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IMPACT OF WORKING CAPITAL ON FINANCIAL PERFORMANCE OF PUBLIC SECTOR COMPANIES

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ABSTRACT

Business success depends heavily on the ability of financial managers to effectively manage the components of working capital. A well calculated and employed working capital management is anticipated to add positively to the firm's performance. The purpose here is to assess the impact of working capital on the financial performance of listed eight Public Sector Companies in India. The study employed panel data regression. In order to estimate the effects of explanatory variables on the financial performance, three estimation models were used namely, pooled ordinary least squares (OLS), random effects model and fixed effects model. The results of the study show that there exists an influence of working capital components on the financial performance of Public Sector Companies as represented by Return on Assets.

1. INTRODUCTION

Working capital management refers to investment in current assets and current liabilities which are liquidated within one year or less and is therefore crucial for firm's day-to-day operations (Kesimli & Gunay, 2011). Working capital is the money needed to finance the daily revenue generating activities of the firm. WCM ensures that a company has sufficient cash flow in order to meet its short-term debt obligations and operating expenses (Mekonnen, 2011). According to Vahid, Mohsen and Mohammadreza (2012) working capital management plays a significant role in determining success or failure of firm in business performance due to its effect on firm's profitability as well on liquidity. Business success depends heavily on the ability of financial managers to effectively manage the components of working capital (Filbeck & Krueger, 2005). A firm may adopt an aggressive or a conservative working capital mana gement policy to achieve this goal. A well calculated and employed working capital management is anticipated to add positively to the firm's performance (Padachi, 2006).

Financial performance of an organisation indicates its financial health and soundness. Financial decisions have their own impact on its performance. Since working capital implies investment in current assets, every effort should be made to ensure o good impact on the financial performance. Financial performance in its turn depends partly on the performance of working capital.

2. REVIEW OF LITERATURE

The literature contains an extensive debate on the risk/ return trade-off among different working capital policies (Gitman, 2005; Moyer et al., 2005; Brigham & Ehrhardt, 2004). While more aggressive working capital policies are associated with higher returns and risk, conservative working capital policies offer both lower risk and returns (Gardner et al., 1986; Weinraub &Visscher, 1998). Bhunia and Das (2012) conducted a study to examine the relationship between the working capital management structure and the profitability of Indian private sector firms. The study found a weak relationship between all the working capital management constructs and profitability. Sharma and Kumar (2011) found a positive relation between WCM and firm profitability, although the relationship between cash conversion cycle and ROA was not statistically significant. Falope and Ajilore (2009) found a significant negative relationship between net operating profitability and the average collection period, inventory turnover in days, average payment period and cash conversion cycle.

3. OBJECTIVE OF THE STUDY

The objective of the present study is to ascertain the impact of working capital on the Financial Performance of Public sector companies.

4. METHODOLOGY OF THE STUDY

The study made use of ex-post facto research design. The study is also descriptive and exploratory in nature. Eight

Public sector companies listed in Bombay Stock Exchange are taken for the study. The study employed panel data regression. The study was purely based on secondary data. Annual Reports of the Public Sector companies in India formed the primary source of such data. Research Data Bases like Money Control, CRISIL, PROWESS and Capital Line were also relevant sources for the required data. The data were collected for a period of 10 years from 2008 to 2017. In order to estimate the effects of explanatory variables on the financial performance, three estimation models were used namely, pooled ordinary least squares (OLS), random effects model and fixed effects model.

Study Hypothesis

The hypothesis formulated for the study is that there exists a significant influence of Working Capital on the financial performance of public sector companies

Model Specification

The effect of working capital management on the financial performance of the listed manufacturing firms in India was modelled using the following regression equation:

$$ROAit = \beta0 + \beta1APPit + \beta2ACPit + \beta3ICPit + \beta4CCCit + \beta5SIZEit + \mu it$$

Where;

ROA = Return on Assets

APP = Average Payment Period

ACP = Average Collection Period

ICP = Inventory Conversion Period

CCC = Cash Conversion Cycle

SIZE = Firm size in Log Total Assets

i = the 16 listed firms from the 1^{st} to the 16^{th}

t = time period in years, starting from year 1, 2…to year 10 [i.e, 2008-2017] (reduced to 9 after first differencing)

μ = error term of the model

β1- β5 = regression model coefficients

= Constant

5. RESULTS AND DISCUSSION

The results of analysis are discussed below:

5.1 Descriptive Statistics

For testing the normality of the data, Jarque-Bera test is done. The following hypothesis is tested using Jarque-Bera statistics:

H0: The distribution is normal

H1: the distribution is not normal

Table 1 Descriptive Statistics (Individual Samples)

Public Sector	ROA	APP	ACP	ICP	CCC	LOG_TA
Mean	-2.0725	282.965	163.4637	369.9752	270.387	3.049471
Median	4.55	336.401	25.98602	305.2478	191.1583	2.964087
Maximum	18.58	359.314	5112	1502.71	5175.275	5.373973
Minimum	-104.65	0	0	0	-332.0594	1.12483
Std. Dev.	20.51381	105.6069	639.2753	304.17	686.049	1.185615
Skewness	-2.893472	-1.67657	6.715631	0.929016	5.114832	0.280756
Kurtosis	13.1992	4.692895	50.41091	4.050856	36.41571	2.267691
Jarque-Bera	458.3749	47.03158	7588.104	15.18862	3816.425	2.838574
Probability	0.0000	0.0000	0.0000	0.0005	0.0000	0.2419
Sum Sq. Dev.	33244.49	881071.8	30241798	7309031	34829074	111.0489
Observations	80	80	75	80	75	80

Source: Panel Data

The P values of Jarque Bera statistics <0.05, rejects the null hypothesis that the distribution is normal, at 5% significance level, in all the cases except the Log of Total Assets. All other data are not normally distributed

5.2 Unit Root Test

In order to test the Stationarity nature of data series, the following hypothesis is used:

H_0: Unit Root is present

H^a: Unit Root is not present

Levin, Lin & Chu t* and PP-Fisher Chi-square Unit Root Test are applied and the results are given below in Table 2.

Table 2 Panel Unit Root Test (At Level) Summary

Panel unit root test: Summary					
Exogenous variables: Individual effects, individual linear trends				Sample: 2008 2017	
Automatic selection of maximum lags	Automatic lag length selection based on SIC: 0 to 1				
Newey-West automatic bandwidth selection and Bartlett kernel					
Null: Unit root (assumes common unit root process)					
Levin, Lin & Chu t*	Statistic	Prob.**	Cross-sections	Obs	Null
Series: ROA	-3.215	0.0007	8	70	Rejected
Series: APP	-2.701	0.0035	8	70	Rejected
Series: ACP	-1.267	0.1025	8	61	Cant be Rejected
Series: ICP	-3.57	0.0002	8	70	Rejected
Series: CCC	-40.4	0.0000	8	65	Rejected
Series: LOG TA	-5.286	0.0000	8	68	Rejected
Null: Unit root (assumes individual unit root process)					
ADF - Fisher Chi-square	Statistic	Prob.**	Cross-sections	Obs	Null
Series: ROA	13.408	0.6427	8	70	Cant be Rejected
Series: APP	12.437	0.7134	8	70	Cant be Rejected
Series: ACP	29.891	0.0186	8	61	Rejected
Series: ICP	15.243	0.5069	8	70	Cant be Rejected
Series: CCC	28.404	0.0283	8	65	Rejected
Series: LOG TA	27.709	0.0342	8	68	Rejected
** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution, while LLC tests assume asymptotic normality.					

Source: Panel Data

At level (without differencing) the probabilities of Levin, Lin & Chu t* in the case of common unit root process are less than 0.05 except ACP with respect to all other variables, which rejects the null hypothesis of presence of a common unit root, at 5 per cent significance level.

However, Augmented Dickey Fuller – Fisher Chi-square statistics in the case of individual unit root process fails to reject the null hypothesis of presence of individual unit root, at 5% significance level, in the cases of ROA, APP and ICP since p values of ADF- Fisher Statistics exceeds 0.05. Hence these three variables are subjected to first differencing before testing for unit root again. However, the variables namely ACP, CCC and Log of Total Assets are found to be stationary since common or individual unit root presence is rejected.

Table 3 shows the individual unit root test results of ACP, ROA, APP and ICP after first differencing.

