



# Impact of capital structure on profitability and earnings of the firm; a study on Pakistani companies from Non-Financial sector

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## Abstract

Capital structure is the driver of profitability and earnings of any company; therefore, the impact of capital structure is analyzed in companies selected from non-financial sector of Pakistan including public and private sector. The financial data of 22 companies has been observed from 2010-2015. Eviews 8 has been used to analyze the panel regression. The Hausman test confirms that random effect model is appropriate for both ROE and EPS. Findings reveal that DE is insignificantly negatively related to ROE but significantly positively related to EPS, where DA is insignificantly positively related to ROE but significantly negatively related to EPS. The policy makers of sample companies should consider the impact of capital structure on EPS.

**Keywords:** Eviews 8; Panel Regression; Hausman Test; Random Effect Model; ROE; EPS; DE and DA.

## 1. Introduction

The profitability is the most important indicator for any business. The company has to analyze the composition of capital structure to gauge its profitability. It's true that more levered firms enjoy more profits but on the other hand, the firm with large scale can only avail this facility, but the companies with low scale will face adverse effect of debt financing on profitability.

Trade-off theory suggests that the debt is positively related to profitability, and the debt is also used as a tax shield source of financing. The objective of this study is to find out the relationship between profitability and the capital structure.

The financial leverage of Pakistani companies needs to be tested with profitability. The impact has to be investigated as many researchers are there in literature but with inconsistent results. The elasticity of financial leverage varies from company to company that is why no one can have thumb rule to say exact wording in literature.

Profitability is the key to success; it is among those indicators which are considered as the sole of the business, the business without making profit is nothing. There are huge inconsistencies among the findings of researchers. Studies like Maina, 2014; Zeitun, 2014; and Ali, 2016 show positive relationship but Muathe, 2014 and Kodongo, 2015 show negative results therefore there is a need of research.

## 2. Literature review

Chisti (2013) explores the impact of capital structure on the profitability by focusing on 10 companies in the automobile sector. The findings of the study say that capital structures do have the statistically significant impact upon the profitability of firms. In this study, the dependent variable is net profit margin and independent variables are financial leverage and interest coverage ratio. The

limitation of this study is a very small sample size which may not be sufficient to argue generally.

Maina (2014) argues the positive relationship between capital structure and profitability, on the other hand, Zeitun (2014) rings the bell of inconsistency by arguing the positive impact in Jordanian firms but negative impact in Gaza. This study is based on panel regression. Similarly, Muathe (2014) supports the argument of Zeitun (2014) findings in Gaza, by finding negative relationship between corporate performance and capital structure in Kenya.

One year later, Kodongo (2015) comes up with the negative impact of capital structure on financial performance. This study is also based in Kenya and has found the same results by supporting the arguments of Muathe (2014) and Zeitun (2014) challenging the findings of Chisti (2013) and Maina (2014). Kodongo (2015) creates more inconsistency and broader the research gap for the upcoming researchers.

After one-year Ali (2016) opens the gap more by arguing both positive and negative impact of capital structure on profitability supporting the mixed findings of Zeitun (2014). This study is based on Pakistan Automobile and Cement sectors. Ali (2016) applies panel regression and with the help of Hausman specific test, he selected the best-fit model between Fixed effect model and Random effect model. Ali (2016) arguments creates a huge gap for upcoming researchers by finding inconsistent results as compared to Maina, 2014; Zeitun, 2014; and Ali, 2016.

