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Impact of Financial Leverage on Profitability of Automobile and Allied Companies of Pakistan

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ABSTRACT

Financial leverage is an index of how much company uses equity and debt to finance their cash-flow and improving the financial condition of the company. The objective of this study is to empirically investigate the relationship between the leverage and profitability of 13 Automobiles and allied companies listed on Karachi Stock Exchange companies from year 2010 to 2014. A Cross sectional random effect estimation for the dependent and independent variables were carried out in order to understand the direction of the impact between them. The results indicated a negative correlation between the leverage and profitability for automobile and allied companies of Pakistan.

Introduction

One of the major financial management decisions is the balanced capital management and financing its assets. Capital structure (the combination of a company debt and equity) is important as there are various costs associated with the debt that the company borrows for financing (ACCA, 2009). The objective of the capital structure decision is not only to increase the value of the company but also to increase the wealth of the shareholders (Umar, M., Tanveer, Z., Aslam, S., & Sajid, M. 2012). According to Watson and Head (2013), a great deal of care is needed while making the capital structure and borrowing decisions because any unbalanced capital structure may bring in significant risk to the company or even to the point of failure. The purpose of this paper is to empirically investigate the relationship between the leverage and profitability of Automobile companies listed on Karachi Stock Exchange. A total of 13 companies after the screening were selected in automobile industry, including the assemblers and spare parts manufacturing companies from year 2010 to 2014. A regression model is employed keeping the leverage ratio independent variable and the profitability ratio as dependent variable to see the relationship. The results indicated the relationship between the profitability and financial leverage of the selected companies.

Automobile Industry in Pakistan

In 1950 General Motors, USA, started an assembly operation and established National Motors Limited, a public limited company which gave rise to the automobile industry in Pakistan. Originally they were known as "General Motors" in Pakistan. The first vehicle developed in Pakistan was a Bedford truck in 1950 (Khalil, S. 2004). Long afterwards, car industry flourished in 1980s. When Suzuki started its assembly of FX 800cc to facilitate the middle class group and captured the large portion of the market. Subsequently, in 1990s, Indus motors (Toyota) being the competitor of Suzuki entered the market and intensified the competition in the market. In commercial line, HinoPak started its industry in the late 1980s and became the market leader in commercial vehicles (Altinkaya, Z. 2013).

The growth in automobile sector was steady during the last couple of years as evident in Table-I. Altinkaya,Z. (2013) indicated that Pakistan has made a steady progress in this sector because of government's privatization policy, facilitation of healthy competition and development of engineering board whose sole purpose is to facilitate this prosperous industry. However, the automobile industry is faced with various challenges including unrestrained import of used cars which is considered to be a significant factor hampering the growth of this industry. Other factors such as obsolete infrastructure, substandard technology levels, insignificant human resource development, nonexistence of R&D, lack of quality standards and certifications are preventing the automobile industry growth in the country as well (Altinkaya, Z. 2013). The consumption of automobiles in the country is lower than the countries of the region. However, the recovery in the industry would be a matter of consistency in policy by the government. Economic Survey of Pakistan (2013-14) indicated that the auto industry is currently not provided with any automobile policy yet there are some signs for the recovery of the economy and one important appearance of that effect is a considerable appreciation of Pak rupee. As this may grow, so would growth in the auto industry which is only subject to long term policy, which only is the key to sustainable growth.

Research Objective

To investigate whether the financial leverage has an effect on financial performance, annual reports of listed automobile and allied companies is to be examined in order to examine the direction of impact being positive or negative (if any) that selected leverage factors variables possess on profitability.

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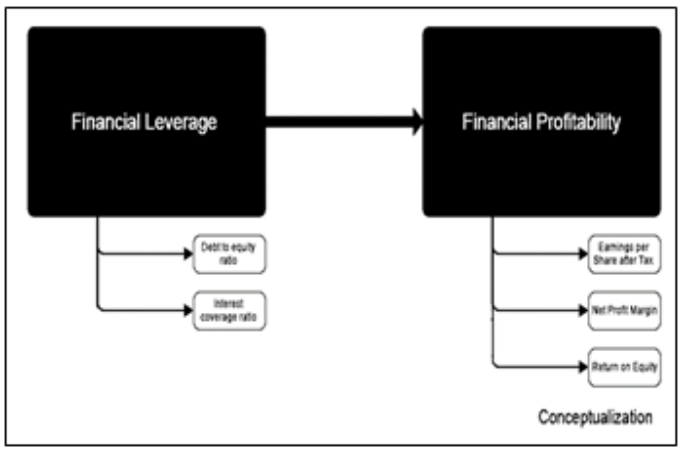
Significance of Study

