# Profitability and Firm Value of CNX 100 Companies: An Econometric Analysis

*Nufazil Altaf* [*], *Farooq Ahmad Shah***

## Abstract

*The paper attempts to study a bi-directional relationship between profitability and firm value of CNX 100 companies for the period of 5 years (2009-2010 to 2013-2014). After following the systematic deletion method of sampling, the study selected 61 sample companies for final analysis. This study has used secondary sources of data collected mostly from Annual statements of companies. Market value (MV) and Enterprise Value (EV) respectively have been used to measure the Firm Value while Return on Assets (ROA) and Return on Equity (ROE) ratios are used to measure profitability. Various econometric techniques have been used for data analysis. Results of the study indicated Co-integration and bi-directional relationship among the three variables that are ROA, ROE and EV. Further, results reveal the existence of significant positive relationships between ROA and ROE on one side and EV on the other.*

**Keywords:** *ROA, ROE, MV, EV, CNX100*

## Introduction

Firm value is the focus of all the activities of the business. To survive in the global competition and promote growth, it becomes important for a company to improve its performance in order to create value. Firm value is reflected in the market capitalization as well as the enterprise value of the firm. Keeping a record of value creation year-on-year enables the management to make decisions that increases value of the firm (Moncla & Gregory, 2003). However, the fundamental question is, how do firms increase value? There are many factors that go into the value creation and one of the important factors is profitability. In other words, performance and success of a company depends upon the profitability. By maximizing profits, an organization is able to withstand the negative shocks of the environment and at the same time maximize the stakeholder and the investor value (Bhutta and Hasan, 2013).

Since higher profitability is the mirror the stock price of the company and profitability act as the guideline for investors to invest in the company and the rising stock market prices leads to increase in firm value (Sudiyatno et.al, 2012). Hence, profitability

*\*Mr. Nufazil Altaf*
*Research Scholar,*
*School of Business Studies,*
*Central University of Kashmir.*

*\*\*Dr. Farooq Ahmad Shah*
*Associate Professor,*
*School of Business Studies,*
*Central University of Kashmir.*

analysis is critical in evaluating the firm's value creation and assessment of performance of the company (Melvin et.al, 2004). Generally measured by various ratios, profitability gives an indication about the company's overall efficiency and is used to analyze the ability of companies to generate earnings during a particular period of time. Ratios are based on deployment of capital, sales, assets and earnings per share. The most common profitability measuring tool is Return on Assets and Return on Equity (Kabajeh et.al, 2012).

Firm value is measured by Market capitalization and Enterprise value of the firm. However, Market capitalization is regarded as a temporary metric of the firm value because it keeps on changing with the change in stock prices. A more comprehensive measure of evaluating the firm value is enterprise value as it takes into consideration market capitalization as well as debt, and preference equity. In this backdrop, this study is an attempt to highlight the impact of profitability on firm value.

## Literature review:

Kabajeh and AL Nu'aimat (2012) in an attempt to examine the relationship between the ROA, ROE and ROI and share prices in Jordanian Insurance Public Companies, on the basis of pooled regression, find positive relationships between ROA, ROE and ROI together with market prices of share. The period of study ranged from 2002 to 2007 and 28 public listed companies on Amman Security Exchange were taken as sample.

The study of AL Khalayleh (2001) covering a period of 12 years (1984 to 1996) and 40 Jordanian public listed companies, investigated the relationship between Accounting Performance Indexes and Market Performance Indexes. Results of regression analysis confirmed a significant positive relationship between market price of shares with ROA and ROE.

The research of Pachori and Totala (2012) does not find any significant influence of financial leverage on shareholder's return and market capitalization. Kodongo et.al (2014) while investigating the relationship between leverage and the financial performance of listed firm in Kenya, observed a significant negative relationship between leverage and profitability.

A.M. Goyal (2013) examined the impact of capital structure on performance of listed public sector banks in India covering a period of 10 years (2008 to 2012). On the basis of regression results, the study finds a positive relationship of short term debt with profitability as measured by ROE, ROA and EPS.

Using multivariate regression analysis, Bhutta and Hasan (2013) investigated the impact of firm specific factors on profitability in food sector of Pakistan and observed a significant negative relationship between size and profitability while negative insignificant relationship between debt to equity ratio and profitability and insignificant positive relationship are found between tangibility, growth of the firm and food inflation together with profitability.

