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Identifying Factors Correlated with Corporate Cash Holdings in Korea and Malaysia

Soh Wei Ni*, Annuar M. Nassir and Cheng Fan Fah

Department of Accounting & Finance, Faculty of Economics and Management, Universiti Putra Malaysia, 43400 UPM Serdang, Selangor, Malaysia

ABSTRACT

This paper reports new findings on how financial ratios and risk factors of corporations are correlated with cash holdings in Korea and Malaysia. Financial risk and risk factor effects of low cash holding firms and high cash holding firms are similar in both stock exchanges. The means of all variables are higher in high cash holdings firms. The significant results in the form of higher values of financial ratios and risk factors are related to the objective of meeting liquidity needs of firms by providing flexibility to meet uncertainties in the demand for cash flows in the future. The lagged cash flow variables have a significant impact on current cash holdings. Liquidity and repayment ability in Korea and low cash holdings firms in Malaysia have similar findings. These findings add new insights into how cash holding size is associated with key firm-specific and economic factors such as exchange rates and inflation factors.

Keywords: cash holdings, risk, exchange rates, inflation, liquidity

INTRODUCTION

This paper identifies the correlation of financial ratios and risk factors on cash holdings of firms in Korean and Malaysian stock exchanges. Firm has insufficient funds to meet cash demands on the firm is more likely technical bankruptcy. Some of the significant financial factors, such as liquidity and solvency factors, correspond to the liquidity conditions and financial health of firms in both short- and long-terms. Liquidity factor refers to the probability of facing losses when disposing of or selling assets to meet short-term obligations. Highly liquid assets can be sold easily and with little loss at no additional cost and with minimal chance

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E-mail addresses:
sohweini@upm.edu.my (Soh Wei Ni),
annuar@upm.edu.my (Annuar M. Nassir),
chengfanfah@upm.edu.my (Cheng Fan Fah)
* Corresponding author

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of illiquidity. Besides, the management of funding sources, the overall monitoring of market conditions also plays an important role in affecting the ability to liquidate the assets of the firms with good value. Too little cash forces firms to liquidate productive assets; holding too much cash will reduce profitability. Nonetheless, long-term solvency factor concerns are not affected by external funding costs; therefore, cash holdings become moderately unimportant. Firms will become insolvent as they fail to meet maturing obligations on the due dates of long-term obligations (after disposal of their assets). Since cash holdings are the most liquidised assets in the short term, it is expected that the liquidity factor is significant in explaining the ratio of cash that a firm holds. However, the relationship between solvency factor and cash ratios is perceived to be weaker or not significant.

A compendium of work has been done on determinants of cash holdings. However, the elements related to cash holdings are unable to mitigate the exposure of a firm to certain risks and fail to contribute to a firm's risk management, whether towards financial ratios and risk factors. Managing risk is one of the primary objectives of firms operating internationally (Ghoshal, 1987). Cash holdings might be affected by the changes in certain financial ratio and risk factors, and risk is the main issue that leads to varying outcomes of expected results. Therefore, this study tends to link cash, financial ratio and risk factors together as they are all related in determining firm's cash holdings decision. Financial ratios and risk factors more easy link with and understandable for investors. The links between financial ratios, risk factors and cash holdings, which are concerned by investors, give a clearer picture to investors on the judgement of the cash holding size. The findings could also serve as a reference for shareholders to understand the purpose of management so as to increase cash holdings.

The motivation for this research is to add findings relevant to the risk management literature by providing evidence of risk factors that influence the level of cash holdings in two yet studied economies, namely, Korea and Malaysia. Both economies have advanced institutional and regulatory frameworks in that the accounting standards are well developed, standards of supervision of securities markets are advanced, as are trading practices. Both economies are relatively affluent economies, although Korea had joined the ranks of developed economies some years back while Malaysia hopes to do so by the year 2020 with its current per capita income close to US$10,000, which is somewhat below the income level needed to be qualified as a developed economy. The similarity in the standards of regulations and supervision makes these two cases comparable in this paper.

The rest of the paper is organised into the following sections. In section 2, one could find a summary of review of literature on cash holdings. Section 3 provides a summary of discussion on how

an appropriate advanced methodology is selected to study this aspect. The findings are reported in Section 4, and the paper ends with a conclusion in Section 5.

LITERATURE REVIEW

Risk factors usually denote discrepancy in a firm's performance or point to results that cannot be predicted before an incident occurs. The source of the risk could stem from external and internal factors impacting a firm's performance such as profitability, management, liquidity, and etc., in which the firm's operations could be exposed to certain indeterminate environmental components. This term of risk tallies with that used by researchers in strategy management that applies the variance or standard deviation of performance variables over the fiscal accounting year (Miller, 1992).

