DETERMINANTS OF CORPORATE CASH HOLDINGS: AN EMPIRICAL STUDY OF CHINESE LISTED FIRMS

Rizwan Ahmed [*], Wu Qi [**], Subhan Ullah [***], Danson Kimani [****]

* Faculty of Business and Law, Coventry University, UK
** Cardiff Business School, Cardiff University, UK
*** *Corresponding author* Accounting and Finance Subject Group, Hull University Business School, UK;
Contact details: Hull University Business School, Hull, HU6 7RX, UK
**** The University of Buckingham, UK

Abstract

This study explores the determinants of corporate cash holdings in the Chinese context. As one of the largest developing countries in the world, China offers an interesting opportunity to explore the role of corporate governance, and ownership structure in explaining corporate cash holdings. Owing to the unique economic problems in the developing and emerging economies, this study aims to investigate whether the research findings on developed countries could be generalized globally. Applying fixed-effects estimations on a sample of 115 Chinese firms listed between 2012 and 2016, we find that the level of corporate cash holdings has a significantly negative relationship with leverage, bank debt, non-cash liquid assets and managerial ownership. In particular, cash flow volatility, investment opportunity and dividend have a significantly positive relationship with cash holdings levels. These findings are consistent with the majority of the existing studies carried out in the Western context. We also find that firm size, cash flow, board independence and ownership concentration have a significant influence on the level of corporate cash holdings. Our study contributes to the finance literature and we offer new insights into the relationship between corporate governance and corporate cash holdings in the Chinese context. Some of the findings on the developed countries could be generalized to a wider context. Further, the unique relationship between corporate governance and cash holdings in the Chinese context provides empirical insights for further research.

Keywords: Cash Holdings, Chinese Listed Firms, Trade-Off Theory, Pecking Order Theory, Free Cash Flow Theory

1. INTRODUCTION

Maintaining cash is closely associated with firms' normal transaction and business operations, and if the level of cash holdings is too low, it would affect the long-term solvency of companies. A far serious problem is that these corporate resources may be occupied and used by managers and large shareholders for personal benefits at the expense of the wealth of firm and the rights of minority shareholders may be expropriated. In this study, we attempt to explore how managerial ownership and other corporate governance characteristics affect the level of corporate cash holdings in China.

The earlier work of Keynes (1936) explains three motives of cash holdings, which are the transaction motive, the precautionary motive and the speculative motive. Researchers apply many financial theories to explain corporate cash holdings levels, contributing to the emergence of the trade-off theory, the financial hierarchy theory and the free cash flow theory. The basic idea of the trade-off theory is the presence of optimal level of cash holdings. This optimal level could be achieved if the marginal benefits of cash holdings exceed the marginal costs of cash holdings (Myers, 1977; Opler et al., 1999; Ferreira & Vilela, 2004). The financial hierarchy theory, which is also called the pecking order theory, assumes that there is no optimal level of cash holdings. This theory presents a hierarchy of different sources of financing (Myers & Majluf, 1984). Regarding corporate cash holdings, it is

served as a buffer between retained earnings and investment needs (Ferreira & Vilela, 2004). The free cash flow theory suggests that managers have a tendency to hold large cash reserves for their own discretionary powers (Jensen, 1986). In fact, there is no single theory that could offer better explanation the level of corporate cash holdings.

Several empirical studies have examined the factors that affect corporate cash holdings. Majority of the existing work is largely carried in the context of USA (Kim et al., 1998; Opler et al., 1999; Dittmar & Mahrt-Smith, 2007; D'Mello et al., 2008; Harford et al., 2008; Bates et al., 2009; Duchin, 2010; Kim et al., 2011). Some of the literature in this area has examined this issue in cross-country and comparative perspectives. For example, Ferreira and Vilela (2004) examine a sample of EMU countries, whilst Pinkowitz and Williamson (2001) investigate large industrial companies in Germany, USA and Japan. Moreover, Guney et al. (2007) examine the cash holding activities in a number of developed nations including France, Japan, UK, the USA and Germany. Ozkan and Ozkan (2004) use a sample of UK firms to examine the factors affecting corporate cash holding in the UK. Overall, it is worth noting that most of the studies put the focus on the cash holdings levels in the developed countries. While the developed countries generally own favourable market environment and mature capital markets, the unique economic problems are presented in the developing and emerging economies. Thus, the research findings on developed countries may not be generalized to a wider world. As the largest developing country in the world, Chinese context offers an interesting opportunity to explore the role of corporate governance, and ownership structure in explaining corporate cash holdings. Particularly, in the recent years, Chinese corporate cash holding levels has mounted to an abnormal level. Thus, through using the sample period from 2012 to 2016, we provide recent empirical insights about the determinants of corporate cash holdings in the Chinese context.

