Full Length Research Paper

Financial constraint, cash value and investment

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The purpose of this study is to investigate relationships between financial constraint, cash value and investment. The study samples consist of 86 firms listed in Tehran Stock Exchange (TSE) for the period of 2006 to 2010 (430 year-firm). Three WW, KZ and KZ_{IR} indexes are used for determining whether firms have financial constraint or not. The results from the first hypothesis show that holding optimal level of cash is very important for firms and cash increases firms' value in constrained more than unconstrained firms. Findings from the second hypothesis indicate that cash and investment have positive relationship. Also, taking that companies are always seeking to maximize their profit and return into consideration, one of the ways to achieve this goal is investment. The third hypothesis suggests that changing in the level of cash holding result in excess return in constrained firms more than unconstrained firms. This change in the level of cash holding may improve firm`s return and performance.

Key words: Financial constraint, cash value, investment, company value, excess return.

INTRODUCTION

Financial constraints are one of the critical issues for all the companies. General methodology to investigate the relationships between financial constraints, cash value and investment is to separate firms into constrained and unconstrained firms. Faray et al. (1999) argue that financial constrained firms put more emphasis on cash flows when they make an investment decision. In other words, increasing gap between internal and external financing cost leads firms to be more sensitive about investment by internal cash holdings. Two theories explain optimal level of cash holdings including trade off theory (TOT), pecking order theory (POT). According to TOT, firm's optimal cash holdings are determine by trading off between cost and benefits of cash holding. Three major motives for cash holdings are cash for trading, speculative motive and cash in case. Often, firms for speculative motive and investment opportunities use cash that held in firm. Cash in case motive is for tackling

financial crises, preventing from liquidity problems and reducing financing cost. According to POT, financing procedures follow on pecking order and internal resources is preferred over external resources.

Cash holdings have lion's share of firm's assets. Cash is important because allows firm to look for opportunities that increase stock`s value (Almeida et al., 2004). Generally, managers are seeking for an optimal cash holdings level, respecting to pros and cons of cash holdings. Cash should be held in the level which trades off between excessive and insufficient cash holding costs. In other words, on the one hand, firms are seeking for an optimal level which does not lead them to big loss because of insufficient cash holdings and on the other hand, they are looking for the optimal level of cash holdings to embrace opportunities. This optimal level of cash holdings is different in different firms and different periods. Firm's cash holdings level is despond on operational nature of them. Managers plan the level of cash holding for a period of time and try to make it.

Firms that have no sufficient cash holdings, increase their capital through the capital market, liquidities their assets, reduce their dividends, renegotiation on financial

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contracts and or do a combination of above. Capital increasing is cost-intensive; regardless it is from selling asset or the capital market; this cost may fixed or variable. Variable part depends on capital increasing. Fixed cost for accessing the external capital market lead firms to avoid capital increasing through it; and normally they try to use their internal cash holdings. Of course, cash holdings bear opportunity cost. However, for the given amount of net assets, there is an optimal level of cash holdings. In other words, there is an optimal level of cash holdings that is neither excessive and nor insufficient to avoid loss from capital freezing and facing insufficiency (Cleary, 2006).

Investment on economy starts with absorbing people`s saving and using these savings in wealth-producing activities result in economy development. Firms` managers' respect to expected return and the level of risk taking ability, choose the alternatives of investment. Firms need resources for new investment which are whether internal or external. Financial constrained firms will have to finance with highly cost if they have no enough cash holdings; this situation result in slowing firm`s growth and profitability down (Wang, 2007).

Constrained firms increase their cash holdings in respond to increasing cash flows because financial constraint make paradox and competition between current and future investments, however, risk existence on future cash flows persuade firms to hold cash in case. Also, financing method and receivables management affect firms' cash holdings.

According to the level of financing constraint, managers should hold cash in firm. Firms that have greater financial constraint should hold more cash and vice versa firms with less financial constraint should hold less cash. Unbalancing among financial constraint, cash holdings and the level of investment may result in liquidity troubles and steps up firm`s expenses, whether financing or opportunity cost. However, firms` future growth depend on management`s right decision and understanding the relationships between financial constraint, cash value and the level of investment. Therefore, emphasizing on the cash holdings level with regard to the level of investment in constrained firms may be management priority in decision making (Murray and Goyal, 2005).

