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Analysis of Working Capital, ROA and Business Turnover for Firms in the FMCG, Manufacturing and Infrastructure Sectors in India

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ABSTRACT

This research examines the relationship between working capital, buniness turnover and ROA for listed Indian firms in the fast moving consumer goods (FMCG), manufacturing and infrastructure sectors. Annual accounting data collected over a decade has been analysed using both, OLS regression of independent samples as well as panel data study of pooled sample. The study tested the association between working capital and business turnover and working capital and return on assets . The results of regression run separately for each firm representing the sectors under the study support the hypotheses of the study only partially. However, the outcome of panel data analysis supports both the hypotheses for listed firms in India. The the study offers some key takeaways for the decision makers planning their working capital management strategies.

1. Introduction

Business turnover is a metric that represents total sales. It is basically the value of sales one is able to make in a set period of time. It is generally measured over a year's period, that year being the tax year, calendar year or financial year. Business turnover is one of many ways to analyse the quality and efficiency of a business. It is a retrospective numeric that measures the revenue generated during a specific time period, which could be a quarter, half-a-year or a complete year. Turnover (BT) is a synonym of a more commonly used term, gross income or total income. Obviously, all firms always try to increase their turnover.

Profitability (FP) is a term that measures how a firm has fared from financial perspective. It can be gauged through many accounting measures but the most commonly used metric is return on assets (ROA). All firms always endeavour to find ways to increase the ROA on a year on year basis.

Turnover and ROA are a function of many accounting and strategic factors. One such parameter is working capital. Working capital (WC) decisions are quite critical for firms as they are connected to their financial stability and also have bearing on how firms are perceived by the market (Afza & Nazir, 2008). Firms should optimize working capital to maximize their value (Howorth and Westhead 2003; Deloof 2003). A firm can have sufficient level of assets and have good profitability too, but it will face liquidity crunch if the current assets that it has cannot be converted into cash, quickly and at their correct market value, to service its short-term obligations.

Since working capital, turnover and profitability are key performance variables for any firm, an analysis of their relationship is critical from the corporate perspective. In the current study, an attempt is made to examine the effect of changes in WC as a whole can be used to estimate increase or decrease in business turnover and ROA of a firm. Quantification of such relationship can help firms take better decisions related to working capital so as to protect its turnover and profitability from any adverse impact.

2. Literature review

Over the last few years, many studies have examined relationship between the variables chosen for the current study. Findings of some of the key studies are discussed in this section. In their study, Wajahat and Hammad (2010) investigated these variables in the context of Swedish firms. The firms that they chose were listed on the country's premier stock exchange. The study spanned a period of 5 years. OLS Regression output did not produce evidence of any relationship between the two variables.

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In a study focused on Mauritian firms, Padachi (2006) selected firms from manufacturing sector. Various components of WC were used to measure their impact on firms' performance. The regression results showed that holding current assets in the form of inventories and receivables lowered profitability.

Srinivas (2012) analyzed working capital management at Karnataka Power Corporation Limited using ratio analysis. The study examined the associations between the firm's performance outcome in financial terms and WC management. Waithaka (2012) also examined these variables for seven listed firms in the agricultural sector in Egypt. Analysis of cash, inventory and receivables revealed that the these variable had positive effect on performance in terms of earnings, that is, increase in WC led to an increase in the performance from financial perspective.

Muhammad, Sabo et.al. (2015) also examined the relationship between these variables for listed firms in Nigeria for a period of five years. They found that while the relationship was positive for some components of WC, it was inverse for others.

Venkataramana et al. (2013) investigated some key ratios related to efficiency of a key component of working capital, namely, receivables for firms operating in the cement sector by extracting accounting data for a span of one decade. The objective of the study was to detect the impact of changes in receivables on profitability.

Firms in paper industry in India were examined by Ramachandran and Janakiraman (2009) to find the association between efficiency in management of WC and pre-tax earnings. They found that some components of WC had negative relationship with pre-tax earnings while others had a positive association.

