Online ISSN : 2249-4588
Print ISSN : 0975-5853

Global Journal

of Management and Business Research: C

Finance

Brazilian Stock Market

Foreign Direct Investment

Highlights

Level Bayesian Network

Listed Indian Companies

Discovering Thoughts, Inventing Future

VOLUME 13 ISSUE 11 VERSION 1.0

Global Journal of Management and Business Research : C
Finance

Global Journal of Management and Business Research : C
Finance
Volume 13 Issue 11 (Ver. 1.0)

Open Association of Research Society

Incorporation No.: 0423089
License No.: 42125/022010/1186
Registration No.: 430374
Import-Export Code: 1109007027
Employer Identification Number (EIN):
USA Tax ID: 98-0673427

Global Journals Inc.

*(A Delaware USA Incorporation with "Good Standing"; **Reg. Number: 0423089**)*

Sponsors: Open Association of Research Society
Open Scientific Standards

Publisher's Headquarters office

Global Journals Headquarters
301st Edgewater Place Suite, 100 Edgewater Dr.-Pl,
Wakefield MASSACHUSETTS, Pin: 01880,
United States of America
USA Toll Free: +001-888-839-7392
USA Toll Free Fax: +001-888-839-7392

Offset Typesetting

Global Journals Incorporated
2nd, Lansdowne, Lansdowne Rd., Croydon-Surrey,
Pin: CR9 2ER, United Kingdom

Packaging & Continental Dispatching

Global Journals
E-3130 Sudama Nagar, Near Gopur Square,
Indore, M.P., Pin:452009, India

Find a correspondence nodal officer near you

To find nodal officer of your country, please email us at *local@globaljournals.org*

eContacts

Press Inquiries: *press@globaljournals.org*
Investor Inquiries: *investers@globaljournals.org*
Technical Support: *technology@globaljournals.org*
Media & Releases: *media@globaljournals.org*

Pricing (Including by Air Parcel Charges):

For Authors:
22 USD (B/W) & 50 USD (Color)
Yearly Subscription (Personal & Institutional):
200 USD (B/W) & 250 USD (Color)

Integrated Editorial Board
(Computer Science, Engineering, Medical, Management, Natural Science, Social Science)

Dr. Bart Lambrecht
Director of Research in Accounting and FinanceProfessor of Finance
Lancaster University Management School
BA (Antwerp); MPhil, MA, PhD (Cambridge)

Dr. Carlos García Pont
Associate Professor of Marketing
IESE Business School, University of Navarra
Doctor of Philosophy (Management), Massachusetts Institute of Technology (MIT)
Master in Business Administration, IESE, University of Navarra
Degree in Industrial Engineering, Universitat Politècnica de Catalunya

Dr. Fotini Labropulu
Mathematics - Luther College
University of ReginaPh.D., M.Sc. in Mathematics
B.A. (Honors) in Mathematics
University of Windso

Dr. Lynn Lim
Reader in Business and Marketing
Roehampton University, London
BCom, PGDip, MBA (Distinction), PhD, FHEA

Dr. Mihaly Mezei
ASSOCIATE PROFESSOR
Department of Structural and Chemical Biology, Mount Sinai School of Medical Center
Ph.D., Etvs Lornd University
Postdoctoral Training,
New York University

Dr. Söhnke M. Bartram
Department of Accounting and FinanceLancaster University Management SchoolPh.D. (WHU Koblenz)
MBA/BBA (University of Saarbrücken)

Dr. Miguel Angel Ariño
Professor of Decision Sciences
IESE Business School
Barcelona, Spain (Universidad de Navarra)
CEIBS (China Europe International Business School).
Beijing, Shanghai and Shenzhen
Ph.D. in Mathematics
University of Barcelona
BA in Mathematics (Licenciatura)
University of Barcelona

Philip G. Moscoso
Technology and Operations Management
IESE Business School, University of Navarra
Ph.D in Industrial Engineering and Management, ETH Zurich
M.Sc. in Chemical Engineering, ETH Zurich

Dr. Sanjay Dixit, M.D.
Director, EP Laboratories, Philadelphia VA Medical Center
Cardiovascular Medicine - Cardiac Arrhythmia
Univ of Penn School of Medicine

Dr. Han-Xiang Deng
MD., Ph.D
Associate Professor and Research
Department Division of Neuromuscular Medicine
Davee Department of Neurology and Clinical NeuroscienceNorthwestern University
Feinberg School of Medicine

