



INTERNATIONAL JOURNAL OF RESEARCH IN COMPUTER APPLICATION AND MANAGEMENT

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MANAGEMENT OF DETERMINANTS OF WORKING CAPITAL – AN UPHILL TASK

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ABSTRACT

An efficient control over the working capital is one of the most important considerations of the financial management of any business undertaking. Working capital is an integral part of the total financial management. Management of current assets is called as working capital. Management of short-term assets and liabilities warrants a careful investigation since the working capital management plays an important role for the firm's profitability and risk as well as its value (Smith 1980). The optimal level of working capital is determined to a large extent by the methods adopted for the management of current assets and liabilities. It requires continuous monitoring to maintain proper level in various components of working capital i.e. cash receivables, inventory and payables etc. The present study investigates the relative relationship between the aggressive/conservative working capital policies and profitability as well as risk of firms for 28 public limited companies listed at Bombay Stock Exchange for the period of 2002-2009. The present study validates the findings of Carpenter and Johnson (1983) that there is no relationship between the level of current assets and liabilities and risk of the firms.

KEYWORDS

Degree of aggressiveness/conservativeness, working capital policies, profitability, market rate of return, Tobin's q, operating risk, financial risk.

INTRODUCTION

The corporate finance literature has traditionally focused on the study of long-term financial decisions, particularly investments, capital structure, dividends or company valuation decisions. However, short-term assets and liabilities are important components of total assets and needs to be carefully analyzed. Management of these short-term assets and liabilities warrants careful investigation since the working capital management plays an important role for the firm's profitability and risk as well as its value (Smith, 1980). Efficient management of working capital is a fundamental part of the overall corporate strategy to create the shareholders' value. Firms try to keep an optimal level of working capital that maximizes their value. In general, from the perspective of Chief Financial Officer (CFO), Working capital management is simple and a straightforward concept of ensuring the ability of the organization to fund the difference between the short term assets and short term liabilities (Harris 2005). In practice, working capital management has become one of the most important issues in the organizations where many financial executives are struggling to identify the basic working capital drives and the appropriate level of working capital (Lamberson 1995). Consequently, companies can minimize risk and improve the overall performance by understanding the role and drivers of working capital.

A firm may adopt an aggressive working capital management policy with a low level of current assets as percentage of total assets or it may also use for the financing decisions of the firm in the form of high level of current liabilities as percentage of total liabilities. Excessive levels of current assets may have negative effect on the firm's profitability whereas a low level of current assets may lead to lower level of liquidity and stock outs resulting in difficulties in maintaining smooth operations (Van Horne and Wachowicz 2007). The main objective of working capital management is to maintain an optimal balance between each of the working capital components. Business success heavily depends on the ability of financial executive to effectively manage receivables, inventory, and payables (Filbeck and Krueger 2008). Firms can reduce their financing costs and/or increase the funds available for expansion projects by minimizing the amount of investment tied up in current assets. Most of the financial managers' time and effort are allocated in bringing non-optimal levels of current assets and liabilities back toward optimal levels. An optimal level of working capital would be the one in which a balance is achieved between risk and efficiency. It requires continuous monitoring to maintain proper level in various components of working capital i.e. cash receivables, inventory etc.

In general, current assets are considered as one of the important component of total assets of a firm. A firm may be able to reduce the investment in fixed assets by renting or leasing plant and machinery, whereas the same policy cannot be followed for the components of working capital. The high level of current assets may reduce the risk of liquidity associated with the opportunity cost of funds that may have been invested in long-term assets. The impact of working capital policies on profitability is highly important, however, a little empirical research has been carried out to examine this relationship. This paper investigates the potential relationship of aggressive/conservative policies with the accounting and market measures of profitability as well as the risk factor of Indian firms. The present study is expected to contribute to better understand these policies and their impact on profitability especially in the emerging markets like India.

REVIEW OF LITERATURE

Many researchers have studied financial ratios as a part of working capital management; however, very few of them have discussed the working capital policies in specific. Some earlier work by Gupta (1969) and Gupta and Huefner (1972) examined the differences in financial ratio averages between industries. The conclusion of both the studies was that differences do exist in mean profitability, activity, leverage and liquidity ratios amongst industry groups. Johnson (1970) extended this work by finding cross-sectional stability of ratio groupings for both retailers and primary manufacturers. Pinches et al. (1973) used factor analysis to develop seven classifications of ratios, and found that the classifications were stable over the 1951-1969 time periods. Chu et al. (1991) analyzed the hospital sectors to observe the difference of financial ratios groups between hospital sectors and industrial firms sectors. Their study concluded that financial ratios groups were significantly different from those of industrial firms' ratios as well these ratios were relatively stable over the five years period.