Available literature leads to a comprehensive view that profitability enhances the Firm Value. Then the next question to ask is whether or not the Firm Value enhances profitability. The study has two primary objectives viz. to draw inferences about bi-directional relationship between profitability and the Firm Value as well as empirically test the existence of long run relationship among the profitability and the Firm Value.

## Objectives of study

Following objectives have been set here:

- To examine Bi-directional relationship among profitability and the Firm Value

- To examine the long run relationship among the variables

- To study the relationship between profitability and the Firm Value

## Data and period of study:

Data have been collected from secondary sources such as Annual statements, websites of the sample companies and NSE. This study covers a period of 5 years (2009-2010 to 2013-2014). However, the financial year 2014-2015 has been left because data for last quarter for the present were not available.

## Sampling method and sample:

Systematic deletion sampling method has been applied on CNX 100 indexed companies to select final sample. Following conditions regarded to be necessary for the companies to be a part of sample:

1. The operations of the company should be non-financial. Thus, financial companies are not considered for final sample. Out of 100 companies 24 companies belong to financial industry. Therefore, these companies have been excluded from the final sample.

2. In order to adhere with the comparability issues, for a company to be a part of the sample, its financial year should end at 31st March of every year. Out of 100 companies' financial year for 7 companies ended at 31ST December every year. However, 2 companies ended their financial year at 30th June and 30th September every year. Therefore, these companies have been taken into the final sample.

3) Financial year of the firm should remain unchanged during the period of study (2009-2010 to 2013-2014). Only one company has changed its financial year so it has been removed from the final sample.

4) Annual statements of all the companies are available. 5 companies have been deleted from the final sample because of non-availability of annual statements.

Thus, after following the systematic deletion method of sampling, 61 companies became the part of final sample

### Variables used in study:

Firm value is measured by Market value (MV) calculated as number of equity shares multiplied by Market value per share and enterprise value (EV) calculated as Market value + Book value of Debt. However, profitability is measured by Return on Assets (ROA) calculated as Net profit/total assets and Return on equity (ROE) calculated as Net profit/total shareholders' equity.

### Methodology

The starting point of the methodology is to ensure that the variables used for analysis are stationary. The Levin, Lin & Chu Unit Root Test is applied to MV, EV, ROA and ROE. Panel Granger Causality test has been used to ascertain the causality among the MV, EV, ROA and ROE in CNX 100 companies. Having tested the stationary of data, Kao Residual Co-integration Test has been applied to check whether the variables are co-integrated or not. Co-integration test helps us determine the existence of long run relationship among the variables.

Finally, fully modified OLS regression has been applied to determine the relationship among the dependent and independent variables. Eviews 8 (Enterprise Edition) has been used for data analysis.

### Analysis and Findings

Table 1 summarizes the descriptive statistics of variables under study. There is a large difference between mean and median value of ROA in CNX 100 index companies. This implies that CNX 100 index is a conduit of less profitable and high profitable companies. It can be further explained by the huge difference between minimum and maximum values of ROA. Huge gap between the maximum and minimum values of ROE is indicative of the fact that CNX 100 index is a conduit of less and more profitable companies.

There is no difference between the maximum values MV and EV meaning that certain companies in CNX 100 index do not have debt finance in their capital structure and have the maximum firm value. However, the difference between mean and median values and then maximum and minimum values are due to that presence of less and high profitable firms in CNX 100 meaning that firms with higher ROA and ROE have higher MV and EV respectively. Standard deviation of ROA, ROE, MV and EV shows the presence of volatility among profitability and firm value in the CNX 100 companies.

The value of skewness and Kurtosis of all variables is suggestive to the fact that variables are not normally distributed. The skewness value for all the variables is positive meaning that variables are abnormally skewed towards the right tail.

In addition to above measures of descriptive statistics Jarque-Bera value for all the variables is positive with the probability value of Jarque-Bera being significant for all the variables meaning that variables are not normally distributed.

## Results of Panel Unit Root Test

From Table 2, it can be seen that probability value of statistic is greater than 0.05 for ROA, ROE and EV hence ROA, ROE and EV are non-stationary. However, the probability value of statistic is less than 0.05 for MV hence MV is stationary at the level. By converting data into first difference, the probability value of statistics for all the variables become less than 0.05 and hence, all the variables become stationary when converted to first difference. Thus, we can reject our first null hypothesis that there is a unit root in the variables.

