



Relationship between Efficiency Level of Working Capital Management and Return on Total Assets in Ise

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Abstract

In our study we aimed to determine the relationship between efficiency level of firms being traded in ISE (Istanbul Stock Exchange) in working capital management and their return on total assets. We tried to explain the relationship between different indicators relating to efficiency in working capital management and their return on total assets through two models. According to the results in terms of both all the firms involved in the study and sectors there is a significance negative relationship between cash conversion cycle, net working capital level, current ratio, accounts receivable period, inventory period and return on total assets.

Keywords: Working capital management, Return on total assets, Panel data analysis

1. Introduction

Working capital means the whole current assets owned by a firm. Net working capital is the sum when short term liabilities are extracted from current assets. Return of total assets of a firm as a result of an activity is closely related to level and distribution of assets of the firm and efficiency in application of these assets. In lots of firms current assets called working capital make up of a remarkable part of community assets. (Note 1) But it is obvious that working capital is neglected in finance literature compared to long term financing decisions. Studies on corporate finance generally focus on main decisions like capital structure, dividend and capital budgeting. However, the amount of assets group a significant part of total asset and called working capital (money and quasi money, trade receivables, inventories and short term liabilities) is a focus matter in all main books relating to corporate finance where efficiency level of distribution and application of assets influence profitability and risk level of the firm.

The main objective of a firm is to increase the market value. Working capital management affects profitability of the firm, its risk, thus its value (Smith, 1980). In other words, efficient management of working capital is an important component of the general strategy aiming at increasing the market value (Howorth & Westhead, 2003; Deloof, 2003; Afza & Nazir, 2007). Since the flexibility of this group of assets is very high in terms of adapting to changing conditions, and due to these characteristics they can often be applied to realize the main objective of financial management through policy changes. Success of a firm mainly depends on efficient management capability of finance director to manage receivables, inventories and liabilities (Filbeck & Krueger, 2005). Firms can strengthen their funding capabilities or decrease the source cost reducing source amount they allocate to current assets.

The fundamental subject of working capital is to provide optimal balance between each element forming working capital. Most of the efforts of finance directors in a firm are the efforts they make to carry the balance between current assets not at optimal level and responsibilities to an optimal level (Lamberson, 1995). One reason for this is the decisive influence of current assets on others, another reasons is obligation of fulfillment of current responsibilities. The combination of the elements forming working capital change over time. Need for working capital influences liquidity level and profitability of a firm. As a result, it affects investment and financing decisions, too. Amount of current assets to be calculated at a level

where total cost is of a minimum degree means an optimum working capital level. The optimum working capital level is the case in which balance between risk and efficiency is provided. A quest for such balance requires a constant monitoring of the elements forming working capital.

2. Efficiency of Working Capital Management

In finance literature there is a common opinion about the importance of working capital management. Explanations about why working capital management is significant for a firm generally focus on the relationship between efficiency in working capital management and firm profitability. Efficient working capital management includes planning and controlling of current liabilities and assets in a way it avoids excessive investments in current assets and prevents from working with few current assets insufficient to fulfill the responsibilities. In relevant studies the measure taken as an indicator of efficiency in working capital management is usually cash conversion cycle. Cash conversion cycle for a firm is the period during which it is transited from money to good and again to money and this cycle can be demonstrated like in figure 1.

The more cash conversion cycle of the firm extends, the more financing is allocated to working capital (Deloof, 2003). Extension of cash conversion cycle can increase the sales, thus profits of the firm. But increasing need for working capital in parallel with the extension of cash conversion cycle brings together an additional financing cost. On this matter Kienschnick, LaPlante and Moussawi (2006), emphasized that an additional dollar invested in working capital would be less than a dollar, indeed.

In the studies conducted by Shin & Soenen (1998), Deloof (2003), Raheman & Nasr (2007) and Teruel & Solano (2007) it was concluded that there is a negative relationship between profitability of a firm and cash conversion cycle. Thus, it is possible to increase firm profitability through more efficient working capital management. To realize this, it is necessary that main elements of cash conversion cycle (short term trade liabilities, short term account receivables and inventories) should be managed in a way they maximize firm profitability. An efficient working capital management will increase free cash flows to the firm and growth opportunities and returns of stockholders.