Table 3 Panel Unit Root Test (After 1st Differencing) Summary

Panel unit root test: Summary					
Exogenous variables: Individual effects, individual linear trends				Sample: 2008 2017	
Automatic selection of maximum lags	Automatic lag length selection based on SIC: 0 to 1				
Newey-West automatic bandwidth selection and Bartlett kernel					
Null: Unit root (assumes common unit root process)					
Levin, Lin & Chu t*	Statistic	Prob.**	Cross-sections	Obs	Null
Series: FD(ACP)	-17.298	0.0000	7	52	Rejected
Null: Unit root (assumes individual unit root process)					
ADF - Fisher Chi-square	Statistic	Prob.**	Cross-sections	Obs	Null
Series: FD(ROA)	36.0454	0.0029	8	58	Rejected
Series: FD(APP)	80.0861	0.0000	8	60	Rejected
Series: FD(ACP)	54.9868	0.0000	7	52	Rejected
Series: FD(ICP)	51.7708	0.0000	8	61	Rejected
** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution, while LLC tests assume asymptotic normality.					

Source: Panel Data

.The null hypothesis of presence of unit root gets rejected, at 5 per cent significance level, since probabilities of Levin,Lin & Chu t* and ADF – Fisher Chi-square statistics fall below 0.05 in all the cases. Thus all the three data series are stationary after first differencing.

5.3 Correlation

The correlation between the dependent and independent variables are ascertained as follows in the following Table 4

Table 4 Correlation

Public Sector						
	FDROA	FDAPP	FDACP	FDICP	CCC	LOG_TA
FDROA	1.000					
FDAPP	-0.029	1.000				
FDACP	-0.634	0.028	1.000			
FDICP	0.072	-0.119	-0.009	1.000		
CCC	0.205	-0.030	-0.283	0.278	1.000	
LOG_TA	-0.227	-0.028	0.234	-0.057	-0.557	1.000

Source: Panel Data

A higher correlation should exist between dependent variable FD(ROA) and independent variables APP, ACP, FD(ICP), CCC and FD (Log TA) and a low correlation between independent variables is desired for regression to be meaningful. A high negative correlation exists between FDROA and FDACP (0.634%)

5.4 Pooled OLS Regression

A Panel Regression is done with the working null hypothesis that all the regression coefficients are equal to zero. Table 5 depicts the results of pooled regression with 1st differenced explained variable return on assets (FDROA) and explanatory variables APP, ACP, FDICP, CCC and FDLOG_TA

The regression results are initially used to test the following hypothesis.

Null Hypothesis: H_{01} The coefficient is equal to zero

Alt Hypothesis: H_{11} The coefficient is not equal to zero

Table 5 Pooled OLS Regression Results Summary

Method: Panel Least Squares			Sample (adjusted): 2009 2017	
Periods included: 9			Cross-sections included: 8	
Total panel (unbalanced) observations: 66				
Dependent Variable: FDROA				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
FDAPP	-0.003269	0.047182	-0.06928	0.9450
FDACP	-0.016692	0.00278	-6.00438	**0.0000**
FDICP	0.00528	0.00742	0.711587	0.4795
CCC	-0.002356	0.005827	-0.40428	0.6874
LOG_TA	-1.246675	1.414422	-0.8814	0.3816
C	4.313119	5.159588	0.835942	0.4065
R-squared	0.414299	Durbin-Watson stat		2.364088
Adjusted R-squared	0.365491	F-statistic		8.488276
S.E. of regression	11.35843	Prob(F-statistic)		**0.000004**

Source: Panel Data

The coefficients of FDAPP, FDICP, CCC, LOG_TA and C are not significant, since p values of t- statistics exceeded 0.05, which fail to reject the null hypothesis, at 5% significance level.

The predictor namely FDACP is found to be significant, since p value of t statistics falls below 0.05 and rejects the null hypothesis that coefficient is zero.

A R squared of 0.414 indicates that 41 percent of variations in ROA is explained by the model. However, a reasonable adjusted R^2 indicates the efficiency of explaining power of the model.

A Durbin-Watson statistic of 2.36 which is near to 2 indicates almost no auto correlation in residuals.

The following hypothesis was tested for overall significance of the model.

Null Hypothesis: H_{02}The fit of the intercept only model is as good as the specified model

Alt Hypothesis: H_{12}The fit of the intercept only model is not as good as the specified model

Since the p value of F statistic is lesser than 0.05, the null hypothesis gets rejected, at 5% significance level. This implies that the explanatory variables have predictability power and can explain more than what the intercept only model could.