General method for investigating financial constraint effect on investment sensitivity to cash flows is to separate constrained and unconstrained firms. First separation measure that has been used in literature is dividend ratio, which was used by Fazzari et al. (1988). Several studies have used different measures for separation- size, company age, dividend ratio, business group, level of cash holdings and optimal cash holding model.

The paper proceeds as follows: summary of related literature and description of the potential contribution of the study: hypotheses development: description of data and methodology; explanation of models and variables; testing of hypotheses; results and conclusions.

LITERATURE REVIEW

Ascioglu et al. (2007) argue that information asymmetry causes investment reduction and more capital expenditure sensitivity to volatility in internal funds. According to theatrical forecast, their results show that when possibility of arm-length transactions increase, on average, capital expenditures are lower and investment sensibility to cash flows is higher.

Denis and Sibilkov (2007) found that cash holdings are more important for constrained firms than unconstrained firms. Their results are according to the hypothesis that more cash holdings by constrained firms versus external financing cost cause an increase firm`s value.

Ezzadine and Salma (2007) used data sample of 39 firms from Tunisia stock exchange during the period of 2000 to 2006. Their results support standard theory which assets constrained firms have more investment sensitivity to higher cash flows than unconstrained firms. Also, these results show that higher investment sensitivity for cash flows drive in lower cash sensitivity for cash flows.

Gopalan et al. (2007) investigated internal capital market in India business groups. They documented that inter-group loans are important tools for transferring cash among group members and normally are used for supporting financially weak firms. Their results highlight that the main reason for supporting is to prevent firms in group from bankruptcy and holding their reputation. Bankruptcy in group results in other firms` external financing, investment and returns reduction and increases the possibility of their bankruptcy too.

Marchica and Mura (2007) analyzed the effects of different cash holding methods on the United Kingdom non-financial investment ability during 1991 to 2001. Their results indicate firms which hold lower cash, invest lower but it is not seem that these firms are under control of imperfect capital market. However, it seems that these firms access financing resources and there is evidence on increasing their future capital expenditures. Also, it seems that higher cash holdings procedure for long time results in a reduction on investment sensitivity to cash holdings. These results suggest that higher cash holding procedure for long time causes mitigation of imperfect capital market. In addition, internal cash accumulation strategy allows firms to invest in high growth investment, practice capital budgets and increase dividend.

Mundaca and Nerdal (2007) studied the relationship between investment and Norwey firms' financial position during 1988 to 2003 for 17000 firms. They used size and the level of cash holdings as the measures for classifying firms in industry. Their results point out that the firms with positive cash flows for long-time have more investment sensitivity for positive cash flows than the firms with

negative cash flows for long-time. This sensitivity is higher for small firms than large ones. Among the firms with negative cash flows, small firms have negative sensitivity and large firms have positive sensitivity. Firms with negative cash flows emphasize on bank loans and cash holdings for investment financing.

Dong-Mi L (2010) in a research analyzed two assets pricing models by inter-relationship between financial constraint and investment on research and development (R and D). First type of pricing model shows ambiguous evidence about financial constraint return relationship. Second model is about firms` excess returns that invest on R and D opposite to capital investment, investment on R and D is more inflexible. One of their results states that constrained firms which invest on R and D cease or sustain their R and D projects. However, risk of R and D intensive firms increases with financial constraint. They empirically and theatrically screened that there is strong correlation between financial constraint and stock return among R and D intensive firms.

Campello et al. (2010) argue that, although, financial crisis in 2008 and subsequent recession aftermath have had intensive economic consequent, but it brought an opportunity to discover financial constraint effect on firm's policy. They used data of 1050 questionnaire from chief executive managers in 39 different countries in December of 2008 and received interesting answers. These answers allowed them to survey whether financial constraints cause dismiss investment or not. They found that constrained firms are willing to reduce investment, technology, marketing and recruitment in comparison with unconstrained firms. Their study point out that constrained firms lost lion`s share of their cash savings during the financial crisis and have had to distribute dividend; but unconstrained firms haven't faced this position. Also, they found that constrained firms step up withdrawing from their credit line because of concerning about the future limitation on their credit line.

HYPOTHESES DEVELOPMENT

H_1: CASH increases firm`s value in constrained firms more than unconstrained.
H_2: There is a positive relationship between cash holding level and investment.
H_3: Cash holdings level changes cause more excess return in constrained firms than unconstrained ones.