In literature, there is a long debate on the risk/return tradeoff between working capital policies (Pinches 1991, Brigham and Ehrhardt 2004, Moyer et. al. 2005, Gitman 2005). More aggressive working capital policies are associated with higher return and higher risk while conservative working capital policies are concerned with the lower risk and return. Working capital management is important because of its effects on the firm's profitability and risk, and consequently its value (Smith, 1980). Greater the investment in current assets, the lower the risk, but also the lower the profitability obtained. In contradiction, Carpenter & Johnson (1983) provided empirical evidence that there is no linear relationship between the level of current assets and revenue systematic risk of US firms; however, some indications of a possible non-linear relationship were found which were not highly statistically significant. For the first time, Soenen (1993) investigated the relationship between the net trade cycle as a measure of working capital and return on investment in U.S firm. The results of chi-square test indicated a negative relationship between the length of net trade cycle and return on assets. Furthermore, this inverse relationship between net trade cycle and return on assets was found different across industries depending on the type of industry. A significance relationship for about half of industries studied indicated that results might vary from industry to industry. Another aspect of working capital management has been analyzed by Lamberson (2005) who studied how small firms respond to changes in economic activities by changing their working capital positions and level of current assets and liabilities. Current ratio, current assets to total assets ratio and inventory to total assets and liabilities. Current ratio, current assets to total assets ratio were used as measure of working capital while index of annual average coincident economic indicator was used as a measure of economic activity. Contrary to the expectations, the study found that there is very small relationship between changes in economic conditions and changes in working capital. In order to validate the result found by Soenen (1993) on large sample and with longer time period, Jose et al. (1996) examined the relationship between aggressive working capital management and profitability of US firms using Cash Conversion Cycle (CCC) as a measure of working capital management where a shorter CCC represents the aggressiveness of working capital management. The results indicated a significant negative relationship between the cash conversion cycle and profitability indicating that more aggressive working capital management is associated with higher profitability. The current study further investigates the impact of the degree of aggressiveness of working capital policies on market measure of profitability.

RESEARCH DESIGN

The study used aggressive investment policy and aggressive investment policy as measuring variable of working capital management. **Aggressive Investment Policy (AIP)** results in minimal level of investment in current assets fixed assets. In contrast, a conservative investment policy places a greater proportion of capital in liquid assets with the opportunity cost of lesser profitability. In order to measure the degree of aggressiveness, following ratio will be used:

AIP= Total Current Assets / Total Assets

Where a lower ratio means a relatively aggressive policy.

Aggressive Financing Policy (AFP) utilizes higher levels of current liabilities and less long-term debt. In contrast, a conservative financing policy uses more long-term debt and capital. The degree of aggressiveness of a financing policy adopted by a firm will be measured by:

AFP= Total Current Liabilities / Total Assets

Where a higher ratio means a relatively aggressive policy.

The impact of working capital policies on the profitability will be analyzed through frequently used profitability measures i.e. Return on Assets (ROA) and Return on Equity (ROE) as well as market measure and Tobin's q by running cross-sectional regressions. The regression models to be estimated are:

ROA *it* = α + β1 (TCA/TA *it*) + β2 (TCL/TA *it*) + ε (1)

ROE *it* = α + β1 (TCA/TA *it*) + β2 (TCL/TA *it*) + ε (2)

Tobin's q *it* = α + β1 (TCA/TA *it*) + β2 (TCL/TA *it*) + ε (3)

Where:

- ROA *it* = Return on Assets of Firm *i* for time period *t*
- ROE *it* = Return on Equities of Firm *i* for time period *t*
- Tobin's q *it* = Value of q of Firm *i* for time period *t*
- TCA/TA *it* = Total Current Assets to Total Assets Ratio of Firm *i* for time period *t*
- TCL/TA *it* = Total Current Liabilities to Total Assets Ratio of Firm *i* for time period *t*
- α = intercept
- ε = error term of the model

The impact of the working capital assets management and financing policies on the relative risk will be measured by applying regression models for the risk of the company and its working capital management policies over the period of 2002-2009. The regression equations are:

SD sales_{*i*} = α + β1 (TCA/TA *i*) + β2 (TCL/TA *i*) + ε (4)

SD ROA_{*i*} = α + β1 (TCA/TA *i*) + β2 (TCL/TA *i*) + ε (5)

SD ROE_{*i*} = α + β1 (TCA/TA *i*) + β2 (TCL/TA *i*) + ε (6)

SDq_{*i*} = α + β1 (TCA/TA *i*) + β2 (TCL/TA *i*) + ε (7)

Where:

SD_{*i*} = Standard Deviation representing risk of Firm *i*

The study analyzes the working capital management practices and impact on profitability and risk of Indian Firms for the period of 2002 to 2009. The total population of the study is the all non-financial firms listed in Bombay Stock Exchange. As first step, 28 non-financial firms were selected whose financial data was available for the study period i.e. 2002-2009. The required financial data of these firms was obtained from the companies' annual reports and publications whereas the market prices data has been collected from the daily quotations of Bombay Stock Exchange (BSE).