## 3. Problem statement

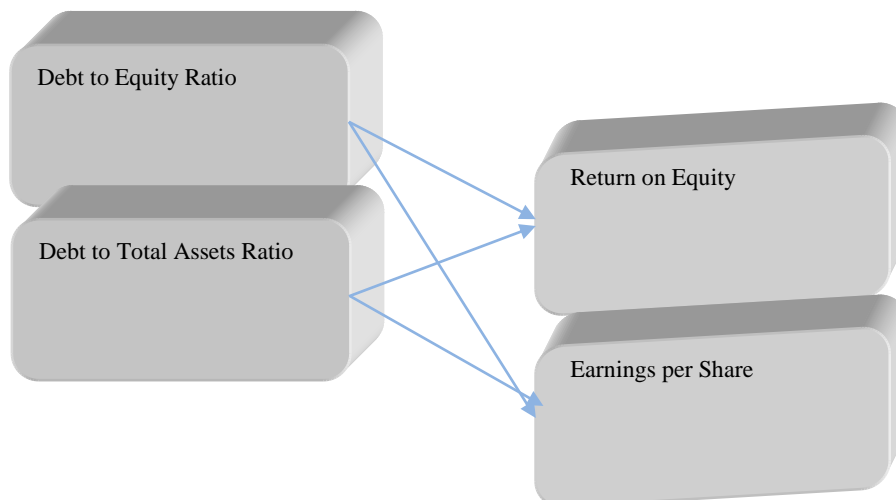
Profitability is the key to success; it is among those indicators which are considered as the sole of the business, the business without making profit is nothing. There are huge inconsistencies among the findings of researchers. Studies like Maina, 2014; Zeitun, 2014; and Ali, 2016 show positive relationship but Muathe, 2014 and Kodongo show negative results therefore there is a need of research.

**Table 1:**Literature Reviews Matrix (Self-Contribution Contribution)

Sr. No	Study	Dependent variable	Independent variable	Findings
1	Chisti, 2013	Profitability	Financial leverage and interest coverage	Significant impact
2	Maina, 2014	Profitability	Financial Leverage	Significant positive relationship
3	Zeitun, 2014	Profitability (ROA & ROE)	Financial Leverage, growth and size	Positive in Jordan but negative relationship in Gaza
4	Muathe, 2014	Profitability	Financial Leverage	Negative relation in Kenya
5	Kodongo, 2015	Financial Performance	Financial Leverage	Negative Impact in Kenya
6	Ali, 2016	Financial Performance	Financial Leverage	Positive and negative relationship in Pakistan

### 3.1. General objective

The general objective of this study is to examine the impact of capital Structure on the profitability in the given sample in Pakistan from 2010-2015.



**Fig.1:**Empirical Framework (Self Contribution).

## 5. Methodology

In this study, the pooled regression model is applied in Eviews 8 on the observations. There are two models on which the hausman test is run to specify the best model between fixed effect and random effect model. The data is taken from 2010-2015 and 22 companies have been selected from Pakistan. Population of our study is the important sectors in Pakistan are included such as Coke and Refined Petroleum Products and Paper, Food Products, Fuel and Energy and Paperboard and Products ((SBP).

## 6. Interpretation

Panel data is additionally referred to as cross sectional statistic information within which behavior of entity's area discovered across time (Torres-Reyna, 2007). In our study, the information is powerfully balanced, and it's testified by Eviews 8. If any company doesn't have information for anyone's year, then the panel is unbalanced (Maddala, 1992).

The fixed-effects (FE here onwards) are used once the researchers' area units are curly about analyzing the impact of variables that modify over time. Hausman specific check (Hausman, 1981) is

### 3.2. Specific objective

To analyze the impact of independent variables such as capital structures on the profitability of the firm in Pakistan.

### 3.3. Research questions

The research questions raised from this research are:

- 1) Is there any significant relationship between dependent variables such as; ROE and EPS with debt to equity ratio and debt to total assets ratio, the independent variables?
- 2) Does firm capital structure have significant effect on dependent variables?

## 4. Theoretical framework

Based on review of existing literature, the following theoretical framework can easily be developed. This framework is strongly supported by different studies like; Maina, 2014; Zeitun, 2014; Ali, 2016; Muathe, 2014 and Kodongo use profitability as the dependent variable and independent variables are capital structure ratios.

used to check which model is the best fit between fixed effect model and Random effect model.

$$\begin{aligned} \text{MODEL 1} \quad & \text{ROE}_{it} = \beta_1 \text{DA}_{it} + \beta_2 \text{DE}_{it} + \alpha_i + u_{it} \\ \text{MODEL 2} \quad & \text{EPS}_{it} = \beta_1 \text{DA}_{it} + \beta_2 \text{DE}_{it} + \alpha_i + u_{it} \end{aligned}$$

Where ROE (return on equity) and EPS (earnings per share) are dependent variables and DA (total debt to assets ratio) and DE (debt to equity ratio) are independent variables. The table 2 shows the Hausman specific test of model 1, the Hausman specific test specifies that Random effect model is suitable for model 1. The P value of Hausman Specific test is 0.7855 which is more than 0.05. This cut off value testifies that null hypothesis cannot be rejected, which shows that we have evidence to reject the use of fixed effect model.

