The Relationship between Working Capital Management Efficiency and EBIT

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This paper is aimed at analyzing the relationship between Working Capital Management Efficiency (WCME) and Earnings before Interest & Taxes (EBIT) of the Paper Industry in India during 1997–1998 to 2005–2006. To measure the WCME three index values viz., Performance Index (PI), Utilization Index (UI), and Efficiency Index (EI) are computed, and are associated with explanatory variables, viz., Cash Conversion Cycle (CCC), Accounts Payable Days (APDAYS), Accounts Receivables Days (ARDAYS), Inventory Days (INVDAYS). Further, Fixed Financial Assets Ratio (FIXDFARA), Financial Debt Ratio (FINDBTRA) and Size (Natural log of Sales) are considered as control variables in the analysis, and are associated with the EBIT. The study reveals that the Paper Industry has managed the WC satisfactorily. The APDAYS has a significant (–)ve relationship with EBIT, which indicates that by deploying payment to suppliers they improve the EBIT. The Paper Industry in India performs remarkably well during the period, however, less profitable firms wait longer to pay their bills, and pursue a decrease in CCC.

Key Words: Working Capital Management Efficiency, Earnings before Interest and Taxes, Current Assets, Current Liabilities, Performance Index, Utilization Index, Efficiency Index
JEL *Classification:* G30, G32

Working Capital (WC) is the flow of ready funds necessary for the working of a concern. It comprises funds invested in *Current Assets* (CAS), which in the ordinary course of business can be turned into cash within a short period without undergoing diminishing in value and without disruption of the organization. *Current Liabilities* (CLS) are those which are intended to be paid in the ordinary course of business within a short time. Every company has to make arrangements for adequate funds to meet the day-to-day expenditure apart from investment

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in *Fixed Assets* (FAS). The internal resources of a business organization often are insufficient for meeting all its needs. Also it is not always possible for the owners, promoters or the entrepreneurs to mobilize finance from their personal resources. Resources, therefore, have had to be financed through borrowing, keeping in view the short, medium and or long term requirements of trade or industry for funds.

Statement of the Problems, Significance and Scope

One of the serious problems faced by the Paper Industry in India is the incidence of sickness. There are many reasons for the sickness of the paper industry. One of the important reasons is low per capita consumption of paper in India. The industry experiences frequent dwindling demands and low EBIT. The paper industry is highly capital intensive. Some of the units that are installed in the backward areas suffer from inadequate infrastructure facilities such as lack of trained manpower, transportation and sustained power supply, the failure of industry in maintaining adequate liquidity leading to imbalanced capital structure, thereby affecting EBIT.

Very few studies have been made in relation to *Working Capital Management* (WCM) especially in the paper industry in India. Therefore, the present study is a maiden attempt to analyze the relationship between WCM efficiency and EBIT in the paper industry in India. The study covers only the listed paper companies on *Bombay Stock Exchange* (BSE) in India, for which an attempt is made to provide an empirical support to the hypothesized relationship between WCM efficiency and EBIT.

Objectives of the Study

The objective of the study is to examine the relationship between the WCM efficiency and EBIT of the paper industry in India.

The following are the specific objectives:

- To analyse the firm's efficiency in WCM in the paper industry in India.
- To analyse the relationship between WCM efficiency and EBIT in selected companies in the paper industry in India.

Review of the Literature

Experts (William 1939) determined the factors of WC and pointed out that WC is an element to be considered in fixing the rate-base. Main-

tenance of adequate WC is an essential condition for efficient financial management (Mohan 1991). WC offers huge cash opportunities that could be released with sustainability within a relative short period of time (Loneux 2004). Inventory, receivables, cash and working finance are the four problem areas of WCM (Mishra 1975). Inventory represents more than 61% of the total CAS of the firm (Swamy 1987).

WC has been financed from internal as well as external sources (Fazeeria 2002). Companies have increasingly been relying on short-term funds particularly short-term bank credit and trade credit (Gupta and Sharma 2003). WC ratios are useful tools in appraising the financial strength and; immediate solvency of a firm (Sagan 1955). Current and quick ratios registered insignificant associations whilst the comprehensive liquidity index indicated significant associations with return on investment (ROI) (Smith and Bahaman 1997). The lower the level of liquid assets, the greater will be the risks of not being able to meet current obligations (Van Horne 1969).