DATA COLLECTION AND METHODOLOGY

This research is an empirical research. Our research method is correlation type and backward method has been used for investigating correlations among variables. Research data sample consists of 430 firms listed in TSE during the period of 2006 to 2010. Sampling method is systematic-elimination and sample firms must have following conditions:

1) Must have accepted in 2003 since we need some of data for the

period of the past 3 years.
2) Fiscal year must be ended at the end of year.
3) Must have positive equity.
4) Must have positive net investment, that is, investment activities in cash flow statement have cash out flows.

Models and variables definition

Model (1)

$$Q_{i,t} = \beta_0 + \beta_1 Cash_{i,t} + \beta_2 Cash_{i,t} * DummyFC$$
$$+ \beta_3 Total\ Debt_{i,t} + \beta_4 PPE_{i,t} + \beta_5 Size_{i,t}$$
$$+ \beta_6 \frac{R\&D_{i,t}}{Sale_{i,t}} + \beta_7 EBIT_{i,t} + \beta_8 DummyFC + \varepsilon_{i,t}$$

Model (2)

$$Q_{i,t} = \beta_0 + \beta_1 Abnormal\ Cash_{i,t} + \beta_2 Abnormal\ Cash_{i,t}$$
$$* DummyFC + \beta_3 Total\ Debt_{i,t}$$
$$+ \beta_4 PPE_{i,t} + \beta_5 Size_{i,t} + \beta_6 \frac{R\&D_{i,t}}{Sale_{i,t}} + \beta_7 EBIT_{i,t}$$
$$+ \beta_8 DummyFC + \varepsilon_{i,t}$$

Model (3)

$$Excess\ Return_{i,t} = \lambda_0 + \lambda_1 \Delta Cash_{i,t} + \lambda_2 FC * \Delta Cash_{i,t}$$
$$+ \lambda_3 \Delta non - Cash\ Assets_{i,t} +$$
$$\lambda_4 \Delta EBIT_{i,t} + \lambda_5 \Delta R\&D_{i,t} + \lambda_6 \Delta IE_{i,t} + \lambda_7 \Delta Div_{i,t}$$
$$+ \lambda_8 Net\ Finance_{i,t} + \lambda_9 Lev_{i,t} +$$
$$\lambda_{10} Cash_{i,t-1} + \lambda_{11} \Delta Cash_{i,t} * Cash_{i,t-1} + \lambda_{12} \Delta Cash_{i,t} * Lev_{i,t}$$
$$+ \lambda_{13} FCDummy + \varepsilon_{i,t}$$

Model (4)

$$Net\ Investment_{i,t} = \gamma_0 + \gamma_1 Cash_{i,t} \cdot$$
$$+ \gamma_2 Cash_{i,t} * FCDummy + \gamma_3 Total\ Debt_{i,t} + \gamma_4 \frac{M_{i,t}}{B_{i,t}}$$
$$+ \gamma_5 \frac{R\&D_{i,t}}{Sale} + \gamma_6 Size_{i,t} + \gamma_7 PPEA + \gamma_8 Cash\ Flow_{i,t}$$
$$+ \gamma_9 Cash\ Flow * FCDummy_{i,t} +$$
$$\gamma_{10} PSale\ Growth_{i,t} + \gamma_{11} Debt\ issue_{i,t}$$
$$+ \gamma_{12} PPE\ Sale_{i,t} + \gamma_{13} FCDummy + \varepsilon_{i,t}$$

For investigating whether a firm has financial constraint or not, we used three indexes of WW, KZ, KZ_{IR}. KZ index was introduced by Kaplan and Zingales in 1997, WW by Whited and Wu in 2006 and KZ_{IR} by raee and hesarzedeh respecting to the Iranian market in 2009.

$Q_{i,t}$ is a proxy for firm's value which calculated as follows:

$$Q_{i,t} = \frac{(Market\ Value\ Of\ Equity_{i,t} + Debt_{i,t})}{(BooK\ Value\ Of\ Assets_{i,t})}$$

$Cash_{i,t}$ is a proxy for cash holding which calculated as follows:

$$Cash_{i,t} = (Cash_{i,t} + Short\ Term\ Investment_{i,t})$$

$DummyFc$ is a dummy variable which indicates existence of constraint or otherwise. If a firm has financial constraint it takes 1 otherwise 0. To do so, WW, KZ, KZ_{IR} indexes are used. In words, a number is obtained by using the formulas of these indexes. Then, the median of all companies are calculated and the firms upper the median are constrained and otherwise unconstrained. $DummyFc$ takes 1 for:

$Total\ Debt_{i,t}$ is total debts including short term and long term.