Mousavi (2012) evaluated the relationship between these two factors for firms listed on a leading stock exchange of Iran, namely, Tehran Stock Exchange. Return on total assets, return on owner's equity and market value to book value ratio were used as measures of corporate performance and net liquidity balance was used to represent management of WC. The results confirmed the existence of a positive relationship between the two variables.

The effect of inventory on the profit generating ability of Turkish firms in weaving, wholesale, eatables and retail sectors for a period from 2003 to 2012 was investigated by Sekeroglu and Altan (2014). The results revealed the existence of a positive relationship between the two variables for the eatables industry. However, no relationship was found in case of the firms in the wholesale, retail and weaving sectors.

Safdar and Chaudhary (2012) also investigated the relationship between corporate financial outcome and WC for firms in Pakistan. They chose hundred firms operating in the manufacturing sector for the purpose of the study. Findings revealed the existence of a strong negative relationship between the two variables.

Gulia (2014) chose to study the impact of management of WC on the leading pharmaceuticals firms' post-tax earnings. The outcome of analysis suggested that there existed a correlation among variables under the study. The study also showed that net working capital and debt ratio of the firms had a noticeable effect on the performance of these firms from the financial perspective.

There were hardly any studies that evaluated the relationship between business turnover and WC.

Based on the existing studies and theoretical background, the current study proposes following hypotheses:

H1: Other things remaining equal, there is a negative association between BT and WC for firms in the FMCG sector in India.

H2: Other things remaining equal, there is a positive association between ROA and WC for firms in the FMCG sector in India.

H3: Other things remaining equal, there is a negative association between BT and WC for firms in the manufacturing sector in India.

H4: Other things remaining equal, there is a positive association between ROA and WC for firms in the manufacturing sector in India.

H5: Other things remaining equal, there is a negative association between BT and WC for firms in the infrastructure sector in India.

H6: Other things remaining equal, there is a positive association between ROA and WC for firms in the infrastructure sector in India.

3. Methods and data

The objective of the current study is to explore the relationship between management of WC on one hand and business turnover and ROA of listed firms in India on the other hand. The firms selected for the study are Proctor & Gamble, Unilever, Bombay Dyeing, Aditya Birla Group and Adani Group. These companies have been chosen as they belong to three key sectors in India, namely, FMCG (P&G and Unilever), manufacturing (Bombay Dyeing and Aditya Birla Group) and infrastructure (Adani Group). Accounting data was obtained from the published financial statements of the selected companies. Summary statistics, given in table 1, were generated to understand the basic nature of data used for the study.

Table 1. Descriptive statistics

P&G	WORKING_CAPITAL	PROFITABILITY__ROA_	TURNOVER
Mean	-253437	0.094952	20095644
Median	21399.11	0.084579	28120643
Maximum	8219154	0.165	41601195
Minimum	-4164248	0.063996	103701.9
Std. Dev.	3545522	0.028914	17663523
Skewness	1.32144	1.495492	-0.240361
Kurtosis	4.344713	4.518293	1.269942
Jarque-Bera	3.663776	4.688002	1.343414
Probability	0.160111	0.095943	0.510836
UNILEVER	WORKING_CAPITAL	PROFITABILITY__ROA_	TURNOVER
Mean	-2488545	0.119674	28538450
Median	-2443219	0.113261	27039029
Maximum	-114019	0.159239	42508462
Minimum	-5617500	0.0973	14699732
Std. Dev.	1612907	0.020468	8575343
Skewness	-0.526446	0.846561	0.13468
Kurtosis	2.825477	2.421226	2.0654
Jarque-Bera	0.4746	1.334018	0.39418
Probability	0.788755	0.513241	0.821117
ABG	WORKING_CAPITAL	PROFITABILITY__ROA_	TURNOVER
Mean	184785.2	0.039424	1489148
Median	144770.5	0.01912	1683650
Maximum	330946	0.23518	2651600
Minimum	97294	0.00533	278639
Std. Dev.	87635.07	0.069097	1008786
Skewness	0.716965	2.620918	-0.110586
Kurtosis	1.868484	7.971014	1.29669
Jarque-Bera	1.390202	21.74493	1.229243
Probability	0.499024	0.000019	0.540846
BOMDYE	WORKING_CAPITAL	PROFITABILITY__ROA_	TURNOVER
Mean	61592.4	0.008117	167705.4
Median	60908.5	0.012909	173073
Maximum	120240	0.05979	278293
Minimum	-15145	-0.0935	38535
Std. Dev.	47026.78	0.038905	84011.1
Skewness	-0.244485	-1.79595	-0.159545
Kurtosis	1.863754	6.136558	1.604682
Jarque-Bera	0.637561	9.474891	0.853637