Dr. Pina C. Sanelli
Associate Professor of Public Health
Weill Cornell Medical College
Associate Attending Radiologist
NewYork-Presbyterian Hospital
MRI, MRA, CT, and CTA
Neuroradiology and Diagnostic Radiology
M.D., State University of New York at Buffalo,School of Medicine and Biomedical Sciences

Dr. Roberto Sanchez
Associate Professor
Department of Structural and Chemical Biology
Mount Sinai School of Medicine
Ph.D., The Rockefeller University

Dr. Wen-Yih Sun
Professor of Earth and Atmospheric SciencesPurdue University Director
National Center for Typhoon and Flooding Research, Taiwan
University Chair Professor
Department of Atmospheric Sciences, National Central University, Chung-Li, TaiwanUniversity Chair Professor
Institute of Environmental Engineering, National Chiao Tung University, Hsin-chu, Taiwan.Ph.D., MS The University of Chicago, Geophysical Sciences
BS National Taiwan University, Atmospheric Sciences
Associate Professor of Radiology

Dr. Michael R. Rudnick
M.D., FACP
Associate Professor of Medicine
Chief, Renal Electrolyte and Hypertension Division (PMC)
Penn Medicine, University of Pennsylvania
Presbyterian Medical Center, Philadelphia
Nephrology and Internal Medicine
Certified by the American Board of Internal Medicine

Dr. Bassey Benjamin Esu
B.Sc. Marketing; MBA Marketing; Ph.D Marketing
Lecturer, Department of Marketing, University of Calabar
Tourism Consultant, Cross River State Tourism Development Department
Co-ordinator , Sustainable Tourism Initiative, Calabar, Nigeria

Dr. Aziz M. Barbar, Ph.D.
IEEE Senior Member
Chairperson, Department of Computer Science
AUST - American University of Science & Technology
Alfred Naccash Avenue – Ashrafieh

Contents of the Volume

Global Journal of Management and Business Research
Finance
Volume 13 Issue 11 Version 1.0 Year 2013
Type: Double Blind Peer Reviewed International Research Journal
Publisher: Global Journals Inc. (USA)
Online ISSN: 2249-4588 & Print ISSN: 0975-5853

Multifractal Behaviour in Natural Gas Prices by using Mf-DFA and WTMM Methods

By Cumhur TAŞ & Dr. Gazanfer Ünal
Yeditepe University, Turkey

Abstract- We make a comparative study of Multifractal Detrended Fluctuation Analysis (MF DFA) and the Wavelet Transform Modulus Maxima (WTMM) method to detect multifractal character of natural gas daily returns. We give a brief introduction on above methods and compare their effectiveness. The results from this methodoligies show that behaviour of natural gas daily returns were multifractal. The major sources of multifractality are long-range correlations of small and large fluctuations and Fat-tail distributions of the series.

Keywords: *natural gas, multifractal, MF-DFA, WTMM*

GJMBR-C Classification : *FOR Code:150304 JEL Code: F39*

Strictly as per the compliance and regulations of:

Multifractal Behaviour in Natural Gas Prices by using Mf-DFA and WTMM Methods

Cumhur TAŞ [α] & Dr. Gazanfer Ünal [σ]

Abstract- We make a comparative study of Multifractal Detrended Fluctuation Analysis (MF-DFA) and the Wavelet Transform Modulus Maxima (WTMM) method to detect multifractal character of natural gas daily returns. We give a brief introduction on above methods and compare their effectiveness. The results from this methodoligies show that behaviour of natural gas daily returns were multifractal. The major sources of multifractality are long-range correlations of small and large fluctuations and Fat-tail distributions of the series.

Keywords: natural gas, multifractal, MF-DFA WTMM.

I. Introduction

Energy plays an essential role in the world economy. The dynamics of energy prices are of great interest among researchers and market participants. Modeling and forecasting has increasingly become very important in analysis of trends in commodity markets, particularly in high frequency trades. It is difficult to predict the price return, i.e. profit or loss, due to many unknown variables including social and political unrest, catastrophic events, etc.

Natural gas prices are a function of market supply and demand. Because of limited alternatives for natural gas consumption or production in the short run, even small changes in supply or demand over a short period can result in large price movements to bring supply and demand back into balance. Natural gas has several interesting characteristics. First, gas is costly to transport internationally, so prices and forward curves vary regionally. Second; once a given well has begun production, gas is costly to store. Third, demand for gas in the United States is highly seasonal, with peak demand arising from heating in winter months. Thus, there is a relatively steady stream of production with variable demand, which leads to large and predictable price swings (http://www.eia.gov/).