$PPE_{i,t}$ is prosperity, plant and equipment including tangibles.

$Size_{i,t}$ is firm`s size and for its calculation sale`s log is used.

$R\&D_{i,t}$ is research and development expenses.

$Sale_{i,t}$ is a total revenue from sales and service.

$EBIT_{i,t}$ is earnings before interest and tax.

$Abnormal\ Cash_{i,t}$ is abnormal cash holdings calculated as follows:

$$Abnormal\ Cash_{i,t}$$
$$= Cash_{i,t} - \left(\frac{Cash_{i,t-1} + Cash_{i,t-2} + Cash_{i,t-3}}{3} \right)$$

KZ is an index for financial constraint calculated as follows:

$$KZ = -1.002 * \left(\frac{CashFlow_{i,t}}{TotalAssets_{i,t}} \right) + 0.283 * \frac{M_{i,t}}{B_{i,t}}$$
$$+ 3.139 * \left(\frac{Debt_{i,t}}{TotalCapital_{i,t}} \right) - 39.368 * \left(\frac{Div_{i,t}}{TotalAssets_{i,t}} \right)$$
$$- 1.315 \left(\frac{CashHolding_{i,t}}{TotalAssets_{i,t}} \right)$$

$Cash\ Flow_{i,t}$ net is cash flows divided by total assets.

$M_{i,t}$ is firms market value.

$B_{i,t}$ is firms book value.

$Debt_{i,t}$ is firms total debt.

$Total\ Capital_{i,t}$ is net book value of equity.

$Div_{i,t}$ is dividend which is divided by total assets to smooth for all companies.

Cash Holding is a proxy for cash holding which is calculated as follows:

$$Cash\ Holding_{i,t} = (Cash_{i,t} + Short\ Term\ Investment_{i,t})$$

$$KZ_{IR} = 17.33 - 37.486 \left(\frac{Cash\ Holding_{i,t}}{Total\ Assets_{i,t}} \right)$$
$$- 15.21 \left(\frac{Div_{i,t}}{Total\ Assets_{i,t}} \right) + 3.39 \left(\frac{Debt_{i,t}}{Total\ Asstes_{i,t}} \right)$$
$$- 1.402 \frac{M_{i,t}}{B_{i,t}}$$

WW is an index for financial constraint calculated as follows:

$$WW = -.091 CF_{i,t} - 0.062\ DivDummy + 0.02 TLTD_{i,t}$$
$$- 0.044\ LNTA_{i,t} + .102\ ISG_{i,t} - 0.035\ SG_{i,t}$$

$CF_{i,t}$ is cash flows divided by total assets.

$$CF_{i,t} = \frac{Cash\ Flow_{i,t}}{Total\ Assets_{i,t}}$$

$DivDummy$ is a dummy variable and takes 1 for companies paid dividend or otherwise 0.

$TLTD_{i,t}$ is calculated as follows:

$$TLTD_{i,t} = \frac{Total\ Long\ Term\ Debt_{i,t}}{Total\ Assets_{i,t}}$$

$LNTA_{i,t}$ is natural logarithm of assets and calculated as follows:

$$LNTA_{i,t} = Ln(Total\ Assets_{i,t})$$

$ISG_{i,t}$ Is industry sales growth of the firm?

$SG_{i,t}$ Is sales growth of the firm and calculated as following:

$$SG_{i,t} = \frac{Sale_{i,t} - Sale_{i,t-1}}{Sale_{i,t-1}}$$

$Excess\ Returm_{i,t}$ is excess return and calculated as follows:

$$Excess\ Returm_{i,t} = R_{i,t} - \left(\frac{R_{i,t-1} + R_{i,t-2} + R_{i,t-3}}{3} \right)$$

R is a proxy for return and considering that the Iranian firms increase their capital continuously, the following formula is used.

$$R_t = \frac{(D_t + P_t(1 + \propto + \beta)) - (P_{t-1} + C \propto)}{(P_{t-1} + C \propto)}$$

α is the percentage of capital increasing from borrowing and contributed cash
B is capital increasing from retained earnings
C is contributed capital

$\Delta non - CashAssets_{i,t}$ is changes in non cash assets calculated as follows:

$$\Delta non - CashAssets_{i,t} =$$

$$\frac{(TotalAsset s_{i,t} - Cash_{i,t}) - (TotalAsset s_{i,t-1} - Cash_{i,t-1})}{(TotalAsset s_{i,t-1} - Cash_{i,t-1})}$$

$Net\ Finance_{i,t}$ is firm`s financing.