The management and finance manager of the companies are always interested in keeping the balance, the use of financial leverage in order to maximize the profitability of the company. They will be benefited from this study in a way that they will get a better understanding that how the financial leverage can affect the profitability. Similarly, they will be able to understand that the while involving the debt to run the operations of the company and how the profitability of the company is affected by the utilization of the debt. The Investors have to consider the financial health of a company before making any investment decisions. The study will help them to understand the company financial health and their investment are safe or not. This study will help in understanding the future finance students who interested in the study of the impact of financial leverage and profitability of the similar or other sectors. The findings acquired from this study also suggested that modern finance and capital structure theories are applicable to Pakistan in some sectors. It is anticipated that the outcome of this study will not only benefit the corporate finance managers, but also the other stakeholders to understand the impact of forces that influence the leverage, profitability and overall capital structure of companies.

Conceptualization



Data

In order to investigate the relationship between the financial leverage and profitability of automobile companies listed on Karachi Stock Exchange (KSE) during 2010-2014 the annual reports are taken from the companies' websites, Karachi Stock Exchange Data Portal Web Site and State Bank of Pakistan's publication and website. Initially, total 22 companies were selected for the analysis. However, some companies were found with incomplete data, such as incapable to publish annual accounts to any relevant platform. Thus, companies with any missing observations for any variable included in our model during the study period dropped from the sample including some outlier in the interest coverage ratio. Subsequent to this screening our total number of companies reduced to 13 as shown in Table II, thus leaving us with 61 company-years observations. Indicators of financial leverage are Debt to equity ratio (Total liabilities / total shareholders' equity) a degree to which the assets of the business are financed by the debts and the shareholders' equity of a business., Interest coverage ratio (earnings before interest and taxes (EBIT) / interest expenses) which shows that how easily a company can pay interest expenses on outstanding debt. These are taken as independent variables. Similarly the dependent variables indicating financial performance (profitability) includes Earnings per Share after Tax (portion of the company's distributable profit which is allocated to each outstanding equity share), Net Profit Margin (revenue remaining after all operating expenses, interest, taxes and preferred stock dividends), and Return on Equity(rate of return on the ownership interest). Both leverage and profitability indicators are extracted from annual reports.

Research Methodology

In this study we use panel data procedures because the sample contains data across companies and over time. In order to see the effects of the independent variables on the dependent variable the regression equation used for analysis is given below:

Model 1

$ROE_{it} = \alpha_i + DE_{it}\,\beta_1 + ICR_{it}\,\beta_2 + \varepsilon_{it}$

Model 2

$EPS_{it} = \alpha_i + DE_{it}\,\beta_1 + ICR_{it}\,\beta_2 + \varepsilon_{it}$

Model 3

$NPM_{it} = \alpha_i + DE_{it}\,\beta_1 + ICR_{it}\,\beta_2 + \varepsilon_{it}$

Whereas

DE= Debt / Equity Ratio

ICR= Interest Coverage Ratio (Before tax)

EPS=Earning per share (After tax)

NPM=Net profit margin (Before tax)

ROE=Return On Equity (Before tax)

As panel data consists of observation of the same cross-sectional units over varied time periods, there was a concern that it could contain cross-sectional effects on each company. In order to address this problem two estimation methods, specifically, fixed effects and random effects were used to conclude the results. But the question arises that which one to use. Therefore, Housman test was used to determine which model is to be used for specific models best to explain our estimations. For interpretation of result Eviews 8 software was used to calculate the results between various models.

Analysis & Result

Initially the Housman test for all the models was carried out and its results are given in Table III. It is evident from the results that the estimations from the cross sectional random effect model is used which is supported by the Housman Test. Test results from cross-section random effects are shown in Table IV and Table V.

Interpretation of Model 1 (ROE) estimations

Based on p-values in our model for listed companies ICR and ROE is statistically significant (sig.<5%), however, DE and ROE is found to be insignificant (p-value>5%). Interpreting the coefficient value it is found that, although, the dependent variable Debt Equity ratio is in significant, its value is negative which indicates a negative correlation between the ROE and DE. The relationship between ICR and ROE is found to be positive and the coefficients value amounts to 0.001054. This shows that for one time increase in the ICR, the ROE get increased by 0.1054%. In Table V, value of R-squared (coefficient of determination) is 16.25% which indicates realization of the regression in predicting the values of the dependent variable within model 2.

