

## Industry Structure, Growth Opportunity and the Value of Cash Holding

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**Abstract:** One of the most important of managers' financial decisions is determining of cash holdings. Recent studies find that deviation from optimal cash holdings can decrease market value of company and its performance. This study investigates the effect of product market competition, relative profitability firm to its industry peers and growth opportunity on the value of cash holdings. The research hypotheses are tested in Tehran Stock Exchange (TSE) for the period of 2001-2012. Using multiple regression analysis, we find that the firms with higher relative profitability and higher growth opportunity have the higher value of cash holdings. Also, the value of cash holdings in firms in low product competition industries is more than other firms.

**Key words:** Industry structure, growth opportunity, firm size value of cash holding, optimal, cash holdings

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### INTRODUCTION

Cash flow as the one of the most important of working capital components always take into consideration of managers and investors. Cash holdings have benefits and problems for firms. Generally, theoretical literature mentions three motivates for cash holdings. These motivates are transaction cost, precautionary and speculative motives. Transaction cost motivates relate to conversion cost of non-liquid assets to cash and expensive cost of external financing. Because based on pecking order theory, financing from internal sources is cheaper than external financing. Precautionary motives refer to hold liquid assets to face with unexpected volatility cash; otherwise, the firm will be imposed the costs of premature financing. Speculative motives related to hold some cash to take advantage of investment opportunities (Shah, 2011). Each of these motivations depending on firm status and the condition of stock market encourages the firms to hold more or less cash. For example growth opportunity and prefer to internal finance are the samples of transaction cost and precautionary motives. Also, according to transaction cost motives, larger firms because of ready access to financing need to lower cash holdings (Oler and Picconi, 2010). In this regard, Opler *et al.* (1999) find large firms and firms with high credit ratings hold lower cash. Holding more cash with increasing uncertainty of cash flows is the sample of speculative motives (Oler and Picconi, 2010). Lee and Powell (2011) indicate that cash holdings are positively related to growth options, cash flow volatility, investment opportunities and financing cash flows.

Ginglinger and Saddour examine the effect of quality of governance and financial constraints on cash holdings. They find that governance quality has a positively related to cash holdings of firms with financially constrain. Furthermore, risk aversion managers tend to hold more liquid assets and versus too investments and leverages (due to payment the large amounts of installments and increase the supervision of creditors and decrease the agency problem) lead to decline the cash holdings.

Agency problem causes the managers store cash for own objectives instead paying out dividends to shareholders. They may accept value-reducing investments. Therefore, with increasing one dollar to the firm's cash holdings, its value increases less than one dollar. In this regard, Lee and Powell (2011) find that the marginal value of persistent excess cash decreases. Oler and Picconi (2010) addresses the question whether deviation from optimal cash holdings decrease future performance. Their results indicate that in both firms holding insufficient cash and firms holding excess cash, their future performance and stock returns are suffered. Sharifi *et al.* (2013) report the negative effect of excess cash holding on firm value. However, it seems that some factors such as industry structure can affect the value of cash holdings. Relative profitability firm to its industry peers is one of these factors. More profitable firms because of their potential ability to using cash for profitable project, the marginal value of excess cash are suffered less. Also, when the firms have more growth opportunity can invest in optimal project and increase the wealth of investors. Saddour (2006) studies the determinants of the cash holdings. His results indicate

that in growth companies cash holdings levels are higher than mature companies. Pinkowitz and Williamson (2002) examine the relation of investment opportunity and value of cash holding. They find that investment opportunities affect the value shareholders place on cash holdings. Product market competition is another factor can impact motives of cash holdings and the marginal value of cash. Morellec *et al.* (2014) show the competitive pressure increases the corporate cash holdings.

The main purpose of this study is studying the role of product market competition, relative profitability firm to its industry peers, growth opportunity and firm size on the value of cash holdings. Therefore, this study contribute to the existing literature about cash holdings and reaction of stock market to structure of firm asset by using observation of firms listed in Tehran Stock Exchange (TSE). Also, the effect of industry structure on the value of cash holdings is investigated. This can provide additional insight for financing literature in stock market of developing countries.

This study seeks to provide answer these questions: First what is the role of relative profitability firm to its industry peers on the value of cash holdings? Second can the product market competition affect the value of cash holdings? Third what are the role of growth opportunity and firm size on the value of cash holdings?