Working capital level of a firm indicates that it wants to take a risk. The more working capital amounts, the lower liquidity risk and profitability become. Filbeck & Krueger (2005), stated that working capital policies of firms vary according to the sectors and within each sector it changes over time. Ganesan (2007), put forward that the firms in less competitive sectors focus on cash conversion minimizing receivables, while the firms in more competitive sectors have a relatively higher level of receivables. Lazaridis & Tryfonidis (2005), stated that small firms focus on inventory management, the firms with low profitability on credit management.

Statements in finance literature about the importance of working capital for firms are being once more emphasized in these turbulent days of global economies. While firms make efforts to increase return on assets in a way they pay their due obligations as late as possible and keep the cash, decreases in activity volume decreases the cash flow, too and this case increases the liquidity risk (Hofler, 2009). All these raise the importance of working capital. In the following part our study the practice section where the relationship between efficiency level of firms being traded in ISE in working capital management and their return on total asset is handled.

3. Data and Method

In our study, we tried to determine the relationship between the efficiency levels of working capital management of shares in ISE and their return on total asset. We carried out this study via 3 month-table data declared by 49 production firms being traded in ISE continually between 1993 and 2007. For the each firm involved in the study, data of 60 period based on 3 month-financial table for 15 years. The variables and calculation method are given in table 1.

We studied on two models to explain return on total asset of the firms through the indicators shown in table 1 and relating to working capital management. These models follow as:

Model (1)

$$RTA_{it} = \beta_{1it} + \beta_{2it}CCC_{2it} + \beta_{3it}DWC_{3it} + \beta_{4it}CR_{4it} + \beta_{5it}NWCL_{5it} + \varepsilon_t$$

Model (2)

$$RTA_{it} = \beta_{1it} + \beta_{2it}ARP_{2it} + \beta_{3it}APP_{3it} + \beta_{4it}AIP_{4it} + \beta_{5it}CR_{5it} + \beta_{6it}NWCL_{6it} + \varepsilon_t$$

In Model 1 we used return on total asset and cash conversion cycle, current ratio and net working capital as percentage of total asset. In Model 2 we tried to deal with the elements (account receivable period, inventory period and accounts payable period) of the findings about active cycle time in Model 1.

In both models above analysis was made with a data assessment method in a way steadiness of serials were tested in these models. When steadiness of serials were tested with Levin, Lin and Chu and IPS unit root tests, both data used for both models were found steady at significance levels of 5% and 10%. In the models where section data is used a problem of changing variance is likely to occur and this should not be ignored (Gujarati, 1999). Thus, for the changing variance

problem of Model 1 and Model 2 White estimator correction method was applied and applying Durbin-Watson values gained from the analysis, in the cases where autocorrelations were stated, autocorrelation problem was solved operating AR(1) process. Hausman test was conducted to determine if constant influences model or random influence model was to be applied.

4. Findings

The results for two models applied to 49 firms involved in our study are shown in table 2.a and table 2.b. It is obvious in that table that explanation power of Model 1 is 54%, while it is 60% for Model 2. The fact that return on total assets has a negative relationship with current ratio at a significant level, and a positive relationship with net working capital level at a significant level indicates if firms minimize resource allocation for net working capital, their return on total assets increase accordingly. This result emphasizes the positive relationship between liquidity risk and profitability in terms of relative highness of short term liabilities, thus confirming traditional risk relationship. In Model 1 it is obvious that there is a negative relationship between return on total assets, daily working capital and cash conversion cycle. According to this, when working capital level of the firms based on daily sales amount of them decreases and their cash conversion cycle becomes shorter, their return on total assets increases. According to the results of Model 2 we created to make the negative relationship between cash conversion cycle and return on total assets clear, two of the elements of conversion cycle (accounts payable period and inventory period) show a negative relationship with profitability at a significant level. (Note 2)

In the second step of the study, we discussed if there is a difference in sectors in terms of the relationship between efficiency level in working capital management and profitability. The firms involved in the study belong to the following sectors: White goods and Electronic:6, Cement:16, Food:6, Textile:7, Chemistry:14. The results about the sectors are demonstrated in table 3.a and table 3.b.

The results relating to the sectors are highly similar to the ones both for the models and the firms. There is not a significant relationship between cash conversion cycle and return on total assets in model 1 for chemistry sector. According to model 2, there is not a significant relationship between inventory period and return on total assets for textile sector.

Except for these two sectors about two models and these two variables, there is a big similarity between sectors in terms of the relationship between efficiency level in working capital and return on total assets.