$\Delta IE_{i,t}$ is changes in firm`s interest expense.

$Lev_{i,t}$ is debt ratio calculated as follows:

$$Lev_{i,t} = \frac{Total\ Debt_{i,t}}{Total\ Assets_{i,t}}$$

$Net\ Investment_{i,t}$ is net investment drawn from cash flow statement

$PPEA_{i,t}$ is fixed assets bought during the period and drawn from statements notes.

$PPESale_{i,t}$ is total sales of fixed assets bought during the period and drawn from statements notes.

$Debt\ Issue_{i,t}$ is added debt in current period calculated as follows:

$$Debt\ Issue_{i,t} = Total\ Debt_{i,t} - Total\ Debt_{i,t-1}$$

$P\ sale\ Growth_{i,t}$ is sales growth in previous year calculated as follows:

$$PsaleGrowth_{i,t} = \frac{Sale_{i,t-1} - Sale_{i,t-2}}{Sale_{i,t-2}}$$

To test first hypothesis, the model number 1 is used. According to this model, cash holdings value for constrained firms is determined by $(\beta_1 + \beta_2)$ and for unconstrained firms by β_1. However, the hypothesis is accepted when $\beta_1 + \beta_2 \geq \beta_1$. Deference between constrained and unconstrained firms is determined by β_2. To test second hypothesis, the model number 4 is applied. If γ_1 is positive, hypothesis is accepted. In testing third hypothesis, model number 3 is used and cash holdings variations in constrained firms are determined by $(\lambda_1 + \lambda_2)$ and for unconstrained firms by λ_1. The hypothesis is accepted when $\lambda_1 + \lambda_2 \geq \lambda_1$. Differences in producing abnormal returns in constrained and unconstrained firms are explained by λ_2.

EMPIRICAL RESULTS

First hypothesis test

According to the results of KZ index, our hypothesis is accepted. In other words, cash holdings in constrained firms result in more value adding than in unconstrained firms. These results are shown in Table 1.

According to the results of KZ_{IR} index, our hypothesis is accepted. In other words, cash holdings in constrained firms result in more value adding than unconstrained firms. These results are shown in Table 2.

Concerning to the results of WW index, our hypothesis is rejected. In other words, cash holdings in constrained firms lead to less value adding than unconstrained firms. These results are shown in Table 3.

Robustness test for first hypothesis using second model

Taking the results of KZ index into account, our hypothesis is accepted. In other words, cash holdings in constrained firms drive in more value adding than unconstrained firms. These results are shown in Table 4.

With respect to the results of KZ_{IR} index, our hypothesis is accepted. In other words, cash holdings in constrained firms drive in more value adding than unconstrained firms. These results are shown in Table 5.

According to the results of WW index, our hypothesis is accepted. In other words, cash holdings in constrained firms lead to more value adding than unconstrained firms. These results are shown in Table 6.

Second hypothesis test

Respecting to results KZ index, our hypothesis is accepted. In other words, there is a positive relationship between cash holdings and investment. These results are

Table 1. Coefficient regression for KZ index in first hypothesis.

Model	Unstandardized coefficient		Standardized coefficient	t	Significance
	B	Standard error	Beta		
(Constant)	-0.370	0.661		-0.560	0.577
Cash	-0.667	0.663	-0.274	-1.005	0.058
Total debt	-0.347	0.111	-2.104	-3.124	0.003
Size	0.359	0.120	0.409	2.994	0.004
PPE	0.114	0.210	0.155	0.543	0.589
R and D to sale	0.678	0.809	0.080	0.837	0.405
EBIT	0.728	0.442	0.783	1.648	0.103
Dummy FC KZ	-0.190	0.115	-0.174	-1.643	0.105
Cash*D KZ	6.952	2.706	1.251	2.570	0.012

Table 2. Coefficient regression for KZ_{IR} index in first hypothesis.