The decision on a cash-holding policy is based on several risk factors and the level of risk that corporations experience, especially credit risk that directly impacts a firm's performance and market value. In general, the corporation with higher cash holdings should be safer and face lower credit risk. However, Acharya *et al*. (2011) remarked that the optimal cash reserves are actually significant and positively related to the risk spread. Their findings showed stronger evidence toward lower credit ratings.

Besides, as revealed in one of the latest studies by Arnold (2014) concerning the role of cash holdings and bankruptcy risk, cash can help in deferring bankruptcy by providing a firm with sufficient liquidity to buffer against insolvency during difficult periods. Other than bankruptcy risk, the cash-holding level is influenced by cost of capital that is incurred when there are insufficient liquid assets to finance a firm's obligations. The increase in the cost of capital burdens cash flow, and may lead to a higher liquidity risk due to the uncertainty of cash outflow in the future. Therefore the rise in liquidity risk will lead to a higher need for holding more cash (Guldimann, 1994).

Mamdouh (2014) concluded that leveraged firms tend to minimise liquidity factor by controlling their cash holdings; default caused by liquidity risk is due to lack of liquidity in covering coupon payments that were due. Nonetheless, there is no study investigating on the external and internal risk factors on cash holdings. Some other research focused on financial ratios with cash holdings which related with interest factor. A firm with an interest coverage ratio of less than one is assumed to be financially distressed (Desai & Jain, 1999). Firms will increase cash on hand to ensure that there is sufficient cash to meet interest obligations in order to avoid becoming financially distressed.

Macroeconomic risk factors are a broad concept encompassing fluctuations in the level of economic activity and prices (Oxelheim & Wihlborg, 1987). Inflation will increase the general price, including the prices of inputs (such as raw materials or labour) and consumer goods. The movements in inflation and

exchange rate will affect the purchasing power of firms, thus, resulting in aggregate production and general costing on daily business transactions. As firm's value and market capitalisation are closely tied up with the movements in stock exchanges, fluctuations in the stock market will affect a firm's decision on investment, financing and performance.

Inflation risk is predicted to have a negative relationship with cash holdings for low-cash-firms, but is positively related with high-cash firms. Firms with exposure to relatively high inflation rates in their cost base might find it tougher to contest on price, thus increasing the challenge of business with a higher chance of defaulting. Higher inflation risk will lead to greater volatility in all financial markets. Therefore, firms might hold on to more cash to makes it easier to perform current investments and buy other investments at declining prices (Refer to Chang *et al*., 2000; Dotsey & Sarte, 2000). However, some firms may prefer to invest in valuable property that continues to appreciate rather than holding on to cash, in order to reduce the loss of value in cash during periods of high inflation.

DATA AND METHODOLOGY

This study analysed the secondary and quantitative data of listed firms in the Korean Stock Exchange (Korea Exchange) and Bursa Malaysia. The time period of this study started from 2000 to 2012; therefore, the listed firms in these two selected Asian countries operating during the study period and fulfilling certain criteria were taken as part of the sample. The financial and utility industries were excluded from the sample as the role and value of cash in these industries differed from other industries. Financial firms were excluded from the sample because of the unique role that cash plays for financial institutions and banks. Utilities were also excluded because they are regulated and should have a small differential between the costs of internal and external funds. The financial data and market data of each listed firm were collected from the Data stream database and the S&P capital IQ dataset. In the meantime, the macroeconomic variables' data were collected from the Department of Statistics and the World Bank's database. In addition, data of firms that are outliers and those that are missing were excluded from the study. The outlier is estimated as the 5 per cent of the bottom and top of the sample. Any listed firms that failed to offer continuous data that are less than 5 years were also deleted from the sample. This tight screening process reduced the sample sizes of Korea Exchange (from three thousands plus to around eight hundreds firms) and Bursa Malaysia (from one thousand plus to around 5 hundreds firms).

Panel regression is separated into two models which indicate the effects of financial ratio and risk factors on cash holdings over the fiscal year. The equation in Model 1 regresses cash holdings on internal factors, including liquidity factor (LF), repayment ability factor (RAF) and solvency factor (SF). The macroeconomic

risk factors such as inflation risk (InfR) and currency risk (CR) are added into Model 2. The function of cash holdings and control variables can be written in simple general forms, as follows:

Cash ratio = f (LF, RAF, SF) (Model 1)

Cash ratio = f (LF, RAF, SF, InfR, CR) (Model 2)

The use of the GMM estimator by Arellano and Bond (1991) is practical, and a general method used in solving the dilemma related to the dynamic panel data model, where some precise estimation problems exist due to the presence of lagged dependent variables on the right hand side of the equation. This problem has a high probability of occurring when examining the objectives of this study. The potential problems might lead to an upward bias of the estimates of the OLS regression analysis, where the error term by definition is corrected with one of the regressors (Bond, 2002).