Interpretation of Model 2 (EPS) estimations

Probability value for ICR is also found to be significant as it is less than 5% significant level. For DE ratio is found to be 67.72% which is far more than significance level (0.05) thus becoming insignificant.

The coefficient value of DE is found to be negative value which shows negative relationship with the model. The relationship between ICR and EPS is found to be positive and the coefficients value amounts to 0.07676. This shows that for one time increase in the ICR, the ROE get increased by 7.676%.

Table I

Production (P) & Sale (S) of Vehicles in Pakistan 2010-14						
		2009-10	2010-11	2011-12	2012-13	2013-14
CAR	Production	121647	133972	154255	120332	116281
	Sales	123957	127944	157325	118830	118102
TRUCK	Production	3425	2901	2597	1923	2674
	Sales	3620	2942	2394	1948	2663
BUS	Production	628	490	568	522	558
	Sales	657	515	609	510	577
JEEP	Production	1172	883	451	1475	1217
	Sales	1201	807	342	1438	1151
PICKUP	Production	15768	19142	20929	14517	17477
	Sales	16496	17746	21472	15042	17635
FARM TRACTOR	Production	71607	70770	48120	50859	34521
	Sales	71512	69203	49745	50593	33584
MOTOR-CYCLE:	Production	736861	838665	828576	819556	771507
	Sales	737768	835455	829893	820217	772046
Source: http://www.pama.org.pk/images/stories/pdf/historical-data.pdf						

TABLE II

1. Atlas Battery Ltd.
2. Atlas Honda Ltd.
3. Baluchistan Wheels Ltd.
4. Bolan Castings Ltd.
5. Exide Pakistan Ltd.*
6. Ghandhara Industries Ltd.
7. Ghandhara Nissan Ltd.
8. Hinopak Motors Ltd.
9. Honda Atlas Cars (Pakistan) Ltd.
10. Indus Motor Company Ltd.
11. Millat Tractors Ltd.
12. Sazgar Engineering Works Ltd.
13. The General Tyre & Rubber Co. of Pak. Ltd.

Table III

Correlated Random Effects - Hausman Test			
	ROE	EPS	NP
Chi-Sq. Statistic	2.315371	2.798622	3.780685
Chi-Sq. d.f.	2	2	2
Prob.	0.3142	0.2468	0.151

Table IV

	Model 1 (ROE)			Model 2 (EPS)			Model 3 (NP)		
Variable	**DE**	**ICR**	**C**	**DE**	**ICR**	**C**	**DE**	**ICR**	**C**
Coefficient	-0.00219	0.00105	0.19534	-0.55904	0.07676	14.5712	-0.0055	0.00015	0.05117
Std. Error	0.0236	0.00032	0.05894	1.33621	0.01429	5.23642	0.00471	6.1E-05	0.01208
t-Statistic	-0.09295	3.33595	3.31453	-0.41838	5.37079	2.78266	-1.16745	2.43664	4.23483
Prob.	0.9263	0.0015	0.0016	0.6772	0.0000	0.0073	0.2478	0.0179	0.0001

Table V

	(ROE)	(EPS)	(NP)
Weighted Statistics			
R-squared	0.162539	0.332379	0.115126
Adjusted R-squared	0.133661	0.309358	0.084613
S.E. of regression	0.214255	8.358751	0.040296
F-statistic	5.628487	14.43782	3.773027
Prob(F-statistic)	0.005834	0.000008	0.028811
Mean dependent var	0.152498	3.850704	0.027744
S.D. dependent var	0.231076	10.09792	0.04222
Sum squared resid	2.662499	4052.385	0.094179
Durbin-Watson stat	1.273147	1.703941	1.667822
Unweighted Statistics			
R-squared	0.238153	0.311368	0.223916
Sum squared resid	3.487248	20859.68	0.139864
Mean dependent var	0.240351	17.01044	0.049913
Durbin-Watson stat	1.042133	0.703353	1.275202

R-squared value showing the coefficient of determination is 33.23%.

Interpretation of Model 3 (NP) estimations

Probability value for ICR is 1.79 % which is significant and DE as interpreted in previous models is found to be insignificant having the value of 24.78%.