Model	Unstandardized coefficient		Standardized coefficient	t	Significance
	B	Standard error	Beta		
(Constant)	0.430	0.602	-0.153	0.714	0.477
Cash	-0.371	0.593	-0.999	-0.627	0.053
Total debt	-0.165	0.114	0.288	-1.447	0.152
Size	0.253	0.108	0.262	2.347	0.022
PPE	0.192	0.184	0.036	1.044	0.300
R and D to sale	0.301	0.712	0.210	0.422	0.674
EBIT	0.195	0.426	-0.534	0.458	0.648
Dummy FC KZ	-0.582	0.104	0.492	-5.607	0.000
Cash*D KZ	2.736	2.756	-0.153	0.993	0.324

Table 3. Coefficient of regression for WW index in first hypothesis.

Model	Unstandardized coefficient		Standardized coefficient	t	Significance
	B	Standard error	Beta		
(Constant)	-2.667	0.753		-3.540	0.001
cash	-0.364	0.601	-0.150	-0.605	0.547
Total Debt	-0.090	0.049	-0.543	-1.848	0.068
Size	0.707	0.131	0.806	5.384	0.000
PPE	0.221	0.190	0.302	1.167	0.247
R and D to Sale	0.281	0.745	0.033	0.378	0.707
EBIT	-0.012	0.342	-0.013	-0.036	0.972
Dummy FC WW	0.603	0.148	0.553	4.067	0.000
cash*DWW	-1.941	9.185	-0.023	-0.211	0.833

shown in Table 7.

According to the results of KZ_{IR} index, our hypothesis is accepted. In other words, there is a positive relationship between cash holdings and investment. These results are shown in Table 8.

Taking the results of WW index into consideration, our hypothesis is accepted. In other words, cash holdings and investment have positive relationship. These results

are shown in Table 9.

Third hypothesis test

According to results KZ index, our hypothesis is rejected. In other words, cash holdings in constrained firms cause less excess return than unconstrained firms. These

Table 4. Coefficient regression for KZ index in first hypothesis.

Model	Unstandardized coefficient		Standardized coefficient	t	Significance
	B	Standard error	Beta		
(Constant)	-0.400	0.662		-0.604	0.548
Total debt	-0.192	0.070	-1.163	-2.758	0.007
Size	0.359	0.120	0.409	2.982	0.004
PPE	0.194	0.206	0.264	0.942	0.349
R and D to sale	0.726	0.807	0.086	0.899	0.371
EBIT	0.290	0.383	0.312	0.757	0.451
Abnormal cash	-0.922	1.349	-0.157	-0.684	0.496
Dummy FC KZ	-0.072	0.107	-0.066	-0.673	0.503
Abnormal Cash*D KZ	10.809	3.995	0.506	2.706	0.008

Table 5. Coefficient regression for KZ_{IR} index in first hypothesis.

Model	Unstandardized coefficient		Standardized coefficient	t	Significance
	B	Standard error	Beta		
(Constant)	0.391	0.600		0.653	0.516
Total debt	-0.106	0.064	-0.644	-1.666	0.100
Size	0.258	0.108	0.294	2.400	0.019
PPE	0.225	0.180	0.307	1.249	0.215
R and D to sale	0.319	0.709	0.038	0.450	0.654
EBIT	-0.010	0.344	-0.010	-0.028	0.978
Abnormal cash	-0.452	1.203	-0.077	-0.376	0.708
Dummy FC KZ_{IR}	-0.534	0.099	-0.490	-5.382	0.000
Abnormal Cash*D KZ_{IR}	4.757	3.607	0.224	1.319	0.191

Table 6. Coefficient of regression for WW index in first hypothesis.

Model	Unstandardized coefficient		Standardized coefficient	t	Significance
	B	Standard error	Beta		
(Constant)	-2.613	0.730		-3.578	0.001
Total debt	-0.092	0.052	-0.560	-1.780	0.079
Size	0.697	0.127	0.794	5.466	0.000
PPE	0.235	0.188	0.321	1.249	0.216
R and D to sale	0.299	0.744	0.035	0.402	0.689
EBIT	-0.067	0.323	-0.072	-0.206	0.837
Abnormal cash	-0.516	1.198	-0.088	-0.431	0.668
Dummy FC WW	0.584	0.125	0.535	4.662	0.000
Abnormal Cash*D WW	2.795	11.610	0.022	0.241	0.810

results are shown in Table 10.