A traditional assumption used in the early studies of financial time series, considered that returns are independent, Gaussian random variables. However, uncountable number of empirical studies, initiated by B. Mandelbrot, have shown that empirical returns reveal instead very rich and non trivial statistical features, such as fat tails, volatility clustering and multiscaling. This paper aims to empirically test whether returns on the Natural Gas spot prices exhibit long-range correlations and multifractal patterns. The term fractal was coined by Mandelbrot (Mandelbrot, 1982:15) to characterize a rough or fragmented geometric shape that displays a large degree of self similarities within its own fractional dimensions.

In principle there are two competitive methods for detecting the multifractality which are commonly used to eliminate trends and concentrate on the analysis of fluctuations. Multifractal Detrended Fluctuation Analysis (MF-DFA) (Kantelhardt, 2002:87) and Wavelet Transform Modulus Maxima (WTMM) (Muzzy, 1994:245).

II. Methodology

a) Multifractal Detrended Fluctuation Analysis

By using the MF-DFA analysis, we estimate the generalized Hurst and the Renyi exponents for price fluctuations. By deriving the singularity spectrum from the above exponents, we quantify the multifractality of a financial time series and compare the multifractal properties . In this method, we use the logarithmic return of the time series for each step u. Methodlogy of MF-DFA is as follows. The deviation in return from the mean of the return is

$$y(u) = \sum_{u}^{n} \left[\left(r(u) - \bar{r} \right) \right] \quad (u=1,2,....N) \tag{1}$$

The length N of the time series is partitioned into n segments, each of length s, N = ns. A least squares method can be used to identify trends in running deviation over each segment k by a polynomial g(u). The average fluctuation $F_{k(s)}$ in each subregion k is

$$\left(F_{k(s)}\right)^2 = \frac{1}{s} \sum_{u=(k-1)s+1}^{ks} \left((y_k)(u) - g(u) \right)^2 \tag{2}$$

The average moment of the fluctuation of order q over n segments of the time series is

$$F_{q(s)} = \left\{ \frac{1}{n} \sum_{k=1}^{n} \left[(\cdot) F_{k(s)} \right)^n \right\}^{\frac{1}{q}} \tag{3}$$

$$\text{As } q \to 0 \tag{4}$$

The power-law dependence of the q-th order moment of the fluctuation Fq(s) in interval s of the time series provides an estimate of the Hurst exponent h(q), i.e.,

Author ασ: Yeditepe University. e-mail: tas@kocfinans.com.tr

In general, the exponent h_q may depend on q. When h_q is constant for all q the time series are mono-fractal. For stationary time series, h_2 is identical to the well-known Hurst exponent H. Thus, we will call the function h_q generalized Hurst exponent. Positive values of q are used for magnifying the effects of large price variations in the scaling analysis, and negative values of q are used for magnifying the effects of small price variations.

When $h_2 > 0.5$, the kinds of fluctuations related to are persistent. An increase (decrease) is always followed by another increase (decrease). When $h_2 < 0.5$, the kinds of fluctuations related to are anti-persistent. An increase (decrease) is always followed by another decrease (increase). However, $h_2 = 0.5$ the, the kinds of fluctuations related to display random walk behavior. The richness in multifractality is associated with high variability of h_q and the degree can be quantified as $\Delta n = n_{qmn} - n_{qmax}$. As large fluctuations are characterized by smaller scaling exponent h_q than small fluctuations, h_q for $q < 0$ are larger than those for, $q > 0$ and Δn is positively defined . Multifractality degree can be used to measure the efficient extent of a finance market. When multifractality degree is weaker, for all q value, generalized Hurst exponents are closer to 0.5. This shows that no matter the fluctuation is big or small, its change of state is closer to random walk, so the market is more efficient.

The analytical relationship between generalized Hurst exponents based on MF-DFA and Renyi exponent τ_q is, $\tau_q = qh_q - 1$. The exponent τ_q represents the temporal structure of the time series as a function of the various moments, q or τ reflects the scale dependence of smaller fluctuations for negative values of, and larger fluctuations for positive values of q. If τ_q increases nonlinear with q, then the series is multifractal.

