Original Research Paper

A Study on The Impact of Capital Expenditure on Working Capital Management

Dr .R.Kavitha	Associate Professor, Sakthi Institute of Information and Management Studies, Pollachi-642001, Coimbatore, Tamil Nadu, India
Dr. R.Shanmugam	Professor (Retd), BSMED,Bharathiar University, Coimbatore, TamilNadu, India.

ABSTRACT   *Corporations are looking for new ways to stimulate growth, improve financial performance and reduce risk in today's challenging economic climate. Funds tied up in working capital can be seen as hidden reserves that can be used to fund growth strategies, such as capital expansion. Cash flows locked in stock and receivables can be freed up and such cash flows could be invested in assets. The determination of capital expenditure is very important for firms triumph. Because the extent and amount of this expenditure shows the future status of a firm and the quality of decisions about these kinds of investment indicate firms' situation. The objective of this study is to investigate the impact of capital expenditure on working capital management. In order to analyze the relationship between working capital management and capital expenditure, net liquidity balance and working capital requirements are used. To analyze the impact of capital expenditure on working capital management, descriptive statistics, correlation analysis and regression analysis have been used.*

1. Introduction

Many of the existing research studies have found that managers spend a considerable number of hours on day-to-day working of capital decisions since current assets are short-lived investments that are continually being converted into other asset types (Rao, 1989). In the case of current liabilities, the firm is responsible for paying its obligations on a timely basis.

In the current competitive environment, corporations are looking for new ways to stimulate growth, improve financial performance, and reduce risk. Funds tied up in working capital can be seen as hidden reserves that can be used to fund growth strategies, such as expansion. Cash flows locked in stock and receivables can be freed up by understanding the determinants of working capital. Many organizations that have earned profits over the years have shown the efficient management of working capital.

Most researchers have attempted to understand the factors that determine the working capital of an organization. Horrigan (1965), Luo (1984), Liu (1985), Zhou (1995), and Su (2001) have found that growth of the firm, size and leverage etc. affects the working capital of a company. Broadly, industry characteristics, firm-specific characteristics and the financial environment are recognized as determining factors of the working capital. However, there are firms that are struggling to manage working capital since they don't have a sufficient understanding of the determining factors of working capital. In addition to the growth, leverage, and the size of a company and type of a company, certain expenditures-financial expenditure, operating expenditure and capital expenditure have different impacts on working capital.

2. OBJECTIVES OF THE STUDY

To analyze the impact of capital expenditure on the working capital management of large, pharmaceutical firms

3. SAMPLE SIZE

The data have been collected for twenty one large pharmaceutical firms in India due to the availability of data for a period of ten years. Large firms taken for the study are Alembic Ltd, Aurobindo Pharma, Cadila Healthcare, Cipla, Dr.Reddy's Lab, FDC Pharmaceuticals Ltd, Glenmark,Pharmaceuticals Ltd, IPCA Laboratories Ltd, JB Chemicals and Pharmaceuticals Ltd, KDL Biotech Ltd, Kopran, Lyka Laboratories, MorepanLaboratories Ltd, Natco

Pharma Ltd, Piramal Healthcare Ltd, Ranbaxy,Sun Pharmaceuticals Industries Ltd, Torrent pharmaceuticals ltd, TTK Healthcare, Unichem Laboratories Ltd, and Wockhardt.

4. VARIABLES

Independent variables used in the study are Capital Expenditure, Operating Expenditure and Financial Expenditure. Operating Cash Flow (OCASH), extracted cash flow statement, Growth Rate (GR) of the firm measured by sales, Price to Book value ratio (P/B) and Leverage measured by total long-term debt capital to equity are used in the study as control variables. Net Liquidity Balance (NLB) and Working Capital Requirement (WCR) are used in this as dependent variables.

5. HYPOTHESES

H0-1: There is no relationship between Capital Expenditure and Net Liquidity Balance

H0-2: There is no relationship between Capital Expenditure and Working Capital Requirement

6. PERIOD OF THE STUDY

The required data for the study have been collected from the Capitaline plus of capital publishers India Pvt Limited, Mumbai, India. The study has been undertaken for the period of ten years from 2004-05 to 2013-14.

7. TOOLS USED IN THE STUDY

To analyze the impact of capital expenditure on working capital management, descriptive statistics, correlation analysis and regression analysis have been used.

