agency costs and information asymmetries) determining cash holdings in large firms are more severe

in their smaller counterparts. SMEs show information opacity that leads to financial asymmetry problems (see, Berger and Udell, 1998; García-Teruel and Martínez-Solano, 2008). In addition, according to Titman and Wessels (1988) and Fazzari and Petersen (1993) small firms suffer from specific financial difficulties and constraints, as well as higher transaction costs (Mulligan, 1997; García-Teruel and Martínez-Solano, 2008). Finally, as García-Teruel and Martínez-Solan (2008) show, they suffer from serious agency problems related to debt due to their "flexibility in operations".

To the best of our knowledge, only two papers have investigated the cash holding decision in SMEs. García-Teruel and Martínez-Solano (2008) examine a sample of Spanish SMEs from 1996 to 2001 and Faulkender (2002) investigates them in the US context. We provide evidence from the UK setting, providing an interesting comparison to García-Teruel and Martínez-Solano (2008)'s Spanish civil law environment. Dittmar, Mahrt-Smith and Servaes (2003) report that firms in common law countries such as the UK hold less cash. One possible explanation is that markets in countries with less shareholder protection are less developed.

In addition, in contrast to García-Teruel and Martínez-Solano (2008) and Faulkender (2002), we examine the importance of internal governance mechanisms in cash holding decisions. These governance practices are voluntarily adopted by UK firms, as they are based on the recommendations of various reports (such as the Cadbury report, 1992). The good governance practices are identified in the Combined Code, yet firms have the right to adopt different approaches to best fit their circumstances. This approach differs from the US and other European systems which are more prescriptive. Finally, unlike previous SMEs studies,

we employ both static and dynamic analyses of cash holdings, which offer rich analytic possibilities and control for any unexpected heterogeneity.

We investigate if governance tools in SMEs can affect cash holdings in contrast to Harford et al. (2008) who applied Gompers' et al.'s (2003) index (GIndex), we develop a new governance index to analyze the association between governance practices and cash holdings. We extend the analysis by including CEO compensation as a determinant of cash. It can be argued that managers pursue their self interest instead of enhancing shareholder's value, which is likely to happen when firms hold excess cash reserves without investing such cash in profitable investments (Jensen, 1986). Therefore, it can be suggested that firms with good governance practices are likely to experience reduced agency conflicts and hence less cash reserves (Chen, 2008).

Our findings provide some evidence that CEO compensation is positively related to cash holdings. Furthermore, large and leveraged SMEs hold less cash. Highly liquid firms also hold less cash. Firms that invest in research and development hold high levels of cash as a precautionary measure. It is also observed that risky SMEs hold more cash. Finally, we find no evidence for a corporate governance index and insider ownership effect on cash holdings. This indicates that SMEs need to improve their governance practices to provide better monitoring for strategic financial decisions. Finally, we detect that SMEs have target cash holdings and they adjust to their targets.

The remaining of the paper is organized as follows: Section 2 reviews the theoretical framework and empirical evidence; Section 3 develops hypotheses; Section 4 describes the sample, data, construction of the governance index and methodology; Section 5 presents the findings; Section 6 concludes the paper; Section 7 discusses the limitations of the study.

2. Theory

In this section, we provide the theoretical underpinnings of the determinants of cash holdings. We follow the main literature in discussing these theories (see, Al-Najjar and Belghitar, 2011; Ozkan and Ozkan, 2004; Opler et al., 1999; García-Teruel and Martínez-Solano, 2008). Then we examine the main empirical studies.

2.1 Trade Off theory

Within trade off theory, it is postulated that transaction costs and precautionary motives are the reasons for firms to hold cash. Firstly, transaction costs mean that firms hold cash reserves because of the costs associated with external financing. However, firms with limited internal funds can avoid such costs by selling their assets, issuing equity, or reducing dividend payments (Ozkan and Ozkan, 2004). The second motive is precautionary: investments may be decreased due to investment costs. Ozkan and Ozkan (2004) further suggest that firms increase cash reserves to fund such investments when the costs of outside financing are high. The trade off perspective on cash holdings posits the existence of an optimal cash holding level when firms assess the marginal benefits and marginal costs of holding cash. Opler et al. (1999) also claim that there is an optimal level of cash where the marginal costs of a lack of cash match the marginal benefits of holding cash. As discussed above, transaction costs are important in SMEs and hence trade off theory appears significant in explaining cash holdings within this context.

2.2 Pecking Order theory

The seminal works of Myers (1984) and Myers and Majluf (1984) have been widely discussed in cash holdings literature, as they argue that there is no optimal level of cash holding. This theory explains the hierarchy of cash holdings in which firms prefer internal funds (being the cheapest source of funding). Only as a second-best alternative will firms turn to external financing. The cost of external financing (in the presence of information asymmetries) is higher than internal funds (Chen, 2008). Therefore, firms maximize cash levels to finance projects. Ferreira and Vilela (2004) further suggest that cash is used for financing investments so that debt can be repaid and further cash accumulated. Similarly, Dittmar et al. (2003) suggest that firms with high level of cash flows are those that pay dividends, issue debt and therefore hold cash. Since SMEs have information opacity that creates more problems in information asymmetry, pecking order theory is applicable in SMEs.

2.3 Agency Theory

Another stream of literature is based on agency theory. Jensen (1986) argues that managers may have self interests to hold cash with the objective of gaining discretionary power. Chen (2008) also ascertains that in situations of high cash reserves, managers have more discretionary power. Other studies such as Myers and Rajan (1998) posit that high cash reserves enable managers to pursue their own interests. Therefore, when cash is available management can engage in negative NPV investments which can adversely impact firm value. Harford et al. (2008) posit that in cases where a high level of cash is available, decisions are made to use this by paying dividends, spending on positive NPV projects or to accumulate further cash reserves. Therefore, to reduce agency conflicts, it is imperative for firms to have good governance practices. In this paper, we investigate whether good governance practices motivate managers to spend or to hold cash, based on the fact that the

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agency costs of debt are high in SMEs and hence governance mechanisms can play a key role.