**Literature review:** In this study, we examine the research several which issue recently about the value of cash holding and the variables such as competition, industry structure and growth opportunity can effect on the value of cash holding as following:

Morellec *et al.* (2014) explore the competition, cash holding and financing decisions in U.S firms in during the period 1980-2007. The results indicate that the effects of product market competition on cash holding and financing decision are stronger for small firms and when financial constraints are more sever. Also, they found the competition variable than other variables (such as cash flow volatility) have a more impact on cash holding.

Azmat (2014) investigate the relationship between firm value and cash holding in the Pakistan firms during the period 2003-2008. The results indicate that firm value and cash holding have a concave relationship. Also, he found that break the level of optimal cash holding affect firm value negatively.

Chan *et al.* (2013) examine the effect of financial constraints, investment policy, product market competition and corporate governance on the value of cash holdings in Australian firms from 1990-2007. The sample includes 1108 individual firms. They employ the Faulkeder and Wang Model to test of hypothesis. The

results show that the marginal value of cash holding is decrease with larger cash holding and higher leverage. Also, the results indicate that firms that have more financially constrained, higher growth rates and greater uncertainty present a higher marginal value of cash holdings but they have evidence that the product market competition has little impact on the value of cash holdings.

Alimov (2014) investigate the product market competition and value of corporate cash in US firms during the period 1971-2006. The results indicate that investors take a higher value on cash holding for firms which the competition is intense. Also for firms have financial constrained and confront to risk of decrease in investment opportunities, the effect of competition on the value of cash holding is great.

Lee and Powell (2011) explore the excess cash holding and shareholder value in Australia capital market during the period 1980- 2007. The final sample consists of 5876 firm-years. They found that marginal value of cash declines with larger cash balance and the longer firms hold on to excess cash.

Hao *et al.* (2011) examine the relative firm profitability and stock return sensitivity to industry level news. The research period is 1973-2004. The results show that the returns of less profitable firms than other firms are more sensitive to industry level news. Also, they found that when the news of industry is negative, the reverse relation between relative profitability and return sensitivity is reveal.

Fresard (2010) empirically studies the effect corporate cash holdings on product market decision in US intra-industry. The research period is 1971-2005. The results indicate that cash holding strategically influence product market outcomes. They found that larger relative to rivals cash reserves lead to systematic future market share gains that obtain at the expense of industry rivals.

## **MATERIALS AND METHODS**

**Hypothesis development:** Cash holdings have many benefits such as low cost finance ability to face with possible events, financial flexibility and avoid high costs of external finance (Baum *et al.*, 2004). However, it can lead to some problems. For example agency problems causes the managers hold more cash and invest to suboptimal projects (Oler and Picconi, 2010). This ultimately decrease the shareholder returns. Therefore, the investors don't relying on managers and with increasing cash holding over than optimal amount, value of cash holding is mitigated.

In the research priors such as Hao *et al.* (2011) reveal that relative firm profitability and stock return sensitivity to industry level news. High profitable firms in industry can implement the profitable project. Hence, firms with highly relative profitability in industry are more likely to hoard more cash reserves because of buffer for their future liquidity needs. Harford *et al.* (2012) show that the firms with longer investor horizons and profitable, the marginal value of their excess cash increases. It seems that with increasing relative profitability, value of cash holdings increases. So, the first hypothesis is explained as follow:

- H<sub>1</sub>: Value of cash holdings in firms with higher relative profitability to its industry peers is more than other firms

The firms can use the growth opportunities if the fund is available for investment. Consequently, firms which facing to the growth opportunities are likely to hold more cash (Opler *et al.*, 1999). In capital market investor percepts that for firms with more cash have a more value because of their can invest in the growth opportunities. So, the second hypothesis is explained as follow:

- H<sub>2</sub>: Value of cash holdings in firms with higher growth opportunity is more than other firms

The firms have experienced a significant increase in the level of competition because of industry deregulation, technological progress, globalization of business activity and reductions in trade barriers (Alimov, 2014). In the prior studies such as Fresard (2010) and Alimov (2014) reports that product market competition affects on the firm financial and investment choices. The product market competition can affect the value of cash holding by enhance the need for cash because of volatility in the future cash flow of firm, defend against possible predatory activities of rivals and reducing managerial agency cost (Alimov, 2014). It seems that with increasing product market competition, value of cash holdings increases. So, the third hypothesis is explained as follow:

- H<sub>3</sub>: Value of cash holdings in firms with higher competition is more than other firms

**Sample selection:** Our sample covers companies listed in Tehran Stock Exchange (TSE) across the period from 2001 -2012. The sample selection criteria are:

- The end of fiscal year is March 2001
- The end of fiscal year aren't change over the period of 2001-2011

- Their basic operations aren't investment, insurance and banking
- Book value of assets aren't negative
- Data is available in this period

Given to above criteria, final sample included 111 firms.