8. MODEL SPECIFICATION

This study uses correlation and regression analysis of cross-sectional data in order to test these hypotheses. The pooled regression type of panel data analysis is used. The pooled regression, also called as the constant coefficients model, is one in which both intercepts and slopes are constant, where the cross section from a data and time series data are pooled together in a single column, assuming that there are no significant cross section or temporal effects (Ranjith Appuhami, 2008). The general forms of the study models are:

$$NLB_{it} = \alpha + \beta0\, n + \Sigma\ \beta_i\ \text{all}\ X_{it} + \varepsilon_{it}$$
$$WCR_{it} = \alpha + \beta0\, n + \Sigma\ \beta_i\ \text{all}\ X_{it} + \varepsilon_{it}$$

WCR_{it}: Working Capital Requirement of firm i at time

t; i = 1, 2…21 large firms and 17 SME's.
NLB it: Net Liquidity Balance of firm i at time t; i = 1, 2…21 large and 17 SME's.
β0: the intercept of equation
βi: Coefficients of X it variables
X it: the different independent variables for working capital management of firm i at time t
t: time = 1, 2,……,10years.
ε: the error term

Above general least squares model is converted into specified equation.

NLBi = α +**β**1CAPEXi+ β2FIEXi+ β3 OPEXi + β4 OCASHi + β5 P/Bi+ + β6 LEVi + β7 GRi + ε

WCRi = α+ β1CAPEXi+ β2FIEXi+ β3 OPEXi + β4 OCASHi + β5 P/Bi+ + β6 LEVi + β7 GRi + ε

Where,
NLB   = Net Liquidity Balance
WCR   = Working Capital Requirement
β   = Coefficient of Regression,
CAPEX   = Capital Expenditure
FIEX   = Financial Expenditure
OPEX   = Operating Expenditure
OCASH   = Operating Cash Flow in Firm
P/B   = Price to Book Value Ratio
LEV   = Leverage (Debt equity ratio)
GR   = Growth Rate
 ε   = The Error Term

8. RESULTS AND DISCUSSIONS
Impact of Capital Expenditure on Net Liquidity Balance and Working Capital Requirement
Descriptive, correlation and multiple regression analysis have been used to analyze the impact of capital expenditure on net liquidity balance and working capital requirement of the firms.

Results of Descriptive Statistics
The study uses descriptive statistics *viz., mean and standard deviation of the dependent, independent and control variables of the working capital management of selected firms during the period of study. Table 1 shows the descriptive statistics of the dependent variables net liquidity balance and working capital requirement of large firms. Average and standard deviation of independent variables CAPEX, FIEX,* *OPEX, OCASH, GR, LEV and P/B ratio of large firms are also showed in the table.*

Table 1
Descriptive Statistics of NLB, WCR and other Variables of
Firms (n=21)

Variable	Average	S.D
CAPEX (Rs.in Crores)	03.91	315.75
FIEX (Rs.in Crores)	21.27	018.21
OPEX (Rs.in Crores)	03.61	417.97
OCASH (Rs.in Crores)	01.26	140.97
P/B (%)	02.25	003.63
LEV (Rs.in Crores)	00.84	000.63
GR (%)	01.74	238.59
NLB (Rs.in Crores)	23.11	525.60
WCR (Rs.in Crores)	02.77	304.27

Table 1 presents the descriptive statistics of the large sized pharmaceutical firms. Average values of NLB and WCR of large pharmaceutical firms are Rs.23.11 crores and Rs.2.77 crores respectively. Average value of the firm's capital expenditure, financial expenditure, operating expenditure, operating cash flow and leverage are Rs.3.91crores, Rs.21.27crores, Rs.3.61crores, Rs.1.26 crores and Rs.0.84 crores respectively. Average of P/B ratio is 2.25%. Average of sales growth of the large firms is 1.74 %. Very high variations Rs.525.60 crores is shown in NLB whereas low variations Rs. 0.63 crores shown in LEV. CAPEX, WCR and OPEX are also showing large variations during the study period.

Results of Correlation Analysis
Correlation analysis is used to find the association between dependent and independent variables selected in the study for the sample firms during the study period. Correlation between net liquidity balance and other independent variables and working capital requirement and independent variables of the large firms are shown in Table 2.