2.4 Empirical Evidence

Different empirical studies have examined the decision to hold cash. From international context, Dittmar et al. (2003) investigate 45 countries to examine how corporate governance impacts cash holdings, reporting that countries with low shareholder protection have less cash balances. They also find that size is negatively associated with cash. In addition, Guney, Ozkan and Ozkan (2003) explore cash holdings frameworks in Japan, France, Germany, and US. They indicate that firms in environments with strong shareholder protection hold low levels of cash. They further argue that there is a negative relationship between ownership concentration and cash holdings. Ferreira and Vilela (2004) also examine the determinants of corporate cash holdings but for EMU countries. Their findings indicate that cash flows and investment opportunities positively affect cash levels and that liquidity, leverage and size have a negative influence on them. Regarding the institutional framework, they observe that firms with strong investor protection tend to have less cash reserves.

The other shceme of literaute has investigated cash hoildings from single country context. For example, Chen (2008) investigates a US sample where the impact of corporate governance on cash holdings, using a sample of firms listed in "new economy" and firms listed in "old economy", is assessed, observing that a high level of board independence raise cash reserves in new economy firms. In addition, the governance index is found to be negatively related to cash. This shows that weak corporate governance mechanisms reduce the levels of cash held by US firms. In relation to firm factors, Chen detects that size, capital expenditures, leverage and liquidity negatively impact cash holdings. Furthermore, the findings indicate that growth opportunities and research and development are positively associated with cash levels. In a

similar vein, Foley, Hartzell, Titman and Twite (2007) examine a sample of US multinational firms, finding that firms having high level of repatriation tax accumulate more cash levels. Martínez-Sola, García-Teruel and Martínez-Solano (2010) also analyze the effect of cash holdings on firm value for a sample of US industrial firms. They note that there is a concave relationship between cash levels and firm value. More recently, Al-Najjar and Belghitar (2011) investigate the relationship between cash holdings and dividend policy in UK settings. They find that when considering for simultaneity, dividends do not have a significant influence on cash holdings.

As noted above, there is limited evidence on small firms. Faulkender (2002) analyzes the effect of firm specific factors on cash holdings, and detects that research and development (a proxy for financial distress costs) and leverage are positively linked with cash. Moreover, managerial ownership is found to negatively affect cash levels. García-Teruel and Martínez-Solano (2008) examine a sample of Spanish SMEs, documenting the existence of target cash and finding that firms adjust to these targets.

3. *Theoretical Foundations and Hypotheses*

According to Stiglitz (1974), firm value is not affected by a firm's financial decisions in situations where market imperfections do not exist; which explains the irrelevancy of holding cash. In this sense, liquid assets could easily be obtained whenever the need arises. Given these conditions, investment decisions using cash have no impact on firm value (see, Opler et al., 1999). However, market imperfections exist and these are more significant in SMEs. Hence, in the context of small businesses, Teruel-Garcia and Martinez-Solano (2008) suggest that firm value will be affected by the optimal level of cash.

Managers are able to use cash for their own interests but governance mechanisms such as board and ownership structure can mitigate these conflicts. In this section we introduce our hypotheses. We begin with the governance index, moving subsequently to insider ownership, CEO compensation, and finally firm-specific factors.

3.1 Governance Index (GINDEX)

Good governance mitigates agency conflicts. Hence, managers will be reluctant to spend on negative NPV projects. To assess the relationship between governance tools and cash holdings, several variables are used to construct our governance index: board size, board independence; board meetings; audit size; audit independence; audit meetings; the existence of nomination committee; nomination independence; the existence of remuneration committee; remuneration independence. The higher the index value, the better the firm's governance practices.

It could be argued that with better governance practices firms can hold less cash. Ozkan and Ozkan (2004) argue that board independence is negatively related to cash holdings. They sustain that high degrees of board independence acts as a monitoring mechanism on boards; and therefore with the existence of a strict board, management will have strict control on the financial policies and hold less cash. Lee (2009) also suggests a negative relationship between corporate governance and cash holdings, explaining that firms with strict corporate governance are more effective in monitoring managers, and reducing managers' tendency to invest in negative NPV projects. In the SMEs context, Brunninge, Nordqvist, and Wiklund (2007) report that SMEs with restricted shareholdings suffer from reluctance to undertake strategic change and that they can overcome this issue by improving governance practices

such as employing independent directors. Hence, their main argument is that SMEs with better governance practices are more able to affect strategic changes. Following Brunninge et al. (2007), we suggest that SMEs with better governance will hold less cash to avoid agency conflicts.

H1: There is a negative relationship between good governance practices and cash holdings.

3.2 Insider Ownership (INSOWN)

Agency problems between managers and shareholders in the context of cash holdings are discussed by prior empirical studies (see, Ozkan and Ozkan, 2004; Harford et al., 2008). It is suggested that in order to mitigate agency conflicts, insider ownership should be increased (Jensen, 1993) and hence managers will be reluctant to increase cash holdings. This will discourage managers from pursuing their own interests and hence insider ownership acts as a monitoring tool. Therefore, managers must be in a position to use available resources to maximize shareholder value (Ozkan and Ozkan, 2004). In the current paper, ownership structure is measured as the proportion of insider shares (closely held shares). Previous studies expect insider ownership to be negatively associated with cash as this will serve as a good monitoring tool so the cost of outside financing is low and hence there is less need to hold cash. In the SMEs context Brunninge et al. (2007) report the importance of having more widespread ownership in SMEs since SMEs with restricted shareholdings are less active in developing strategic change. Accordingly, we hypothesize that higher insider ownership the better the monitoring of firm strategic financial decisions and the less the need to hold cash.

H2: There is a negative relationship between insider ownership and cash holdings.