5. Conclusion

The fact that the sales of firms have decreased and cash flows have slowed down in this global crisis emphasizes the importance of working capital management for financial decision- taking mechanisms. While obscurity for the future keeps firms away from steady capital investments, the only intervention area is likely to be the assets group called working capital in terms of increasing and preserving profitability, or intervening with decline.

With respect to these assets group, new applications as well as traditional applications should be developed to shorten the cash conversion cycle. Moreover it will be possible to maintain the capital resources allocated to working capital at minimum level by improving short term sources. In the study it is concluded that finance directors positively affect firm profitability through efficiency increase in management of this assets group.

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Notes

Note 1. The mean of current assets/total assets ratio is 58% for all the firms and this ratio at different sectors is as follows: 51% for Cement Sector, 56% for Food Sector, 69% for White goods and Electronic Sector, 62% for Chemistry Sector and 61% for Textile Sector.

Note 2. * means 5% significance level, ** means 10% significance.

Table 1. Variables and Calculation Methods

Variables	Symbol	Variables Name	Calculation Methods
RTA		Return on Total Assets	Net Term Profit/Total Assets
ARP		Accounts Receivable Period	365/(Net Sales/Short-Term Account Receivables)
APP		Accounts Payable Period	365/(Selling Cost/Accounts Payable)
AIP		Accounts Inventory Period	365/(Selling Cost/Inventories)
CR		Current Ratio	Current Assets/Current Liabilities
NWCL		Net Working Capital Level	(Current Assets – Current Liabilities)/Total Assets
CCC		Cash Conversion Cycle	(ARP+AIP)-APP
DWC		Daily Working Capital	(Receivables+Inventories)-Liabilities/Daily Sales

Table 2a. Relationship between Variables and Return on Total Assets: Model 1

Model 1			
Fixed Effects Model			
Variables	coefficient	t-value	p-value
DWC	-0.000203	-3.8366	0.0001*
CCC	-0.00044	-2.5258	0.0116*
CR	-0.026613	6.6071	0.0000*
NWCL	0.015314	1.6699	0.0959**
C(constant)	0.028376	1.8200	0.0689
AR(1)	0.642238	7.7853	0.0000
Adj. \bar{R}	0.541228		
F-statistic	65.32883		0.0000
Durbin-Watson	2.035881		
Hausman	26.911337		0.0000

Table 2b. Relationship between Variables and Return on Total Assets: Model 2

Model 2			
Fixed Effects Model			
Variables	coefficient	t-value	p-value
ARP	-0.000576	-3.3121	0.0009*
APP	0.000577	0.7602	0.4472
AIP	-0.000128	-10.341	0.0000*
CR	-0.022259	7.4454	0.0000*
NWCL	0.009321	1.4738	0.0957**
C(constant)	0.040905	2.9688	0.0030 *
AR(1)	0.671433	7.8473	0.0000 *
Adj. R^2	0.607737		
F-statistic	83.91675		0.0000
Durbin-Watson	2.057962		
Hausman	20.656462		0.009

Table 3a. Relationship between Variables and Return on Total Asset in Terms of Sectors: Model

Variables	White Goods and Electronic Sector			Cement Sector			Food Sector			Chemistry Sector			Textile Sector		
	Fixed Effects Model			Fixed Effects Model			Random Effects Model			Random Effects Model			Random Effects Model		
	coefficient	t-value	p-value	coefficient	t-value	p-value	coefficient	t-value	p-value	coefficient	t-value	p-value	coefficient	t-value	p-value
DWC	-0.00010	2.221	0.026*	-0.00021	-2.305	0.021*	-0.00083	-1.991	0.047*	-0.00023	-2.800	0.005*	-0.00011	-1.917	0.050*
CCC	-0.00015	-8.796	0.000*	-0.00010	-5.306	0.000*	-0.00020	-2.333	0.020*	-0.00082	-0.925	0.355	-0.00037	-2.455	0.014*
CR	-0.02575	-3.393	0.0008*	0.000307	1.128	0.259	-0.02382	-3.263	0.001*	-0.03014	-4.212	0.000*	-0.01533	-4.356	0.000*
NWCL	0.32388	4.019	0.0001*	0.39048	8.986	0.000*	0.37890	9.404	0.000*	0.48276	8.060	0.000*	0.36130	8.900	0.000*
C(constant)	0.03215	1.599	0.110	0.02820	1.833	0.067	0.02955	2.875	0.004	0.02511	2.018	0.043	0.01260	1.117	0.264
AR(1)	0.71181	9.278	0.000	0.65303	9.806	0.000									
Adj. R^2	0.66395			0.66912			0.37298			0.40781			0.28552		
F-statistic	70.7458		0.000	111.833		0.000	54.3894		0.000	145.447		0.000	42.8615		0.000
D.Watson	1.87818			2.11110			1.59887			1.66283			1.42769		
Hausman	25.55242		0.000	10.8127		0.028	4.69959		0.319	1.51131		0.824	5.71446		0.221