**Research design:** In order to test the research hypotheses, the regression model 1 with pooled data are estimated two times for each hypotheses:

$$\frac{MV_{it}}{MV_{it-1}} = \alpha_0 + \alpha_1 \frac{\Delta cash_{it}}{MV_{it-1}} + \alpha_2 \frac{\Delta OI_{it}}{MV_{it-1}} + \alpha_3 \frac{\Delta NA_{it}}{MV_{it-1}} + \alpha_4 \frac{\Delta I_{it}}{MV_{it-1}} + \alpha_5 \frac{\Delta DPS_{it}}{MV_{it-1}} + \alpha_6 LEV_{it} + \alpha_7 \frac{\Delta NF_{it}}{MV_{it-1}} + \alpha_8 \frac{Cash_{it-1}}{MV_{it-1}} + \alpha_9 LEV_{it} \times \frac{\Delta Cash_{it}}{MV_{it-1}} + \varepsilon_{it}$$

Where:

MV = The market value of equity

Cash = The cash balance

Δcash = The change in cash scaled by market value of equity at the beginning of the year

ΔOI = The change in operating income is the change in non-cash assets

ΔI = The change in interest expense is the change in dividend

LEV = The financial leverage that is determined by ratio of total debt to total assets

ΔNA = The net changes in total financing cash flows

In order to examine the role of relative profitability on the value shareholders place on cash holdings, first, total data in terms of relative profitability firm to its industry peers partition in two groups and then model 1 is estimated separately for each group. Relative profitability calculates as follows:

$$RPROF = 1 - \frac{ROA - Rank}{Number - Firm}$$

Where:

RPRO = The ranking of firm profitability in its industry

ROA-rank = The ranking of firm in terms of ROA between the other firms in the same industry and Number-Firm is the number of firms in its indust

For investigate the effect of growth opportunity on the value of cash holdings, total data are sorted in terms of book-to-market ratios as the index of growth opportunity and therefore grouped in two parts. Then, model 1 is estimated separately both group of firms with high and low growth opportunity.

Finally in order to examine the role of competitive pressure on the value of cash holdings, model 1 is estimated twice for firms in high and low competitive industries. Competition is calculated by Herfindahl-Hirschman index:

$$HH = \sum_{i=1}^n \left( \frac{\text{Sales} - \text{Firm}_i}{\text{Sales} - \text{Industry}_i} \right)^2$$

Herfindahl-Hirschman index indicate the concentration of industry. Therefore with decreasing this index, competition increases.

## RESULTS AND DISCUSSION

Descriptive statistics of the variables are showed in Table 1. All the variables except leverage, ranking of firm profitability and Herfindahl-Hirschman index are divided by market value of equity at the beginning of the year.

As mentioned in research design in order to test the hypotheses, first total data respectively partition in terms of relative profitability, growth opportunity and product market competition and then model 1 is estimated separately for each group. For interpret the results, the mean of variables are needed. These are provided in Table 2.

The first hypothesis refers the role of relative profitability on the value of cash holdings. The results of the examination of this hypothesis are showed in Table 3. The coefficients of the change in cash for high and low relative profitability groups, respectively are 3.356 and 1.603 and significant. For determining how is the marginal value of cash holdings in two groups, coefficients of change in cash and its interaction to other variables should be considered. The marginal value of cash holdings calculated as followed:

The coefficients of change in cash+  
(Coefficients of interaction of change  
in cash to leverage×Mean of leverage)

Therefore, the marginal value of cash holdings for high and low relative profitability groups, respectively are  $(3.356 + (-9.639 \times 0.197) = 1.457)$  and  $(1.603 + (-1.993 \times 0.317) = 0.97)$ . These results indicate the marginal value of cash holdings in high relative profitability firms to its industry peers is more than the firms with low relative profitability.