3.3 CEO compensation (CEOCOMP)

We follow Hartford et al. (2008) in controlling for agency issues by including CEO compensation. CEO compensation is measured as the natural logarithm of CEO total compensation. Harford et al. (2008) use top management pay "*We measure top management pay mix, or the fraction of top pay for the top five managers received in equity-based forms, as the ratio of stock option grants (SOG) divided by the summation of SOG, salary, and bonus compensation*" (Harford et al., 2008: 540). Rewarding top management including CEO for performance is a signal of a good governance practice as managers are keen to increase shareholders' wealth. Brick et al. (2006) argue that managers and directors work hand in hand to enhance shareholders' interests due to the complexity and size of firms. This is because further effort and control are required to manage firms. Therefore, instead of pursuing their own interests, managers and top executives are motivated to enhance shareholders' interests. Hence, top management are compensated for their performance, for which high cash levels are needed. Harford et al. (2008) provide some evidence that top management pay enhances US firms' cash levels. As noted in SME literature, top management (especially the CEO) has a strong influence in strategic decisions because of the small size and flexibility of SMEs structure (see, Brunninge et al., 2007). Hence, the CEO is more able to impose high compensation to reward his/her good performance. Therefore, we hypothesize

H3: There is a positive association between CEO pay and cash holdings.

3.4 Firm specific factors

Following the literature, we include the following firm-specific factors:

Firm Size (SIZE): One of the major firm specific factors influencing cash holding is firm size. Here, this is measured as the natural logarithm of total assets. Prior studies, like Miller and Orr (1966) suggest that large firms hold less cash because of their economies of scale. In

addition, large firms are better placed compared to small ones, since small firms incur higher external financing costs and face financial constraints in obtaining funds (see, Fazzari and Petersen, 1993; Kim, Mauer, and Sherman, 1998). Furthermore, it is argued that large firms are more diversified and face less financial distress situations (Titman and Wessels, 1988). Firms facing financial distress incur high costs (Warner, 1977); and in cases where the firms are small, a liquidation process is more likely to occur (Ozkan and Ozkan, 2004). Therefore, small businesses have to hold cash reserves as a precautionary measure. Empirical studies have documented a negative link between firm size and cash: Opler et al. (1999), Ozkan and Ozkan (2004), and Al-Najjar and Belghitar (2011). García-Teruel and Martínez-Solano (2008) also find a negative association between SMEs size and cash levels. Hence, following García-Teruel and Martínez-Solano (2008), our hypothesis is:

H4: There is a negative relationship between firm size and cash holdings.

Leverage (LEV): Several studies argue that leverage has an effect on cash holdings. Here, leverage is measured as the ratio of total debt to total assets. It is suggested that firms with debt levels are likely to have high cash reserves because of the probability of falling into financial distressed situations. Hence, such leveraged firms hold high cash levels. Baskin (1987) argues that cash levels decrease with high debt ratios (as liquidity rises with high debt). Empirically, Ferreira and Vilela (2004), Opler et al. (1999), Ozkan and Ozkan (2004), Hardin, Highfield, Hill, and Kelly (2009), and Al-Najjar and Belghitar (2011) posit that leverage is negatively linked with cash holdings. In the small firm context, García-Teruel and Martínez-Solano (2008) argue that debt levels are likely to be negatively related to cash holdings as the costs involved in liquid assets increase with rising leverage. We follow García-Teruel and Martínez-Solano's (2008) framework and hypothesize that:

H5: There is a negative association between leverage and cash holdings.

Growth Opportunities (MTBV): It is argued that firms with high growth opportunities have more financial distress costs. Hence, such firms should hold high cash levels to avoid these costs. This positive association between firms' growth opportunities and cash level is sustained by the precautionary motive: growing firms raise cash to diminish the probability of financial distress on one hand, and to have the ability to finance future investment, on the other. Several empirical studies document a positive association between growth opportunities and cash holdings, including Kim et al. (1998), Ferreira and Vilela (2004), Opler et al. (1999), Ozkan and Ozkan (2004), and Hardin et al. (2009). In the current analysis, we use market to book ratio as an index for growth opportunities. García-Teruel and Martínez-Solano (2008) explain the positive link between growth opportunities and cash holdings by the fact that outside financing is costly because of information asymmetries in SMEs. Therefore, we hypothesize:

> *H6: There is a positive link between growth opportunities and cash holdings.*

Cash flows (CASHFLOW) Ferreira and Vilela (2004) posit that cash flows can substitute for the need to hold cash. Similarly, Kim et al. (1998) claim a negative link between cash flows and cash levels because cash flows can be used to substitute for cash. On the other hand, Opler et al. (1999) argue for a positive relationship between cash flows and cash holdings, explaining that firms with high cash flows accumulate cash to finance future investments. In the UK context, Ozkan and Ozkan (2004) observe a positive association between cash flows and cash levels. Opler et al. (1999) and Ferreira and Vilela (2004) confirm these findings. In the small firm setting, García-Teruel and Martínez-Solano (2008) show that cash flows are positively associated with cash holdings because of the preference for internally-generated

funds. We use cash flow from operating activities scaled by total assets as an index for cash flows (García-Teruel and Martínez-Solano, 2008) and hypothesize that:

H7: There is a positive relationship between cash flows and cash holdings.

Liquidity (NWCR): Net working capital ratio is applied here to measure firms' liquidity. Highly liquid assets can be easily converted into cash. Ozkan and Ozkan (2004) suggest that the costs of converting liquid assets to cash are cheaper than those for other assets. They further claim that firms with liquid assets do not need to depend on capital markets to access funds as they can easily convert these assets to cash. Prior empirical studies (Ozkan and Ozkan, 2004; Ferreira and Vilela, 2004; Al-Najjar and Belghitar, 2011) show that liquidity is negatively related to cash. This paper adopts the net working capital ratio as current assets net of cash less current liabilities divided by total assets. García-Teruel and Martínez-Solano (2008) argue for a negative relationship between asset liquidity and cash holdings in the SMEs context. Based on the empirical explanation of liquidity and cash holdings, we hypothesize:

H8: There is a negative relationship between liquidity and cash holdings.

Capital expenditures (CAPEX): Capital expenditures are found to determine cash holdings. It is argued that capital expenditures can be applied as collateral to increase borrowing capacity, leading to lower cash levels (Bates, Kahle and Stulz, 2009). However, Opler et al. (1999) and Riddick and Whited (2009) suggest a positive association between capital expenditures and cash holdings. They argue that firms with high capital expenditure ratios hold high cash levels as capital expenditures can be used to proxy for financial distress and growth

opportunities. If capital expenditures can be seen as an index for growth opportunities then, we follow García-Teruel and Martínez-Solano (2008) and hypothesize:

H9: There is a positive relationship between capital expenditures and cash holdings.