Table 3 shows Random effect model 1 results. The results show that the dependent variable is ROE and there are 22 companies in Pakistan. The panel time series has 6 years span starting from 2010-2015. The results reveal that constant value 5.444416 having P value 0.0004. DE is negatively related to ROE. The value of the coefficient of DE is -0.479883 with insignificant P value. So we cannot say that this coefficient is insignificant. DA is positively related 1.133312 but again the value is insignificant. The ANOVA

results of Model 1 show insignificant results with very low R-squared value and insignificant P value.

Equation 1: The results in model 1 (self-contribution) \*\*\* means significant at 1% significance level.

$$\text{MODEL 1} \quad \text{ROE}_{it} = 1.133312\text{DA}_{it} - 0.479883\text{DE}_{it} + 5.444416\text{***}$$

**Table 2:** Hausman Specific Test for Model 1 (Generated in Eviews 8)

Correlated Random Effects - Hausman Test			
Equation: Untitled			
Test cross-section random effects			
Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	0.482942	2	0.7855

Dependent Variable: ROE  
 Method: Panel EGLS (Cross-section random effects)  
 Sample: 2010 2015  
 Periods included: 6  
 Cross-sections included: 22  
 Total panel (unbalanced) observations: 130  
 Swamy and Arora estimator of component variances.

**Table 2:** Random Effect Model 1 (Generated in Eviews 8)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	5.444416	1.491208	3.651011	0.0004
DE	-0.479883	1.280481	-0.374768	0.7085
DA	1.133312	1.791960	0.632443	0.5282
Effects Specification				
			S.D.	Rho
Cross-section random			1.561262	0.6205
Idiosyncratic random			1.220995	0.3795
Weighted Statistics				
R-squared	0.006561	Mean dependent var		1.510275
Adjusted R-squared	-0.009083	S.D. dependent var		1.205591
S.E. of regression	1.214329	Sum squared resid		187.2737
F-statistic	0.419391	Durbin-Watson stat		1.745436
Prob(F-statistic)	0.658355			
Unweighted Statistics				
R-squared	0.034413	Mean dependent var		4.942245
Sum squared resid	464.9958	Durbin-Watson stat		0.750787

Further the regression results are also tested from diagnostic point of view. For that purpose the normality of residuals are tested and the P-value suggested a value more than 0.05, here we can accept the null hypothesis that the residuals are normally distributed (see figure 2). The figure 3 shows the residuals plot which does not draw a systematic pattern, therefore we can conclude that the diagnostic checks show the model 1 is fine, but the coefficients and ANOVA results are not significant.