In order to examine whether the growth opportunities affect the value shareholders place on cash holdings, model 1 is estimated for the firms have high and growth opportunity separately are reflected in Table 4. The coefficients of the change in cash for high and low growth opportunities groups respectively are 3.051 and 0.621 and significant. As the above equation, the marginal values of cash holdings for these firms are  $(3.051 + (-4.315 \times 0.236) = 2.032)$  and  $(0.691 + (-0.47 \times 0.29) = 0.48)$ . Based on these results, value of cash holdings in firms with higher growth opportunity is more than firms with lower growth opportunity.

Table 5 shows the results obtained from testing the third hypothesis which investigates the effect of competition on the value of cash holdings. The coefficients of the change in cash for firms with high and low competitive pressure respectively are 1.968 and 2.644 and significant. The marginal values of cash holdings for firms have high and low competition separately are  $(1.968 + (-4.131 \times 0.254) = 0.91)$  and  $(2.644 + (-3.555 \times 0.26) = 1.719)$ . Therefore, the value of cash holdings in firms with low competition is more than other firms.

Table 1: Descriptive statistics of variables for total data

Variables	Mean	Median	SD
MV	1.254	1.019	0.890
Cash	0.079	0.043	0.143
ΔCash	0.014	0.003	0.152
ΔOI	0.036	0.019	0.233
ΔNA	0.285	0.169	0.684
ΔI	0.019	0.005	0.210
ΔDPS	0.014	0.000	0.130
LEV	0.258	0.235	0.168
ΔNF	-0.001	0.000	0.399
RPROF	0.519	0.512	0.279
HH	0.142	0.086	0.152
Book to market	0.666	0.535	0.672

Table 2: The mean of variables separately for each group

Variables	High relative profitability	Low relative profitability	High growth opportunity	Low growth opportunity	High market competition	Low market competition
MV	1.370	1.142	1.006	1.419	1.198	1.345
Cash	0.063	0.094	0.108	0.060	0.062	0.107
ΔCash	0.015	0.015	0.018	0.013	0.012	0.019
ΔOI	0.066	0.007	0.025	0.044	0.035	0.039
ΔNA	0.253	0.317	0.347	0.244	0.294	0.272
ΔI	0.008	0.032	0.022	0.018	0.013	0.031
ΔDPS	0.032	-0.003	0.005	0.020	0.013	0.016
LEV	0.197	0.317	0.291	0.237	0.257	0.260
ΔNF	0.006	-0.008	-0.048	0.030	0.006	-0.013

Table 3: Regression results for effect of relative profitability on the value of cash holdings

Variables	Coefficients (t-statistics) relative profitability	
	High	Low
$\Delta \text{cash}_{it}$	3.356* (3.61)	1.603* (3.55)
$\Delta \text{OI}_{it}$	1.672* (8.07)	0.511* (4.44)
$\Delta \text{NA}_{it}$	0.519* (5.63)	0.193* (5.35)
$\Delta I_{it}$	-0.876 (-1.51)	0.377* (3.24)
$\Delta \text{DPS}_{it}$	1.390* (5.09)	1.347* (5.80)
$\text{LEV}_{it}$	-0.621* (-2.40)	-0.631* (-3.54)
$\Delta \text{NF}_{it}$	-0.116 (-0.99)	0.174* (2.66)
$\text{Cash}_{it-1}$	0.741 (1.75)	0.988* (5.32)
$\text{LEV}_{it} \times \Delta \text{cash}_{it}$	-9.639* (-3)	-1.993* (-2.51)
F-statistics (p-value)	32.64 (0.000)	21.62 (0.000)
Adjusted R <sup>2</sup>	0.344	0.254

Table 4: Regression results for effect of growth opportunities on the value of cash holdings

Variables	Coefficients (t-statistics) growth opportunity	
	High	Low
$\Delta \text{cash}_{it}$	3.051* (4.19)	0.621* (1.97)
$\Delta \text{OI}_{it}$	1.075* (7.81)	0.286* (2.70)
$\Delta \text{NA}_{it}$	0.398* (6.45)	0.145* (5.24)
$\Delta I_{it}$	1.318* (4.78)	0.008 (0.09)
$\Delta \text{DPS}_{it}$	1.714* (7.21)	0.713* (3.71)
$\text{LEV}_{it}$	-0.934* (-4.76)	-0.218 (-1.52)
$\Delta \text{NF}_{it}$	0.267* (2.27)	-0.041 (-0.91)
$\text{Cash}_{it-1}$	1.997* (6.59)	0.464* (3.14)
$\text{LEV}_{it} \times \Delta \text{cash}_{it}$	-4.316* (-2.05)	-0.471 (-0.87)
F-statistics (p-value)	51.88 (0.000)	8.26 (0.000)
Adjusted R <sup>2</sup>	0.412	0.131