Via a Legendre transform, another important variable set $\alpha - f(\alpha)$ is defined by $\alpha = hq + qh'_q$ $f(\alpha) = q(\alpha - h_q) + 1$ Here, α is the Holder exponent or singularity strength which characterizes the singularities in a time series. Singularity basically points at the rapid changes in the time series values for small changes in time. In the multifractal case, the different parts of the dataset are characterized by different values of α, or the singularity spectrum.

b) Wavelet transform modulus maxima method (WTMM)

As proven by Mallat and Hwang (1990:549), multifractal formalism based on wavelet transform modulus maxima (WTMM) allows us to determine the whole singularity spectrum directly from any experimental signal. Muzy et al. (1991:3515) define the scaling behavior of partition functions (a) from the WTMM. The slope of the partition function determines the scaling $\tau()$ of moments of the distribution. Linearity of the scaling function suggests monofractal behavior of the time series, (all moments exhibit the same H scaling with time). The procedures of calculating the multifractal singularity spectrum based on WTMM is described in Yalamova (2003). Wavelet transform has proved to be a particularly efficient tool for measuring the local regularity of a function. The wavelet transform of $f(t) = p(t)$ is defined as:

$$W(\tau, a) = \int_{-\infty}^{+\infty} f(t)\psi_{\tau,a}\, t\, (dt) \qquad (5)$$

where the analyzing wavelet ψ is a function with local support, centered around zero and the family of wavelet vectors is obtained by translation τ and dilatation a. The modulus maxima (largest wavelet transform coefficients) are found at each scale a as the suprema of the computed wavelet transforms such that:

$$\frac{\partial W(\tau, a)}{\partial \tau} = 0 \qquad (6)$$

The originality of the WTMM method is in the calculation of the partition function $z(q, a)$ from these maxima lines. The space-scale partitioning given by the wavelet tiling or skeleton defines the particular Gibb's partition function:

$$Z(q, a) = \sum_{\tau, a} \sup_{a} |W(\tau, a)|^q \qquad (7)$$

The WTMM method uses continuous wavelet transform rather than Fourier transforms to detect singularities – that is discontinuities, areas in the signal that are not continuous at a particular derivative. Another interesting property of the wavelet transform is that the coefficients at these maxima-which are a small fraction of the total number of coefficients-are enough to encode the information contained in the signal (Muzzy, 1994:245), Moreover, as one follows a maxima line from the lowest scale to higher and higher scales, one is following the same singularity. This fact allows for the calculation of h_q by a power law fit to the coefficients of the wavelet transform along the maxima line (Struzik,2000:163).

Wavelet Skeleton is an aggregate of all Local Maxima Lines (LML) on each scale of Wavelet coefficient matrix. The idea of Skeleton matrix construction is to remove all wavelet coefficients in absolute wavelet coefficients matrix that are not maximal. Skeleton matrix is a scope of all local maxima points that exist on each scale a. If scaling exponential function is everywhere convex that indicates multifractal behaviour of the signal. It assumes that the signal does not have some decent fractal measure, but is characterized by the scope of fractal measures. In case of monofractal behaviour, the scaling exponential function is line. (Puckovs,2012:83)

III. Data Analysis

The Natural Gas Spot prices data were taken from Energy Information Administration in the US Department of Energy (http://www.eia.gov/) The data constitutes of daily closing prices over the period from Jan 01, 1997 to April 01, 2013 for 4065 observations in Figure1. In our analyses we used log return of the spot prices illustrated as Figure 2.