Research and Development (RnD): Here, research and development is applied as a proxy for financial distress costs. García-Teruel and Martínez-Solano (2008) suggest that financial distress costs are perceived in situations where firms do not repay debt obligations, and therefore this will affect cash holdings. Thus, to account for financial distress costs, firms should hold more cash. Harford et al. (2008) find that research and development exert a positive effect on cash holdings. Research and development is measured as the ratio of research and development expenses to sales. We follow Faulkender (2002) who focuses on US small firms and finds a positive association between the research and development ratio and cash holdings, and expect a positive relationship between research and development and cash holdings. We apply a different measure from García-Teruel and Martínez-Solano (2008) as we suggest that using the Z score will lead to different endogeneity problems with the independent variables (since the calculation of Z score includes items that are included in the firm specific factors). Hence, we hypothesize:

H10: There is a positive relationship between research and development ratio and cash

holdings.

Operating Risk (OPRISK): In common with Opler et al. (1999), we use standard deviation of operating income to total assets as a measure for risk. They observe a positive association between the standard deviation of operating income and cash holdings. Firms with volatile earnings are expected to hold more cash reserves because outside financing is expensive for

such firms. Harford et al. (2008) measure risk as cash flow volatility and also document a positive influence of risk on cash holdings. Since we deal with small firms that experience limited external financing, we argue that SMEs with volatile income will hold more cash. We hypothesize:

H11: There is a positive relationship between risk and cash holdings.

4. Data, development of the governance index, and methodology

4.1 Data

We use different databases to extract our sample: FAME, DataStream, and Thomson One Banker (depending on the availability of data). The sample is constructed following the Companies Act 2006 and Collis (2008), and is constructed after matching the firms in the alternative market (AIM index) with FAME and DataStream databases. To derive the sample of UK SMEs, at least two criteria have to be met: turnover and number of employees. Given the change in the definition of SMEs in 2008, the number of employees should be"50 to 250" and turnover should be "£6.5m to £25.9m" for 2008 and 2009 (see Collis, 2008). Before 2008, the number of employees should be "50 to 250"; turnover should be "£5.6m and £22.8m". The initial sample is 307 non-financial SMEs listed on the AIM market.

 Financial data are collected from FAME and DataStream for 2000 to 2009. For the construction of the governance index, all the governance variables are hand collected from Thomson One Banker dataset. Information about board meetings and audit meetings are hand collected from annual reports. The governance index is constructed using the corporate governance details, allocating each firm a score from 0 to 10. Section 4.2 provides a detailed discussion of the index's development.

Table 1 presents descriptive statistics. For the cash variables, it can be deduced that they have an average of around 14% of total assets (or sales for our third definition of cash "cash3"). This indicates that the firms in our sample have high cash levels compared those of García-Teruel and Martínez-Solano (2008) (6.57%). UK firms in the sample have on average a governance index of 3, which is not high (below the scale's mid point (5)). This might be explained by the relative weak governance practices in UK SMEs. Concerning ownership structure, on average 41.6% of shares are held by insiders, showing relatively high insider ownership in our sample. CEO compensation indicates that a CEO in the sample obtains on average £4.08 (equivalent to £171,099.41) annually. Finally, our sample of SMEs enjoys low debt levels with a mean of 13.7%.

[Insert Table 1 about here]

Table 2 shows the correlation matrix of the variables in our model. There are no high and significant bivariate correlations among the independent variables. In other words, the correlation coefficients among independent variables are relatively low and not statistically significant. Hence, multicolinearity is not an issue in our models.

[Insert Table 2 about here]

4.2 Development of the Governance Index

We develop a new governance index with the available governance variables for our sample of SMEs. The governance variables included in this study are: board size, board independence, board meetings, audit size, audit independence, audit meetings, existence of remuneration committee, remuneration independence, existence of nomination committee and nomination independence. The scale ranges from 0 to 10 (equal weights). If a firm in a

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year meets all of the components of the governance index then it is given an index value of 10; and for firms that meet none of the criteria a value of 0 is assigned. The construction of the index is based on the recommendations of the Cadbury Report (1992) and the UK Governance Code (2010). In Table 3, we present summary statistics (Panel A) for the governance variables used. We also provide an overview of the recommendations (Panel B) as set out in the Combined Code of Practice in the Cadbury Report (1992), if the recommendations for our variables are available.

From Table 3, we notice that the average size of the board is 6 directors. In addition, independent directors form 41.6% of SMEs boards; this indicates a relatively good level of board independence for UK SMEs (close to 50%, the requirement for good governance practices in UK). Furthermore, boards meet around 9 times annually. Concerning the audit characteristics, on average, there are around 2 members on the audit committee. Audit independence is in line with the governance recommendations, suggesting that the committee should be mainly composed of independent directors. In our case, 93% of audit committees are composed of independent directors. The average number of meetings is 2, in line with the meeting frequency of audit committees recommended in the Cadbury Report. 91% of remuneration committees are independent. On average there are 2 members on nomination committees; and there is a high level of independent directors on these committees.

Panel B in Table 3 shows the base for our index, related to the corporate governance details wherever the recommendations of the Cadbury Report (1992) and The UK Corporate Governance Code (2010) are available. In cases where no specific recommendations exist then, the average of the variable is taken, where if it is greater than average, a value of 1 is assigned, and 0 otherwise. This is the case for board size, board meetings and nomination independence. Concerning sub-committees, a value of 1 is given for firms having a

remuneration committee, and 0 otherwise and we treat the nomination committee in a similar fashion.

[Insert Table 3 about here]

The recommendations in the Cadbury Report and UK Corporate Governance Code (2010) suggest a minimum of 3 independent directors. Also, it states that audit committee should have a minimum of three members. It is recommended that an audit committee should have at least three members for small companies with two independent directors. Cadbury recommends that there should be at least two meetings annually. Furthermore, in small firms two independent directors should be on the remuneration committee.