Regarding the purpose of this paper, we aim to investigate which factors have a significant impact on the corporate cash holdings levels in the context of Chinese listed firms, during the reporting period of 2012 and 2016. We further explore how firm-specific factors may affect the cash holdings levels in Chinese listed companies.

The major contribution of this paper is that it provides fresh empirical insights to the ambiguous predictions based on different theories, and to further explore the inconclusive results reported in the existing studies. Our findings show that the high level of cash holdings is related to firms having a low level of leverage, high variability in cash flows, low bank debts, more investment opportunities, higher dividend payouts, low non-cash liquid assets, and low level of managerial ownership.

The outline of the remaining paper consists of four sections. Section 2 provides a critique of existing literature, section 3 described the research methodology of the paper, and subsequently, section 4 discusses the results, and, finally, section 5 presents the conclusion.

2. LITERATURE REVIEW

This paper contributes to the literature on determinants of corporate cash holdings in China in two ways. First, we contribute to the limited work of developing countries by taking into account both the firm characteristics and corporate governance mechanisms in a unique legal and institutional environment. Second, this paper provides insights into the current Chinese economic, governance and structural reforms and their impact on corporate cash holdings level in China.

The literature review covers the relationship of cash holdings with a number of explanatory factors, namely: firm size, leverage, cash flow, cash flow volatility, bank debt, dividends, investment opportunities, non-cash liquid assets, managerial ownership, board independence and ownership concentration. In the following section, we discuss how firm-level internal corporate governance mechanisms and firm-specific characteristics are related to corporate cash holdings.

2.1. Firm size

Researchers argue that the fixed cost component of borrowings may result in higher level of cash holdings for smaller firms (Ozkan & Ozkan, 2004; Kim et al., 2011; Bates et al., 2009). Other studies attribute this negative relation as a result of difficulties in accessing the capital markets for smaller firms, which increases the benefits of cash holdings (D'Mello et al., 2008; Hardin et al., 2009; Wu et al., 2017; Al-Najjar & Clark, 2017). Another view is that larger firms are exposed to the lower risk of financial distress owing to the diversification of their products and services (Titman & Wessels, 1988; Ferreira & Vilela, 2004; Ozkan & Ozkan, 2004). However, empirical research shows quite mixed results. The negative results are reported by Opler et al. (1999) and Ferreira and Vilela (2004) based on a sample of U.S. firms and EMU countries, respectively. Other studies report the non-monotonic relationship between firm size and cash holdings (Pinkowitz & Williamson, 2001; Bates et al., 2009). On the other hand, Ozkan and Ozkan (2004), and Guney et al. (2007) report the insignificant relationship between firm size and corporate cash holdings. Consistent with previous studies we use a proxy for firm size (SIZE), which is the natural logarithm of the book value of total assets. We develop the following hypothesis:

H_1: *There is a negative relationship between firm size and cash holdings.*

2.2. Leverage

From a trade-off perspective, highly leveraged firms face a higher probability of bankruptcy and risks of financial distress, and highly levered firms are expected to have a higher level of cash holdings (Ferreira & Vilela, 2004; Ozkan & Ozkan, 2004; D'Mello et al., 2008). Another argument, however, suggests an inverse relationship for the reason that leverage is treated as a proxy for firms' ability to issue additional debts (Ozkan & Ozkan, 2004; Guney et al., 2007). Overall, trade-off model fails to predict a clear directional relationship. On the other hand,

the pecking order theory expects a negative relationship, owing to the reason that cash and debt follow an inverse pattern, in particular, when the level of an investment exceeds retained earnings (Ferreira & Vilela, 2004). Agency theory also predicts that leverage is negatively associated with cash holdings. This is because of the monitoring role of debt financing, which restricts high-leveraged firms to have a lower level of managerial discretion (Opler et al., 1999; Ferreira & Vilela, 2004). Much of the empirical research reports a negative relationship between leverage and cash holdings (Opler et al., 1999; Ferreira & Vilela, 2004; Ozkan & Ozkan, 2004; D'Mello et al., 2008; Bates et al., 2009; Hardin et al., 2009; Fernandes & Gonenc, 2016). Generally, a ratio of total debt to total assets is used as a proxy for leverage (Kim et al., 1998; Opler et al., 1999; Ozkan & Ozkan, 2004; Guney et al., 2007; Harford et al., 2008). Following this discussion, we develop the following hypothesis:

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

2.3. Corporate cash flows

There are two major views about the expected relation between cash flows and cash holdings. Under the trade-off theory, cash flows are considered as cash substitutes (Kim et al., 1998; Ferreira & Vilela, 2004). In contrast, the pecking order theory suggests that cash flows are regarded as a source of internal funds, and could be better than costly external funds, which, thereby implies that cash flows are positively correlated with cash holdings (Ozkan & Ozkan, 2004; D'Mello et al., 2005; Chen et al., 2015). Majority of empirical research reports a positive relationship between these two variables (Opler et al., 1999; Pinkowitz & Williamson, 2001; Ferreira & Vilela, 2004; D'Mello et al., 2005). A few studies report a negative relationship between cash flows and corporate cash holdings levels (Hardin et al., 2009; Duchin, 2010). We measure cash flow (CFLOW) by dividing a firm's cash flow by its total assets (Ozkan & Ozkan, 2004; Duchin, 2010; Liu et al., 2015). We develop the following hypothesis:

H₃: There is a positive relationship between corporate cash flows and corporate cash holdings.

2.4. Cash flow volatility

Literature assumes a positive relationship between cash flow volatility and cash holdings (Opler et al., 1999; Ozkan & Ozkan, 2004; Guney et al., 2007). Cash flow volatility measures the degree of uncertainty in the future stream(s) of cash flows. Corporations with high cash flow volatility tend to hold large amounts of cash attempting to avoid the potential costs of liquidity constraints (Ozkan & Ozkan, 2004; Guney et al., 2007). Some empirical studies provide evidence for this theoretically positive relationship (Opler et al., 1999; Guney et al., 2007; Han & Qiu, 2007). However, Ferreira and Vilela (2004) find evidence in support of this negative relationship, and, they consider this inverse relationship as the possible cause of higher agency costs and higher cost of capital. Following Ozkan and Ozkan (2004), Guney et al. (2007) and Liu et al. (2015), we measure cash flow volatility (VOLATILITY)

by calculating the standard deviation of cash flows to total assets over the 5-year sample period. We propose the following hypothesis:

H₄: There is a positive relationship between cash flow volatility and cash holdings.

2.5. Bank debt

Bank financing can reduce informational asymmetries and agency conflicts. Therefore, banks could effectively perform the monitoring function of debt, resulting from the reduction in financing costs (Ferreira & Vilela, 2004). Bank financing is often considered as a corporate governance mechanism, and borrowers are often required to strictly meet the covenants' requirements. Bank debt could also be treated as a substitution for cash, which may explain the expected negative relationship between bank debt and cash holdings. Ozkan and Ozkan (2004) find a significantly negative association for a sample of UK firms, which is consistent with Ferreira and Vilela's (2004), and Keefe and Yaghoubi (2016) results. On the other hand, Pinkowitz and Williamson (2001) report a significantly positive relationship using a sample of Japanese firms. This could be explained in the context of the monopolistic nature of Japanese banking system, which extracts rent from firms in order to reduce their cost of monitoring. Ferreira and Vilela (2004) also explain their negative results as the possible reason for the lower bank power in EMU countries. Empirical studies define bank debt (BANK_DEBT) as the percentage of total bank borrowings to total debt (Pinkowitz & Williamson, 2001; Ferreira & Vilela, 2004; Ozkan & Ozkan, 2004). Owing to the different field contents in the database and the requirement to distinguish with the leverage, we consider the ratio of bank debt to total liability as a more appropriate representation of bank debt. We, therefore, derive the following hypothesis.

H₅: There is a negative relationship between bank debt and cash holdings.