The Coefficient value of DE shows the negative relationship. However the relationship between ICR and NP is found to be positive and the coefficients value amounts to 0.00015. This shows that for one time increase in the ICR, the NP get increased by 0.15%. Value of R-squared is 11.51% and adjusted R-squared value is 8.46%.

Conclusion

The capital structure decisions are critical for any business organization because the primary need of the organization is to maximize returns to their stakeholders and also because such decision impact has an impact on the competitiveness of the organization.

In this study, a sample of 13 companies in the automobile and allied companies were analyzed by using a cross-section random effects to interpret the impact of financial leverage and profitability of these companies.

The results indicated that there was an inverse relationship between the leverage and profitability.

The findings imply that an increase in debt position is associated with a decrease in profitability; thus, the higher the debt, the lower the profitability of the company. Also, because of the economic down turn, the revenue of the company seems to decrease thus default rate of the payment tends to increase therefore decreasing the profitability of the companies.

Moreover, it is observed that the interest coverage ratio has significant positive relationship with profitability, which shows that companies which are able to cover their interest charges tends to be more profitable.

Recommendation

Based on these results it is suggested that the optimal capital structure of debt and equity should be employed by the companies' management in order to maximize their profit. This should be done keeping in view the performance of the company with the over emphasis on the debt for financing which should be avoided especially in the economically recession period. Every effort should be made by the top management and finance manager to make cautious financing decision in order to remain profitable and competitive. Also managers should be well aware of how and to what extent leverage should be used and how much the leverage has an effect on the profitability of their firm.

Limitation

This study has the following limitations

a) This study is based on the secondary data confined to five years data from 2010 to 2014.

b) This empirical study has limited dependent and independent variables but future research will provide better output.

c) R squared value for the various models estimations did not exceeded 33.24 % which indicate that there are various other factors and variable that are needed to be taken in account.

d) Outliers in the data sample for which the whole year was taken out of the consideration before making the interpretations.

e) The finding contains the insignificance of relationship. However the interpretation and the direction of impact provided the direction for the results and conclusions.