The major reason for slow progress of an undertaking is shortage or wrong management of WC (Siddarth and Das 1993). Due to lack of a proper plan for WC requirements most firms often experience excess WC or shortage of WC (Agarwal 1977). Firms are able to reduce financing costs/or increase the funds available for expansion by minimizing the amount of funds tied up in CAS. There is a significant difference among industries in WC measures across time (Krueger 2002).

The way in which WC is managed will have a significant impact on the profitability of companies. This is a significant (−)ve relation between gross operating income and the number of days of accounts receivable, inventories and accounts payables. The (−)ve relation between account payables and profitability is consistent with the view that less profitable companies wait longer to pay their bills (Deloof 2003). The chief executives properly recognize the role of efficient use of WC in liquidity and profitability, but in practice they could not achieve it due to suboptimum utilization of WC (Prasad 2001). The Public Sector Enterprises (PSUS) could improve the WCME by reducing their dependence on outside funds (Jain 1988).

Efficient WCM is necessary for achieving both liquidity and profitability of a company. A poor and inefficient WCM leads to tie up funds in idle assets and reduces the liquidity and profitability of a company (Reddy and Kameswari 2004). Efficient liquidity management involves planning and controlling CAS and CLS in such a manner that eliminates the risk of

inability to meet due short-term obligations and avoids excessive investment in these assets. The CCC has been one of the more important measures of liquidity than the current ratio that affects profitability. There is a (−)ve relationship between profitability and liquidity indicators such as current ratio and cash gap (Eljelly 2004).

WCM could vitally affect the health of the firm (Sagan 1955). Industry practices, company size, future sales growth of company, the proportion of outside directors on a board, executive compensation (current portion), and CEO share ownership significantly influence the WCME of a company (Kieschnick 1960). For measuring WCME, performance, utilization, and overall efficiency indices were used, instead of some common WCM ratios (Gosh and Maji 2003).

There is a strong (−)ve relation between CCC and corporate profitability of a large sample of listed American companies during 1975–1994 (Shin and Soenen 1998). There is a significant +ve relationship between profitability, measured through gross operating profit, and CCC. Profit can be created by handling correctly the CCC and keeping each of the different components (accounts receivables, accounts payables, inventory) to an optimum level (Lazaridis and Tryfonidis 2006). There is a significant (−)ve relationship between WCM and profitability. The greater the CCC the lesser will be the profitability. There is a significant (−)ve relationship between liquidity and profitability. There is also (−)ve relationship between debt used by the firm and its profitability (Rehmann 2007).

H_0^1 *There is no significant efficiency in the use of various components of* CAs *for enhancing sales in the paper industry.*

H_0^2 *The paper industry as a whole does not have the ability to utilise all the* CAs *for the purpose of generating sales.*

H_0^3 *The paper industry, as a whole does not have efficiency in* WCM.

H_0^4 *There is no significant relationship between* WCM *efficiency and* EBIT *of the paper industry in India.*

Although ample research studies have been conducted in the field of WCM, very few researches touched on the aspects of WCM and EBIT. Therefore, to fill this gap in the literature, the study has been undertaken.

Methodology, Sources of Data and Sampling Design

The study used only secondary data, which are collected from the CMIE prowess (package). The collected data from this source have been compiled and used with due care as per the requirements of the study. Orig-

TABLE 1   Sample procedure

Type of companies	No. of companies	No. of companies listed in BSE	Sample size
Paper	113 (78%)	66 (78%)	23
Paper product	33 (22%)	19 (22%)	7
Total	146 (100%)	85 (100%)	30

inally the sample for this study had been planned to choose from the list of companies listed in National Stock Exchange (NSE). Since the number of companies listed in the NSE is small (6 companies in the paper and paper product industry), the sample of 30 companies of paper industry has been chosen from 85 listed companies in BSE.