2.6. Dividends

Companies that pay dividends are expected to hold less cash for the reason that they could obtain money by reducing their dividends (Opler et al., 1999; Ferreira & Vilela, 2004; Ozkan & Ozkan, 2004). Liu et al. (2015) document that firms without dividend payments are likely to raise capital in the external market, which discourages them from holding a large reserve of cash. However, the above studies provide no significant evidence for this inverse relationship. Although, Pinkowitz and Williamson (2001) report a negative association for a sample of firms listed in the USA, the significantly positive relationship is also observed in Japanese and German markets (Chen et al., 2012; Hill et al., 2014). They argue that dividend-paying firms may hold cash, with an intention to avoid cash shortages, particularly when dividend payments are needed. Following Opler et al. (1999) and Ferreira and Vilela (2004), we use a dividend dummy (DIVIDEND), which takes a value of one if firms have declared a dividend that year, otherwise, zero. We develop the following hypothesis:

H₆: There is a positive relationship between dividend and cash holdings.

2.7. Investment opportunities

The theoretical literature predicts that investment opportunities may positively affect corporate cash holdings. Based on financial hierarchy theory, it is costly for firms to raise funds in the external market, and managers are likely to give up profitable investment projects in times when cash is needed. Thus, corporations with better investment opportunities are expected to retain more cash reserves (Opler et al., 1999; Ferreira & Vilela, 2004; Ozkan & Ozkan, 2004; Terzani & Liberatore, 2016). Furthermore, owing to higher financial distress costs, companies having more investment opportunities are more likely to hold greater amounts of cash (Ferreira & Vilela, 2004; Ozkan & Ozkan, 2004; Bates et al., 2009; Belghitar & Khan, 2013). Other empirical studies also provide evidence in support of trade-off and pecking-order theory (Opler et al., 1999; Ferreira & Vilela, 2004; Ozkan & Ozkan, 2004; Bates et al., 2009; Hardin et al., 2009; Kim et al., 2011; Chung et al., 2015). Following the prior work of Opler et al. (1999), Ferreira and Vilela (2004) and Ozkan and Ozkan (2004), we use the market value of total assets (book value of total assets minus book value of shareholders' equity plus market value of equity) divided by book value of total assets (MARTOBOOK). We derive the following hypothesis:

H_7: *There is a positive relationship between investment opportunity and cash holdings.*

2.8. Non-cash liquid assets

Theoretically, a negative relationship is predicted between non-cash liquid assets and cash holdings. This is because non-cash liquid assets are considered a substitution for cash when firms are facing liquidity problems (Opler et al., 1999; Ferreira & Vilela, 2004; Ozkan & Ozkan, 2004). Most empirical studies support this negative relationship (Opler et al., 1999; Ferreira & Vilela, 2004; Ozkan & Ozkan, 2004; Chen, 2008; Bates et al., 2009; Hardin et al., 2009). In line with prior research (Opler et al., 1999; Ferreira & Vilela, 2004), we measure non-cash liquid assets (LIQUID) by dividing net working capital by the total assets of a firm. We propose the following hypothesis:

H_8: *There is a negative relationship between non-cash liquid assets and cash holdings.*

2.9. Managerial ownership

According to Jensen (1986), agency problems could be largely reduced by increasing the level of managerial ownership. The rationale lies in the interest-alignment effect with increased managerial ownership. Specifically, managers are expected to apply resources to maximize value which is aligned with shareholders' interests (Ozkan & Ozkan, 2004). The reduction in the agency conflicts contributes to the lower agency costs and less costly external financing, resulting in the lower level of cash holdings (Ozkan & Ozkan, 2004; Chen, 2008). However, firms with high managerial ownership might face an increased probability of managers pursuing personal interests at the expense of

shareholders (Ozkan & Ozkan, 2004; Chen & Chuang, 2009; Kuan et al., 2011; Portal & Basso 2015). This entrenchment effect implies a positive association between managerial ownership and cash reserves (Yu et al., 2015). Managerial shareholding refers to internal shareholdings by directors, supervisors, executives and other senior managers (Ozkan & Ozkan, 2004; and Kuan et al., 2011). A ratio of the number of shares held by management divided by the total numbers of shares outstanding (MANAGER) is used to proxy for managerial ownership. We derive the following hypothesis for managerial ownership.