4.3 Methodology

In this section, we develop the models to be estimated. The relationship between governance index, CEO compensation, cash holdings and firm specifics are assessed in a panel regression setting (pooled with clustered errors). We use static and dynamic models. The premise of the dynamic model is to examine if SMEs have target cash holdings. We follow Harford et al.'s (2008) models by using the lag of the governance factors to minimize any endogeneity between these factors and our dependent variables.

$$\text{CASH}_{it} = \beta_0 + \beta_1\text{GINDEX}_{it-1} + \beta_2\text{INSOWN}_{it-1} + \beta_3\text{CEOCOMP}_{it-1} + \beta_4\text{SIZE}_{it} + \beta_5\text{LEV}_{it} +$$

$$\beta_6\text{MTBV}_{it} + \beta_7\text{CASHFLOW}_{it} + \beta_8\text{NWCR}_{it} + \beta_9\text{CAPEX}_{it} + \beta_{10}\text{RnD}_{it} + \beta_{11}\text{OPRISK}_{it} + \varepsilon_{it}$$

Where: CASH is defined in three alternative ways: Cash1 is the ratio of cash and cash equivalents to total assets; Cash2 is the cash to total assets ratio, where cash is the total amount of available cash; Cash3 is measured as ratio of cash and cash equivalents to sales; CGINDEX measures the quality of a firm's governance by giving a value ranging from 0 to 10; INSOWN is insider ownership (closely held shares); CEOCOMP is the natural logarithm

of CEO pay; SIZE is the natural logarithm of total assets; LEV is the ratio of total debt to total assets; MTBV is the market to book ratio; CASHFLOW is the ratio of cash flows to total assets; NWCR is networking capital ratio measured as most liquid assets divided by total assets; CAPEX is the ratio of capital expenditures to total assets; RnD is measured as the ratio of research and development expenses to sales; OPRISK is defined as the standard deviation of operating income (EBIT) to total assets (the standard deviation is measured for the entire period for each firm). The standard errors in the models are clustered among the firms to capture the group (firm) specific effects (panel effect).

To provide further evidence on the determinants of cash holdings, we develop a dynamic model to investigate if firms aim for target cash levels. The dynamic panel is as follows:

$$CASH_{it} = \beta_0 + \beta_1 CASH_{it-1} + \beta_2 GINDEX_{it-1} + \beta_3 INSOWN_{it-1} + \beta_4 CEOCOMP_{it-1} + \beta_5 SIZE_{it} +$$
$$\beta_6 LEV_{it} + \beta_7 MTBV_{it} + \beta_8 CASHFLOW_{it} + \beta_9 NWCR_{it} + \beta_{10} CAPEX_{it} + \beta_{11} RnD_{it} +$$
$$\beta_{12} OPRISK_{it} + \varepsilon_{it}$$

Where $CASH_{it-1}$ is lagged value of cash and the other variables are defined as in Model 1.

5. Results

To examine the associations among governance practices, CEO compensation, firm specifics and cash holdings, we employ static models and present them in Table 4. Three definitions of cash are applied, Models 1, 2 and 3 employ the ratio of cash and cash equivalents to total assets; Models 4, 5 and 6 use the ratio of cash to total assets; Models 7, 8 and 9 apply the ratio of cash and cash equivalents to sales. It is found that governance index and insider ownership have no effect on UK firms' cash levels. This contradicts our hypotheses. Hence, governance mechanisms and insider ownership are not as active as they are supposed to be in monitoring SMEs' strategic financial policies.

CEO compensation exerts a positive influence on cash. This is consistent with our hypothesis and Harford et al. (2008). Regarding firm characteristics, firm size exerts a consistent negative impact on cash holdings across all models. This indicates that big SMEs with more economies of scale hold less cash (see Miller and Orr, 1966). This is consistent with our hypothesis and UK studies such as: Al-Najjar and Belghitar (2011) and Ozkan and Ozkan (2004). Our findings are in line with the literature on small firms (García-Teruel and Martínez-Solano, 2008).

Furthermore, we find that leverage is negatively associated with cash holdings, showing that highly leveraged firms hold less cash, consistent with our hypothesis and Baskin (1987) who posits that high debt ratios reduce cash holdings as liquidity is available with high debt structure. Opler et al. (1999), Ozkan and Ozkan (2004) and Al-Najjar and Belghitar (2011) also observe a negative relationship between leverage and cash. A further possible explanation for this negative association is that debt entails a cash drain and hence reduces cash levels.

Liquidity affects UK cash levels in a negative way in accordance with our hypothesis. Firms with high non-cash liquid assets have lower cash reserves. Therefore, such assets can easily and cheaply be converted into cash whenever needed. This confirms other researchers' findings (Al-Najjar and Belghitar, 2001; Ferreira and Vilela, 2004; Ozkan and Ozkan, 2004; Harford et al., 2008).

 Consistent with our hypothesis, the ratio of research and development to sales has a positive sign across all models. This indicates that such firms with high financial distress costs have

high cash levels to anticipate them. Harford et al. (2008) also document a positive link between research and development ratio and cash holdings. A plausible explanation for such a relationship is that firms with high research and development expenditures have higher intangible assets, leading such firms to have less borrowing power and thus requiring more cash.[1] We find that operating risk is positively related to cash holdings in line with our hypothesis and Harford et al. (2008).

We re-estimate the main models in Table 4 applying the IV regression analysis, using the lagged governance variables as our instruments. We report the results in Table 5. The Sargan test is not significant in all models and hence the instruments are valid. All the results in Table 5 confirm the previous findings. Thus, we argue that there is no endogeneity problem.

[Insert Table 5 about here]

Table 6 shows the dynamic settings of cash holdings. Similar to the static regressions, three different types of cash are utilized as dependent variables. The results reveal that the lagged cash coefficient is consistently positive. Furthermore, the adjustment coefficients $(1-\beta_1)$, where β_1 is the coefficient of the lagged cash, are quite high (0.439; 0.459; 0.584; 0.618; 0.543; 0.579 for the models respectively). This is because in the majority of the models, the adjustment coefficient is greater than 0.50 which explains that firms adjust to their target cash levels at a relatively quick pace.