Table 2
Results of Correlation Analysis of NLB and WCR of Large Firms (n=21)

Variable	CAPEX	FIEX	OPEX	OCASH	P/B	LEV	GR	NLB	WCR
CAPEX	1.000								
FIEX	0.575* (0.006)	1.000							
OPEX	0.867* (0.000)	0.473** (0.030)	1.000						
OCASH	0.685* (0.000)	0.219 (0.340)	0.785* (0.000)	1.000					
P/B	0.261 (0.253)	0.066 (0.778)	0.480** (0.028)	0.540** (0.012)	1.000				
LEV	-0.298 (0.190)	0.040 (0.862)	-0.425*** (0.054)	-0.566* (0.008)	-0.511** (0.018)	1.000			
GR	0.747* (0.000)	0.223 (0.332)	0.849* (0.000)	0.878* (0.000)	0.259 (0.256)	-0.366 (0.102)	1.000		
NLB	-0.114 (0.624)	-0.345 (0.126)	-0.359 (0.110)	0.722* (0.000)	0.366 (0.104)	-0.424*** (0.056)	0.662* (0.002)	1.000	
WCR	0.788* (0.000)	0.332 (0.142)	0.681* (0.000)	0.681* (0.000)	0.399*** (0.074)	-0.376*** (0.094)	0.565* (0.008)	0.322 (0.138)	1.000

*Significant at1%, ** Significant at 5%, ***Significant at 10%.

Inter relationship between NLB, WCR and other variables are indicated in Table 2. The correlation co- efficient is strongly positive and significant between NLB and OCASH and GR. The correlation coefficient of NLB with OCASH and GR is 0.722 and 0.662 respectively. This means that, if there is an increase of amount of rupees in OCASH, and GR, there will be an increase of amount of rupees in NLB. The correlation coefficient between NLB and LEV is -0.424. It shows a negative and significant relationship between NLB and LEV. It indicates that there is an increase in the amount of rupees in LEV, there will be a decrease of amount of rupees in NLB. Similar results are indicated when analysis is done in the case of CAPEX *vis-à-vis FIEX, OPEX, OCASH and GR.*

The correlation coefficients are strongly positive and significant between WCR and CAPEX, OPEX, OCASH, P/B and GR. Positive relationship between WCR and variables indicates that there is an increase of amount of rupees in CAPEX, OPEX, OCASH, P/B and GR will increase the requirement of working capital. There is a negative and significant correlation shows between WCR and LEV. It indicates the increase of amount of rupees in LEV result into decrease of amount of rupees in the WCR. According to the correlation analysis, there is no significant relationship between net liquidity balance and working capital requirement of the large firms.

Results of Regression Analysis of Net Liquidity Balance
Table 3. explains the regression coefficient, ANOVA, R-Square and Durbin-Watson results of independent variables viz., capital expenditure, financial expenditure, operating expenditure, operating cash flow, leverage, prices to book value ratio and growth rate of large pharmaceutical firms. Dependent variable of this regression analysis is NLB.

Table 3
Results of Regression Analysis of NLB of Large Firms (n=21)

Variable	Regression Coefficient	Standard Error	t-value	p-value
CAPEX	-1.07*	0.306	-3.529	.004
FIEX	-6.26***	3.452	-1.815	.093
OPEX	-0.165	0.396	-0.417	.684
OCASH	2.34**	1.084	2.161	.050
P/B	12.11	23.530	0.515	.615
LEV	-2.05	90.334	-0.023	.982
GR	1.61***	0.787	2.053	.061

Constant	R-Square	Adjusted R-Square	F-value	Durbin-Watson
-15.510	0.961	0.923	22.259*(0.000)	1.10

* Significant at 1%. **Significant at 5%. ***Significant at 10%.
The multiple regression tests indicate that NLB is influenced by number of variables significantly. Capital expenditure is negatively related to NLB and significant at 1% level. The null hypothesis of the study is that there is no relationship between capital expenditure and net liquidity balance. The result found that there is a negative relationship between CAPEX and NLB of large firms. An increase of one rupee in CAPEX decreases 1.07 rupees in NLB. So the hypothesis is rejected. This is against the findings of Appuhami (2008), in which he has found that Net liquidity balance is positively related to capital expenditure at 1% level of significance and the findings is consistent with the findings of Abdul Raheman (2012) and Hashem Valipour (2012).

In addition to the capital expenditure, financial expenditure is also negative and significantly associated with NLB. The regression coefficient of financial expenditure is -6.26 with p-value of 0.093. This indicates that the increase of amount of rupees in financial expenditure decreases the amount of 6.26 rupees in NLB. The relationship is significant. This result is however, not consistent with Appuhami's findings (2008), but consistent with the findings of Hashem Valipour (2012) and Abdhul Raheman (2012).

Regression coefficient shows a positive and significant relationship between NLB and OCASH. This is significant at 5% level. This implies that an increase of one additional rupee in OCASH result in an increase of 2.34 rupees in NLB of the firms.

Growth rate has positive and significant relationship with NLB of the firm. It indicates that there is an increase of one additional rupee in GR increases 1.61 rupees in NLB of the large firms.

