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COMPONENTS OF WORKING CAPITAL AND PROFITABILITY: A CASE OF FUEL AND ENERGY SECTOR OF PAKISTAN *

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ABSTRACT

This paper analyzed the impact of components of working capital on the profitability of fuel and energy sector of Pakistan. Initially six variables have been taken, and panel data analysis has been applied to identify their significance. Results revealed that fixed effect model is an appropriate model based on Hausman test. Further, debt ratio, current ratio, and company size have significant impact on the profitability.

Key Words: Working Capital; Profitability; Fuel and Energy Sector; Panel Data; Pakistan.

INTRODUCTION

Capital management is very important for the success of any business. The management of working capital is divided into two groups: application of asset management and debt management. Nilsson (2010) suggested that profitability, operating cash flow, company size, sale growth and debt ratio are the factors which influence the working capital management.

Corporations are looking for new ways to stimulate growth, improve financial performance, and reduced risk in today's challenging economic climate. Funds tied up in working capital can be seen as hidden reserves that can be used for the capital expansion of business. Many organizations that earned profits over the years have shown the efficient management of working capital. The successful management of working capital is essential for short-run corporate solvency or the survival of any organization. Especially, efficient working capital

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management will lead a firm to react quickly and appropriately unanticipated changes in market variables, such as interest rates, raw material prices, and to gain competitive advantages over its rivals. The way of managing working capital efficiently has varied from firm to firm. An optimal level of working capital is one way which strikes a balance between risk and efficiency. Continued vigilanceis required to maintain the optimal level of various components of working capital such as cash receivables, inventories, and accounts payable (Lamberson, 1995).

The purpose of this quantitative study is to determine the components which effect the working capital management in fuel and energy sector of Pakistan. Further to determine the relationship between the company size, sales growth, debt ratio, quick ratio, current ratio, and operating cash flow and its impact on the profitability in fuel and energy sector of Pakistan.

Identification of significant variables that influence the overall performance of a company is very important for the success of any business. This paper is concerned with the problems involved in working capital management of fuel and energy sector of Pakistan. Very few studies have been made in relation to working capital management in the fuel and energy sector of the Pakistan to find out the significance of working capital management of fuel and energy sector of Pakistan. The objectives of the research are as follows:

- To find out the components of working capital having significant effect on the profitability of fuel and energy sector of Pakistan

LITERATURE REVIEW

Profitability and Operating Cash Flow

Holmstrom and Tirole (2011) suggested that companies has to keep a close watch on their current and forecasted cash positions to ensure their essential liquidity needs. According to Abdual (2007), liquidity and profitability of the companies have a great relationship with each other. Horne & Wachowicz 2004 ducumented that corporate finance basically deals with three decisions: capital structure decisions, budget decisions and working capital management decisions. Capital management is an important component of corporate finance,

as it affects the profitability and liquidity of a company. Johnson & Soenen, 2003 revealed that investigation of the determinants of capital management in an organizational environment has provided valuable information that could be used in formulating an effective strategy for working capital management. Deloof (2003) found that there is significant negative relationship between earnings before income and tax and the number of days accounts receivable, inventories and accounts payable of Belgian firms.

Profitability and Working Capital Management

Zubairi (2010) found that variations in profitability are due to the variables of three quarters selected. Danuletiu (2010) revealed that there is a weak negative linear correlation between the working capital management and profitability. In Malaysia Neab and Noriza (2010) found a significant negative relationship between the components of working capital and business performance. Appuhami (2008) found that companies operating cash flow have a significant relationship with the management of working capital. According to Samiloglu and Demiraunes (2008), is a negative relationship between the time, account receivables and business productivity. Ganesan (2007) found that the days of working capital adversely affected the profitability of companies. It really has no affected the transportability of the companies in the telecommunications equipment industry. Garcia & Martinez (2007) revealed that capital management is an important component of corporate finance, as it directly affects the liquidity and profitability of the company. Padachi (2006) documented that high investment in inventories and accounts receivable were associated with lower profitability. Lazaridis and Tryfonidis (2006) found a negative relationship between profitability and cash conversion cycle. Ross (2005) concluded that the ability of financial managers of the companies is to manage the working capital.

Current and Quick Ratio

Smith and Begemann (1997) emphasized that profitability is the major goal of the management of working capital. Chatteriee (2010) concluded that the relationship between working capital management and profitability. The analysis of different variables has taken including average collection period, inventory turnover in days, average payment period, cash conversion cycle, quick ratio and current ratio. Debt ratio and firm size was also used to

compare the profitability. Binti and Saad (2010) found that there is an inverse relationship between the various components of working capital and firm performance. Neab and Noriza (2010) studied the impact of the dimensions of the working capital component of the cash conversion cycle, the current ratio, working capital ratio of total assets, current liabilities in relation to total assets, and debt to assets ratio upon performance of the firm. They find that there is a negative relationship between the variables of working capital and business performance.