## Results of Panel Co-integration test

For performing Co-integration test, variables must be non-stationary at the level but stationary when converted to first difference. Since MV became stationary at level, it has been dropped from further analysis as it does not fulfill the assumptions of Co-integration test. Co-integration test is used to find out if the variables have long run relationship among themselves or the variables move in tandem. Table 3 shows the results of Kao Residual Co-integration Test. Results reveal that there is Co-integration among the variables since the probability value of t-statistics is significant (0.0135). It indicates that long run relationship exists among ROA, ROE and EV meaning that interplay between profitability and firm value is an ongoing phenomenon rather than a static phenomenon.

## Results of Panel Granger causality test:

Panel Granger causality Test was performed on stationary data. Table 4 indicates the bilateral causality of one variable with another. Results of Table 4 show that ROA and EV have bidirectional causality as the probability value for F-statistics is equal to 0.0469 and 0.0490 respectively. The probability value of F-statistics for both ROA and EV are less than 0.05 meaning that ROA causes EV and EV causes ROA. Further, results show bidirectional causality between

ROE and EV which means that ROE causes EV and EV causes ROE. This implies more profitable a company is , higher its firm value or higher the firm value, the company is more profitable. However, no relationship is found between ROE and ROA but ROA results indicate that ROA causes ROE meaning that if a company utilizes its assets efficiently, it can increase returns for shareholders and hence firm value.

## Results of Fully Modified OLS (FM-OLS):

Fully Modified OLS was developed by Phillips and Hansen (1990) for providing optimal estimates to Co-integrating regressions. This method modifies least squares to account for serial correlation effects and endogeneity among the repressors resulting from Co-integrating relationship (Peter C. B. Phillips, 1993).

Fully Modified OLS (FM-OLS) has been performed by taking EV as the dependent variable while as ROA and ROE are taken as independent variables. Results of FM-OLS presented in Table 6 indicate a significant positive relationship between ROA and EV since the coefficient of ROA is equal to 0.478551with the probability value of 0.0280 which is highly significant meaning that with 1 unit increase in ROA, Firm value will increase by 0.478551. Significant positive relationship is also found between ROE and firm value since the coefficient of ROE is equal to 0.79634 with the probability value of 0.0280 meaning that with 1 unit increase in ROE, Firm value will increase by 0.79634.

If the value of Durbin Watson is equal to two then there exists no autocorrelation but if the value is less than two then there exists positive autocorrelation and if the value is higher than 2 than there exist negative autocorrelation (Kohler, 1994). Since our value of Durbin Watson is 1.757083 which is closer to 2 so we can conclude there is a slight positive autocorrelation in the residuals.

## Conclusions:

This study examined the Causality and Co-integration between profitability and firm value in CNX 100 companies for the period of 5 years (2009-2010 to 2013-2014). Results of the study indicated Co-integration among the three variables that are ROA, ROE and EV which are indicative of the existence of

long run relationship among the variables. Panel Granger Causality Test indicated a bi-directional relationship between ROA and EV and ROE and EV. Panel granger causality test indicates the existence of relationship between ROA and ROE. Results of Fully modified OLS indicate the existence of significant positive relationship between ROA and ROE together with EV.

## References:

Abdel,M., Kabajeh,M., Mukhled Ahmed,S.M., Nu'aimat., &Dahmash,F.N. (2012). The Relationship between the ROA, ROE and ROI Ratios with Jordanian Insurance Public Companies Market Share Prices. *International Journal of Humanities and Social Science* Vol. 2 No. 11

Balgati,B.H. (2012). *Econometric analysis of Panel Data.* John Wiley & Sons, LTD. Fourth Edition

Bosch-Badia. Maria Teresa (2010). Connecting productivity to return on assets through financial statements. *International Journal of Accounting & Information Management.* Vol. 18 Issue 2

Bhutta,N.T.,& Hasan,A. (2013) Impact of Firm Specific Factors on Profitability of Firms in Food Sector. *Open Journal of Accounting,* 2013, 2, 19-25 http://dx.doi.org/10.4236/ojacct.2013.22005.

Dickey, D. A., & Fuller, W. A. (1979). Autoregressive Time Series with a Unit Root. *Journal of the American Statistical Association*, Vol.74.

Fouad, K.,Ahmed,N.,&Riahi-Belkaoui. (1999). Multinationality, profitability and firm value. *Managerial Finance.* Vol. 25. Iss 12.

Gentry,R. (2010).The relationship between Accounting and Market measures of firm's Financial Performance. How strong is it? *Journal of Managerial Issues* Vol.21.NO4

Gujarati Damodar N, Porter Dawn C., Gunasekar Sangeetha. (2012), *Basic Econometrics,* Fifth edition.Mc graw –Hill.