Thus the regression can be represented as follows:
FDROA = 4.3131 - 0.0033*FDAPP - 0.01669*FDACP + 0.0052*FDICP - 0.0023*CCC - 1.2466*Log_TA

5.5 Multicollinearity

The OLS pooled regression model is subjected to multicollinearity test using variance inflation factors, the result of which is shown in table 6.

Table 6 Multicollinearity - Variance Inflation Factors

Public Sector			
Sample: 2008 2017	Included observations: 66		
	Coefficient	Uncentered	Centered
Variable	Variance	VIF	VIF
FDAPP	0.002226	1.018035	1.017064
FDACP	0.000008	1.126628	1.103244
FDICP	0.000055	1.120329	1.119112
CCC	0.000034	2.183621	1.657564
LOG_TA	2.000589	11.07058	1.486277
C	26.62135	13.61875	NA

Source: Panel Data

The centered VIF in the cases of all the regressors stand well below 2, which shows that there is no multicollinearity among independent variables.

Since the model is found to be significant and free from multicollinearity, both the cross section and period random effects are analysed.

5.6 Period Random Effects

Since two way effects and mixed effects are not possible with unbalanced data, the random effects of periods are tested independently. The results of estimated generalized least square (EGLS) regression for period random effects are shown in Table 7.

Table 7 EGLS Period Random Effects – Results Summary

Method: Panel EGLS (Period random effects)				
Dependent Variable: FDROA		Sample (adjusted): 2009 2017		
Periods included: 9		Cross-sections included: 8		
Total panel (balanced) observations: 66				
Swamy and Arora estimator of component variances				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
FDAPP	-0.002168	0.052184	-0.041553	0.9670
FDACP	-0.016579	0.002912	-5.694248	**0.0000**
FDICP	0.005476	0.008074	0.678274	0.5002
CCC	-0.002499	0.005949	-0.420063	0.6759
LOG_TA	-1.26553	1.42986	-0.885073	0.3797
C	4.404293	5.456752	0.807127	0.4228
	Effects Specification			
			S.D.	Rho
Period random			4.674323	0.1428
Idiosyncratic random			11.45266	0.8572
	Weighted Statistics			
R-squared	0.414403	Durbin-Watson stat		2.370289
Adjusted R-squared	0.365603	F-statistic		8.491907
S.E. of regression	10.96775	Prob(F-statistic)		**0.000004**
	Unweighted Statistics			
R-squared	0.414262	Mean dependent var		1.334091
Sum squared resid	7741.332	Durbin-Watson stat		2.362807
Figures in bold indicates significant at 5% level				

Source: Panel Data

As in the case of pooled regression, the coefficients of FDAP, FDICP, CCC, LOG_TA and C are not found to be significant since the p value of their t statistics exceeded 0.05. Similarly, a 0.414 R^2 explains that variations in working capital components account for a 41.4 per cent variation in financial performance represented by return on assets, though adjusted R^2 is reasonably good. The Durbin Watson statistics of both weighted and un-weighted statistics stand near to the value of 2, which means that there are no reasons of concern, though a slight negative serial correlation of the first order could be traced. The overall significance of the model is justified by a lesser than 0.05 probability of F statistics.

It may be inferred that period effect of working capital components on financial performance is statistically significant.

5.7 Multicollinearity - Period Random Effects

The variance inflation factors indicating multicollinearity among the predictors in the period random effects model is tested and the results are summarised in Table 8 below:

Table 8 Variance Inflation Factors – Period Random Effects

Sample: 2008 2017	Included observations: 66		
	Coefficient	Uncentered	Centered
Variable	Variance	VIF	VIF
FDAPP	0.002723	1.044698	1.044258
FDACP	0.000008	1.122918	1.111034
FDICP	0.000065	1.141141	1.140333
CCC	0.000035	1.914939	1.666946
LOG_TA	2.0445	5.811216	1.489479
C	29.77614	6.730049	NA

The preferred model is random effects for period effects.

Source: Panel Data

5.8 Correlated Random Effects – Hausman Test

To check whether the preferred model is random effects, Hausman test is conducted to test the hypothesis on period random effects, the results of which are tabulated in table 9.