Probability	0.727035	0.008761	0.652582
ADANI	**WORKING_CAPITAL**	**PROFITABILITY__ROA_**	**TURNOVER**
Mean	-91051.6	2.826	1003646
Median	45871.5	2.75	1135543
Maximum	151440	4.87	1493285
Minimum	-1187433	-0.79	292685
Std. Dev.	398634	1.547178	348900.4
Skewness	-2.374486	-1.031336	-0.911933
Kurtosis	7.100605	4.302884	3.059238
Jarque-Bera	16.4032	2.48005	1.387498
Probability	0.000274	0.289377	0.499699

OLS Regression is used to analyze the dependent-predictor variable relationship between WC on one hand and turnover and profitability respectively on the other. The result is interpreted in terms of R-squared to evaluate the model fit and p-value of the regression coefficient to interpret the statistical significance of the output generated. Further, robustness analysis is undertaken by applying Panel least square method to pooled data of all five companies under the study.

4. Results

To investigate the relationship between the selected variables for Indian firms in the three sectors, namely, FMCG, manufacturing and infrastructure, the data obtained from the annual reports for the past ten years was regressed with working capital as the predictor and the other two as outcome variables. Before running the regression, a correlation matrix was generated. The results are reported in table 2.

Table 2. Correlation matrix

P&G	**WORKING_CAPITAL**	**PROFITABILITY__ROA_**	**TURNOVER**
WORKING_CAPITAL	1		
PROFITABILITY__ROA_	0.202	1	
TURNOVER	-0.249	-0.232	1
UNILEVER	**WORKING_CAPITAL**	**PROFITABILITY__ROA_**	**TURNOVER**
WORKING_CAPITAL	1		
PROFITABILITY__ROA_	0.395	1	
TURNOVER	-0.774	-0.481	1
ABG	**WORKING_CAPITAL**	**PROFITABILITY__ROA_**	**TURNOVER**
WORKING_CAPITAL	1		
PROFITABILITY__ROA_	0.385	1	
TURNOVER	0.723	0.106	1
BOMDYE	**WORKING_CAPITAL**	**PROFITABILITY__ROA_**	**TURNOVER**
WORKING_CAPITAL	1		
PROFITABILITY__ROA_	-0.172	1	
TURNOVER	-0.023	0.084	1
ADANI	**WORKING_CAPITAL**	**PROFITABILITY__ROA_**	**TURNOVER**
WORKING_CAPITAL	1		
PROFITABILITY__ROA_	0.244	1	
TURNOVER	-0.291	-0.324	1

4.1 Business Turnover as dependent variable

Relationship between BT and WC of five companies, namely, P&G, Unilever, Aditya Birla Group, Adani group and Bombay Dyeing is analysed using OLS regression. In the case of P&G, it is seen that the R-squared is 6.2 percent, which shows that there is quite a low degree of variation in turnover in response to the changes in WC. Also, the probability value of the regression coefficient is 0.487, which is more than 0.05 and hence, the regression is not statistically significant. Therefore, it can be concluded that the relationship between turnover as the outcome and working capital as the predictor is not strong.