Table 5: Regression results for effect of product market competition on the value of cash holdings

Variables	Coefficients (t-statistics) market competition	
	High	Low
$\Delta \text{cash}_{it}$	1.968* (3.14)	2.644* (3.50)
$\Delta \text{OI}_{it}$	0.931* (6.44)	0.963* (6.09)
$\Delta \text{NA}_{it}$	0.176* (4.25)	0.297* (4.71)
$\Delta I_{it}$	0.285 (1.43)	0.345* (1.96)
$\Delta \text{DPS}_{it}$	1.56* (6.57)	1.552* (5.42)
$\text{LEV}_{it}$	-0.498* (-3.24)	-0.875* (-3.13)
$\Delta \text{NF}_{it}$	0.021 (0.27)	0.131 (1.39)
$\text{Cash}_{it-1}$	1.368* (4.73)	0.737* (2.70)
$\text{LEV}_{it}$	-4.131 (-1.90)	-3.556* (-2.84)
F-statistics (p-value)	25.39 (0.000)	20.68 (0.000)
Adjusted R <sup>2</sup>	0.245	0.301

$$\frac{\text{MV}_{it}}{\text{MV}_{it-1}} = \alpha_0 + \alpha_1 \frac{\Delta \text{cash}_{it}}{\text{MV}_{it-1}} + \alpha_2 \frac{\Delta \text{OI}_{it}}{\text{MV}_{it-1}} + \alpha_3 \frac{\Delta \text{NA}_{it}}{\text{MV}_{it-1}} + \alpha_4 \frac{\Delta I_{it}}{\text{MV}_{it-1}} + \alpha_5 \frac{\Delta \text{DPS}_{it}}{\text{MV}_{it-1}} + \alpha_6 \text{LEV}_{it} + \alpha_7 \frac{\Delta \text{NF}_{it}}{\text{MV}_{it-1}} + \alpha_8 \frac{\text{Cash}_{it-1}}{\text{MV}_{it-1}} + \alpha_9 \text{LEV}_{it} \times \frac{\Delta \text{cash}_{it}}{\text{MV}_{it-1}} + \epsilon_{it}; * \text{Significant at } 5\%$$

## CONCLUSION

In years ago, cash holdings have a zero Net Present Value (NPV) investments. As a result, one dollar of cash should increase the market value of the firm = 1\$. This notion is true when capital market is perfect. But, this subject may be not hold because of the capital markets is imperfect. Therefore, 1 dollar of cash held by a firm may be valued at more or <1 dollar by investors. Previous research report the deviation from optimal cash holdings

may decline the market firm value. Because in presence of agency problems, it may that managers hold more cash for own personal interests. This can suffer the investors' wealth. Therefore, the market reactions negatively to holding excess cash. It seems that some factors can affect the marginal value of cash holdings. For example industry structure and growth opportunity are some of these factors. This study provides empirical evidence to demonstrate the role of relative profitability firm to its industry peers, growth opportunity and product market competition on the value of cash holding in capital market context.

The results indicate that the value shareholders place on cash holdings for firms with higher relative profitability to its industry peers is more than other firms. These results are consistent with the notion and show because of ability of profitable firms to use cash efficiently, value of cash holding doesn't decrease. The other result of this research is that growth opportunities have positive effect on the marginal value of cash holdings. These results is consistent with the result of Faulkender and Wang, Pinkowitz and Williamson (2002), Lee and Powell (2011) and Saddour (2006). Finally, the results show that product market competition has negative effect on the value of cash held by firms. This isn't consistent with the notions. It seems that the main reason of this result is inefficiency of corporate governance to decline the agency problems. The other reason is the imperfect competition in Tehran Stock Exchange. These results is consistent with Chan *et al.* (2013) and against to Morellec *et al.* (2014) and Alimov (2014).

Generally, the results of this study reveals that holding excess cash by firms in the special condition can improve the stock price and shareholders' wealth. That is apart from the agency problem, the other factors such as firms' features, profitability firm and industry features can impact the marginal value of cash holdings.

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