The cash level is measured by cash and its equivalents over total assets minus cash. The average of firm's cash ratio more than 25% is considered as high cash holdings firm and otherwise (Mikkelson & Partch, 2003). The justification and expected signs of each financial ratio and risk factor are clarified in subsections 3.1 and 3.2, respectively.

Financial Ratio Factors

Liquidity factor is measured by liquid assets over total assets ratio, which is also known as justification for short-term liquidity or daily transaction. Solvency factor is estimated using equity over total assets, which is also known as long-term liquidity for long-term debt obligations. The two measurements were used in the study by Ariff *et al*. (2013) who expected positive regression with cumulative abnormal return. Since cash holdings aid in reducing the pressure of increased liquidity risk, it is believed that liquidity and solvency risk factors are positively related to cash holdings.

The repayment ability factor is calculated to measure the ability of a firm to repay the interest on debt. Therefore, the proxy for this factor is estimated by earnings before interest, taxes and depreciation (EBITD), divided by interest expenses, which are also known as the interest coverage ratio. Hence, the repayment ability factor is expected to be positively significant with cash holdings.

Macroeconomic Risk Factors

Inflation and currency risk factors are measured by the standard deviation of changes in monthly data for a particular fiscal year. Firms are exposed to macroeconomic risks. These corporate risk exposures tend to be multifaceted as to challenge any attempt at analytical modelling in a pro-forma statement (Bartram, 2000). Rita (1980) concluded that the appreciation in currencies will lead to an increase in cash holdings and marketable securities. Thus, currency risk and cash holdings are expected to move in the same direction and positively related to cash holdings.

FINDINGS

Descriptive Statistics for Cash Ratio, Financial Ratios and Risk

Factors

This study investigated the effects of financial ratios and macroeconomic risk factors on firm's cash ratio to further complete and provide comprehensive findings of corporate cash holdings for this study. Many studies have been conducted to determine cash holdings by involving firm-specific and macroeconomics variables. However, none of these provides evidence regarding financial ratios and risk factors that significantly affect changes in firm cash ratio.

The descriptive statistics for financial ratios and macroeconomics risk factors, as well as the cash ratio, are shown in Table 1. The top part of the table gives the descriptive statistics for the listed firms in Korea Exchange, while the bottom part is for the listed firms in Bursa Malaysia. Among the financial ratios, the listed firms in Korea Exchange face a comparatively higher repayment ability factor, whereas the listed firms in Bursa Malaysia experience higher liquidity and solvency factors, which mainly focus on sufficient liquidity to meet short-term and long-term obligations. These criteria could be further explained by the firm-specific characteristics. The macroeconomic risk factors, which include currency, and inflation risk factors, are greater for the listed firms in Korea Exchange than for Bursa Malaysia. The volatility of macroeconomic elements in Malaysia is slightly lower than the fluctuation of exchange rates and inflation risk in South Korea.

TABLE 1
Descriptive statistics for Korea Exchange and Bursa Malaysia (2001 to 2012)

Korea Exchange	All		High cash		Low cash	
Variable	Mean	Std. dev.	Mean	Std. dev.	Mean	Std. dev.
Cash ratio	0.1232	0.1124	0.3293	0.1389	0.1017	0.0840
Repayment ability	9.9415	34.1960	32.4102	80.1360	8.2737	27.2145
Liquidity factor	1.7963	1.6345	4.1667	2.8734	1.5512	1.2062
Solvency factor	11.9879	16.4386	23.9792	24.7571	11.4161	15.7121
Currency risk	0.0278	0.0136				
Inflation risk	0.0040	0.0008				

Bursa Malaysia	All		High cash		Low cash	
Variable	Mean	Std. dev.	Mean	Std. dev.	Mean	Std. dev.
Cash ratio	0.1273	0.1313	0.3470	0.1728	0.1015	0.0971
Repayment ability	8.2508	19.8297	14.8846	28.2104	7.8121	19.0697
Liquidity factor	2.2798	1.8595	3.8944	2.3490	2.1165	1.7205
Solvency factor	13.6371	17.8790	16.6535	21.2195	13.4472	17.6335
Currency risk	0.0116	0.0102				
Inflation risk	0.0030	0.0031				