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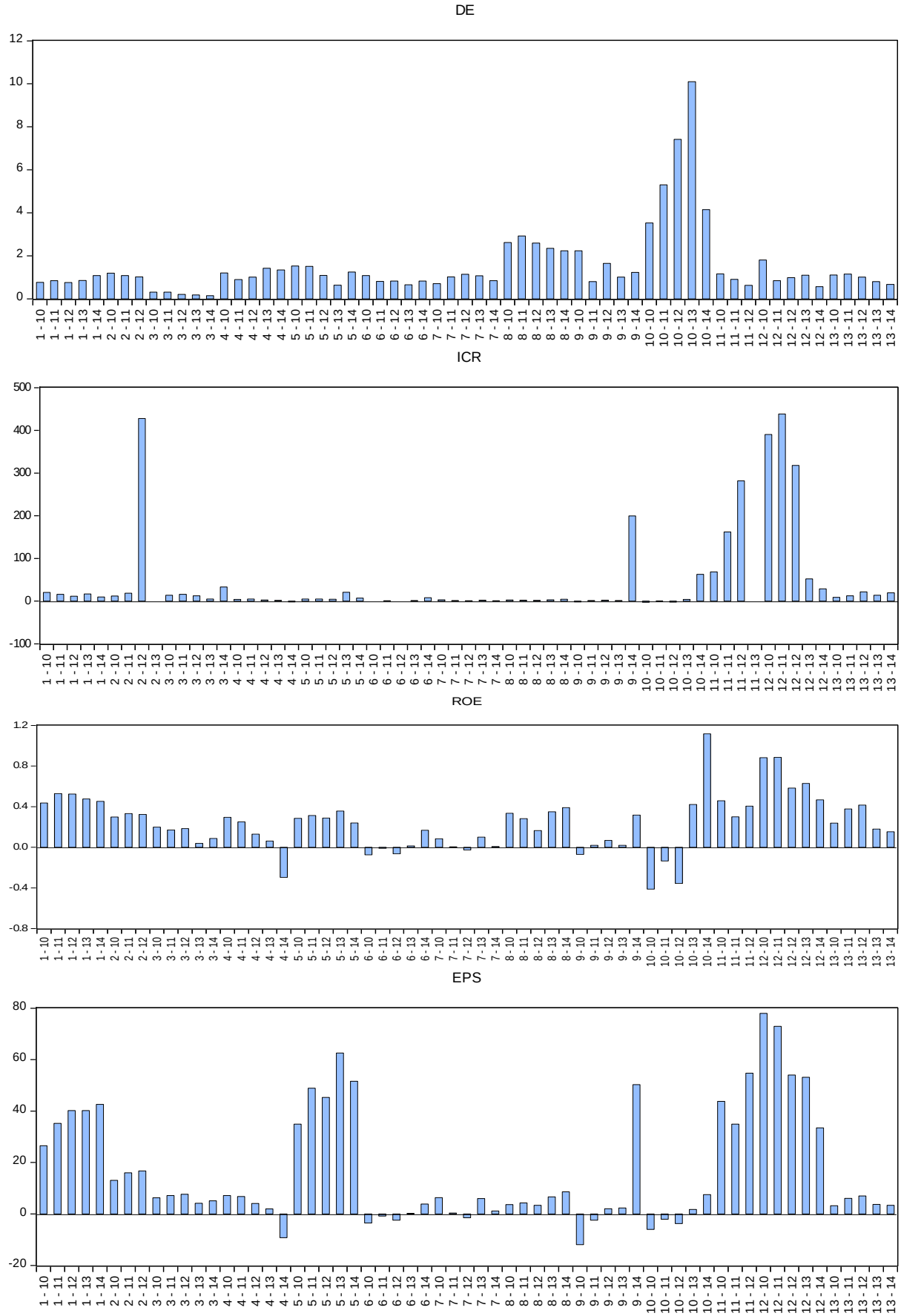
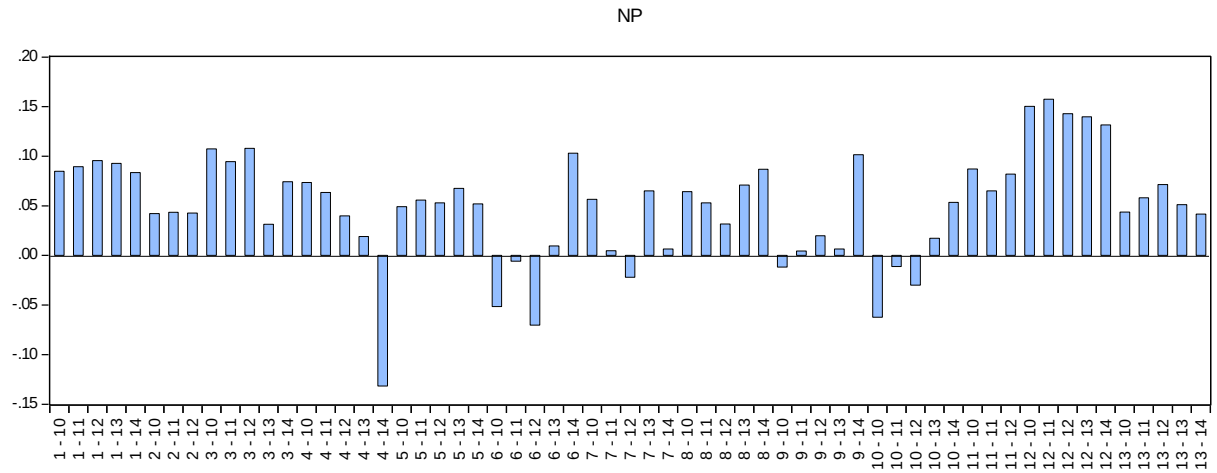
Appendix