Null Hypothesis: The preferred model is random effects
Alt Hypothesis: The preferred model is fixed effects

Table 9 Period Correlated Random Effects – Hausman Test

Correlated Random Effects - Hausman Test			
Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f	Prob.
Period random	0.095934	5	0.9999

Source: Panel Data

A greater than 0.05 probability of Chi-Square statistic of Hausman test fails to reject the null hypothesis that the preferred model is random effects, at 5 per cent significance level. Hence the period fixed effects model is not evaluated.

5.9 Cross Section Random Effects

The results of estimated generalized least square (EGLS) regression for cross section random effects are shown in Table 10.

Table 10 EGLS Cross Section Random Effects – Results Summary

Method: Panel EGLS (Cross-section random effects)				
Dependent Variable: FDROA		Sample (adjusted): 2009 2017		
Periods included: 9		Cross-sections included: 8		
Total panel (balanced) observations: 66				
Swamy and Arora estimator of component variances				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
FDAPP	-0.003269	0.049898	-0.065508	0.9480
FDACP	-0.016692	0.00294	-5.677594	**0.0000**
FDICP	0.00528	0.007847	0.672859	0.5036
CCC	-0.002356	0.006162	-0.382273	0.7036
LOG_TA	-1.246675	1.495833	-0.833432	0.4079
C	4.313119	5.456561	0.790446	0.4324
	Effects Specification			
			S.D.	Rho
Cross-section random			0	0
Idiosyncratic random			12.0122	1
	Weighted Statistics			
R-squared	0.414299	Durbin-Watson stat		2.364088
Adjusted R-squared	0.365491	F-statistic		8.488276
S.E. of regression	11.35843	Prob(F-statistic)		**0.000004**
	Unweighted Statistics			
R-squared	0.414299	Mean dependent var		1.334091
Sum squared resid	7740.84	Durbin-Watson stat		2.364088
Figures in bold indicates significant at 5% level				

Source: Panel Data

As observed in the cases of pooled regression as well as period random effects model, the coefficients of regressors FDAPP, FDICP, CCC, LOG_TA and C are not statistically significant, while the coefficients of other regressor FDACP are significant and not equal to zero. Once again, the cross section random effects of WC explains 41.4 per cent of variations in ROA as is evident from the R^2, and the adjusted R^2 is reasonable. The overall significance of the model is proven by a lesser than 0.05 probability of F statistics, which indicates that the fit of the specified model is better than that of the intercept only model. A near 2 value of Durbin Watson Statistic raises no alarm of concern for first order auto correlation.

5.10 Multicollinearity – Cross Section Random effects

The multicollinearity that may exist among the regressors in the cross section random effects model is tested using variance inflation factors, as is shown in Table 11.

Table 11 Variance Inflation Factors – Cross Section Random Effects

Sample: 2008 2017	Included observations: 66		
	Coefficient	Uncentered	Centered
Variable	Variance	VIF	VIF
FDAPP	0.00249	1.018035	1.017064
FDACP	0.000009	1.126628	1.103244
FDICP	0.000062	1.120329	1.119112
CCC	0.000038	2.183621	1.657564
LOG_TA	2.237515	11.07058	1.486277
C	29.77406	13.61875	NA

Source: Panel Data

It is observed that no multicollinearity exists between regressors in the model as is evident from the low centered variance inflation factors.

5.11 Correlated Random Effects – Hausman Test

To check whether the preferred model is random effects, Hausman test is conducted on cross section random effects, the results of which are tabulated in table 12.

Null Hypothesis: The preferred model is random effects

Alt Hypothesis: The preferred model is fixed effects

Table 12 Cross Section Correlated Random Effects – Hausman Test

Correlated Random Effects - Hausman Test			
Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	0.54329	5	0.9905

Source: Panel Data

A greater than 0.05 probability of Chi-Sq. Statistic fails to reject the null hypothesis that the preferred model is random effects model. Hence it is inferred that the random effects of working capital components of Public Sector companies represent as cross sections do affect the financial performance represented by ROA. The fixed effects of cross sections are not evaluated since the preferred model is random effects.

6. CONCLUSION

The conclusions drawn from the analysis show that the variations in working capital components account for a 41.4 per cent variation in financial performance represented by return on assets, though adjusted R^2 was reasonably good. The overall significance of the model was proven by a lesser than 0.05 probability of F statistics, which indicated that the fit of the specified model was better than that of the intercept only model. The preferred model is random effects It can be finally inferred that the random effects of working capital components of Public Sector companies represented as cross sections do affect the financial performance represented by ROA.

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