The Sample Interval (SI) is calculated by *N/n*. SI = 85/30 = 2.8333. All the BSE listed paper and paper product companies are considered and every 3rd company is selected for the study by use of the *Systematic Random Sampling Technique.* The data used for the analysis relate to the selected paper companies for the period of ten years on a yearly basis ranging from 1997–2006.

Variables Used for Analysis of Data

ANALYSIS I: WCM EFFICIENCY

The first part of the analysis is the measure of WCM efficiency for which three indexes are used, viz., Performance Index (PI), Utilization Index (UI) and, Efficiency Index (EI).

$$\text{PI}_{\text{WCM}} = \frac{I_s \sum_{i=1}^{n} \frac{W_{i(t-1)}}{W_{it}}}{N}, \tag{1}$$

where I_s = sales index defined as S_t/S_{t-1}, W_i = individual group of CAs, N = number of CAs group, and $i = 1, 2, 3, \ldots N$.

$$\text{UI}_{\text{WCM}} = \frac{A_{t-1}}{A_t}, \tag{2}$$

where A = *(current assets)/sales.*

$$\text{EI}_{\text{WCM}} = \text{PI}_{\text{WCM}} \times \text{UI}_{\text{WCM}}. \tag{3}$$

ANALYSIS II: NET EBIT

The second part of the analysis is the measure of Net EBIT, for which the following equation is formulated, based on the basic indicator.

The general form of the model is:

$$\text{EBIT}_{it} = \beta_1(\text{PI}_{it}) + \beta_2(\text{UI}_{it}) + \beta_3(\text{EI}_{it}) + \beta_4(\text{CCC}_{it})$$
$$+ \beta_5(\text{FFAR}_{it}) + \beta_6(\text{FDR}_{it}), \tag{4}$$

where EBIT_{it} = Earnings Before Interest & Tax (*i* at time *t*; *i* = 1, 2, 30 companies), CCC = Cash Conversion Cycle = No. of Days A/R + No. of Days Inventory – No. of days A/P; FDR = Financial Debt Ratio = (Fixed Financial Assets)/(Total Assets); FFAR = Fixed Financial Assets Ratio = (Short Term Loans + Long Term Loans)/(Total Assets).

Tools Used for Analysis

To analyze the WCM efficiency of the paper industry in India, statistical techniques viz *Minimum, Maximum, Mean, Standard Deviation and Co-efficient of Variation, Correlation, and Regression Matrix* have been used. To ascertain the linear trend and sign of growth in various components of WC ratios, the simple regression technique has been extensively used.

Limitations and Scope for Further Study

- The study is confined to ten years data only, i. e. from 1997–2006, therefore, a detailed analysis covering a lengthy period, which may give slightly different results has not been made.
- The study is based on secondary data collected from the CMIE prowess (package), therefore the quality of the study depends purely upon the accuracy, reliability and quality of the secondary data source. Approximation, and relative measures with respect to the data source might impact the results.
- The study is based on 30 companies of the Paper Industry in India that are also drawn from the companies listed in BSE. Therefore, the accuracy of results is purely based on the data of sample units. If one takes sample units from, say, NIFTY the results may go slightly differently.

Further studies could be made by future researchers in the following aspects and areas:

- by inclusion of extraneous variables like profitability ratios (G/P ratio, N/P ratio, etc) and analyzing the inter-relationship between the WCME and profitability;

- by categorizing the firms into heterogeneous groups like Small, Medium, and Large firms based on measures like assets, capital, long term borrowings, and Net Worth.

Industry Analysis and Findings

An evaluation of WCM efficiency of the paper industry as a whole is done here. It can be observed vide table 2 that there are occurrences of the PI, UI and EI values of above 1 in 3, 5 and 4 respectively out of 9 years. In many years, PI and EI values are < 1, but mean value of PI is nearer to 1 (0.93) and EI value is 1.01. This shows that the Paper Industry has satisfactorily managed its WC while handling its CAS for generating sales and has adopted a moderate WCM policy. But, the incidences of the occurrence of the most successful year (EI > 1) followed by the most unsuccessful one (EI < 1), and vice versa, have exposed the fact that the industry has been inefficient in adopting a very sound WCM policy. Moreover, the coefficient of variation (CV), which is very high at 49.12 when compared to that of PI, UI and EI, elicits the high degree of inconsistency in the WCM policy adopted by the paper industry. Further, Compounded Annual Growth Rates (CAGRs) are (−)ve for all the indices.