H_9: *There is a negative relationship between managerial ownership and cash holdings.*

2.10. Board independence

Firms with higher board independence are less likely to have higher agency problems (Harford et al., 2008). The presence of independent directors on corporate boards improves the quality of disclosure (Chahine & Filatotchev, 2008; Chen & Chuang, 2009). These views suggest that firms with independent boards are better positioned to attract external funds. Independent or external directors are generally expected to connect a firm with external resources. Chen and Chuang (2009) expect a positive relationship between board independence and cash holdings levels. Independent boards may also discourage their firms from holding excessive cash reserves. We define board independence (BOARD_INDEP) as a percentage of independent directors on the corporate boards (Chen & Chuang, 2009; Liu et al., 2015). We develop the following hypothesis for board independence:

H_{10}: *There is a negative relationship between board independence and cash holdings.*

2.11. Ownership concentration

Firms with concentrated ownership structure are likely to own lower level of cash holdings. Large block holders exercise significant influence within their investee companies (Kuan et al., 2011). Large shareholders may closely monitor their companies compared with minority shareholders, resulting in lower agency costs and financing costs (Dittmar & Mahrt-Smith, 2007; Guney et al., 2007; Harford et al., 2008; Kuan et al., 2011). Ozkan and Ozkan (2004) document that the potential conflicts between large shareholders and minority shareholders might induce large shareholders to hoard large amounts of cash under their control, and they may attempt to increase their private benefits of control. Based on the theoretical view of the monitoring function of large shareholders, the study expects a negative relationship between ownership concentration and cash holdings. We employ H-index as a proxy for ownership concentration (OWNERSHIP). The index measures the proportion of shares held by ten largest shareholders. This measurement is similar to those ratios used in the findings of Kuan et al. (2011) and Liu et al. (2015). We derive the following hypothesis for ownership concentration:

H_{11}: *There is a negative relationship between ownership concentration and cash holdings.*

3. METHODOLOGY

3.1. Data, sample selection procedures and econometrics specification

The data on Chinese listed firms is retrieved from China Stock Market and Accounting Research Database (CSMAR). We selected the period of 2012 to 2016 as the sampling period for the reason that the recent statistics show the abnormal level of cash holdings in Chinese firms. China Securities and Regulatory Commission (CSRC) has introduced a number of corporate governance reforms in the past few years, and hence, it would be interesting to see the impact of such regulatory changes on corporate cash holdings levels in Chinese listed firms.

The following steps were used in the sample selection procedures. First, we chose the Chinese listed firms (with A-shares) at the Shanghai Stock Exchange and Shenzhen Stock Exchange. Shanghai and Shenzhen Stock Exchanges are the two largest stock exchanges in China. Another notable feature in Chinese stock markets concerns market segmentation. We have only focused on A-shares, as

an investment in these A-shares are only restricted to Chinese citizens, while the investment in B-shares is restricted to foreign investors. Companies can issue A-shares and B-shares at the same time. Thus, only companies issuing A-shares are included in our analysis, as this represents the largest segment of Chinese listed companies. Firms with B-shares are excluded from our analysis. Next, financial firms are excluded from our sample for the reason that they hold a large amount of cash due to their unique business/financial operations. We also exclude financial firms because these firms have different governance and regulatory requirements compared to non-financial firms. This study attempts to investigate the corporate cash holdings levels under the condition of normal business operations. Firms with continuous losses would produce abnormal changes in the level of cash holdings. Finally, we initially focused on the top 200 market capitalization firms from 2012 to 2016. After applying the sample selection criteria, the final sample consists of 115 Chinese listed firms.

We test the following fixed-effects model:

$$cash_{it} = \beta_0 size_{it} + \beta_1 leverage_{it} + \beta_2 cash_{flow_{it}} + \beta_3 cf_{volatility_{it}} + \beta_4 bank_{debt_{it}} + \beta_5 invest_{opportu_{it}} + \\ + \beta_6 dividend_{it} + \beta_7 liquied_{asset_{it}} + \beta_8 managerial_{owner_{it}} + \beta_9 board_{indep_{it}} + \beta_{10} owner_{concer_{it}} + \alpha_i + v_{it}$$

(1)

The definitions of all variables are reported in Appendix 1.

Following the popularity of OLS in prior research, we started our initial analyses with Pooled OLS estimation. The results reported under OLS need to be interpreted with cautions, as OLS fails to control for endogeneity problems (Ullah et al., 2018). Fixed effects panel data estimation could correct for some of the endogeneity issues because the internal transformation process used in fixed effects could remove unobserved heterogeneity (Ullah et al., 2018).