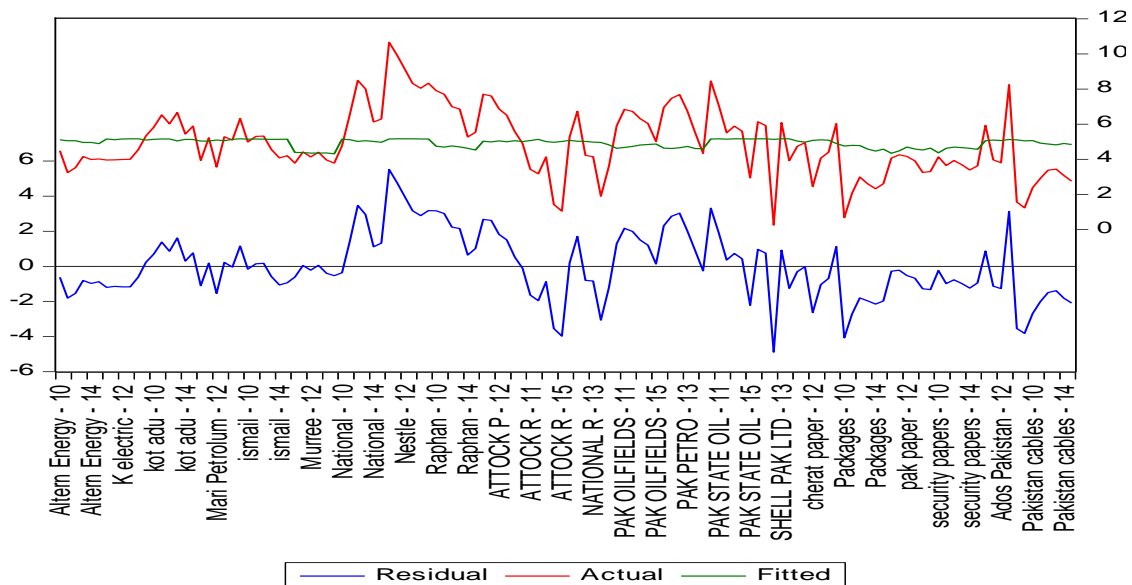
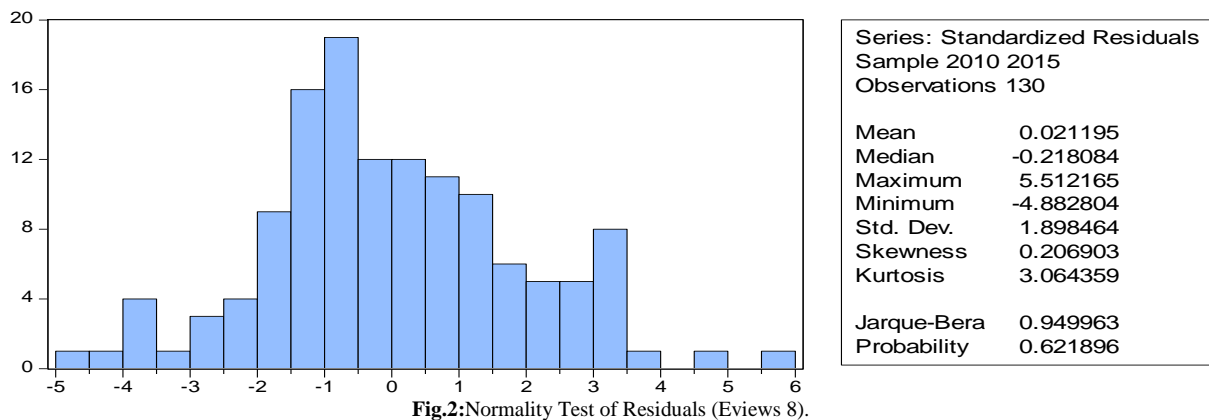


Table 4 shows the results of Hausman specific test for model 2 and the results also suggest that the random effect model 2 is best fit for model 2.

**Table 3:** Hausman Specific Test Model 2 (Eviews 8)

Correlated Random Effects - Hausman Test			
Equation: Untitled			
Test cross-section random effects			
Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	0.462775	2	0.7934

