



DETERMINANTS OF CORPORATE CASH HOLDINGS: PANAL DATA ANALYSIS: PAKISTAN

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Pakistan

ARTICLE INFO

Article History:

Received 19th November, 2013
Received in revised form
10th December, 2013
Accepted 15th January, 2014
Published online 28th February, 2014

Key words:

Cash holdings, Cash flow,
Generalized Method of Moments,
Financial distress, Working Capital.

ABSTRACT

The study focuses on the corporate cash holdings and its determinants using panel data analysis study on non financial firms selected from Karachi Stock Exchange. The sample of 50 non-financial firms were examined for the duration of ten years from 2003-13. Generalized Method of Moments (GMM) was applied on data; which was collected from annual reports of the firms. The results of the study show that firms; due to having high adjustment cost are unable to adjust the targeted cash level; so the results show a negative ROA and positive relationship was found with firms growth opportunities, receivables accounts, financial distress and inventories. Similarly the results of the study show no significant relationship of cash holdings with cash flows. This study has filled the study gaps and will be beneficial for financial analysts.

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INTRODUCTION

The prevalence of cash holding and the literature found in finance is more focusing and concentrated upon the facts that what are the factors and determinants which emphasize the firms to have huge amount in hand in the form of cash holdings. So it generates a question why firms need a minimum amount of cash in hand and what is that optimal level? The literature review of finance explains three important models; Pecking order theory, trade off theory and free cash flow theory, which help to answer above questions and lend a hand upon in determining the factors of corporate cash holdings. The empirical results of different studies, using above models, have helped to determine the cash level of firm. However some modern researchers have been working on developing economies (Dittmar and Mahrt-Smith 2007; Faulkender and Wang 2006; Petersen *et al.*, 1993). The rationale of the research work is endow with an evidence to determine the factors of corporate cash holdings in non financial firms of Pakistani KSE market.

Literature review

Prior studies, basing upon three main models of cash flows have acknowledged growth opportunities, cash flows, financial leverage, firm size and liquid assets as determinants of cash holdings. So the study tried to deliberate the total assets equal to ratio of cash and cash equivalent, which is in line with the loom followed and focused by. The pecking order theory elaborate the fact that firms preferably rely on internal

financing instead of relying on external financing and the reason behind it is the less cost or relatively very low cost with internal financing. For that reason the firms hold huge amount of cash as a source of internal funds. (Hofmann 2006; T. A. 1993; and Koshio and Cia 2003). So a positive relation is expected between cash flows and cash holdings opposite to, Kalcheva and Lins, (2007) study the negative relation was found. The study measured

Cash Flows → Cash flows/Net Total assets and similarly investment proxy is used to measure net working capital

Similar to the previous studies, the negative relationship was expected between non cash liquid assets and cash holdings (Pinkowitz *et al.*, 2003; and Williamson 2001). Literature reveals financial leverage as a momentous determinant with negative relationship with cash holdings. Opposite to that view; agency theory reveals that the firms with high leverage are unable to raise funds and finance or to hold excessive amount of cash hence provoke a positive relationship. In this study the leverage is measured as → Debt to asset ratio (Sargan 1958; Natke 2001). The bank relationship with firms existence would help the firm to pool up more external fund signifying their borrowing power and trust worthiness. Steijvers and Niskanen (2009) in their study found that debt from banks can help firm to hold huge amount of cash in hand hence another surrogate for cash holdings. Their study concluded that the firms having high debts have a negative relationship because they are depending upon debts and hold less cash in hand. According to trade off theory, it was expected that cash holdings would have a positive relation with growth opportunities while on the other hand, the pecking order theory suggests a negative relationship and same was expected in this study so

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Market to book ratio → $\frac{BV(Assets) - BV(Equity) + MV(Equity)}{BV(Assets)}$

Another important and significant determinant of cash holdings is firm size. Prior studies reveal that smaller firms endure more financial constraints and undergo greater financial distress. In addition, for larger firms the cost of external finance is very smaller while on other hands it is greater for smaller firms, so smaller firms should hold more cash (Pastor 2010). In this study the size of firm is measured as