Source: Datastream

The mean and standard deviation of cash ratio are about the same for both the stock exchanges, which showed a mean of 0.1232 and a standard deviation of 0.1124 for the listed firms in Korea Exchange, and a mean of 0.1273 and a standard deviation of 0.1313 for the listed firms in Bursa Malaysia. The previous section reports on a higher standard deviation of the change in interest expenses for Korea Exchange relative to the listed firms in Bursa Malaysia. The higher mean and standard deviation of the change in interest expenses showed that the listed firms in Korea Exchange are paying a relatively higher payment on interest charges. As a result, the interest risk for the listed firms in Korea Exchange is greater than in Bursa Malaysia.

These two financial ratios are lower for the listed firms in Korea Exchange, which eventually portray the weakness of these firms in terms of liquidity and solvency management. Financial risk and risk factor trends of low cash holding firms and high cash holding firms are similar for both the stock exchanges. High cash holding firms experience higher means of all variables. Overall, the status of financial ratios and higher risk factors might be the key motives to encourage firms to hold more cash in order to have sufficient liquidity and flexibility to overcome the uncertainties of the future.

(i) Diagnostic Check for GMM Estimation for Korea Exchange and Bursa Malaysia

There are two diagnostics that are part of the GMM in testing the appropriateness of the instruments used. The Sargan test is used to identify the restrictions under the null hypothesis on the validity of the instruments (Arellano *et al*., 1991; 2003). The test concludes with the null hypothesis that mentions that all IVs are uncorrelated or that the model is not over-identifying restrictions. If the statistical value shows enough evidence to reject the null hypothesis, then at least some of the IVs are not exogenous. In order to continue with the GMM estimations, the Sargan test must show that the model is not over-identifying restrictions. The results for the Sargan test in Table 2 show that they are not statistically significant. With respect to the Sargan test of over-identifying restrictions, the high p-value suggests insufficient data in rejecting the null hypothesis that the set of instruments are appropriate. The second diagnostic test is a check of the first-order and second-order serial correlations in the first different residuals, stated as asymptotically standard normal distribution values. As required, the test for the first-order correlation AR (1) in the GMM estimation must reject the null hypothesis that the autocorrelation exists in the data set, and the second-order correlation AR (2) must fail to reject the null hypothesis. The statistical reports of the p-value of AR (1) and AR (2) are fulfilling the requirement. Thus, the validity of GMM is supported in this model.

TABLE 2
GMM post-estimation diagnostic checking for Korea Exchange and Bursa Malaysia

Variable/ model		Sargan test	AR 1	AR 2
Korea Exchange	Model 1	65.0768	-5.3324	0.9870
		(0.1235)	(0.0000)***	(0.3237)
All	Model 2	63.5036	-5.3067	1.0369
		(0.2887)	(0.0000)***	(0.2998)
High cash	Model 1	23.6004	-2.5851	0.7974
		(0.8860)	(0.0097)***	(0.4252)
	Model 2	30.8503	-2.5316	0.8390
		(0.9742)	(0.0114)***	(0.4015)
Low cash	Model 1	63.3947	-6.5809	0.3507
		(0.1553)	(0.0000)***	(0.7259)
	Model 2	63.8806	-6.5234	0.4049
		(0.2776)	(0.0000)***	(0.6856)
Bursa Malaysia	Model 1	69.8309	-6.4058	0.4916
		(0.1373)	(0.0000)***	(0.6230)
All	Model 2	50.9692	-6.2191	0.9167
		(0.0778)	(0.0000)***	(0.3593)
High cash	Model 1	34.6623	-2.0164	-0.5695
		(0.3885)	(0.0438)**	(0.5690)
	Model 2	37.9771	-1.9844	-0.6060
		(0.4705)	(0.0472)**	(0.5445)
Low cash	Model 1	61.0121	-6.4094	0.9566
		(0.2101)	(0.0000)***	(0.3388)
	Model 2	86.3219	-6.6833	1.1798
		(0.0662)	(0.0000)***	(0.2381)

Note: Sargan test was used to test over-identifying restrictions in a statistical mode. Arellano-bond tests 1 and 2 were used to detect the existence of autocorrelation.
*** Significant at 0.01 confidence level,
** Significant at 0.05 confidence level,
* Significant at 0.1 confidence level, p-values are in parenthesesFindings of GMM Estimation for Korea Exchange

(ii) Findings of GMM Estimation for Korea Exchange

As mentioned earlier, a GMM estimation consisting of lagged variables as the regressors can aid in improving results by allowing the significance of the previous exogenous variables to be reflected in the current adjustments. Therefore, the findings of the dynamic relationship of corporate cash holdings with the financial ratios and risk factors might be improved by including the effects of lagged variables. The results for the GMM estimation for the listed firms in Korea Exchange are presented in Table 3.