STATISTICAL ANALYSIS

Equation (1) has been estimated for 28 non-financial firms for the period 2002-2009 and results are reported in Table 1. For each year, TCA/TA and TCL/TA ratios have been regressed against ROA values, and we have eight regression models indicating the impact of working capital policies on the profitability of firms in India. The model F-values and, we have eight regression models indicating the impact of working capital

policies on the profitability of firms in India. The model F-values and the Durbin-Watson statistics indicate overall best fit of the model. The t-statistics of both TCA/TA and TCL/TA are statistically significant at 1% level for ROA for all the years except for the year 2002 and 2009. The positive coefficient of TCA/TA shows a negative relationship between the degree of aggressiveness decreases, and return on assets goes up. Therefore, there is negative relationship between the relative degree of aggressiveness of working capital investment policies and return on assets. The negative value of β coefficient for TCL/TA also points out the same negative relationship between the aggressiveness of working capital financial policy and return on assets. Higher the TCL/TA ratio, more aggressive the financing policy, the yields negative return on assets.

TABLE 1: REGRESSION ANALYSIS OF WORKING CAPITAL POLICIES AND RETURN ON ASSETS (ROA)

Year	Investment Policy		Financing Policy		F-Value	Durbin- Watson
	β coefficient	t-value	β coefficient	t-value		
2002	0.14	1.766*	-0.208	-2.633***	3.608**	1.893
2003	0.427	5.859***	-0.451	-6.199***	24.202***	2.018
2004	0.424	5.643***	-0.38	-5.057***	18.989***	1.716
2005	0.398	5.579***	-0.303	-4.254***	17.719***	2.040
2006	0.324	4.623***	-0.412	-5.876***	20.156***	2.178
2007	0.441	6.885***	-0.405	-6.323***	33.2***	2.104
2008	0.189	2.351**	-0.294	-6.665***	6.819***	1.966
2009	0.585	8.694***	-0.582	-8.653***	49.409***	2.039

***Significant at 1% **Significant at 5% *Significant at 10%

The results of regression model (2) have been reported in Table 2, where the dependant variable is return on equity having the same independent variable of working capital investment policy and working capital financing policy. As the degree of aggressiveness of working capital policies tends to increase, the returns are likely to decrease. Though, the results are statistically less impressive which is apparent from the low level of significance of β coefficients and t-values, however, we can predict a negative relationship between the degree of aggressiveness of working capital policies and accounting measures of returns.

TABLE2: REGRESSION ANALYSIS OF WORKING CAPITAL POLICIES AND RETURN ON EQUITY (ROE)

Year	Investment Policy		Financing Policy		F-Value	Durbin-Watson
	β coefficient	t-value	β Coefficient	t-value		
2002	-0.069	-0.857	0.018	0.221	0.395	2.028
2003	0.345	4.55***	-0.352	-4.638***	14.023***	1.983
2004	0.279	3.506***	-0.161	-2.028**	6.173***	1.535
2005	0.072	0.946	-0.152	2.009**	4.000**	2.044
2006	0.183	2.424**	-0.051	-0.68	3.002*	1.977
2007	0.321	4.619***	-0.224	-3.216***	12.365***	2.021
2008	0.038	0.457	-0.107	-1.292	0.875	1.969
2009	0.135	1.694*	-0.259	-3.248***	5.273***	1.995

***Significant at 1% **Significant at 5% *Significant at 10%

To further validate the above-mentioned results, the impact of working capital investment and working capital financing policy has also been examined on the market returns. Tobin's q has been used as a measure of market returns and, for each year from 2002 to 2009. A q value of greater than 1 indicated the greater perceived value given by investor to the firm. The results of equation (3) have been presented in Table 3. The results reported in first panel of Table 3 are in accordance with results of Table 1 and Table 2 highlighting that the market returns on Tobin's q are decreasing as the firms are following the aggressive investment policy by keeping low level of current assets in the firm. This similarity in market and accounting returns confirms the notion that investors do not believe in the aggressive approach of working capital management, hence, they don't give any additional value to the firms in Bombay Stock Exchange. However, there are some dissimilarities are found in the relationship of financing policy and Tobin's q. In the year 2002 to 2006, the relationship between working capital financing policy and Tobin's q is positive, indicating that higher the degree of aggressiveness of working capital financing policy, the greater the investor's value given to the firm.