Firm Size → $\ln(Sales)$

And were expecting that firm size should have negative relation similar with findings of trade off theory the study expect a negative relation of ROA with cash holdings hence predicting huge cash flows from high profit gaining firms so in order to overcome any problem related to underinvestment while on other side the pecking order theory oppose the view; it reveals that cash holding would change with cash flows. In this study ROA is measured as → $\frac{Net\ profits}{BV(Assets)}$ similar to the prior studies, Anderson *et al.* (2003); Kahle *et al.* (2009). Account receivable is another most significant determinant of cash holdings. The prior studies reveal that firms having huge number of account receivables connotes lesser cash holdings (Dittmar *et al.* 2003). Another prominent determinant of cash holdings is inventories. Previous literature reveals that as there is possibility of using inventories for getting loans and placing them as a collateral or they can be used after converting in to cash (Dittmar *et al.* 2003; Servaes, 2004). In addition to above determinants, financial distress is significant determinant. Firms having long term or short term obligations or liabilities, when are unable to pay them then financial distress arises. So mainly firms try to raise amount of cash in financial distress so that no liability is denied or delayed plus to minimize their risk and will liquidate their resources to pay their liability (Pastor 2010).

MODEL AND METHODOLOGY

The sample of fifty non-financial firms quoted form Karachi Stock Exchange were selected. The sample selection was from non-financial sector because the financial firms have high peculiarity in their policies regarding cash holdings. The data of quoted firms were taken from their annual reports from year 2003-13 and were analyzed using Generalized Method of Moments. The model was adopted from Natke, (2001) study work and all determinants of cash holdings are included in this model.

$$CASH^*_{i,t} = \beta_0 + \beta_1MTB_{i,t} + \beta_2SIZE_{i,t} + \beta_3CF_{i,t} + \beta_4NWC_{i,t} + \beta_5LEV_{i,t} + \beta_6ROA_{i,t} + \beta_7STO_{i,t} + \beta_8INV_{i,t} + \beta_9APAY_{i,t} + \beta_{10}AREC_{i,t} + \beta_{11}FDISTRESS_{i,t} + \beta_{12}BANKR_{i,t} + \epsilon_{i,t}$$

Where $\epsilon_{i,t}$ = Random disturbance β_k = Unknown parameter

The estimation of target cash is adopted from Koshio and Cia (2003).

$$CASH^*_{i,t} = \alpha + \rho CASH_{i,t-1} + \delta_1MTB_{i,t} + \delta_2SIZE_{i,t} + \delta_3CF_{i,t} + \delta_4NWC_{i,t} + \delta_5LEV_{i,t} + \delta_6ROA_{i,t} + \delta_7STO_{i,t} + \delta_8INV_{i,t} +$$

$$\delta_9APAY_{i,t} + \delta_{10}AREC_{i,t} + \delta_{11}FDISTRESS_{i,t} + \beta_{12}BANKR_{i,t} + \eta_{1t} + \lambda_{1t} + \mu_{i,t}$$

Where α = intercept term, $\delta_1, \dots, \delta_{12}$ = the coefficients.

- MTB → Growth opportunities
- SIZE → $\ln(sales)$
- NWC → Liquid Assets
- LEV → Total Debts/Total Assets
- ROA → Operating profits/Assets
- STO → Inventories/Net Assets
- INV → Variation in Fixed Assets/Net Assets
- APAY → Trade Credit/Net Assets
- AREC → Trade Debtor/Net Assets
- FDISTRESS → Re-estimation of Altman’s Model
- BANKR → Banks Debt/Total debt ratio.

In this study the assumptions made were that U_{it} has no restrictions on heteroskedasticity and is distributed with zero mean. In panel estimation, the estimation become inconsistent if endogenous and dynamic regressors are present. In this study $CASH^*_{i,t}$ is a firm unobserved fixed effect and is correlated with regressors which satisfy the condition of orthogonality for GLS estimation. The study is based on method proposed by (Rajan *et al.*, 1995). In our study we used it partly because we were unable to locate the endogenous regressor. So due to presence of that endogenous regressor we use it partly. The dynamic panel GMM estimator was presented and formulated by Arellano and Bond. This programme run in DPD 98 and estimate orthogonal deviation at first difference form. We applied Sargan test to check the validity of instrument for GMM estimation.