Company Size

Raheman, Afza, Qayyum, and Bodla (2010) found that the performance of firms is significantly related to the cash conversion cycle and the average age of inventory. Dong and Su (2010) found that there is significant and negative relationship between profitability and the receivable conversion period, inventories conversion period and the cash conversion cycle. However, the relationship between profitability and the payable deferral period is positive and significant. Nazir and Afza (2008) found that the operating cash flow, leverage, return on assets and company size has an influenced on the working capital requirements significantly. Sen, Koksal, and Oruc (2008) studied that inventories, accounts receivable and short-term current liabilities has shown the effect of change in working capital management. Raheman and Nasr (2007) documented that there is negative relationship between the variables of capital management and profitability. Kieschnick, Laplante, and Moussawi (2006) suggested that the size of company and the sale has a significant positive impact in the management of working capital. Saghafi and Hashemi (2005) documented that the profitability, operating cash flow, firm size, sales growth and the debt ratio are the factors that influenced the management of working capital.

Sales Growth

Nilsson (2010) found that growth in profitability, operating cash flow, firm size and the sale have an impact on working capital management. Willson (2009) has much attention to financial managers and the impact factors in the management of working capital. The results indicated that the debt ratio, the size and growth are the factors that affect the management of working capital. Shah and Sana (2006) suggested that there is possibility that financial

managers can maximize shareholder wealth by efficient management of working capital. Pandey (2005) noted that overworked capital results unnecessary accumulation of inventories leading to an inventory of mismanagement, waste and theft, the highest incidence of delinquency, the complacency of the inefficient management, increase profit speculative inventories accumulated and the resulting loss of benefits. Narware (2004) has examined by computing coefficient of correlation and regression between the rate of return and the ratio of working capital.

THEORETICAL FRAMEWORK

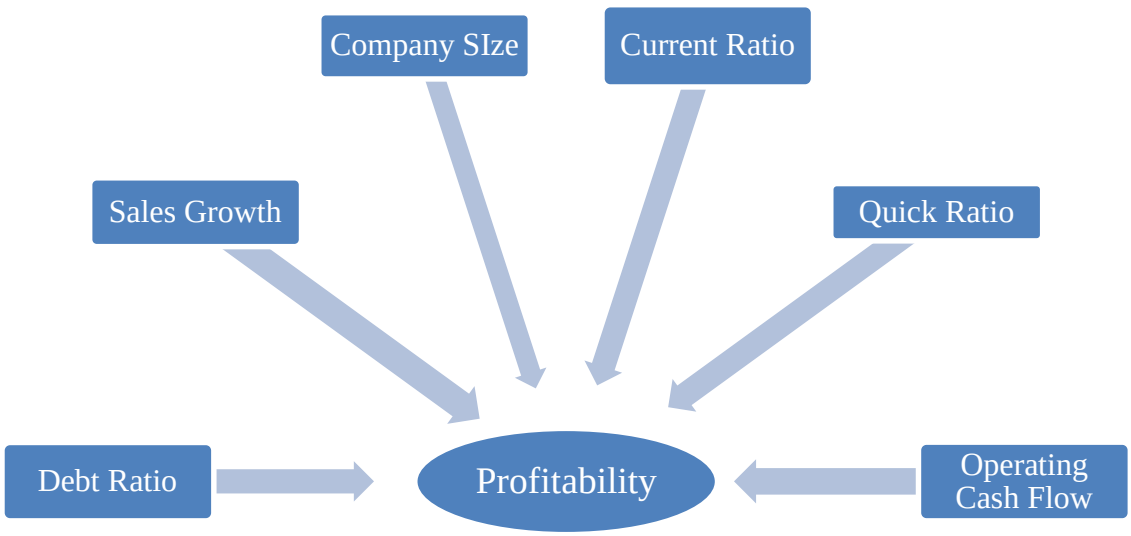
According to the Khan (2007) the theory explained that the working capital management deals with the problems that arise in attempting to manage the current assets and current liabilities. The goal of working capital management is the effective management of the company's current assets and liabilities, so that a satisfactory level of working capital is maintained. This is because if the company cannot maintain a satisfactory level of working capital then it is likely to be insolvent and can be forced into bankruptcy. The interaction between current assets and current liabilities is therefore the focus of the theory of labor management. The basic ingredients of the theory of working capital management can say that they are defined. The optimal level of current assets, the trade-off between return and risk that is associated with the level of current assets and liabilities.