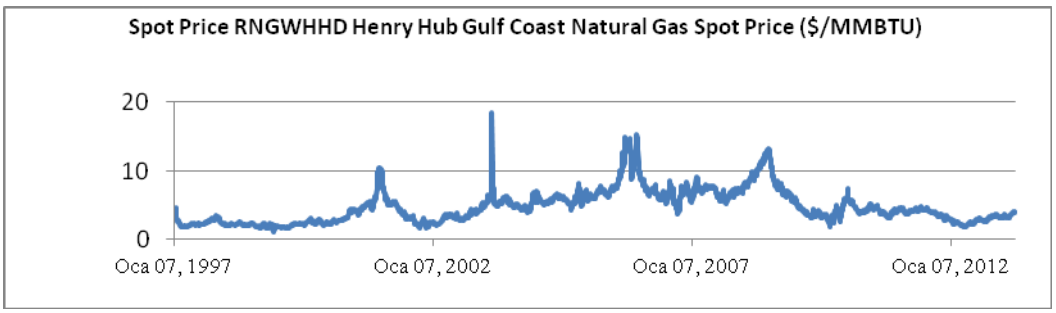


Figure 1 : Natural Gas Spot Price

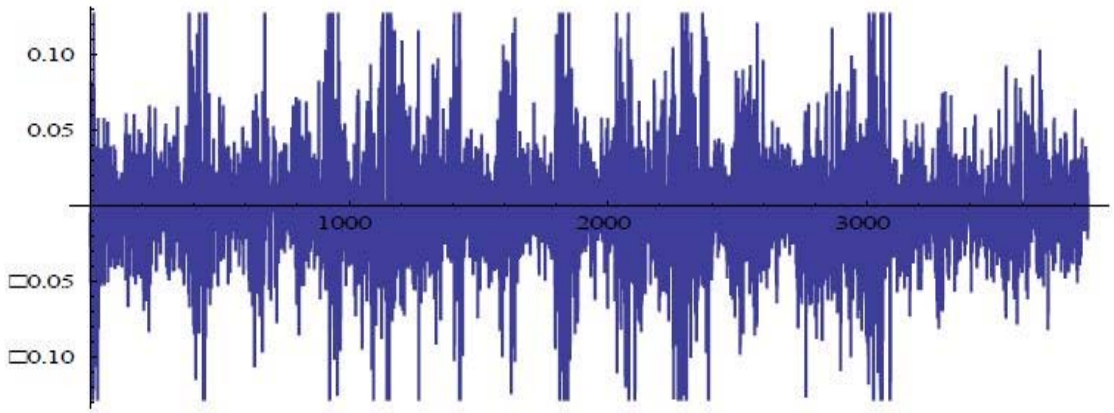


Figure 2 : Log Return Of Spot Prices

IV. Emprical Results

a) MDF-FA Method

We have used matlab codes to implement MF-DFA on log-return data of NaturalGas Spot prices. (Ihlen,2012:3) We estimate the generalized Hurst and the Renyi exponents for price fluctuations. Deriving the singularity spectrum from the exponents, we quantify the multifractality of a financial time series. In Figure 3 (Upper Right Corner), The generalized Hurst exponents for time scales is given. When q varies from -5 to 5, h_q decreases from 0.4465 to -0.16511. h_q is not a constant, indicating multifractality in time series. Due to $H < 0.5$, the system displays fractional Brownian motion and anti-correlation and The antipersistent behavior and deviations of one sign generally followed by deviations with the opposite sign is an indication of the high degree of natural gas prices nervousness and uncertainty. It means that the analysis of these events doesn't give support to the Efficiency Market Hypothesis.

There are two factors contributing to multifractal properties, namely long-range temporal correlations for small and large fluctuations and the fat-tailed probability distributions of variations. (K.Matia, 2003:422) As shown in Figure 3 (Lower Left Corner), multifractal scaling function almost linear with for negative moments, but show significant non-linearities for positive moments. This means that the temporal structure of the larger fluctuations play an important role in the multifractality.

The spectrum, in Figure 3 (Lower Right Corner) as an upside-down parabola, peaks at and stretches from min to max. $\Delta\alpha = \alpha_{max} - \alpha_{mn}$ conventionally quantifies the degree of multifractality which is the width of singularity spectrum, while $f(\alpha)$ tells how frequently events with α scaling exponent occur. The width of the fractal spectrum, which shows the distinction between the maximum probability and the minimum probability, The larger the value of $\Delta\alpha$, the more uneven is the distribution of time series, and thus the stronger is the multifractality. The long-range and short correlations lead to a relatively narrow width of the spectrum (lower risk) or vice versa. In our case, the widht of spectrum 0.57409-(-0.37938)=0.95347 reveals that there is strong multifractility in Natural Gas daily returns.

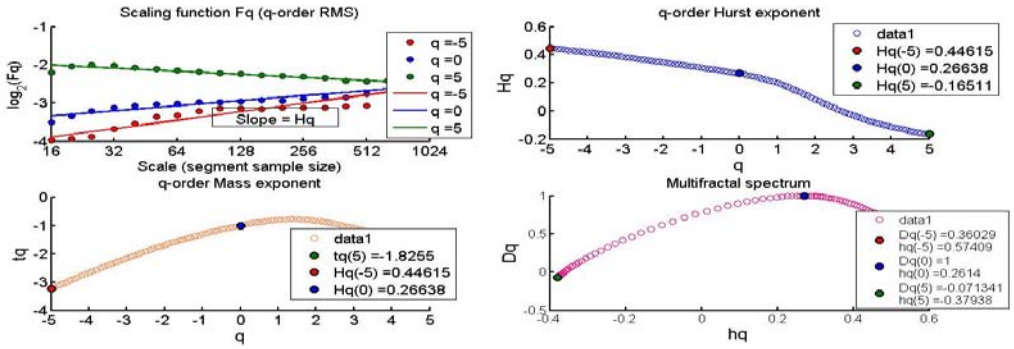


Figure 3 : Generalized Hurst Exponent, Reyni Exponents, Multifractal Spectrum

b) Wavelet Transform Modulus Maxima (WTMM)