Table 3b. Relationship between Variables and Return on Total Asset in Terms of Sectors: Model 2

Variables	White Goods and Electronic Sector			Cement Sector			Food Sector			Chemistry Sector			Textile Sector		
	Fixed Effects Model			Fixed Effects Model			Random Effects Model			Random Effects Model			Random Effects Model		
	coefficient	t-value	p-value	coefficient	t-value	p-value	coefficient	t-value	p-value	coefficient	t-value	p-value	coefficient	t-value	p-value
ARP	-0.0010	-2.341	0.019*	-0.0009	-5.467	0.000*	-0.0005	-3.313	0.001*	-0.0012	-5.948	0.000*	-0.0009	-5.068	0.000*
APP	0.00085	3.064	0.002*	0.00044	1.6123	0.107	0.00015	1.876	0.061**	0.00077	0.250	0.802	-0.00016	-0.685	0.493
AIP	-0.0016	-4.605	0.000*	-0.00012	-8.522	0.000*	-0.0004	-1.930	0.054**	-0.00086	-3.304	0.0001*	-0.00022	-1.185	0.236
CR	-0.02654	-3.517	0.000*	-0.00285	1.0186	0.068**	-0.02367	-3.002	0.002*	-0.03678	-5.367	0.000*	-0.01604	-4.657	0.000*
NWC L	0.31391	3.9160	0.000	0.35259	7.7631	0.000*	0.37017	8.926	0.000*	0.47894	8.429	0.000*	0.35399	9.5767	0.000*
C(constant)	0.05009	2.7410	0.006	0.02664	1.8407	0.0660	0.03390	3.069	0.002	0.04844	3.654	0.003	0.01603	0.8404	0.401
AR(1)	0.71292	8.8145	0.000	0.64820	8.7774	0.0000									
Adj. R ²	0.66882			0.67768			0.38970			0.45725			0.31493		
F-statistic	65.8095		0.000	95.4134		0.000	46.8472		0.000	142.368		0.000	39.5243		0.000
D.Watson	1.87058			2.00144			1.58943			1.89224			1.48058		
Hausman	16.3766		0.005	12.43092		0.029	6.97064		0.222	1.69410		0.889	1.03548		0.959

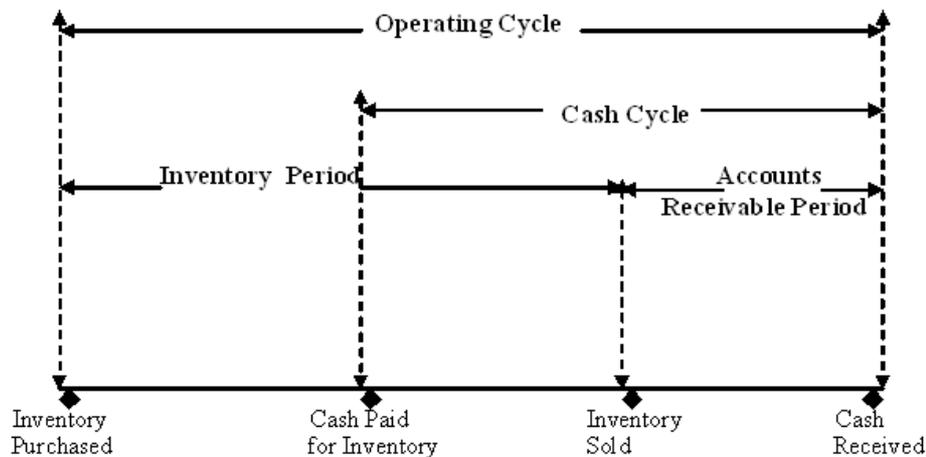


Figure 1. Cash Flow Time Line and the Short-Term Operating Activities of a Firm
 (Ross, Westerfield & Jordan, 2003, p. 643)