Other variables OPEX, P/B ratio and LEV are not significantly related to NLB. It indicates that there is no positive or negative relationship between net liquidity balance and variables operating cash flow, price to book ratio, and leverage.

ANOVA test indicates that the possibility of predicting NLB. R-Square value is 96.1%. Calculated value of ANOVA is 22.259, highly significant at 1% level. Durbin-Watson test is indicating (1.10) less auto correlation between the independent variables. Hence it is concluded that all the independent and control variables jointly affect the net liquidity of the firm.

Results of Regression Analysis of Working Capital Requirement

Regression coefficient of all independent and control variables related to working capital requirement, ANOVA test results, R-Square, Standard error and Durbin Watson tests are shown in the following Table 4

Table 4
Results of Regression Analysis of WCR of Large Firms (n=21)

Variable	Regression Coefficient	Standard Error	t-value	p-value
CAPEX	0 .782**	0.307	2.547	.024
FIEX	-5.493	3.471	-1.583	.138
OPEX	0.369	0.398	0.928	.370
OCASH	2.473**	1.089	2.270	.041
P/B	20.500	23.653	0.867	.402
LEV	-70.218	90.810	-0.773	.453
GR	1.644***	0.791	2.078	.058

Constant	R-Square	Adjusted R-Square	F-value	Durbin-Watson
-83.802	0.678	0.643	6.24*(0.000)	1.727

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

The null hypothesis formulated for the study is that there is no relationship between capital expenditure and working capital requirement. According to the Table 4, the test result proves that CAPEX has a significant and positive relationship with the working capital requirement. The re-

gression coefficient of capital expenditure is 0.782 and the p-value is 0.024. It may be inferred that, the CAPEX can be recognized as a significant factor in predicting the working capital requirement. The regression coefficient implies that, when the WCR increases by 0.782 rupee for each one rupee invested in CAPEX. The result indicates that firms are managing their WCR efficiently when they tend to invest in CAPEX with the purpose of getting profits from growth opportunities. The hypothesis is rejected. It does not consistent with the findings of Appuhami (2008) and Abdhul Raheman (2012). But the findings of this study are consistent with findings of HashemValipour (2012).

Operating cash flow has a positive and significant relationship with the WCR. Table 4 shows that the companies tend to increase their working capital requirement along with increase in OCASH. The regression coefficient of OCASH is 2.473. This indicates that there is a one rupee increase in OCASH results into the increase of 2.473 rupees in WCR.

Growth rate also shows a significant and positive relationship with WCR. WCR will be increased by 1.644 rupees by increasing of one rupee in GR.

There is no significant relationship between WCR and other variables like FIEX, OPEX, P/B ratio, and LEV of the large firms.

According to the table, the ANOVA test shows that the model has the possibility of predicting working capital requirement 6.24 with a significant level since the p-value is (0.003). R-Square value between WCR and variables is 67.8%, which shows the higher variation in the WCR, due to more variation in independent variables, such as capital expenditure, financial expenditure, operating expenditure and operating cash flows. Durbin-Watson test (1.727) indicates that there is a less auto correlation between the independent variables. Therefore it is concluded that the independent variables are jointly affect the WCR of the large firms.

9. Summary

Average of net liquidity balance of pharmaceutical firms are Rs.23.10 crores . The average of large firms working capital requirements are Rs. 2.778 crores. Leverage and P/B ratio of showed less variation in firms. Whereas net liquidity balance, working capital requirement and capital expenditure showed high variations in large firms during the study period.

The correlation co-efficient of large firms is positive and significant between net liquidity balance and OCASH, and GR. Significant negative relationship showed between net liquidity balance and LEV of the large firms.

According to the regression analysis of large firms, NLB has significant negative relationship with CAPEX, FIEX and OCASH, and has a significant positive relationship with GR. There is a significant and positive relationship between WCR and CAPEX, OCASH and GR. The regression results of small pharmaceutical firms showed that the variable FIEX has significant and negative relationship with NLB. OCASH has significant positive relationship with NLB. There is no significant relationship between CAPEX and NLB of small firms. CAPEX has significant and negative relationship with WCR and the other variables FIEX, OPEX, OCASH are positively related to WCR. Their results are significant. In firms, positive relationship indicates that there is an increase of rupees in the value of NLB and WCR of the firms due to increase of the amount of rupees

in the value of independent and control variables and negative relationship indicates that there is a decrease of values in the amount of NLB and WCR due to the increase of values in the variables.

10. REFERENCES

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