The total number of the listed firms is 864, out of which, 10.8% are high cash holding firms, and there are 770 low cash holding firms. The horizontal arrangement makes it easy to compare the findings from row to row across each category. The data were estimated using a two-year moving average as the number of years for

the sample is not long enough to conduct a 3-year or 5-year moving average. The results for Korea Exchange are presented in Table 3. The statistics indicates that the coefficient of lagged cash ratio is positively significant to dependent variables in that it supports the dynamic relationship of the dependent variable existing in this model. The cash-holding level relative to total assets in previous periods do generate a positive impact on the current cash ratio, while the impact of the lagged cash reserves has more of an effect on low cash holding firms than high cash holding firms, as shown by the coefficient of 0.3228 compared to 0.1304 in model 2.

The listed firms in Korea Exchange, including high cash holding firms and low cash holding firms, the liquidity (tally with the finding in Mamdouh, 2014) and repayment ability factors are positively significant to cash holdings. The coefficients for the results of the GMM estimation showed that low cash holding firms have a higher coefficient for liquidity factor, while the coefficient for the repayment ability factor is almost the same for both the high cash holding firms and low cash holding firms. Low cash holding firms have a higher coefficient of 0.0321 for the liquidity risk factor, which is almost double compared with the coefficient of 0.0147 for the high cash holding firms. This finding shows that the cash ratio of low cash holding firms is greatly responsive to the changes in liquidity risk. Firms have access to two types of external financing: debt and equity. When internal cash holdings are insufficient to cover a firm's daily payments, the firm might need to issue equity to cover the deficit. If shareholders are no longer keen to pump in additional capital, the firm defaults (Chen, 2010). Therefore, low cash holding firms with relatively weak internal cash reserves are more sensitive to the changes in the liquidity risk factor. As firms need more cash to pay off the increase in daily transactional needs and short-term obligations, the cash ratio of a particular firm has to be adjusted to a higher proportion. Since high cash holding firms always have a higher amount of ready funds on hand, the response of the cash ratio towards the rise in liquidity risk is lower.

The coefficients of the repayment ability factor are quite similar for high cash holding firms and low cash holding firms, which are 0.0010 and 0.0007 in model 1, respectively. The coefficient of repayment ability factor for high cash holding firms decreased to 0.0005 in Model 2, after including the effect of macroeconomic risk factors. Therefore, the significance of the repayment ability factor in explaining the cash ratio in high cash holding firms is subject to the changes in macroeconomic risk factors. High cash holding firms would be concerned about the changes in interest rate, and the amount of interest payments might burden their cash flow when they experienced an unexpected need for cash reserves during bad economic times, a situation that is out of their control.

The change of macroeconomic risk factors might increase the probability of high cash holding firms to increase their debt and leverage. Furthermore, the

uncertainties in inflation and currency risk factors might negatively impact on the revenue of the firms which is used in serving the interest payment. However, the cash ratio of low cash holding firms is always sensitive to interest rate, no matter how bad the economic conditions may be. As they rely on debt in financing their short-term and long-term obligations, cash ratio of low cash holding firms is adjusted according to a certain level of repayment ability. Any changes in interest payment will turn them into default when they fail to cover their interest payments. Therefore, the awareness of cash ratio on interest expenses obligation is very strong for low cash holding firms.

TABLE 3
GMM estimation of the impacts of firm-level and macroeconomic factors on cash holdings ratio for the listed firms in Korea Exchange from 2001 to 2012 using two-year moving average

This table presents the results of the dynamic effects of cash ratio in the entire sample and the two subsamples of high cash holding firms and low cash holding firms. Model 1 regresses the cash ratio with lagged cash ratio and financial ratio factors; macroeconomic risk factors were added to Model 2. Liquidity factor was measured by liquid assets over total assets ratio, solvency factor was estimated using equity over total assets, and repayment ability factor was calculated using EBITD over interest expenses. Inflation and currency risk factors were measured by the standard deviation of changes in monthly data for particular fiscal year.