CEO compensation (CEOCOMP) has a positive impact on cash holdings, consistent with the previous findings. Similar to the static models, firm size is negatively influencing cash levels. Moreover, leverage is found to be negatively related to cash; highly leveraged firms hold

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[1] We are thankful to the anonymous reviewer for pointing out this alternative explanation of the relationship as well as the alternative explanation of the relationship between debt and cash holdings.

more cash. We also confirm the previous result that asset liquidity is negatively related to cash.

Finally, there is some evidence that the research and development ratio positively affects cash holdings. Weak evidence of operating risk on cash is found. However, we find that growth opportunities, cash flows and capital expenditures do not affect cash holdings.

[Insert Table 6 about here]

The industry dummies include: manufacturing, agriculture, construction, retailer, hotels, transportation, real estate, and other services. From the seven dummy variables included in our models only manufacturing and retail sectors have a positive significant impact on cash holdings, indicating that these sectors require more cash holdings. This might be because of investment opportunities in such sectors. For the year dummies, 2001; 2002; 2005; and 2007 have significant negative impact on cash holdings.

6. *Summary and Conclusion*

We investigate, for the first time, the relationship between a governance index and cash holdings for 307 UK SMEs from 2000 to 2009. Unlike previous SMEs studies, we employ both static and dynamic analyses of cash holdings and examine the importance of governance mechanisms in cash holding decisions.

Our governance index is based on the Cadbury report (1992) and the UK Corporate Governance Code (2010). The results indicate that cash holdings are significantly determined by CEO compensation, size, leverage, liquidity, research and development ratio, and operating risk. However, no significant evidence is found for our governance index and insider ownership in determining cash holdings. One possible explanation is that monitoring activities in SMEs are less than in large firms. For example, the independent directors are

sub-optimally active (Guest, 2008; Ozkan, 2007). Accordingly, this result, to some extent, is consistent with the findings of previous UK literature.

The study sheds new light, for policy makers, on the importance of improving governance practices in UK SMEs. Our results show that governance practices are not significantly related to firms' strategic financial decisions, such as holding cash. One possibility is to make some of the recommendations in the Combined Code mandatory for small businesses, in line with the Walker (2009) report, on corporate governance in financial entities, which highlights the importance of mandating certain provisions of the Combined Code.

7. *Limitations of the study*

The construction of the governance index suffers from restrictions that might lead to the insignificant relationship found in this study: an equal weight methodology was adopted in its construction. However, the index provides a fair indication of governance practices in UK SMEs as it is based on the updated governance recommendations. Another limitation is related to the availability of financial and governance information for SMEs. Our original sample was more than 2550 SMEs, however, due the frequency of the financial accounts, we could use only 307 SMEs listed on the AIM market.

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Table 1 Descriptive Statistics

Variables	Observations	Mean	Standard deviation	Minimum	Maximum
CASH1	2225	0.147	0.211	0	0.995
CASH2	2268	0.134	0.211	0	0.985
CASH3	2128	0.141	0.199	0	0.996
GINDEX	3067	3.313	2.821	0	10
INSOWN	2390	0.416	0.222	0	1
CEOCOMP	773	12.050	1.453	1.099	19.391
SIZE	2457	16.428	1.275	8.29	21.88
LEV	2425	0.137	0.176	0	0.996
MTBV	2456	2.294	7.052	0.019	219.164
CASHFLOW	2421	0.002	0.210	-0.982	0.758
NWCR	2269	0.061	0.347	-0.995	0.976
CAPEX	2456	0.048	0.0795	0	0.839
RnD	2290	0.043	0.105	0	0.985
OPRISK	2997	0.434	3.879	0.008	66.391

Note: CASH1 is the ratio of cash to total assets, where cash is measured as cash and cash equivalents; CASH2 is the ratio of cash divided by total assets, where cash is assessed as money available for use in the normal operations of the company; CASH3 is measured as ratio of cash and cash equivalents to sales; GINDEX measures the quality of governance mechanisms by giving an index ranging from 0 to 10; INSOWN is measured as closely held shares; CEOCOMP is the natural logarithm of the amount of pay for CEO; Size is the natural logarithm of total assets; LEV is the ratio of total debt to total assets; MTBV is the market to book ratio; CASHFLOW is the ratio of cash flow to total assets; NWCR is networking capital ratio which is measured as current assets net of cash less current liabilities divided by total assets; CAPEX is the ratio of capital expenditures to total assets; RnD is measured as the ratio of research and development expenses to sales; OPRISK defined as the standard deviation of operating income to total assets.

Table 2 Correlation Matrix

Variables	CASH1	CASH2	CASH3	GINDEX	INSOWN	CEOCOMP	SIZE	LEV	MTBV	CASHFLOW	NWCR	CAPEX	RnD	OPRISK
CASH1	1.000													
CASH2	0.903***	1.000												
CASH3	0.680***	0.747***	1.000											
GINDEX	-0.060	-0.083	-0.120	1.000										
INSOWN	0.123***	0.183***	0.141***	-0.125	1.000									
CEOCOMP	0.0008	-0.014	-0.017	0.008*	-0.030	1.000								
SIZE	-0.321***	-0.335***	-0.156***	0.287	-0.255***	0.307***	1.000							
LEV	-0.067***	-0.080***	-0.065***	-0.045***	-0.0002	0.114**	0.248*	1.000						
MTBV	-0.011	0.033	-0.055	0.098**	-0.0004	-0.0002*	-0.161	-0.218	1.000					
CASHFLOW	0.067	0.049	-0.091**	0.152***	0.105***	0.058	0.105***	-0.113*	-0.072*	1.000				
NWCR	-0.447***	-0.506***	-0.337***	-0.003	-0.016****	-0.120**	0.020*	-0.335**	0.143	-0.020	1.000			
CAPEX	-0.032	-0.037	0.007	-0.051*	0.067	0.106*	0.218	0.153**	0.102**	0.165	-0.103**	1.000		
RnD	0.019**	0.003**	0.105***	0.102***	-0.051***	0.036***	-0.010	-0.144	0.248	-0.192	0.192	-0.075	1.000	
OPRISK	-0.013	-0.011	0.219	-0.036	0.031	-0.037	-0.001	-0.046	-0.011	-0.257	0.114	0.032	0.144	1.000

Note: Variables are defined in Table 1, ***, **, * significant at 1 %, 5 %, and 10 % levels respectively.