Net working capital is an important consideration of the trade-off between risk and return. The level of net working capital has an influenced on the profitability and risk. It is assumed that the greater the amount of net working capital the less prone to the risk of the company is. The greater the net working capital, the more liquid is the firm and is less likely to become technically insolvent. In comparison, lower net working capital and liquidity are associated with higher levels of risk. It has been shown that the hedging approach is associated with high profits and high risk, while the conservative approach offers low returns and low risk. A balance between these two extremes would give an acceptable financial strategy. The third approach –trade- of between the two approaches and strikes a balance offers a financing plan that lies between these two extremes.

An increase in the ratio of current assets to total assets will lead to a decrease in profitability due to the current assets are assumed to be less profitable than fixed assets. A second effect of the ratio will increase the risk of technical insolvency may also decrease because the increase in current assets, assuming no change in current liabilities, increase in net working capital. A decrease in the ratio of current assets to total assets will result in increased profitability and risk. The increase in profitability is mainly due to the corresponding increase in fixed assets that can generate higher profits. Since assets decrease without a corresponding reduction in current liabilities will increases the risk.

FIGURE 1

Theoretical Framework



The figure shows that profitability is taken as the dependent variable and debt ratio, sales growth, company size, current ratio, quick ratio and operating cash flow is taken as independent variable. The graphic above illustrates the research framework used in this research which elaborates the relationship that the researcher intends to check in this study. The dependence of the performance has been checked through the critical elements of working capital management. The figure above shows the relationship between dependent and the independent variables. The hypothesis that has been tested in this study is as follows:

- *$H1_1$ = Components of the working capital have significant effect on the profitability and financial position of fuel and energy sector of Pakistan.*

RESEARCH METHODOLOGY

The methodology used within the framework of our empirical analysis is that of panel data, which presents the advantage of treating jointly the individual effects and the temporal effects, and increasing the degree of freedom and inference exactitude. The panel data estimation makes it possible to highlight the heterogeneity of the observations in their individual dimensions by the taking into account of a fixed or random specific effect. Three tests make it possible to validate the specification of the model. The first is the test of presence of an individual effect, which consists in checking the existence of an individual effect. The second is the test of homogeneity of the coefficients that makes it possible to test the equality for all the companies and the third test is the test of Haussman, which is used to discriminate the fixed effect and the random effect.

TABLE 1

Variables Definition and Explanation

Variable	Explanation
Profitability	In their study, the dependent variable, return on total assets consider as a tool for measuring the profitability
Operating Cash Flow (OCF)	Operating cash flow is calculated by dividing cash flow from operation with current liabilities
Company Size (CS)	The company size is calculated by taken logarithm of company's total assets
Sales Growth (SG)	Sales Growth is calculated by (Current Year Sales – Previous Year Sale) / Previous Year Sale
Current Ratio (CR)	Current ratio and the ratio of quick are generally financial ratios.

Variable	Explanation
	Current ratio is the ratio of current assets to current liabilities
Quick Ratio (QR)	Quick ratio= (Current assets - Inventories) /Current liabilities.
Debt Ratio (DR)	When this ratio is high it indicates that domestic investment is low and companies need to finance their operations. Debt Ratio: Total Debt/Total Assets

Data Collection

The population of the research has 411 companies, listed in Karachi Stock Exchange. Fuel and Energy Sector firms has selected as a sample. The data has been taken from over the years 2003-2012. Panel data analysis has been employed by taking profitability as dependent variable and remaining as independent variables. Following two econometrics panel data model which has been used in present model:

- Fixed Effect Model (FEM), and
- Random Effect Model (REM)

RESULTS AND DISCUSSIONS

Random Effect Model (REM)

Present study has applied Ordinary Least Square (OLS) technique and provided all these parameters should be linear in nature. The general form of panel model is as follow:

$$Y_{it} = \beta_0 + \beta X_{it} + u_{it}$$

Where;

i = 1, 2, 3, ……..n

t = 1, 2, 3,……..t

Table 2 shows the result of random effect model. The finding reveals that performance of fuel and energy sector of Pakistan is positive related with company size and operating cash flow and their relationship with profitability is also statistically significant based on p values. In case of sales growth and quick ratio, their relation with profitability is positive but not significant. The value of R^2 shows that 84% variation in Return on Assets explained by the independent variable. The P value hows that overall random effect model is good fit, but the value of Durbin-Watson test not better as compare to than fixed effect model.