Cash ratio is applied as a proxy to measure corporate cash holdings. Previous literature uses two major definitions of cash ratio. Prior research also uses a ratio of cash and marketable securities to total assets (Kim et al., 1998; Ozkan & Ozkan, 2004; Guney et al., 2007; Kim et al., 2011; Liu et al., 2015). The other alternative proxy is cash and cash equivalents to net assets, employed by Opler et al. (1999) and Ferreira and Vilela (2004). Owing to the fact that there would not be a significant difference

in the results by using these two ratios, we used the cash ratio, measured by cash and cash equivalents to total assets.

4. ANALYSIS AND FINDINGS

Table 1 reports the descriptive statistics for all the variables. In order to deal with extreme outliers, we winsorize all of the variables at 1% level. Table 1 shows that Chinese listed firms hold around 18% of their total assets in cash and cash equivalents. However, a higher standard deviation of 13% could demonstrate considerable differences in the cash holdings levels among Chinese listed firms. The average for banking financing is 27% which reflects the influence of Chinese banks in the financing activities of Chinese listed firms. Board independence is around 40%, while the percentage of ownership concentration is 51% which shows the degree of ownership concentration in Chinese listed companies.

Table 1. Descriptive statistics

Variables	Obs	Mean	SD	Median	Min	Max	Skewness	Kurtosis
CASH	575	0.179	0.131	0.144	0.011	0.608	1.072	3.71
SIZE	575	26.298	1.318	26.201	23.568	29.606	0.298	2.56
LEVERAGE	575	0.529	0.192	0.522	0.123	0.847	-0.156	2.043
CASH Flow	575	0.052	0.039	0.045	-0.017	0.197	1.179	4.868
VOLATILITY	575	0.028	0.071	0.013	0.002	0.568	6.516	46.99
Bank Debt	575	0.271	0.197	0.267	0	0.735	0.33	2.186
MARTOBOOK	575	1.094	0.291	0.996	0.886	2.768	3.391	16.226
DIVIDEND	575	0.748	0.435	1	0	1	-1.141	2.303
LIQUID	575	-0.033	0.168	-0.42	-0.469	0.354	-0.011	2.908
MANAGER	575	0.084	0.278	0	0	1.584	3.949	18.41
BOARDINDEP	575	0.39	0.073	0.364	0.3	0.667	1.801	6.24
OWNERSHIP	575	0.515	0.21	0.527	0.06	0.962	0.015	2.334

Figure 1 plots the changes in the average and median corporate cash holdings levels from 2012 to 2016. The mean and median values of cash ratio in this sample decrease significantly from 2012 to 2014, followed by a relatively stable trend in the following two years. The mean and median values indicate that Chinese firms hold a large amount of cash reserves. A slight decrease in the cash ratio in the first three years indicates cash management in Chinese corporations has considerably improved. However, the average cash ratios reported between 31 December 2014 and 31 December 2016 vary from 15% to 20%, implying that the management of corporate cash holdings in Chinese listed firms requires further improvement.

Figure 1. Average and median cash ratio
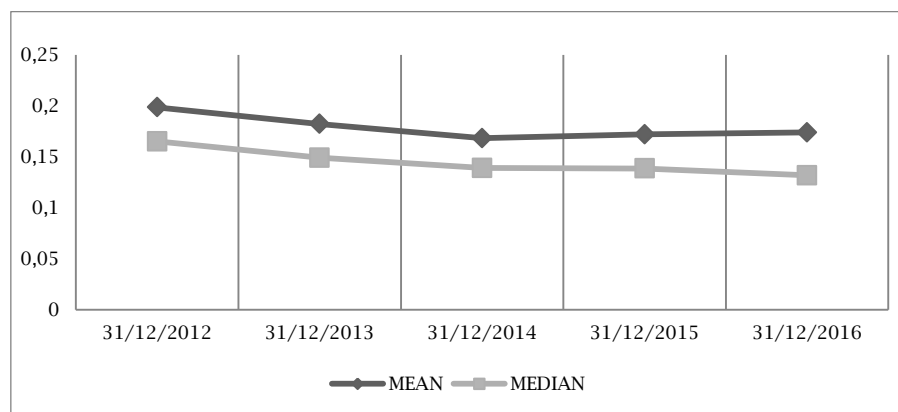
We employ a pooled OLS model in our initial analysis with the year and industry dummies included in the model. Furthermore, for all of the regression models, the present study tests the presence of heteroscedasticity and autocorrelation attempting to avoid the biased estimates.