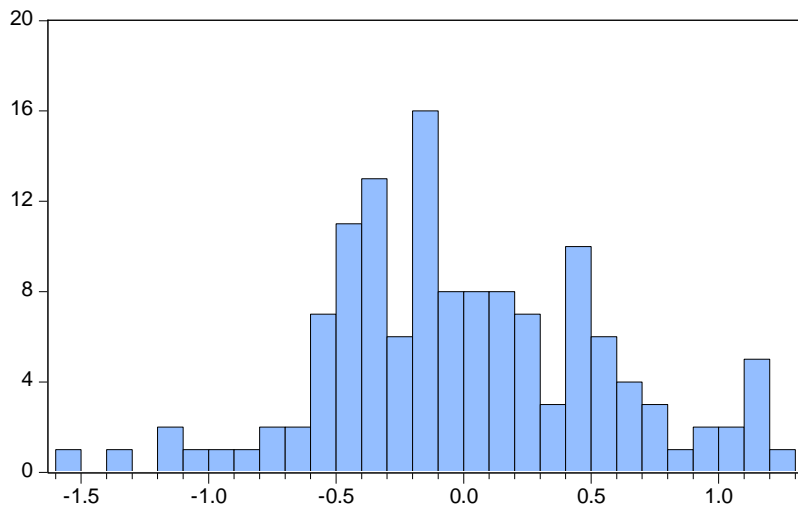
Table 5 shows Random effect model 2 results. The results show that the dependent variable is EPS and there are 22 companies in Pakistan. The panel time series has 6 years span starting from 2010-2015. The results reveal that constant value 0.038432 having P value 0.9144. DA is negatively related to EPS. The value of the coefficient of DA is -1.3588 with significant P value. So we can say that this coefficient is significant. DE is positively related 1.0580 but again the value is significant. The ANOVA results of Model 1 show insignificant results with very low R-squared value and significant P value (00022). The model 2 has significant results therefore we can develop our model as;  
 Equation 2: The results in model 2 (self-contribution) \*\*\* means significant at 1% significance level

$$\text{MODEL 2} \quad \text{EPS}_{it} = -1.3588^{***}\text{DA}_{it} + 1.0580^{***}\text{DE}_{it} + 0.038432$$

For that purpose of diagnostic checks, the normality of residuals is tested and the P-value suggested a value more than 0.05, here we can accept the null hypothesis that the residuals are normally distributed (see figure 4). The figure 5 shows the residuals plot which does not draw a systematic pattern, therefore we can conclude that the diagnostic checks show the model 1 is fine, but the ANOVA results are not significant.

**Table 4:**Random Effect Model 2 (Generated in Eviews 8)

Dependent Variable: EPS				
Method: Panel EGLS (Cross-section random effects)				
Sample: 2010 2015				
Periods included: 6				
Cross-sections included: 22				
Total panel (balanced) observations: 132				
Swamy and Arora estimator of component variances				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
DA	-1.358846	0.434724	-3.125769	0.0022
DE	1.058037	0.300097	3.525649	0.0006
C	0.038432	0.356967	0.107663	0.9144
Effects Specification			S.D.	Rho
Cross-section random			0.504217	0.7762
Idiosyncratic random			0.270720	0.2238
	Weighted Statistics			
R-squared	0.090335	Mean dependent var		0.265262
Adjusted R-squared	0.076231	S.D. dependent var		0.279986
S.E. of regression	0.269102	Sum squared resid		9.341666
F-statistic	6.405196	Durbin-Watson stat		1.553322
Prob(F-statistic)	0.002228			
	Unweighted Statistics			
R-squared	0.035546	Mean dependent var		1.238902
Sum squared resid	38.90967	Durbin-Watson stat		0.413583



Series: Standardized Residuals	
Sample 2010 2015	
Observations 132	
Mean	-1.08e-16
Median	-0.092167
Maximum	1.223450
Minimum	-1.586928
Std. Dev.	0.544996
Skewness	0.111217
Kurtosis	3.036252
Jarque-Bera	0.279352
Probability	0.869640