	Dependent variable: cash ratio					
	All		High cash		Low cash	
Variable	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
Constant a	-0.0056	0.0205	0.3519	0.0778	-0.0070	0.0124
b	(-0.5000)	(1.1200)	(4.1800***)	(0.9100)	(-0.6600)	(0.7100)
c	(0.6190)	(0.2620)	(0.0000)	(0.3610)	(0.5100)	(0.4760)
L. Cash Ratio	0.3164	0.3110	0.2737	0.1304	0.3413	0.3228
	(5.8300***)	(5.7500***)	(2.6900**)	(2.2200**)	(6.7700***)	(6.4200***)
	(0.0000)	(0.0000)	(0.0070)	(0.0270)	(0.0000)	(0.0000)
Liquidity Risk	0.0185	0.0190	0.0053	0.0091	0.0200	0.0213
	(5.9200***)	(5.5300***)	(2.3400**)	(1.9600**)	(7.1100***)	(6.7400***)
	(0.0000)	(0.0000)	(0.0190)	(0.0500)	(0.0000)	(0.0000)
Repayment ability factor (3.2400***)	0.0006	0.0006	0.0010	0.0005	0.0007	0.0007
	(3.2300***)	(1.8100*)	(2.2200**)	(4.5500***)	(4.5500***)	
	(0.0010)	(0.0010)	(0.0700)	(0.0260)	(0.0000)	(0.0000)
Solvency factor	0.0003	0.0003	0.0007	0.0004	0.0005	0.0004
	(1.4100)	(1.5200)	(2.4500**)	(1.4800)	(1.9800**)	(1.8800*)
	(0.1580)	(0.1290)	(0.0140)	(0.1390)	(0.0470)	(0.0600)
Inflation Risk		-5.5697		-13.4356		-3.7371
		(-1.9900**)		(-2.4000**)		(-1.4400)
		(0.0470)		(0.0160)		(0.1510)
Currency Risk		-0.2597		4.3455		-0.0976
		(-1.1600)		(5.9100***)		(-0.4600)
		(0.2470)		(0.0000)		(0.6450)
Wald chi	158.3100	163.9600	389.0200	382.3000	217.6400	232.2300
p-value	(0.0000***)	(0.0000***)	(0.0000***)	(0.0000***)	(0.0000***)	(0.0000***)

Note: a =coefficients, b = t-statistics, c = p-values, significant at 0.01(*), 0.05(**), 0.001(***) level.

The solvency factor is significantly related with cash ratio. As mentioned in the previous portion, since solvency risk is measured by long-term assets and liability, cash holdings, which are seen as part of current liquid assets, hardly contribute to any explanation of the cash ratio. Thus, the significance of solvency risk in the GMM estimation shows that solvency risks do provide some explanations of cash ratio and the impacts of the lagged cash ratio play an important role in enhancing this evidence. Solvency factor is measured by equity over-total-assets, issuance new equity which is seen as a source of external funding has a stronger explanation of cash holding for low cash holding firms. However, the significance of solvency factor is very weak for high cash holding firms that are less likely to obtain the external funding through equity issuance.

High cash holding firms are more likely to be explained by macroeconomic risk factors, which are currency and inflation risk factors. This evidence shows that high cash holding firms in Korea Exchange are likely to be greatly exposed to changes in macroeconomic risk. The coefficient of inflation risk, which is 13.4356 with a negative sign, shows that high cash holding firms will keep less cash reserves when inflation risk increases in order to avoid depreciation on cash holding value. High inflation erodes the purchasing power of the cash on hand. Firms with high cash holding prefer investing on assets or investment to shelter cash reserve from inflation. This finding tallies with those of Kim *et al*. (1998) and Natke (2001). The cash ratio of low cash holding firms is unexplainable by inflation risk because the cash on hand is only sufficient for daily transactions. Therefore, the need of adjusting cash ratio according to the change in inflation risk does not exist for low cash holding firms.

Generally, firms with high cash holding have higher efficiency in internal management than in firms with low cash holding. A better internal control of assets for firms with high cash holding aids in accumulating cash holding. Therefore, firms with high cash can easily increase cash on hand compared to firms with low-cash holding. This finding is consistent with the capital flight theory, indicating that the appreciation in currency will increase the holdings of cash and marketable securities. The currency risk is significant with a positive coefficient of 4.3455 for high cash holding firms shows that firms are keeping more cash holding when the currency risk increases. As mentioned in the study of Rita (1980), the liquid fund will move in the same direction as the trends in the exchange markets. However, the currency risk is insignificant for low cash holding firms due to restrictions in liquidity management. Firms with low cash holding are unable to increase and adjust the cash ratio immediately as their liquidity is tied up with other components such as inventory and account receivables.