TABLE 2

Results of Random Effect Model

	Coefficient	Std. Error	t-Statistic	Prob.
SG	0.267908	0.236797	1.258073	0.1104
QR	0.632375	0.768021	0.940567	0.2585
OCF	3.57E-07	1.02E-07	3.397083	0.0008
DR	-24.76749	3.407100	-7.915087	0.0000
CS	5.668453	1.469504	5.354496	0.0000
CR	-0.768263	0.436615	-2.217661	0.0162
C	-34.31423	9.755213	-3.731772	0.0002
Weighted Statistics				
R-squared	0.832892	Mean dependent var	1.317448	0.832892
Adjusted R-squared	0.609097	S.D. dependent var	7.281683	0.609097
S.E. of regression	5.597444	Sum squared resid	4480.387	5.597444
F-statistic	18.19277	Durbin-Watson stat	1.564209	18.19277
Prob(F-statistic)	0.0000			
Unweighted Statistics				

R-squared	0.806091	Mean dependent var	5.095007
Sum squared resid	10057.65	Durbin-Watson stat	1.796809

Fixed effect model (FEM)

Fixed Effect Model is also used to pool the time series data and cross sectional data but considering time effects and individual effects on the intercept. Fixed Effect Model is being used in order to authenticate the panel data regression model. This model facilitates to explore the each variable as significant and/or insignificant for including on hand study. The general form of FEM is as follow:

$$Yit = (\alpha + u_t) + \beta X_{it} + u_{it}$$

Table 3 shows the results of Fixed Effect Model. Results indicates that performance of fuel and energy sector of Pakistan has a negative relationship and is significantly correlated with the debt ratio and current ratio. Company size has significant and positive correlation with performance of fuel and energy sector of Pakistan. R^2 shows that 82 % variation in Profitability is explained by six independent variables. P value shows that overall Fixed Effect Model is good fit. Further, the value of Durbin-Watson also indicates the absence of autocorrelation problem which is a good sign to select this model by consideration an appropriate model for prediction.

Table 3

Results of Fixed Effect Model

	Coefficient	Std. Error	t-Statistic	Prob.
SG	0.366520	0.239280	1.448180	0.1400
QR	0.487785	0.773149	0.760249	0.3485
OCF	2.39E-07	1.61E-07	1.418680	0.2584
DR	-25.67064	3.654313	-7.325767	0.0000

CS	8.444520	1.803751	5.125163	0.0000
CR	-0.702889	0.439426	-2.054701	0.0319
C	-42.35557	12.11612	-3.741757	0.0001

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.829770	Mean dependent var	5.095007
Adjusted R-squared	0.749579	S.D. dependent var	14.43589
S.E. of regression	5.598840	Akaike info criterion	6.412173
F-statistic	43.07762	Schwarz criterion	6.833662
Prob(F-statistic)	0.000000	Durbin-Watson stat	1.514986

Hausman Test

The null hypothesis of Hausman test is that the coefficients estimated by the efficient random effects estimator are the same as the ones estimated by the consistent fixed effects estimator. If they are (insignificant P-value, Prob>chi2 larger than .05) then it is safe to use random effects. If you get a significant P-value, however, you should use fixed effects.

TABLE 4

Results of Hausman Test

Hausman Specification Test (Random vs. Fixed Effects)

Equation: Untitled

Test for correlated cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	5.928654	6	0.4312

The statistic provides little evidence against the null hypothesis that there is no misspecification. It is not a universal rule but more conventional to compare the p-value to 0.05. If $p<0.05$, reject the null. Since the p-value equals 0.4312 we fail to reject the null and there is a random effect.

- *H_0: random effects would be consistent and efficient*
- *H_1: random effects would be inconsistent*

In random effect model, value of Durbin Watson test 1.797shows that this model has not issue of autocorrelation as compare to pooled data model and fixed effect model. In this model 84 % variation in dependent variable explains by the independent which is also high percentage of variation as compare to pooled data model and fixed effect model. Random effect model has been selected to be the best model.

$$\text{Profitability} = b_0 + b_1\,SG + b_2\,QR + b_3\,OCF + b_4\,DR + b_5\,CS + b_6\,CR + e$$

$$\text{Profitability} = -34.314 + 0.268\,SG + 0.632\,QR + 3.57\,OCF - 24.767\,DR + 5.668\,CS - 0.76826CR + e$$

CONCLUSIONS

This study has empirically investigated the significance of working capital management in fuel and energy sector of Pakistan. Findings of present study concluded that random effect model is the most appropriate method for this study and best model as compare to fixed effect model. The finding also reveals that performance of fuel and energy sector of Pakistan is positive related with company size and operating cash flow and their relationship with profitability is also statistically significant based on p values. In case of sales growth and quick ratio, their relation with profitability is positive but not significant. The value of R^2 shows that 84% variation in Return on Assets explained by the independent variable. The P value shows that overall random effect model is good fit, but the value of Durbin-Watson test not better as compare to than fixed effect model.

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