We draw the Wavelet Skeleton by using Mathematica. Time shifting coefficients (b) are drawn on x axis, Scales (a) are drawn on Y axis. Local maxima lines are constructed using Wavelet coefficient matrix, selecting local maxima points on each scale parameter (Figure 4). The scope of all local maxima lines builds the so called Skeleton function. This function illuminates periodicity of the signal on decent scales. Dark colours correspond to lower absolute wavelet coefficient values. Light colours indicate higher absolute wavelet coefficient values. Continuous maxima line from small scales to large scales determine the time of the singularity at different scales. According to WTMM methods, we see that scaling exponential function is convex which shows that Natural Gas daily returns has multifractal properties.

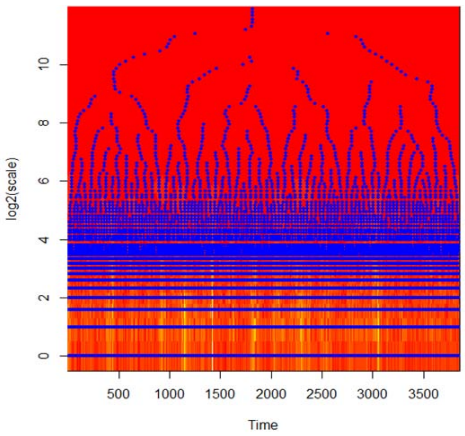


Figure 4 : Wavelet Sceleton

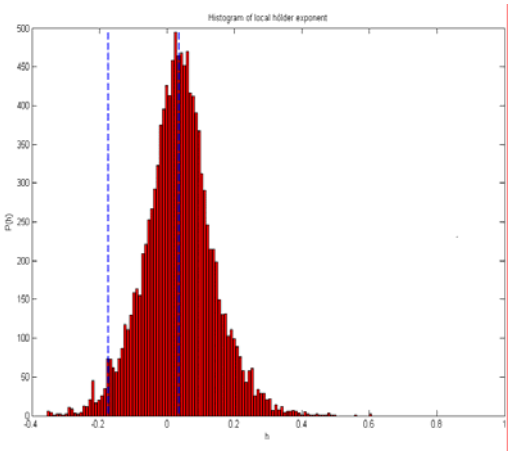


Figure 5 : Histogram Of Local Holder Exponent

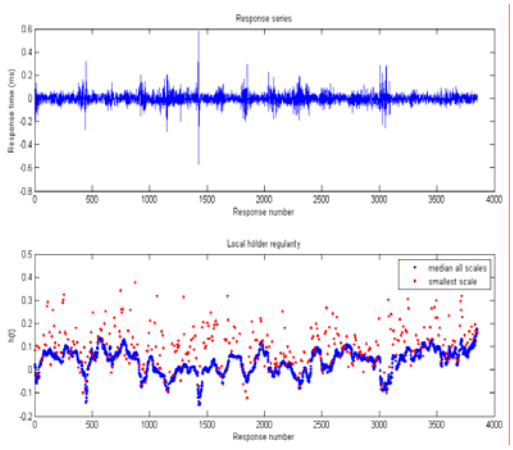


Figure 6 : Local Holder Regularity

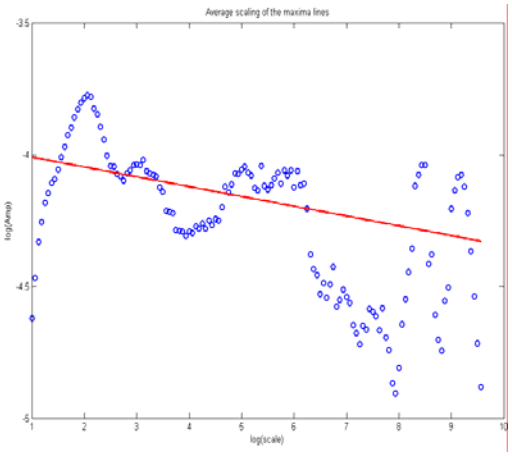


Figure 7 : Average Scaling of Maxima Lines

Unlike Multifractal, If we look at the scaling function, the Monofractal price series' behaviour is observed to be less deviated from the trend line (Figure 7). And also fat tails in both ends of the Local Holder Exponents indicates multifractality of the series (Figure 5).