Concerning to the results of KZ_{IR} index, our hypothesis is accepted. In other words, cash holdings in constrained firms drive in more excess return than unconstrained firms. These results are shown in Table 11.

According to the results of WW index, our hypothesis is accepted. In other words, cash holdings in constrained firms result in more excess return than unconstrained firms. These results are shown in Table 12.

RESULTS SUMMARY AND CONCLUSIONS

According to TOT theory, firms hold optimal level of cash holdings in order to determine cost and benefits of cash holdings, so cash holdings is important to the companies.

Table 7. Coefficient of regression for KZ index in second hypothesis.

Model	Unstandardized coefficient		Standardized coefficient	t	Significance
	B	Standard error	Beta		
(Constant)	0.045	0.077		0.583	0.562
Cash	0.291	0.049	0.202	5.882	0.000
Total debt	0.071	0.014	0.726	4.991	0.000
M/B	0.000	0.004	-0.002	-0.075	0.940
R and D to sale	0.034	0.098	0.007	0.345	0.731
Size	-0.011	0.014	-0.020	-0.746	0.458
PPEA	0.758	0.099	0.470	7.673	0.000
Cash flow	0.416	0.274	0.034	1.519	0.133
P sale growth	-0.001	0.003	-0.008	-0.394	0.695
Debt issue	0.304	0.059	0.322	5.182	0.000
PPE sale	-2.096	0.872	-0.096	-2.403	0.019
Cash flow*D KZ	0.415	0.592	0.016	0.701	0.485
Cash*D KZ	-2.099	0.334	-0.638	-6.287	0.000
Dummy FC KZ	0.031	0.014	0.049	2.177	0.033

Table 8. Coefficient of regression for KZ_{IR} index in second hypothesis.

Model	Unstandardized coefficient		Standardized coefficient	t	Significance
	B	Standard error	Beta		
(Constant)	0.049	0.072		0.681	0.498
Cash	0.251	0.049	0.174	5.162	0.000
Total debt	0.100	0.015	1.025	6.490	0.000
M/B	-0.003	0.004	-0.016	-0.724	0.471
R and D to sale	0.023	0.092	0.005	0.256	0.798
Size	-0.009	0.013	-0.018	-0.720	0.474
PPEA	0.749	0.091	0.465	8.268	0.000
Cash flow	0.112	0.656	0.009	0.170	0.865
P Sale growth	-0.001	0.003	-0.008	-0.467	0.642
Debt Issue	0.202	0.060	0.214	3.390	0.001
PPE sale	-2.435	0.821	-0.111	-2.964	0.004
Cash flow *D KZ_{IR}	0.430	0.692	0.033	0.621	0.537
Cash *D KZ_{IR}	0.021	0.016	0.033	1.359	0.178
Dummy FC KZ_{IR}	-2.666	0.353	-0.810	-7.549	0.000

Table 9. Coefficient of regression for WW index in second hypothesis.

Model	Unstandardized coefficient		Standardized coefficient	t	Significance
	B	Standard error	Beta		
(Constant)	0.073	0.132		0.550	0.584
Cash	0.458	0.054	0.318	8.546	0.000
Total debt	-0.004	0.010	-0.038	-0.385	0.701
M/B	0.000	0.005	-0.002	-0.081	0.936
R and D to sale	0.030	0.122	0.006	0.245	0.807
Size	-0.011	0.023	-0.021	-0.466	0.643
PPEA	0.550	0.116	0.341	4.754	0.000
Cash flow	0.257	0.625	0.021	0.411	0.682
P sale growth	-0.002	0.003	-0.014	-0.589	0.558

Table 9. Continued.

Debt Issue	0.485	0.065	0.514	7.488	0.000
PPE sale	-1.194	1.070	-0.055	-1.115	0.268
Cash flow *D WW	0.184	0.711	0.013	0.259	0.797
Cash *D WW	-0.341	1.560	-0.007	-0.218	0.828
Dummy FC WW	-0.017	0.026	-0.027	-0.666	0.508

Table 10. Coefficient of regression for KZ index in third hypothesis.