Table 2. The impact of internal corporate governance, and firm-specific characteristics on cash holdings levels

Independent variables	Predicted sign	Pooled OLS	Fixed Effects
SIZE	Negative	-0.0263*** (0.0021834)	0.0474*** (0.005185)
LEVERAGE	Negative	-0.1297*** (0.0021786)	-0.4201*** (0.012679)
CFLOW	Positive	-0.4454*** (0.0205863)	0.0451 (0.037748)
VOLATILITY	Positive	0.1504*** (0.0314317)	0.7067*** (0.057865)
BANK_DEBT	Negative	-0.3019*** (0.0087346)	-0.0630*** (0.007198)
MARTOBOOK	Positive	0.0859*** (0.010859)	0.0254*** (0.004099)
DIVIDEND	Positive	0.0227*** (0.00822)	0.0131*** (0.000754)
LIQUID	Negative	-0.1301*** (0.0214175)	-0.4441*** (0.005188)
BOARD_INDEP	Negative	-0.0361*** (0.0129874)	-0.0238 (0.016824)
OWNERSHIP	Negative	-6.79E-06*** (2.60e-06)	2.15E-06*** (7.64E-07)
MANAGER	Negative	-0.0664*** (0.0026705)	-0.0866*** (0.024418)
Constant		0.9917*** (0.0451261)	-0.8672*** (0.1358)
Year dummy		Yes	Yes
Industry dummy		Yes	
Adjusted R-Square		0.4310	0.3781
number of observations		575	575

Note: ***, **, * indicate the coefficients are significant at 1%, 5% and 10% levels, respectively. The dependent variable is the level of corporate cash holdings in all two models.

Table 2 reports the regression results for all of the models. From this table, the coefficients for the size (SIZE) in the pooled OLS model show strong evidence that cash holdings are negatively influenced by firm size. Under the fixed effects model, the strong positive relationship is reported, which is contrary to the predicted hypothesis. The positive relationship implies that large firms face less borrowing constraints in the Chinese capital market. This also means that many of the Chinese larger firms are state-owned and they get substantial support from state-owned Chinese banks. The significant and negative relationship between firm size and cash holdings level is consistent with the

majority of previous studies (Opler et al. 1999; Ferreira & Vilela, 2004; Dittmar & Mahrt-Smith, 2007; Kim et al., 2011).

We also find a significantly negative relationship between leverage and cash holdings level in all two models. In the context of a trade-off theory, these results support the argument that leverage is regarded as a proxy for companies' ability to issue debts (Ozkan & Ozkan, 2004; Guney et al., 2007). Thus, high levered firms could borrow more money, which may simultaneously increase the level of cash holdings. The negative impact of leverage is in line with the prior empirical research of Opler et al. (1999), Ferreira and Vilela (2004), Ozkan and Ozkan (2004) and Hardin et al. (2009).

We find an insignificantly positive association between cash flow (CFLOW) and cash holdings level in the fixed effects estimation. The insignificant positive relation could not provide evidence for the pecking-order argument, which considers cash flow as an important source of internal funds. However, the negative sign in OLS estimation supports the trade-off view, where cash flow is regarded as a cash substitute. The mixed results in the two models could not be used to make inferences about the relationship between cash flow and cash holdings levels. In terms of cash flow volatility, the coefficients show the positive relationship (at 1% significance level) for the pooled OLS model and the fixed effects model. The findings show that Chinese companies have a tendency to hold a large amount of cash when facing high probability/risk of cash shortage. The result is in line with the earlier research of Opler et al. (1999) and Han and Qiu (2007). The results also show strong evidence that bank debt (BANK_DEBT) has negative impacts on cash holdings, which is consistent with our expected hypothesis. The reason lies in the monitoring role of bank debt, which reduces the financing costs and as a result bank financing offers a favourable source of financing compared to internally generated cash. This negative finding is in line with the prior empirical work of Ozkan and Ozkan (2004) and Ferreira and Vilela (2004).