TABLE 3: REGRESSION ANALYSIS OF WORKING CAPITAL POLICIES AND TOBIN'S Q

Year	Investment Policy		Financing Policy		F-Value	Durbin-Watson
	β coefficient	t-value	β Coefficient	t-value		
2002	0.129	1.664*	0.19	2.456**	8.515***	1.913
2003	0.072	0.913	0.151	1.909**	4.190*	1.848
2004	0.075	0.935	0.123	1.526	3.223**	1.953
2005	0.097	1.298	0.205	2.754***	7.517***	1.862
2006	0.106	1.421	0.153	2.031**	5.153***	1.989
2007	0.191	2.646***	-0.111	-0.111	3.799**	2.016
2008	0.19	2.325**	-1.558	-1.558	2.769*	2.022
2009	0.22	2.732***	-1.836*	-1.836*	3.846**	2.053

***Significant at 1% **Significant at 5% *Significant at 10%

Finally, to empirically test the theory of Van-Horne and Wachowicz (2004), impact of working capital policies on risk of the firm have been investigated by regressing the ordinary least square regressions for equations 4-7. The risk is measured by the standard deviation of sales and different return measures as operating and financial risk respectively. The standard deviation has been estimated over the eight years from 2002 to 2009 and then four regressions have been run for working capital investment and working capital financing policy and result are

reported in Table 4. The positive β coefficients of SDsales, SDROA and SD Tobin's q indicate negative relationship between the risk measurements and the working capital investment policy. On the other hand, similar relationship has been found for the working capital financing policy. The increased variation in sale sales profitability is attributed to increasing the level of current assets and decreasing the level of current liabilities in the firm. However, these are not statistically significant except the Tobin's q. In general, there is no statistically significant relationship between the level of current assets and current liabilities and operating and financial risk of Indian firms.

TABLE 4: REGRESSION ANALYSIS OF WORKING CAPITAL POLICIES AND RISK

Year	Investment Policy		Financing Policy		F-Value	Durbin-Watson
	β coefficient	t-value	β Coefficient	t-value		
σ Sales	0.076	0.951	0.108	1.358	2.716*	1.624
σ ROA	0.129	1.608	-0.122	-1.522	1.633	2.094
σ ROE	-0.041	-0.505	0.066	0.818	0.34	2.031
σ Tobin's Q	0.159	1.99**	-0.067	-0.839	1.998	2.012

***Significant at 1%

**Significant at 5%

*Significant at 10%

Although, results of all return variables are significant, however, model (1) produced more broader and consistent results as compared to model (2) and (3) where F-value and β coefficients are highly significant. Market returns (Tobin's q) are slightly less significant in our study which is attributed to the more volatile stock market of India. The Bombay Stock Market is said to be heavily overvalued stock market, and hence, the results based on market share price data are more inconsistent.

CONCLUSION

The study investigated the relative relationship between the aggressive/conservative working capital policies for 28 public limited companies listed at Bombay Stock Exchange for a period of 2002-2009. The impact of aggressive/conservative working capital investment and financing policies has been examined through cross-sectional regression models between working capital policies and profitability as well as risk of the firms. We found a negative relationship between the profitability measure of firms and degree of aggressiveness of working capital investment and financing policies. The firms yield negative returns if they follow an aggressive working capital policy. These results are further validated by examining the impact of aggressive working capital policies on market measure of profitability which was not tested before. The results of Tobin's q were in line of the accounting measures of profitability and produced almost the same results. Moreover, we also confirmed the findings of Carpenter and Johnson (1983) that there is no significant relationship between the aggressiveness/conservativeness of working policies of firms and their operating and financing risk. As we used a new measure of profitability i.e. Tobin's q to estimate the relationship of working capital management and firms returns in India, the present study is expected to be a significant contribution in finance literature. Moreover, theoretical discussion on risk and working capital management has also been tested on empirical basis in an emerging market of India. Although the results of present study are in contradiction to some earlier studies on the issue, yet, this phenomenon may be attributed to the inconsistent and volatile economic conditions of India. The reasons for this contradiction may further be explored in upcoming researches and this topic is left for future.

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