**Fig.4:**Normality Test of Residuals (Eviews 8).

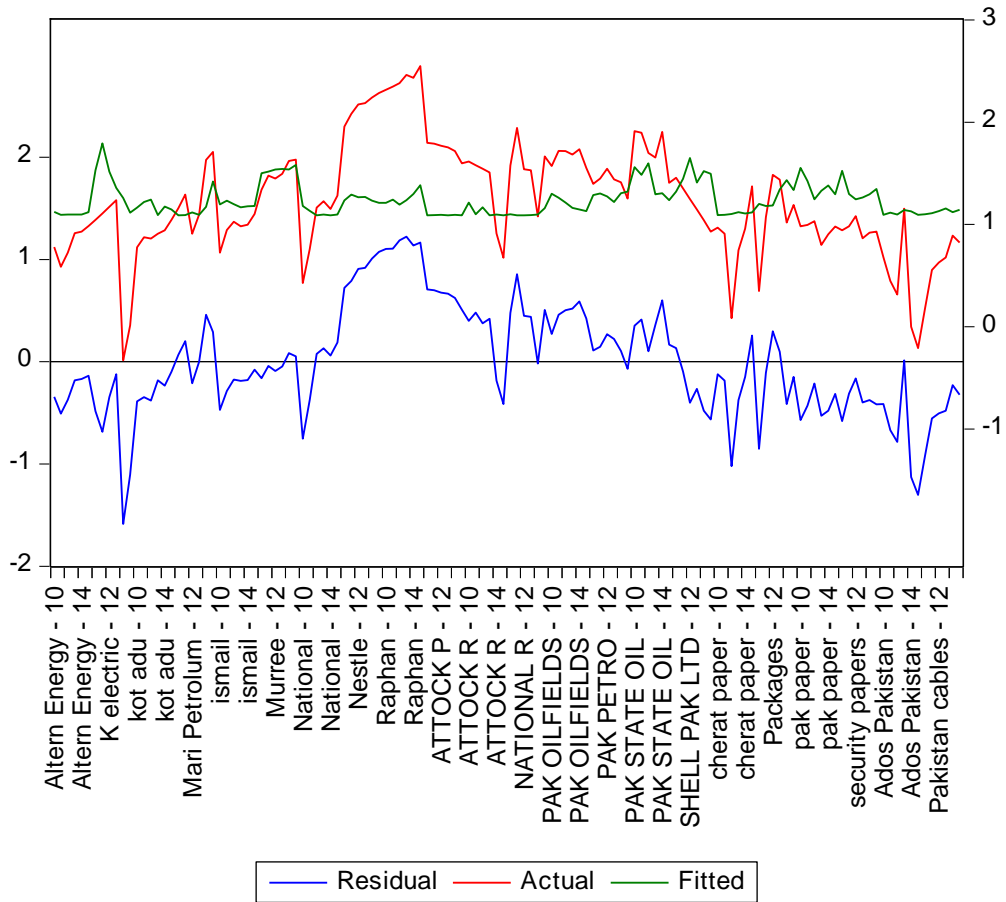


Fig.5: Residuals Plot (Eviews 8).

**7. Conclusion**

The results suggest that the important sectors in Pakistan are included in this study such as Coke and Refined Petroleum Products and Paper, Food Products, Fuel and Energy and Paperboard and Products should focus on the results of model 2. The Debt to total assets is negatively related to EPS and Debt to Equity is positively related to EPS. So the policy makers must pay attention to our results, and they should rely on the findings. Figure 7 shows the forecasting of model 2. Figure 8 can show the policy makers the area covered by the model 2 and deviation from the actual values.



Fig.6: Impact of DA on EPS (Self-Contribution).