Company	Year	Total Debt / Equity Ratio DE	Interest Coverage Ratio (Before tax) ICR	Earning per share (After tax) EPS	Net Profit Margin NP	Return on Equity ROE
Atlas Battery Limited	2010	0.764622235	20.37820804	26.52026065	0.084804476	0.436634188
	2011	0.843695034	15.82080158	35.20617893	0.08948155	0.528677237
	2012	0.753635579	11.68991227	40.22237866	0.095557422	0.524596511
	2013	0.852350972	16.93757011	40.19956678	0.09285154	0.475755228
	2014	1.082197446	9.555220035	42.59539308	0.083540919	0.452364061
Atlas Honda Limited	2010	1.189789672	11.99551904	13.0982917	0.04215381	0.298687968
	2011	1.081429746	18.53980551	16.02750982	0.043370859	0.331322897
	2012	1.022241784	427.8777339	16.73884757	0.042618307	0.32263391
	2013	0.83536991	2576.912485	19.43545687	0.052156985	0.369493095
	2014	0.815319323	8965.726667	19.35620887	0.060465284	0.372431347
Baluchistan Wheels Ltd.	2010	0.313102278	13.77600758	6.273820148	0.10743348	0.198801469
	2011	0.307095077	16.08831537	7.124258491	0.094563984	0.17122368
	2012	0.207904448	12.53990644	7.695792055	0.107967534	0.183717467
	2013	0.182224656	4.951614645	4.189121289	0.031419143	0.038795729
	2014	0.141557975	33.15277254	5.137427537	0.074220781	0.086378273
Bolan Castings Ltd.	2010	1.204160588	4.074171862	7.161211593	0.073630175	0.295472248
	2011	0.894671021	4.883890196	6.816735672	0.063595039	0.250363515
	2012	1.013479657	2.637820132	4.062584441	0.040012432	0.129877121
	2013	1.421402787	1.724637367	1.940379168	0.019141751	0.061460009
	2014	1.338485752	-1.944745156	-9.198169536	-0.131696764	-0.296414147
Exide Pakistan Ltd.	2010	1.525747369	4.960777662	34.91867113	0.049046272	0.284898156
	2011	1.509065918	4.742801401	48.9194499	0.055725692	0.312709371
	2012	1.087659247	4.471613118	45.33090734	0.052919988	0.28763608
	2013	0.631379701	20.65851749	62.54099838	0.067602697	0.35668165
	2014	1.24674967	7.258434191	51.6298947	0.052049876	0.239393203
Ghandhara Nissan Ltd.	2010	1.082427514	0.060437222	-3.518048997	-0.051446818	-0.074543799
	2011	0.804400102	0.909160202	-0.846241875	-0.005846265	-0.009306343
	2012	0.829236623	0.010544548	-2.430931615	-0.0703767	-0.06407699
	2013	0.647348368	1.229979333	0.227409588	0.009552228	0.013207501
	2014	0.828476494	7.828585897	3.864896395	0.102940559	0.167267184
Ghandhara Industries Ltd	2010	0.706988897	3.234585212	6.363145641	0.056518989	0.083756068
	2011	1.017027797	1.170220612	0.363539926	0.004810545	0.004718774
	2012	1.136277603	0.702293543	-1.459088263	-0.021978664	-0.026199961
	2013	1.072750105	2.121076727	5.995756745	0.065115085	0.100882028
	2014	0.840907448	1.097003159	1.129672744	0.006411673	0.007874924
The General Tyre & Rubber Co. of Pak. Ltd.	2010	2.617255217	2.594351603	3.652692557	0.064400807	0.335066438
	2011	2.922622365	2.269871554	4.326494761	0.05287164	0.282358537
	2012	2.589918945	1.659609594	3.391848088	0.031680901	0.165193955
	2013	2.348596885	3.034200595	6.618583349	0.071013701	0.349589651
	2014	2.231509756	4.552546364	8.595118891	0.086934648	0.391275199
Hinopak Motors Ltd	2010	2.234285779	-1.708618899	-11.94055126	-0.01172046	-0.070093219
	2011	0.800648606	1.347711835	-2.430527555	0.004362291	0.018813832
	2012	1.646876236	2.009992779	2.073286776	0.019783278	0.068587247
	2013	1.007691392	1.432409098	2.353918359	0.006386704	0.019041584
	2014	1.226629992	199.7665816	50.31514604	0.101537289	0.316643638
Honda Atlas Cars (Pakistan) Ltd.	2010	3.528031605	-2.843457626	-5.967787115	-0.062316838	-0.411359241
	2011	5.304239882	-0.620716135	-2.09	-0.011115309	-0.134047554
	2012	7.413598221	-2.312507471	-3.726981793	-0.030049143	-0.35565132
	2013	10.0987408	3.799322594	1.710693277	0.017335223	0.421117289
	2014	4.15108982	62.81278552	7.518697479	0.05356505	1.116775926
Indus Motor Company Ltd.	2010	1.15595075	68.48370363	43.80919847	0.087240226	0.458172024
	2011	0.900516075	161.9797745	34.90310433	0.065012657	0.300401805
	2012	0.620779837	281.4579464	54.74192112	0.082017286	0.405496702
	2013	0.418954507	18407.57407	42.71685751	0.077860677	0.286383362
	2014	0.311061019	179161.6071	49.2805598	0.087910596	0.266771496
Millat Tractors Ltd.	2010	1.806477043	390.1103207	78.01181533	0.150298859	0.882324662
	2011	0.845345765	438.4968146	72.95996503	0.157432427	0.885119727
	2012	0.982957891	317.6679515	54.02516015	0.142816591	0.582735881
	2013	1.099758185	51.8807107	53.11294889	0.139786809	0.628845744
	2014	0.56379725	28.67121204	33.45594112	0.131614257	0.466402231
Sazgar Engineering Works Ltd	2010	1.101612131	8.935640939	3.20450334	0.043742371	0.237701388
	2011	1.1501655	12.19844964	6.090938803	0.058116831	0.377388327