We also find that non-cash liquid assets (LIQUID) have a negative impact on cash holdings in Chinese listed firms. Liquid assets are considered as a valid substitution for cash. This negative relationship is also reported in prior empirical work of Ferreira and Vilela (2004) and Chen (2008). We also report that investment opportunity (MARTOBOOK) shows a positive relationship with cash holdings level in both pooled OLS and the fixed effects models. This indicates that Chinese firms anticipating investments opportunities in near future are more likely to increase their cash reserves to meet their investment requirements. Previous studies are also supportive of these arguments (Bates et al., 2009; Hardin et al., 2009; Kim et al., 2011). We also find a positive relationship between dividend payment and corporate cash holdings levels. This implies that dividend-paying firms are likely to keep higher cash reserves (Chen et al., 2012; Hill et al., 2014). This finding contradicts the view that dividend-paying firms would cut the dividend to obtain funds (Ferreira & Vilela, 2004).

We find that managerial ownership (MANAGER) is negatively associated with cash holdings. This is in line with the interest-alignment effect of managerial ownership, which shows that a conflict of interests between principal and agent could be aligned through managerial shareholdings. For board independence (BOARD_INDEP), the coefficients indicate a negative relationship, which highlights the monitoring role of independent boards in minimizing agency costs and information asymmetry costs in Chinese listed companies. Finally, our fixed effects estimation shows that ownership concentration (OWNERSHIP) is significantly positively related to corporate cash holdings levels in Chinese listed companies. This result supports the monitoring function of large shareholders in companies where ownership is highly concentrated. This is also consistent with the view that large blockholders play a distinctive monitoring role within the Chinese corporate governance landscape.

5. CONCLUSION

In this paper, we investigate the impact of the firm-specific determinants on the level of corporate cash holdings for a sample of 115 large Chinese listed firms for the period 2012 to 2016. We report a number of key determinants of corporate cash holdings. The results show that cash holdings levels are negatively related to leverage, bank debt, and non-cash liquid assets. We also find that corporate cash holdings levels in Chinese listed firms are significantly positively associated with cash flow volatility, investment opportunity and dividends. For the remaining variables including firm size, cash flow, board independence and ownership concentration, the mixed results under OLS and fixed effects estimation could not ascertain their exact relationship with cash holdings levels.

This paper focusses on the firm-specific determinants which are firm financial characteristics and corporate governance factors. China has a relatively well-developed capital market and many Chinese companies are going abroad (listed in the overseas markets), which provides them with an opportunity to learn and implement best corporate governance practices acquired in the international markets. Other factors such as legal environment and national culture also have potential effects on the cash holdings levels. However, the present study did not examine such national-level characteristics. Lastly, we also employed static panel data estimation without considering potential dynamic endogeneity issues.

This paper only focuses on firm-specific factors in understanding the determinants of corporate cash holdings. Further research could examine this phenomenon in an international context by exploring how country-specific variables, including national culture, political stability, judicial efficiency and legal environment may impact corporate cash holdings levels.

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Appendix 1. Definitions of variables

Variables	Definition
Size (*SIZE*)	A proxy for firm size (SIZE), which is the natural logarithm of the book value of total assets.
Leverage (*LEVERAGE*)	A ratio of total debt to total assets.
Cash Flow (*CFLOW*)	Cash flow (CFLOW) by dividing a firm's cash flow by its total assets.
Volatility (*VOLATILITY*)	The standard deviation of cash flows to total assets over the 5-years' sample period.
Bank Debt (*BANK_DEBT*)	A ratio of bank debt to total liability.
Investment Opportunity (*MARTOBOOK*)	The market value of total assets (book value of total assets minus the book value of shareholders' equity plus the market value of equity) divided by book value of total assets (MARTOBOOK).
Dividends (*DIVIDEND*)	A dividend dummy (DIVIDEND), which takes a value of one if firms have declared a dividend that year, otherwise, zero.
Non-Cash Liquid (*LIQUID*)	Non-cash liquid asset (LIQUID) divided net working capital.
Managerial Ownership (*MANAGER*)	A ratio of the number of shares held by management divided by the total numbers of shares outstanding. MANAGER is used to proxy for managerial ownership.
Board Independence (*BOARD_INDEP*)	The number of independent directors divided by the total number of directors on the boards.
Ownership Concentration (*OWNERSHIP*)	A proxy for ownership concentration (OWNERSHIP) which is squared of the proportion of shares held by ten largest shareholders.