Macroeconomic risk factors might be the main reasons or sources of risk that encourage high cash holding firms to hold higher liquidity in order to

manage unexpected changes; however, macroeconomic risk is usually out of their control.[1] Yet, the effects of those risk factors have been restricted in the fixed-effect regression; the explanation of the variables in the previous period on the current exogenous variable has been ignored. Therefore, it can only reflect that it is significant after including the effect of lagged exogenous variables. The F-statistics for all models in Table 3 are significant at 0.01.

(iii) Findings of GMM Estimation for Bursa Malaysia

The results in Table 4 summarise all the findings of the GMM estimation for the listed firms in Bursa Malaysia, which show that the lagged cash ratio is part of the endogenous variables in this model, and is statistically significant at 0.1 with a positive sign. It shows that a dynamic relationship exists in this model. Therefore, the GMM estimation aids in enhancing the estimation of this regression. The coefficient of the lagged cash ratio for the listed firms in Bursa Malaysia is slightly higher compared to the listed firms in Korea Exchange, exhibiting that the cash ratios for the listed firms in Bursa Malaysia are more likely to be affected by the lagged cash ratio, and in a relatively higher proportion.

The liquidity and interest risk factors of the listed firms in Bursa Malaysia are statistically significant for all the categories with a positive sign. Higher-cash firms have a higher coefficient of 0.0334 for the liquidity risk factor compared with the coefficient of low cash holding firms at 0.0055 in Bursa Malaysia. High cash holding firms in Bursa Malaysia behave relatively in a more risk-adverse manner than high cash holding firms in Korea Exchange; the conservatism practice leads to higher response towards the increase of liquidity risk. As discussed in the earlier section, the coefficient of the liquidity factor indicates the firms' response towards the adjustment on cash ratio. The sensitivities of high cash holding firms and low cash holding firms towards liquidity factor are dissimilar with firms in Korea Exchange. Somehow, high cash holding firms are seen as more capable in increasing cash by supportive cash management practices in their organisations. Thus, the coefficient of the liquidity factor is higher for high cash holding firms that act conservative towards any possible damage for firms with high cash holding in Bursa Malaysia.

[1]The importance of macroeconomic risk factors in explaining the cash ratio of high cash holding firms is hinted in the fixed-effect regression shown by the increase in the adjusted R-square in the results of fixed-effect regression from Model 1 to Model 2 after including macroeconomic risk factors; it is available whenever required.

TABLE 4
GMM estimation of the impacts of firm-level and macroeconomic factors on cash holdings ratio for the listed firms in Bursa Malaysia from 2001 to 2012 using two-year moving average

This table presents the results of the dynamic effects of cash ratio in the entire sample and the two subsamples of high cash holding firms and low cash holding firms. Model 1 regresses the cash ratio with lagged cash ratio and financial ratio factors; macroeconomic risk factors were added to Model 2. Liquidity factor was measured by liquid assets over total assets ratio, solvency factor was estimated using equity over total assets, and repayment ability factor was calculated using EBITD over interest expenses. Inflation and currency risk factors were measured by the standard deviation of changes in the monthly data for particular fiscal year.

	Dependent variable: cash ratio					
		All		High cash		Low cash
Variable	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
Constant a	0.0014	0.0112	0.1045	0.1044	0.0754	0.0160
b	(0.1400)	(1.0300)	(7.0400***)	(0.4700)	(6.0600***)	(1.5800)
c	(0.8910)	(0.3010)	(0.0000)	(0.6410)	(0.0000)	(0.1130)
L. cash ratio	0.5742	0.5082	0.3265	0.3200	0.4567	0.4646
	(3.7200***)	(3.3000***)	(5.8500***)	(4.9200***)	(3.7100***)	(4.3300***)
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Liquidity factor	0.0083	0.0056	0.0293	0.0334	0.0066	0.0055
	(2.4900**)	(1.8200*)	(5.3400***)	(3.4300***)	(2.0200**)	(1.8200*)
	(0.0130)	(0.0690)	(0.0000)	(0.0000)	(0.0430)	(0.0690)
Repayment ability factor (3.0600**) (1.0400)	0.0012	0.0004	0.0014	0.0014	0.0004	0.0007
	(4.1600***)	(3.7600***)	(0.8500)	(1.7700*)		
	(0.0020)	(0.2970)	(0.0000)	(0.0000)	(0.3950)	(0.0760)
Solvency factor	0.0000	0.0001	0.0001	0.0002	0.0005	0.0001
	(0.0200)	(0.4600)	(0.3400)	(0.4300)	(1.7500*)	(0.4600)
	(0.9840)	(0.6490)	(0.7340)	(0.6680)	(0.0800)	(0.6420)
Inflation risk		-2.258		-1.4907		-2.3637
		(-4.5200***)		(-1.2600)		(-4.7800***)
		(0.0000)		(0.2090)		(0.0000)
Currency risk		1.1034		0.0648		1.1436
		(3.5000***)		(0.0900)		(3.0300***)
		(0.0000)		(0.9290)		(0.0000)
Wald chi	295.5300	347.8500	396.4300	414.8700	263.6300	306.8700
p-value	(0.0000***)	(0.0000***)	(0.0000***)	(0.0000***)	(0.0000***)	(0.0000***)