V. Conclusion

Using the multifractal detrended fluctuation analysis (MF-DFA) together with WTMM, we showed the multifractal properties of the USA Natural Gas daily returns. Anti-persistent behaviour of prices which means that an increase (decrease) is always followed by another decrease (increase) is an indication of the high degree of market nervousness and uncertainty as stated in the literature. The fat-tailed distributions (probability distribution of returns), also contribute to the multifractal behaviour of the natural gas daily returns.

VI. Bibliography

1. B.B. Manderlbrot,The Fractal Geometry ofNature, FreemanWH,New York, 1982.
2. W.Kantelhardt, S.A.Zschiegner, E.Koscienlny-Bunde, S. Havlin,Multifractal detrended fluctuation analysis of nonstationary time series,Physica A316 (2002) 87_114.
3. Muzy, J. F., Bacry, E. & Arneodo, A. (1994) The multifractal formalism revisited with wavelets. Int. J. Bifurc. Chaos. 4, 245-302. (1994).
4. Struzik. Z. R. (2000) Determining local singularity strengths and their spectra with the wavelet transform. Fractals 8, 163-179.
5. Andrejs Puckovs, Andrejs Matvejevs, Wavelet Transform Modulus Maxima Approach for World Stock Index Multifractal Analysis. University, Information Technology and Management Science. pp76-86.
6. Espen Ihlen (2012),"Introduction to multifractal detrended fluctuation analysis in Matlab",Frontiers in Physiology.
7. K. Matia, Y. Ashkenazy, H.E. Stanley, Multifractal properties of price fluctuations of stock and commodities, Europhysics Letter 61 (2003) 422–428.
8. Mallat, S. G. and Hwang, W. L. (1990). Technical Report #549, Computer Science Department, New York University, unpublished.
9. Muzy, J. F., Bacry, E. and Arneodo, A. (1991). Wavelets and multifractal formalism for singular signals: Application to turbulence data. Physical Review Letters, 67(25), 3515–3518.
10. Yalamova, R. (2003). Wavelet MRA of index patterns around financial market shocks. Ph.D. thesis, Kent State University.

This page is intentionally left blank

Global Journal of Management and Business Research
Finance
Volume 13 Issue 11 Version 1.0 Year 2013
Type: Double Blind Peer Reviewed International Research Journal
Publisher: Global Journals Inc. (USA)
Online ISSN: 2249-4588 & Print ISSN: 0975-5853

Future Volatility Forecasting Models: An Analysis of the Brazilian Stock Market

By Bernardo Hallak Amaral, Antonio Carlos Figueiredo Pinto, Paulo Vitor Jordão da Gama Silva & Marcelo Cabus Klotzle

Pontifícia Universidade Católica do Rio de Janeiro/IAG, Brazil

Abstract- Future volatility forecasting intrigues many scholars, researchers, and people from the financial markets. The model and methodology used for forecasting are fundamental for asset pricing in general, since future volatility deeply influences the final result. Thus, this study uses databases from the companies Vale and Petrobrás, in the period from July 1994 to August 2013, to test the Univariate, Bivariate, GARCH, and EGARCH models (also analyzing the results for the linear and quadratic methods) in order to assess the best model for forecasting future volatility.

Keywords: *brazilian market; volatility forecas ting; future volatility; historic volatility; average historic volatility .*

GJMBR-C Classification : *FOR Code:150304 JEL Code: H54, G10*

Strictly as per the compliance and regulations of:

Future Volatility Forecasting Models: An Analysis of the Brazilian Stock Market

Bernardo Hallak Amaral [α], Antonio Carlos Figueiredo Pinto [σ], Paulo Vitor Jordão da Gama Silva [ρ] & Marcelo Cabus Klotzle [ω]

Abstract- Future volatility forecasting intrigues many scholars, researchers, and people from the financial markets. The model and methodology used for forecasting are fundamental for asset pricing in general, since future volatility deeply influences the final result. Thus, this study uses databases from the companies Vale and Petrobrás, in the period from July 1994 to August 2013, to test the Univariate, Bivariate, GARCH, and EGARCH models (also analyzing the results for the linear and quadratic methods) in order to assess the best model for forecasting future volatility. The results indicate that the quadratic method can better forecast future volatility than the linear method. The Univariate model showed the best results, proving that it is more efficient to use only short-term volatility for future volatility forecasting. If it were necessary to include long-term volatility, the Bivariate model would be the best, despite the GARCH and EGARCH models showing similar results.

Keywords: brazilian market; volatility forecasting; future volatility; historic volatility; average historic volatility.