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Table 3 Descriptive Statistics & Construction details for the Governance Index

Panel A

Variables	Observations	Mean	Minimum	Maximum
BSIZE	2414	6.087	1	21
BOARDIND	2414	0.416	0	1
BMEET	754	8.781	2	20
AUDSIZE	1620	1.756	1	4
AUDIND	1620	0.933	0	1
AUDMEET	805	2.366	1	6
REMSIZE	1619	1.812	1	6
REMIND	1619	0.910	0	1
NOMSIZE	841	2.121	1	8
NOMIND	840	0.807	0	1.667

Panel B

Governance Components	Cadbury Report Recommendations	Measurement	Studies
Board Size		Value of 1 is assigned for firms where board size is greater than average of board size, 0 otherwise.	It is argued that large boards are beneficial in enhancing firm performance owing to collaborative work among the directors (Dalton, Daily, Johnson, and, Ellstrand , 1999). Lehn, Sukesh, and Zhao (2004) further argue that large boards with higher percentage of non-executive directors improve the concept of control

			and monitoring. Coles . Daniel, and Naveen (2008) suggest the benefit of having larger boards as it enables firms to develop in terms of better advisory control.
Board Independence	✔		
Board Meetings		Value of 1 is given for firms whose board meetings are greater than average number of board meetings	Number of board meetings measures board diligence of a firm. This internal corporate governance mechanism has a crucial effect on performance. As suggested by Lasfer (2002) the monitoring aspect of UK firms' boards. Thus, higher board diligence infers more monitoring capacity in enhancing firm value.
Audit Size	✔		
Audit Independence	✔		
Audit Meetings	✔		
Remuneration Size		Firms which has a remuneration committee are assigned a value of 1, 0 otherwise.	The presence of a remuneration committee within a firm is essential. Klein (1998) posits that such committee set an overview of remuneration plans for senior management.
Remuneration Independence	✔		
Nomination Size		Value of 1 for firms which has a nomination committee, 0 otherwise.	The existence of a nomination committee further enhances corporate governance quality of a firm. Therefore, it is crucial for a firm to hold a nomination committee. Klein (1998) stresses that this sub-committee helps in the appointment of qualitative board members.
Nomination Independence		Value of 1 is given to firms whose ratio of non-executive directors on nomination board is greater than average of	The presence of independent members on boards indicates strict and independent control and monitoring of management. Similarly, for sub-committees, this paradigm exists, where an independent nomination committee implies better disclosure

nomination independence, 0
otherwise.

and accountability in nominating senior management.

BSIZE is defined as the number of directors on board; BOARDIND is the ratio of non-executive directors to total number of board directors; BMEET is the total number of meetings; AUDSIZE is the number of directors on audit committee; AUDIND is defined as the ratio of directors to total number of directors on audit committee; AUDMEET is the total number of audit meetings held in a year; REMSIZE is the total number of directors on remuneration committee; REMIND is the ratio of number of non-executive directors to total number of directors on remuneration committee; NOMSIZE is the total number of directors on nomination committee; NOMIND is the ratio of non-executive directors to total number of directors on nomination committee

Table 4 Static Analysis of cash holdings, firm governance and CEO pay

Dependent Variable: CASH	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Independent Variables:									
GINDEX $_{(t-1)}$		0.002		0.003	0.0007	0.002		-0.003	-0.002
		(0.498)		(0.360)	(0.836)	(0.547)		(0.580)	(0.676)
INSOWN $_{(t-1)}$		0.014		0.002	0.049	0.041		0.074	0.058
		(0.778)		(0.968)	(0.200)	(0.303)		(0.145)	(0.243)
CEOCOMP $_{(t-1)}$		0.009**		0.009**	0.003	0.003		0.002	0.003
		(0.016)		(0.031)	(0.295)	(0.310)		(0.669)	(0.445)
SIZE	-0.003***	-0.052***	-0.033***	-0.058***	-0.036***	-0.042***	-0.031**	-0.016	-0.028**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.023)	(0.113)	(0.018)
LEV	-0.030***	-0.156*	-0.32***	-0.215**	-0.179**	-0.233***	-0.258***	-0.247**	-0.274**
	(0.000)	(0.086)	(0.000)	(0.005)	(0.013)	(0.000)	(0.000)	(0.007)	(0.001)
MTBV	0.006 **	-0.005	0.002**	-0.005	0.004	0.003	0.0006	-0.009	-0.010
	(0.031)	(0.503)	(0.045)	(0.517)	(0.516)	(0.600)	(0.563)	(0.284)	(0.183)
CASHFLOW	0.113***	0.086 (0.241)	0.091***	0.103	0.046	0.072	0.048	-0.011	0.025
	(0.003)		(0.010)	(0.181)	(0.498)	(0.307)	(0.148)	(0.904)	(0.777)
NWCR	-0.35***	-0.343***	-0.373 ***	-0.368***	-0.391***	-0.411***	-0.301***	-0.381***	-0.386***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
CAPEX	-0.016	-0.065	-0.035	-0.019	-0.113	-0.076	0.098	-0.110	-0.132
	(0.798)	(0.653)	(0.544)	(0.901)	(0.341)	(0.507)	(0.246)	(0.548)	(0.476)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
RnD	0.238***	0.219**	0.267***	0.219**	0.252**	0.242**	0.313***	0.422**	0.410**
	(0.002)	(0.039)	(0.000)	(0.028)	(0.010)	(0.007)	(0.007)	(0.019)	(0.022)
OPRISK	0.001***	0.002*	0.001***	0.002**	0.002*	0.002**	0.007***	0.008***	0.009***
	(0.001)	(0.074)	(0.000)	(0.043)	(0.084)	(0.026)	(0.000)	(0.000)	(0.000)
Constant	0.510***	0.569***	0.001***	0.626***	0.457***	0.497***	0.007	0.316**	0.434***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)
Industry Dummies	Yes		Yes	Yes		Yes	Yes		Yes
Year Dummies	Yes		Yes	Yes		Yes	Yes		Yes
No. of clustered firms	307	307	307	307	307	307	307	307	307
R^2	0.380	0.333	0.455	0.379	0.434	0.498	0.262	0.361	0.428

Note: Variables are defined in Table 1. ***, **, * significant at 1 %, 5 %, and 10 % levels respectively; the clustered firms are 307 for all the models, with more than 2000 observations for Models 1,4, and 7, and around 1000 observations in the other models, the reduction of the number of observation is due to the lagged data and the CEO compensation data availability.