Kettler, Scholes (1970) Study. College Teaching Methods & Styles Journal – Special Edition 2009. Vol 5, Number 1

Khalaileh,M. (2001). The Relationship between Accounting Performance Indexes and Market Performance Indexes- An Applied Study on Listed Corporations at Amman Security Exchange. *Administrative Sciences Studies Magazine, Jordan University, Amman, issue 1.*

Kodongo,O., Mokoteli,T.,&Maina,T. ( 2014). Capital structure, profitability and firm value: panel evidence of listed firms in Kenya. *Online at http*://mpra.ub.uni-muenchen.de/57116/MPRA PaperNo.57116

Masood,O., Aktan,B.,& Chaudhary,S. (2009). An empirical study on Banks profitability in the KSA: A co-integration approach. *African Journal of Business Management* Vol. 3 (8).

Pachori,S., Totala,N.K. (2012). Influence of Financial Leverage on Shareholders Return and Market Capitalization: A Study of Automotive Cluster Companies of Pithampur, (M.P.), India. *2nd International Conference on Humanities, Geography and Economics (ICHGE'2012) Singapore*

Phillips,C.B. (1993). *Fully modified lest squares and Vector Auto regression.* Cowles Foundation discussion Paper No. 1047

Melvin., Boehlje,M., Dobbins,D., & Gray,A. (2004). The Dupont profitability analysis model: an application and evaluation of an e-learning tool. *Agricultural Finance Review. Vol. 64. Iss 1.*

## Table 1: Descriptive statistics

|  | ROA | ROE | MV | EV |
|---|---|---|---|---|
| Mean | 223.1641 | 19.31741 | 4440754. | 4455088. |
| Median | 133.3400 | 15.38000 | 35007.82 | 43346.27 |
| Maximum | 1179.130 | 119.2300 | 566000 | 566000 |
| Minimum | 5.850000 | 0.270000 | 3169.117 | 3840.447 |
| Std. Dev. | 229.5464 | 15.84408 | 35171493 | 35171178 |
| Skewness | 1.571005 | 2.543443 | 13.83527 | 13.83469 |
| Kurtosis | 5.177413 | 13.36686 | 215.4130 | 215.3992 |
| Jarque-Bera | 185.7113 | 1694.633 | 583121.4 | 583045.6 |
| Probability | 0.000000 | 0.000000 | 0.000000 | 0.000000 |
| Observations | 305 | 305 | 305 | 305 |

## Table 2: Results of Levin, Lin & Chu (LLC) Unit Root Test

| Variable | Levin, Lin& Chu Unit Root Test (Level) | | Levin, Lin& Chu Unit Root Test (First Difference) | |
|---|---|---|---|---|
|  | Statistic | Probability | Statistic | Probability |
| ROA | -10.356 | 0.068 | -452.789 | 0.000 |
| ROE | -27.4875 | 0.094 | -42.066 | 0.000 |
| MV | -16.7475 | 0.000 | -67.259 | 0.000 |
| EV | -19.6065 | 0.081 | -66.1894 | 0.000 |

**Table 3: Results of Kao Residual Co-integration Test**

|  | t-Statistic |  |
|---|---|---|
| Probability |  |  |
| ADF | -2.210469 | 0.0135 |
| Residual variance | 304.127 |  |
| HAC variance | 774.14 |  |

**Table 4: Results of Panel Granger Causality Test**

| Null Hypothesis | F-statistics | Probability |
|---|---|---|
| ROA does not Granger Cause EV | 0.35991 | 0.0469 |
| EV does not Granger Cause ROA | 0.02312 | 0.0490 |
| ROE does not Granger Cause EV | 0.79591 | 0.0452 |
| EV does not Granger Cause ROE | 0.10277 | 0.0402 |
| ROE does not Granger Cause ROA | 0.68826 | 0.5038 |
| ROA does not Granger Cause ROE | 0.84567 | 0.0431 |

**Table 5: Results of Fully Modified Least Squares (FM-OLS)**

| Variable | Coefficient | t-statistic | Probability |
|----------|-------------|-------------|-------------|
| ROA | 0.478551 | 0.083120 | 0.0280 |
| ROE | 0.79634 | 0.024760 | 0.0380 |
| R-squared | 0.232424 | Durbin-Watson stat | 1.757083 |