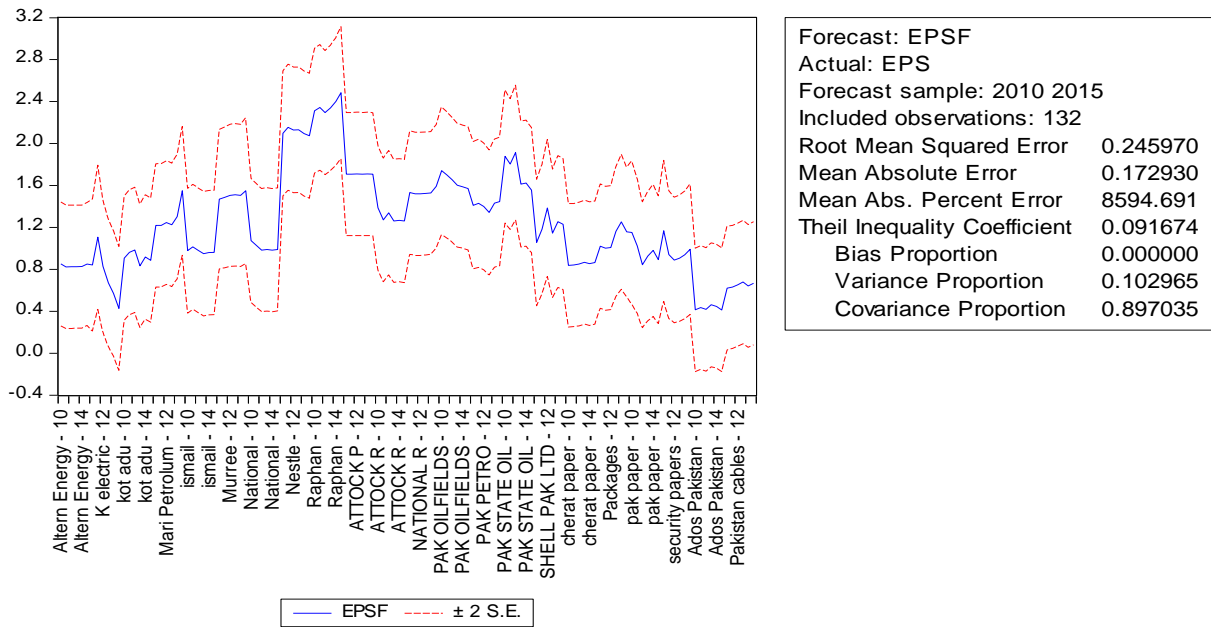


Fig.7: Forecasting Based on Model 2 (Eviews 8).

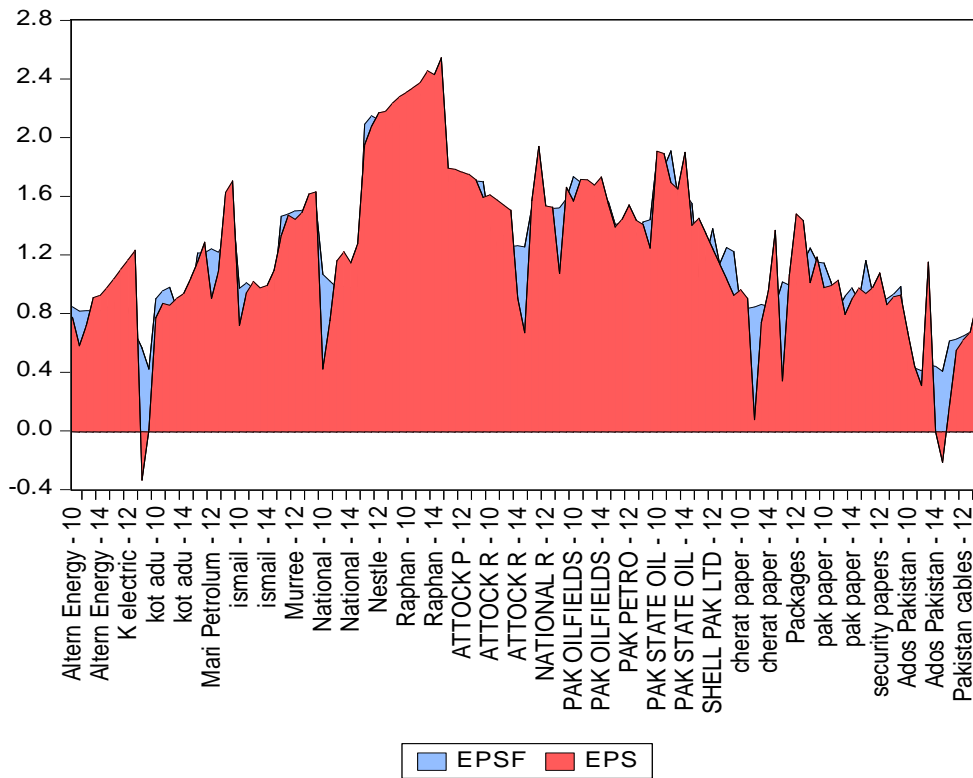


Fig.8: Area Graph Forecasting (Eviews 8).

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