Table 5 IV Static Analysis of cash holdings, firm governance and CEO pay

Dependent Variable: CASH	(1)	(2)	(3)	(4)	(5)	(6)
Independent Variables:						
GINDEX	0.001	0.003	-0.0005	0.001	-0.004	-0.004
	(0.728)	(0.457)	(0.865)	(0.676)	(0.235)	(0.294)
INSOWN	0.015	0.0008	0.071	0.063	0.096	0.076
	(0.755)	(0.987)	(0.101)	(0.103)	(0.104)	(0.117)
CEOCOMP	0.009*	0.009*	0.002	0.003	0.006	0.002
	(0.100)	(0.094)	(0.596)	(0.458)	(0.909)	(0.688)
SIZE	-0.051***	-0.057***	-0.035***	-0.041***	-0.014*	-0.025***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.092)	(0.004)
LEV	-0.154**	-0.212***	-0.183***	-0.236***	-0.263***	-0.285***
	(0.003)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
MTBV	-0.006	-0.005	0.002	0.002	-0.008	-0.009
	(0.248)	(0.338)	(0.601)	(0.578)	(0.144)	(0.119)
CASHFLOW	0.122	0.127**	0.074	0.088*	-0.016	0.015
	(0.1225)	(0.027)	(0.114)	(0.059)	(0.780)	(0.784)
NWCR	-0.343***	-0.378***	-0.397***	-0.415***	-0.383***	-0.386***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
CAPEX	-0.098	-0.050	-0.132	-0.088	-0.043	-0.59 (0.642)
	(0.404)	(0.672)	(0.179)	(0.366)	(0.737)	
RnD	0.188***	0.200***	0.212***	0.208***	0.372***	0.342***
	(0.009)	(0.008)	(0.000)	(0.001)	(0.000)	(0.000)
OPRISK	0.002 (0.154)	0.003*	0.002	0.003*	0.011***	0.012***
		(0.100)	(0.140)	(0.061)	(0.000)	(0.000)
Constant	0.578***	0.620***	0.454***	0.481***	0.316**	0.419***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)
Industry Dummies		Yes		Yes		Yes
Year Dummies		Yes		Yes		Yes
No. of clustered firms	307	307	307	307	307	307
R^2	0.3434	0.382	0.434	0.502	0.389	0.448
Sargan test	2.633	2.48	1.76	2.14	0.044	0.025

	(0.1046)	(0.1150)	(0.1835)	(0.143)	(0.833)	(0.878)

Note: Variables are defined in Table 1. ***, **, * significant at 1 %, 5 %, and 10 % levels respectively; the clustered firms are 307 with around 1000 observations in all models, the reduction of the number of observation is due to the lagged data and the CEO compensation data availability. The instruments are the lagged governance variables.

Table 6 Dynamic Analysis of cash holdings, firm governance and CEO pay.

Dependent Variable: CASH	(1)	(2)	(3)	(4)	(5)	(6)
Independent Variables:						
CASH $_{(t-1)}$	0.561***	0.541***	0.416***	0.382***	0.457***	0.421***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
GINDEX $_{(t-1)}$	0.003	0.003	0.001	0.002	0.002	0.002
	(0.257)	(0.266)	(0.650)	(0.523)	(0.580)	(0.656)
INSOWN $_{(t-1)}$	-0.0004	-0.009	0.021	0.017	0.040	0.040
	(0.991)	(0.807)	(0.479)	(0.594)	(0.290)	(0.280)
CEOCOMP $_{(t-1)}$	0.005**	0.004*	0.001	0.0007	0.00016	0.0013
	(0.033)	(0.099)	(0.630)	(0.763)	(0.949)	(0.619)
SIZE	-0.025***	-0.028**	-0.020**	-0.024**	-0.0098	-0.014*
	(0.000)	(0.001)	(0.002)	(0.002)	(0.129)	(0.095)
LEV	-0.098*	-0.131**	-0.137**	-0.170**	-0.168**	-0.188**
	(0.104)	(0.011)	(0.009)	(0.001)	(0.015)	(0.002)
MTBV	-0.003	-0.002	0.003	0.004	-0.003	-0.003
	(0.428)	(0.724)	(0.475)	(0.383)	(0.564)	(0.517)
CASHFLOW	-0.003	0.005	-0.009	0.008	-0.057	-0.038
	(0.947)	(0.926)	(0.860)	(0.876)	(0.378)	(0.576)
NWCR	-0.175**	-0.199***	-0.258***	-0.284***	-0.223***	-0.234***
	(0.002)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
CAPEX	-0.056	-0.020	-0.057	-0.031	-0.081	-0.051
	(0.466)	(0.803)	(0.468)	(0.711)	(0.593)	(0.741)
RnD	0.118*	0.123**	0.180**	0.175**	0.120	0.104
	(0.059)	(0.048)	(0.010)	(0.011)	(0.269)	(0.348)
OPRISK	0.00066	0.00092	0.0007	0.001	0.003**	0.003**
	(0.262)	(0.165)	(0.274)	(0.138)	(0.017)	(0.024)
Constant	0.270***	0.314***	0.267***	0.308***	0.178**	0.232**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.007)	(0.003)
Industry Dummies		Yes		Yes		Yes
Year Dummies		Yes		Yes		Yes
No. of clustered firms	307	307	307	307	307	307
R^2	0.547	0.561	0.544	0.563	0.488	0.512

Note: Variables are defined in Table 1. ***, **, * significant at 1 %, 5 %, and 10 % levels respectively. the clustered firms are 307 with around 900 observations in all models, the reduction of the number of observation is due to the lagged data and the CEO compensation data availability