For Unilever, R-squared value is 0.6, which shows 60 percent of the variation in BT comes from the changes in working capital of the firm. Also, a low p-value, which is less than 0.05, indicates that the regression coefficient is significant at 5 per cent level of significance. This result shows that there is a dependence of BT on WC, where one raw unit increase in working capital, decreases the turnover by 4.12 units.

In case of Aditya Birla Group, the value of R-squared is 0.524, which means that 52.4 percent of the variation in the dependent variable comes from the changes in the independent variable, which is considerably high. Also, the p-value is 0.018, which is less than 0.05, indicating that the relationship between the two variables is statistically significant. Thus, for ABG, every one raw unit of increase in working capital leads to a decrease in business turnover by 8.33 units.

Further, for Bombay Dyeing, the value of R-squared is 0.001, which shows that only 0.1 percent of the variation in BT comes from the changes in WC of the firm. Also, the p-value is higher than 0.05, indicating that the output has no statistical significance. Thus, there is no relationship between the two variables for this company. For Adani group, the value of R-squared is 0.085, indicating 8.5 percent of the variation in the dependent variable comes from the changes in the independent variable, which is considerably low. Also, the p-value of 0.414 indicates that the relationship is statistically insignificant. The results of OLS regression with model fit criteria are exhibited in table 3.

Table 3: Regression output

TURNOVER	R-Squared	Working Capital	p-value*
P&G	0.062	-1.242	0.487
UNILEVER	0.600	-4.119	0.008
BOMDYE	0.001	-0.042	0.949
ABG	0.524	-8.329	0.018
ADANI	0.085	-0.255	0.414
PROFITABILITY	**R-Squared**	**Working Capital**	**p-value**
P&G	0.671	0.116	0.004
UNILEVER	0.029	1.800	0.641
BOMDYE	0.583	1.500	0.010
ABG	0.363	1.120	0.065
ADANI	0.811	2.300	0.000

*at 5 percent level of significance

4.2 ROA as dependent variable

After analysing the relationship between WC and BT, the relationship between working capital and ROA of the firm was also assessed. The results are tabulated in table 3.

For P&G the value of R-squared is 0.67, indicating that 67 percent of the variance in ROA of P&G is explained by the changes in WC. The higher the R-squared, the better the model fit. Thus, the outcome supports the assumption of dependence of profitability on working capital. Further, the regression output is also statistically significant as the p-value is less than 0.05. This shows that there is a dependence of ROA on working capital, where one raw unit increase in working capital, increases the ROA by 0.12 units.

In case of Unilever, the value of R-squared indicates that only 2.9 percent variability of ROA is attributable to the changes in WC. However, this relationship is not statistically of any value as the p-value of the regression coefficient is more than 5 percent. For Aditya Birla Group, the value of R-squared is 0.36, indicating that only 36 percent of the variability of profitability comes from the changes in working capital. However, this relationship is not statistically of any value as the p-value of the regression coefficient is more than 5 percent.

In case of Bombay Dyeing, the value of R-squared is 0.58, indicating that 58 percent of the variability of profitability comes from the changes in WC. This value is quite high and indicates a good fit. Further, the regression coefficient is also statistically significant, with p-value of less than 0.05. This result clearly shows that there is a dependence of profitability on working capital, where one raw unit increase in working capital, increases the ROA by 1.5 units. Finally, for Adani group, the value of R-squared is 0.81, indicating 81 percent of the variation in profitability comes from the changes in the independent variable, which is considerably high. Also, the p-value of 0.00 indicates that the relationship has significance statistically at 1 percent significance level. This result clearly shows that there is a dependence of profitability on working capital, where one raw unit increase in WC, increases the ROA by 2.3 units.