This, in turn, reveals that the efficiency in managing WC required for various components of CAS relevant to augmenting the sales as well as WCM policy has been kept weakening further over the period of study. Overall, it can be inferred that the Paper Industry has shown low efficiency in WCM relevant to manufacturing activities, and has been inefficient in adopting a sound WCM policy on the whole during the period of study.

Regression Analysis and Results

In order to measure the firm's efficiency in achieving the targeted level of efficiency during the study period, the OLS model has been used. The estimated β value represents the speed of the individual firm in improving the efficiency in achieving the industry norms in this regard.

Firm's efficiency in the matter of managing WC is equal to the average efficiency level of the industry as a whole. Similarly, < 1 indicates the need of the firm to further improve its efficiency in WCM.

Management of WC is an essential condition of financial management (Reddy 1991). The WCM has highlighted the managerial aspects of inventories, receivables and advances, and cash (Rao 1985). The WCME has been tested through a hypothesis in terms of various components of CAS.

TABLE 2   Average Performance, Utilization and Efficiency Indices showing the WCM
            Efficiency of the Paper Industry

Financial Year	Performance Index	Utilization Index	Efficiency Index
1997–1998	1.47	1.35	1.98
1998–1999	0.65	0.75	0.49
1999–2000	1.12	1.26	1.41
2000–2001	0.79	1.05	0.83
2001–2002	0.71	0.84	0.60
2002–2003	1.17	1.21	1.42
2003–2004	0.71	0.89	0.63
2004–2005	0.97	1.06	1.03
2005–2006	0.77	0.93	0.71
Minimum	0.65 (1999)	0.75 (1999)	0.49 (1999)
Maximum	1.47 (1998)	1.35 (1998)	1.98 (1998)
Mean	0.93	1.04	1.01
SD	0.27	0.20	0.50
CV	29.54	19.67	49.12
CAGR	−3.15	−1.67	−4.77

NOTES   Computed from Financial Statements; figures in parentheses are years.

H_0^1 *There is no significant efficiency in use of various components of CAS for enhancing sales in the paper industry.*

The H_0^1 is rejected; numerically the overall PI (> 1) indicates efficient WCM. Average value of PI, as a whole, shows that the PI is > 1 for 17 firms out of 30 firms. Thus, the performance of the industry as whole in WCM was mostly efficient during the period of study. Similarly, from the OLS regression results for UI it is understood that 14 out of 30 firms (β coefficients > 1) are successful in establishing their efficiency in the paper industry in the matter of utilization of CAS as a whole in generating sales.

The chief executives of the paper industry properly recognized the role of efficient use of WC in liquidity and profitability, but in practice they could not achieve it. Most of them followed the budgetary method in planning WC, and WCM was inefficient due to sub-optimum utilization of WC (Prasad 2001). The level of WC is a function of sales (Sagan 1955). This statement has been tested in H_0^2.

H_0^2 *The paper Industry as a whole does not have the ability to utilise the CAS for generating sales.*

TABLE 3   Regression Results showing the Relationship between Cash Conversion Cycle
and EBIT of the Paper Industry

Explanatory variables	Coefficient	SE of coeff.	t value	P value
Intercept	-88.3882^2	8.9779	-9.85	0.0000
FIXDFARA	-266.6349^2	90.5067	-2.95	0.0035
FINDBTRA	-2.7995	14.2790	-0.20	0.8447
LNSALES	27.2530^2	1.7090	15.95	0.0000
CCC	-0.0416^1	0.0201	-2.07	0.0390
R^2	0.4696			
Adjusted R^2	0.4625			
F value	65.31^2			
Degrees of freedom	4,295			

NOTES   [1] Significant at 5% level. [2] Significant at 1% level.