	2012	1.006878012	21.7285482	7.015446156	0.071555633	0.415451359
	2013	0.799073879	13.89569876	3.700516148	0.051071451	0.179086425
	2014	0.669988975	19.54856169	3.363011096	0.041611625	0.153744806

Graphical Representation of Data





Hausman Tests and Cross-sectional Random Effect

Correlated Random Effects - **Hausman Test**
Equation: **Model 1 (ROE)**
Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	2.315371	2	0.3142

Dependent Variable: ROE
Method: Panel EGLS (Cross-section random effects)
Date: 12/22/14 Time: 15:30
Sample: 2010 2014 IF ICR<1000
Periods included: 5
Cross-sections included: 13
Total panel (unbalanced) observations: 61
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DE	-0.002193	0.023597	-0.092950	0.9263
ICR	0.001054	0.000316	3.335948	0.0015
C	0.195341	0.058935	3.314531	0.0016

Weighted Statistics

R-squared	0.162539	Mean dependent var	0.152498
Adjusted R-squared	0.133661	S.D. dependent var	0.231076
S.E. of regression	0.214255	Sum squared resid	2.662499
F-statistic	5.628487	Durbin-Watson stat	1.273147
Prob(F-statistic)	0.005834		

Unweighted Statistics

R-squared	0.238153	Mean dependent var	0.240351
Sum squared resid	3.487248	Durbin-Watson stat	1.042133

Correlated Random Effects - **Hausman Test**
Equation: **Model 2 (EPS)**
Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	2.798622	2	0.2468

Dependent Variable: EPS

Method: Panel EGLS (Cross-section random effects)
Date: 12/22/14 Time: 15:31
Sample: 2010 2014 IF ICR<1000
Periods included: 5
Cross-sections included: 13
Total panel (unbalanced) observations: 61
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DE	-0.559043	1.336209	-0.418380	0.6772
ICR	0.076760	0.014292	5.370788	0.0000
C	14.57118	5.236416	2.782663	0.0073

Weighted Statistics

R-squared	0.332379	Mean dependent var	3.850704
Adjusted R-squared	0.309358	S.D. dependent var	10.09792
S.E. of regression	8.358751	Sum squared resid	4052.385
F-statistic	14.43782	Durbin-Watson stat	1.703941
Prob(F-statistic)	0.000008		

Unweighted Statistics

R-squared	0.311368	Mean dependent var	17.01044
Sum squared resid	20859.68	Durbin-Watson stat	0.703353

Correlated Random Effects - **Hausman Test**
Equation: **Model 3 (NP)**
Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	3.780685	2	0.1510

Dependent Variable: NP
Method: Panel EGLS (Cross-section random effects)
Date: 05/19/15 Time: 17:28
Sample: 2010 2014 IF ICR<1000
Periods included: 5
Cross-sections included: 13
Total panel (unbalanced) observations: 61
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DE	-0.005502	0.004713	-1.167448	0.2478
ICR	0.000148	6.06E-05	2.436637	0.0179
C	0.051170	0.012083	4.234827	0.0001

Weighted Statistics

R-squared	0.115126	Mean dependent var	0.027744
Adjusted R-squared	0.084613	S.D. dependent var	0.042220
S.E. of regression	0.040296	Sum squared resid	0.094179
F-statistic	3.773027	Durbin-Watson stat	1.667822
Prob(F-statistic)	0.028811		

Unweighted Statistics

R-squared	0.223916	Mean dependent var	0.049913
Sum squared resid	0.139864	Durbin-Watson stat	1.275202