Model	Unstandardized coefficient		Standardized coefficient	t	Significance
	B	Standard error	Beta		
(Constant)	17.751	12.012		1.478	0.149
Δnon cash assets	45.414	9.111	1.682	4.984	0.000
EBITΔ	-3.803	4.400	-0.091	-0.864	0.393
R and DΔ	-0.870	0.958	-0.086	-0.908	0.370
ΔInterest expense	-19.894	6.648	-0.296	-2.993	0.005
Δdividend	9.933	5.225	0.205	1.901	0.066
Net finance	-221.115	67.563	-0.546	-3.273	0.002
Leverage	-17.416	17.771	-0.120	-0.980	0.334
$Cash_{i,t-1}$	-6.210	37.627	-0.035	-0.165	0.870
CashΔ	-13.549	7.745	-5.180	-1.749	0.089
ΔCash*$Cash_{i,t-1}$	12.825	52.028	0.055	0.247	0.807
Leverage*Δcash	12.649	11.600	3.182	1.090	0.283
ΔCash*D KZ	1.001	4.067	0.385	0.246	0.807
Dummy FC KZ	-3.658	8.292	-0.062	-0.441	0.662

Table 11. Coefficient of regression for KZ$_{IR}$ index in third hypothesis.

Model	Unstandardized coefficient		Standardized coefficient	t	Significance
	B	Standard error	Beta		
(Constant)	24.975	14.598		1.711	0.096
Δnon cash assets	46.732	9.122	1.731	5.123	0.000
ΔEBIT	-3.773	4.344	-0.091	-0.869	0.391
ΔR and D	-0.723	0.952	-0.071	-0.759	0.453
ΔInterest expense	-19.568	6.595	-0.291	-2.967	0.005
Δdividend	11.160	5.252	0.230	2.125	0.041
Net finance	-231.636	63.358	-0.572	-3.656	0.001
Leverage	-31.396	19.405	-0.216	-1.618	0.115
$Cash_{i,t-1}$	-14.807	36.685	-0.084	-0.404	0.689
CashΔ	25.838	16.482	-9.878	-1.568	0.126
ΔCash*$Cash_{i,t-1}$	38.029	51.626	0.163	0.737	0.466
Leverage*Δcash	29.477	21.402	7.415	1.377	0.177
ΔCash*D KZ$_{IR}$	2.163	2.596	0.803	0.833	0.410
Dummy FC KZ$_{IR}$	-0.757	6.746	-0.013	-0.112	0.911

With respect to the first hypothesis, we found that cash holdings in constrained firms causes more value adding than unconstrained firms. This result is consistent with Denis and Sibilkov (2007). Results of the second hypothesis are consistent with Lyandres (2005) and Pawlina and Renneboog (2005). Results of the third hypothesis are consistent with Dang Me Llee (2010).

We proposed three hypotheses in this study. According

Table 12. Coefficient of regression for WW index in third hypothesis.

Model	Unstandardized coefficient		Standardized coefficient	t	Significance
	B	Standard error	Beta		
(Constant)	15.591	13.348		1.168	0.251
Δnon cash assets	45.439	8.947	1.683	5.079	0.000
ΔEBIT	-4.276	4.161	-0.103	-1.028	0.311
ΔR and D	-0.847	0.950	-0.084	-0.892	0.379
ΔInterest expense	-18.584	6.935	-0.277	-2.680	0.011
Δdividend	9.689	5.142	0.200	1.884	0.068
Net finance	-221.551	69.421	-0.547	-3.191	0.003
Leverage	-18.670	16.146	-0.128	-1.156	0.256
$Cash_{i,t-1}$	-8.730	36.589	-0.049	-0.239	0.813
CashΔ	12.842	7.757	-4.910	-1.656	0.107
$\Delta Cash * Cash_{i,t-1}$	22.376	51.129	0.096	0.438	0.664
Leverage*Δcash	10.754	12.159	2.705	0.884	0.383
ΔCash*D WW	1.441	3.920	0.554	0.368	0.716
Dummy FC WW	1.625	6.866	0.028	0.237	0.814

to the first hypothesis results which accepted cash holdings in constrained firms result in more value adding than unconstrained firms. According to second hypothesis results which accepted cash holdings and investment have positive relationship. According to third hypothesis results which accepted cash holdings in constrained firms drive in more excess return in constrained firms than unconstrained firms.

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