The H_0^2 is rejected; numerically, the overall UI (> 1) indicates efficient
WCM. The average value of UI, as a whole, shows that the UI is > 1 for
15 firms out of 30 firms. Thus, the utilization of WC for the industry as a
whole was mostly efficient during the period of study. From the results
of OLS regression for EI, it is evident that the > 1 for 12 out of 30 firms,
i. e., these 12 firms have achieved targeted industry norms in respect of
adopting efficiency in WCM policy.

Efficient WCM is necessary for achieving both liquidity and profitabil-
ity of a company. A poor and inefficient WCM leads to tie up funds
in idle assets and reduces the liquidity and profitability of a company
(Reddy and Kameswari 2004). WC offers huge cash opportunities that
could be released with sustainability within a relative short period of time
(Loneux 2004). This has been tested in H_0^3.

H_0^3 *The paper Industry, as a whole, does not have efficiency in* WCM.

The H_0^3 is rejected as the EI (> 1) shows efficient WCM. The average
value of EI shows that the EI is > 1 for 12 firms out of 30 firms under
study for the study period.

Relationship between WCM Efficiency and EBIT

The relationship of Earnings before Interest and Taxes (EBIT) of the pa-
per industry with efficiency of WCM is evaluated here. EBIT is taken as the
proxy and CCC, APDAYS, ARDAYS, INVDAYS are considered as measures
of WCM efficiency in the analysis. Apart from these variables, FIXDFARA,

FINDBTRA and size (natural log of sales) are considered as control variables in the regression model. First, correlation among all selected variables is worked out and OLS regression is run, the results of the regression are presented in table 3.

From the regression results, it is apparent that APDAYS has a significant (−)ve association with EBIT, which indicates that a more profitable firm delays its payment to its suppliers. The other three WCM efficiency measures, CCC with +ve in sign, ARDAYS and INVDAYS with (−)ve in sign have an insignificant one to one relationship with EBIT in the paper industry. The +ve relationship of CCC shows that more profitable firms under paper industry failed to reduce the CCC.

From the results of regression between EBIT and CCC it can be inferred that CCC has a significant (−)ve relationship with EBIT. Also, all the three control variables are related significantly with EBIT. The relationships of FIXDFRA and FINDBTRA are (−)ve and that of the LNSALES is +ve with EBIT. The results show that larger firms with less fixed financial assets and financial debt ratio earned more EBIT by decreasing the CCC remarkably under the paper industry.

The regression results between EBIT and APDAYS show that APDAYS has a significant +ve coefficient with EBIT. Further, among the control variables, the coefficient of FIXDFRA is significant at 1 per cent level and that of the FINDBTRA is insignificant. On the other hand, size of firms is highly related to EBIT with +ve in sign.

From the results, it is well established that the larger firms under the paper industry with less fixed financial assets earned more EBIT by delaying the payment to their suppliers. Regarding the relationship between EBIT and ARDAYS, the results of regression shown in table 5 reveal that the coefficient of ARDAYS is significant +vely, and coefficients of all the control variables are significant but with a different sign. While firm size is +vely related, FIXDFRA and FINDBTRA are (−)vely related to EBIT of the firms under the paper industry. In sum, it is found that the larger firms with less fixed financial assets and financial debt have generated more profit (after operating cost) by increasing the credit period granted to their customers under the paper industry.

With regard to the impact of number of days in inventory (inventory cycle) on the EBIT of the firms under the paper industry, the regression results disclose that INVDAYS has an insignificant (−)ve co-efficient with EBIT. On the other hand, the coefficients of FIXDFRA with (−)ve in sign and that of LNSALES with +ve in sign are significant at 1 per cent level.

TABLE 4   Regression Results showing the Relationship between Number of Days
Accounts Payable and EBIT of the Paper Industry

Explanatory variables	Coefficient	SE of coeff.	t value	P value
Intercept	-93.8385^2	9.1316	-10.28	0.0000
FIXDFARA	-259.6095^2	89.8865	-2.89	0.0042
FINDBTRA	-9.0700	14.8742	-0.61	0.5425
LNSALES	27.6829^2	1.7380	15.93	0.0000
APDAYS	0.0509^1	0.0210	2.43	0.0159
R^2	0.4724			
Adjusted R^2	0.4653			
F value	66.05^2			
Degrees of freedom	4,295			

NOTES   [1] Significant at 5% level. [2] Significant at 1% level.