Note: a =coefficients, b = t-statistics, c = p-values, significant at 0.01(*), 0.05(**), 0.001(***) level.

Repayment ability is positively significant with cash ratio of the listed firms in Bursa Malaysia, which is consistent with the finding in the Korea Exchange sample. The trends of the coefficients for repayment ability factor of high cash holding firms and low cash holding firms in Bursa Malaysia are not similar to those of the listed firms in Korea Exchange. In more specific, the coefficient of repayment ability for firms with low cash holding was found to decrease from 0.0004 (model 1) to 0.0007 (model 2) after including the effect of macroeconomic risk factors. The changes of the cash ratio in low cash holding firms might be due to the risk-adverse and conservatism practices in the listed firms of Bursa Malaysia. Generally, the fluctuations of inflation and currency are associated with interest rate changes. Firms with low cash holding are adjusting their repayment ability according to the changes in inflation and currency risk factors to avoid failure in fulfilling interest expenses obligations which might turn them into default. Meanwhile, the coefficients of repayment ability factor are consistent in model 1 and model 2 for firms with high cash holding in Bursa Malaysia. The unchanged coefficients for the repayment ability factor in high cash holing firms in model 1 and model 2 might be explained by sufficient liquid to meet the interest expenses obligations. Furthermore, firms with high cash holding are usually involved in lesser debt and low interest payments, and therefore, they do not need to adjust according to the changes in the macroeconomic risk factors.

Unlike the findings in Korea Exchange, low-cash holding firms are statistically significant to macroeconomic risk factors, inflation and currency risk factors. However, there is no evidence found for high cash holding firms. The cash ratio of high cash holding firms in Bursa Malaysia is less likely to be affected by its macroeconomic risk factors as the listed firms in Bursa Malaysia practice conservatism in their cash management. The coefficient of 1.2102 for inflation risk is significant with a negative sign at 0.01 for low cash holding firms that showed the same sign compared with the inflation risk factors for the high cash holding firms in Korea Exchange. When the inflation risk is greater, low cash holding firms will further reduce the cash holdings to mitigate the loss of a drop in the value of cash and purchasing power.

The coefficient of 1.0299 with a positive sign for the currency risk of low cash holding firms indicates that firms will hold more cash when the volatility of the exchange rate or the change of value in the local currency is greater. Also, low cash holding firms expect local currency to depreciate; thus, the conversion of payment for import from other countries in foreign currency will be relatively expensive. Thus, low cash holding firms will keep more cash holdings as a preparation for the unanticipated increase in their daily transactions and obligations. The F-statistics is significant at 0.0001 for all models (see Table 4).

CONCLUSION

This study was an attempt to identify the impacts of financial ratios and risk factors on cash holdings, which are similar between Korea Exchange and Bursa Malaysia. The results of the panel regression, without considering the lagged effects of exogenous variables on the current stage, showed that the liquidity ratio and repayment ability factor significantly impacted the cash-holding decision. The results of this objective reported that most external risk factors are significant for low cash holding firms in Bursa Malaysia (in fixed-effect regression and GMM estimation) and high cash holding firms in Korea Exchange (in GMM estimation).

The limitation of this study lies in the method used in testing the data. The reliability of GMM applied in this study is still under debate. The criticism is on the homogenous of the number of company; one of the assumptions of GMM is not valid. A new method called Pool Mean Group is introduced to overcome this issue. However, the latest method was not utilised in this study due to the unavailability of this method at the time when this study was conducted.

A preliminary research on the relationship among financial ratio, risk factors and firm-specific elements (cash holdings) was conducted in this study. Financial ratio and risk factors are usually linked with stock returns and management in past literature. The results of the study showed that financial ratios and external risk factors (such as currency and inflation risk factors) that were often been overlooked in existing studies are significant with cash holdings. By connecting the risk factors to other significant variables in firm's management such as working capital, a better explanation could be given for the relationship between risk factors and important firm-specific elements. This is because a good understanding of risk and firm-specific elements aids in enhancing the risk management.

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