EMPIRICAL ANALYSIS AND RESULTS

The study was based on adopted which was analyzed and tested, for that reason unit root test was applied. A stochastic trend series can not be analyzed and forecast due to non-stationarity in data while a stationarity in series have a non-spurious results and consistency will be found in its predictions (Sargan 1958). The illustration of ADF test is as under:-

$$Y_t = \mu + \rho Y_{t-1} + \epsilon_t$$

The assumptions of WND (white noise disturbance) is not obeyed if the data of series is correlated and hence Augmented Dickey Fuller test predicts parametric correction. So in this study the by adding lagged difference methodology was adjusted.

Figure 1. ADF TEST (Probability 0.000)

Variable	Augmented Dickey Fuller Test Statistic	Order of Integration
CASH	172.98	1
Cash Flows	158.234	0
D. Size	201.981	0
Leverage	159.671	0
D. STO	175.192	0
INV	179.023	1
APAY	164.231	1
BANKR	169.439	1
DMTB	237.980	1
Net Working Capital	169.102	0
ROA	169.234	0
DAREC	243.986	1
DFDI	198.243	0

The results of ADF tests significantly predicts that Cash level of previous year positively effect the cash level of current year. The value of adjustment coefficient is also suggesting that the model is acceptable and firm can not immediately shift to high cash level because of changes in firm characteristics and the reason for that is the adjustment cost.

Statistical Results

Variable	t-stat	Standard Error	Coefficient	Probability
CASH	7.037256***	0.013371	0.107463	0.0000
Cash Flows	1.539191	0.005225	0.008043	0.1245
Net Working Capital	-20.72592***	0.016920	-0.350679	0.0000
D. Size	-2.055467**	0.007707	-0.018103	0.0405
Return on Assets	-3.047912***	0.002756	-0.008399	0.0025
Investment	9.107754***	0.000140	0.001377	0.0000
Accounts Payable	0.766544	0.074394	0.073131	0.3867
D. Account Receivables	2.944797***	0.073332	0.345395	0.0034
BANKR	-1.727365*	0.001030	-0.001781	0.0847
D.MTB	1.623200*	0.105966	0.173005	0.1053
Leverage	7.973665***	0.047461	0.434873	0.0000
D.STO	1.722097	0.066497	0.131167	0.0692
D.FDI	1.757675*	0.011107	0.019534	0.0796

The statistical results of above table show positive coefficient of cash flows as described by pecking order theory. According to which firms try to maintain huge amount of fund as internal finance. Altman (1968) claimed another additional source and backup of liquidity for the firm is cash flows, which are substitute for cash but on contrary Kim *et al.* 1998, predict that positive relationship. The study results supports that smaller firms should follow an attitude to hold more cash. These results are inconsistent with Steijvers *et al.* (2009). Interestingly, the study results regarding Size are negative and significant which is line with the results of Alvarez *et al.* 2010. Financial leverage results are significantly positive which means that a firm can depend on mechanism of borrowing for cash holding. However the firm with high leverage has high cash holdings so its financial distress will be lesser (Agency theory). In this study the account payables have no significant impact on cash holdings so firms should prefer large cash to resolve their payment. On the other hand study result regarding a positive relationship between account receivables and cash holdings predicts that firm should have reserve amount in hand to settle the payment without any delay. This result is inconsistent with the results of Dittmar 2004. Similarly the study results of financial distress are significant while BANKR are insignificant which means negative. These results are inconsistent with Arellano *et al.* (1991) and trade off theory respectively. The inventories results are positive and significant. As p- value tends toward 1 so null hypothesis in this case is rejected.

Conclusion and future direction

The research study was done to determine the corporate cash holdings for non-financial firms of Pakistan for the period of 2003-13. The future researcher can do research on other financial firms also and can have a combine research on both financial and non-financial sectors.

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