TABLE 5   Regression Results showing the Relationship between Number of Days in
Accounts Receivables and EBIT of Paper Industry

Explanatory variables	Coefficient	SE of coeff.	t value	P value
Intercept	-99.7462^2	9.9563	-10.02	0.0000
FIXDFARA	-232.8214^2	89.8986	-2.59	0.0101
FINDBTRA	-7.3206	14.6625	-0.50	0.6180
LNSALES	27.4998^2	1.7180	16.01	0.0000
ARDAYS	0.1686^1	0.0709	2.38	0.0180
R^2	0.4720			
Adjusted R^2	0.4649			
F value	65.94^2			
Degrees of freedom	4,295			

NOTES   [1] Significant at 5% level. [2] Significant at 1% level.

However, the FINDBTRA has an insignificant +ve coefficient with EBIT. Overall, the regression results exposed the fact that the larger firms under paper industry, which earn more EBIT, have fewer inventories, but decrease in inventory level does not influence the increase in EBIT significantly. At the same time these firms have gained more EBIT with less fixed financial assets and by increasing the financial debt insignificantly.

There is a strong (−)ve relationship between variables of the WCM and profitability of the firm (Reheman 2007). This means that as the CCC increases it will lead to a decrease in the profitability of the firm, and

TABLE 6   Regression Results showing the Relationship between Number of Days in
Inventory and EBIT of the Paper Industry

Explanatory variables	Coefficient	SE of coeff.	t value	P value
Intercept	-86.2624^2	9.3964	-9.18	0.0000
FIXDFARA	-255.2521^2	90.7656	-2.81	0.0053
FINDBTRA	5.6502	14.0239	0.40	0.6873
LNSALES	26.4734^2	1.6602	15.95	0.0000
INVDAYS	-0.0622	0.0537	-1.16	0.2474
R^2	0.4644			
Adjusted R^2	0.4571			
F value	63.94^2			
Degrees of freedom	4,295			

NOTES   [2] Significant at 1% level.

managers can create a +ve value for the shareholders by reducing the
CCC to a possible minimum level. This has been tested in H_0^4.

> H_0^4 *There is no significant relationship between* WCM *efficiency and* EBIT
> *of the paper industry.*

The H_0^4 is rejected as APDAYS (*F* value 66.05), CCC (*F* value 65.31), and
ARDAYS (*F* value 65.94) and Number of Days in Inventory (*F* value 63.94)
are significantly related to EBIT of the paper industry. Therefore, it is
inferred that there is a significant relationship between WCM efficiency
and EBIT of firms in the paper industry in India.

Conclusion

The importance of efficient WCM is indisputable. Moreover, adequate
WCM is essential as it has a direct impact on EBIT and liquidity. An at-
tempt has been made in the present study to investigate the relationship
between WCM efficiency and EBIT of Indian paper companies. In the
matter of WCM, three indexes and net EBIT have been computed for all
the firms over the period of study – ten-years.

From the study it is concluded that the Indian paper firms perform
remarkably well during the period. Industry overall efficiency index was
> 1 in 3 out of 9 years for the study period. Though some of the sample
units had successfully improved efficiency during these years, the exis-
tence of a very high degree of inconsistency in this matter clearly points
out the need for adopting sound WCM policy in these firms.

There is found to be a (–)ve relationship between EBIT and the cash conversion cycle (CCC) which was used as a parameter, therefore it seems that operational EBIT dictates how to manage the WC of the firm. Further, it is found that lower gross EBIT is associated with an increase in the APDAYS. This could lead to the conclusion that less profitable firms wait longer to pay their bills, taking advantage of credit period granted by their suppliers. The +ve relationship between ARDAYS and firms EBIT suggests that less profitable firms will pursue a decrease of their ARDAYS in an attempt to reduce their cash gap in the CCC.

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