4.3 Discussion

The proposed hypotheses are only partially supported by the results of the study. The study had proposed six hypotheses. H1 proposed to explore the existence of negative relationship between business turnover and WC for firms in the FMCG sector, represented by P&G and Unilever. The hypothesis is partially supported as the results are statistically significant for Unilever only. H2 proposed a positive relationship between ROA and WC for firms in the FMCG sector. Again the hypothesis is only partially supported as the results are not statistically significant for Unilever at 5 percent level of significance.

H3 proposed to investigate the existence of negative relationship between BT and WC for firms in the manufacturing sector, represented by Aditya Birla Group and Bombay Dyeing. This hypothesis is also partially supported as the results are statistically significant for ABG only. Next, H4 proposed a positive association between ROA and WC for firms in the manufacturing sector. Again the hypothesis is partially supported as the results are not statistically significant for ABG at 5 percent level of significance.

H5 proposed to investigate the existence of negative association between BT and WC for firms in the infrastructure sector, represented by Adani Group. This hypothesis is not supported as the results are not statistically significant. Next, H6 proposed a positive association between ROA and WC for firms in the infrastructure sector. This hypothesis is fully supported as the results are statistically significant for Adani at 5 percent level of significance. A summary of discussion is given in table 4.

Table 4. Results of the Study

Hypothesis	Outcome
H1	Partially Supported
H2	Partially Supported
H3	Partially Supported
H4	Partially Supported
H5	Not Supported
H6	Supported

5. Robustness analysis

As no conclusive result was found from the preceding analysis, the relationship between the variables under the study was explored further to establish whether an outcome-predictor relationship as hypothesized by the study existed or not. For this purpose, the data for all five companies representing three key sectors in India was pooled together and panel least square equation was run twice, once with BT as the dependent variable and then with ROA as the dependent variable . In both instances, WC was used as the explanatory variable. The results are tabulated in table 5.

The results show that work capital is a statistically significant predictor of turnover as well as profitability for firms in India in the manufacturing, FMCG and infrastructure sectors. The relationship is inverse one for turnover, with every one raw unit increase in working capital causing the turnover to decrease by 3.892 raw units. In case of profitability, as measured by ROA, the relationship is positive; indicating that every raw unit increase in WC can cause the ROA to increase by 1.03 raw units.

Table 5. Robustness analysis

Dependent Variable: BUSINESS TURNOVER			
Method: Panel Least Squares			
Variable	**Coefficient**	**Std. Error**	**Prob*.**
C	0.825	0.184	0.000

WORKING_CAPITAL	-3.892	0.918	0.000
Dependent Variable: PROFITABILITY__ROA_			
Method: Panel Least Squares			
Variable	**Coefficient**	**Std. Error**	**Prob*.**
C	0.651	0.191	0.001
WORKING_CAPITAL	1.034	0.200	0.048

*at 5 percent level of significance

6. Conclusions

The current study was undertaken to study the association between business turnover, working capital and ROA of five firms in FMCG, manufacturing and infrastructure sectors in India. Using regression analysis, it was found that out of the five companies whose data was analysed, only two, namely Aditya Birla and Unilever, were found to have association between working capital as independent and turnover as dependent variable. Further, the relationship was an inverse one, that is, an increase in working capital led to a decrease in turnover and vice-versa. These results indicate that organisations can take their working capital decisions in such a way that the turnover is not adversely impacted by it. The outcome is also supported by the panel regression run for pooled data of all five companies analysed for the purpose of the study. Relationship between ROA and working capital was also explored by the current study for chosen firms. According to the regression performed between these two variables, a statistically significant positive relationship existed in case of three companies, namely, P&G, Bombay Dyeing and Adani. . These results indicate that organisations can take their working capital decisions in such a way that the profitability can be positively impacted. The outcome is also supported by the panel regression run for pooled data of all five companies analysed for the purpose of the study.

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