I. Introduction

When investors seek to invest their funds, the majority use profitability as the main criteria in making their decisions. However, it is also necessary to analyze risk and return, and volatility is one of the key measurement variables needed to make a good investment decision.

The standard, and simplest, way of measuring the volatility of an asset is by estimating the standard deviation of its returns. This measurement is usually defined as historic volatility. However, what is important for the financial market is not the historic value of the variance, but rather the value that is expected to prevail in the future. contrast, a high volatility asset presents abrupt oscillation, and is thus considered a high risk.

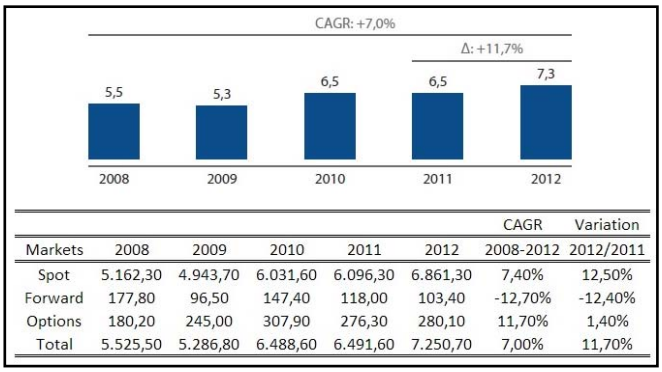
Therefore, the higher the volatility, the riskier the investment will be. When an asset has a low volatility it has a lower risk since its value changes slowly. In

In this study, volatility is calculated as both the dispersion of asset returns in the stock market (standard historic volatility) and the variation between the highest and lowest price of an asset on a given day (average historic volatility).

There are several types of volatility mentioned in the literature on this subject, such as historic, future, expected, and implied volatility, which support investor analyses. However, future volatility is the type that matters the most, since it best describes the price dispersion of the underlying asset.

Due to the ease of obtaining historic and implied volatilities, these are often used in calculating the theoretical price of assets, even if this is not the best estimation method.

This study focuses on the Brazilian stock market. In the last five years, there has been growth in the average daily trading volume at an average annual rate of 7.0%(Compound Annual Growth Rate), with an emphasis on the options market, which grew at an average annual rate of 11.7% (Figure 1).



Markets	2008	2009	2010	2011	2012	CAGR 2008-2012	Variation 2012/2011
Spot	5.162,30	4.943,70	6.031,60	6.096,30	6.861,30	7,40%	12,50%
Forward	177,80	96,50	147,40	118,00	103,40	-12,70%	-12,40%
Options	180,20	245,00	307,90	276,30	280,10	11,70%	1,40%
Total	5.525,50	5.286,80	6.488,60	6.491,60	7.250,70	7,00%	11,70%

Figure 1 : Bovespa's Average Daily Trading Volume.

Moreover, there is great potential in the Brazilian market because of the following reasons: the need for new listings by Brazilian companies wanting to obtain more capital for their investments; the growth of the middle class; and the wider dissemination and awareness of financial information due to the efforts of BM&FBOVESPA that launched a campaign in September 2010 with the strategy of increasing its total number of investors to 5 million within five years.

Author α: Masters in Business Administration at PUC - RIO DE JANEIRO. Bachelor in Production Engineering at UFRJ.
e-mail: bha1006@hotmail.com
Author σ: Professor at PUC - RIO DE JANEIRO. Ph.D. in Economics at FGV - RIO DE JANEIRO. Bachelor in Administration at UERJ.
e-mail: Figueiredo@iag.pucrio.br
Author ρ: Masters in Business Administration at PUC - RIO DE JANEIRO. Bachelor in Business Administration at PUC- RIO DE JANEIRO.e-mail: rjdagamahotmail.com
Author ω: Professor at PUC - RIO DE JANEIRO. Post-doctorate in Behavioral Finance at McMaster University. Ph.D. in Economics - Katholische Universitat Eichstatt. Master in Business Administration Universitat Bayreuth. Bachelor in Business Administration - Universitat Bayreuth. e-mail: klotzle@iag.puc-rio.br

To give more consistency to the data and results, two highly liquid assets with a long trading history were chosen, namely, Petrobras PN (PETR4) and Vale PNA (VALE5). These are the two most negotiated shares on the Brazilian stock market in recent years. Their calls and puts are also the most negotiated options on BM&FBOVESPA, exchange where most trading in stock options is concentrated. Other stock options have low volume.

Figure 2 represents the daily returns of Petrobras and of Vale from July 5, 1994 to August 27, 2013, respectively.

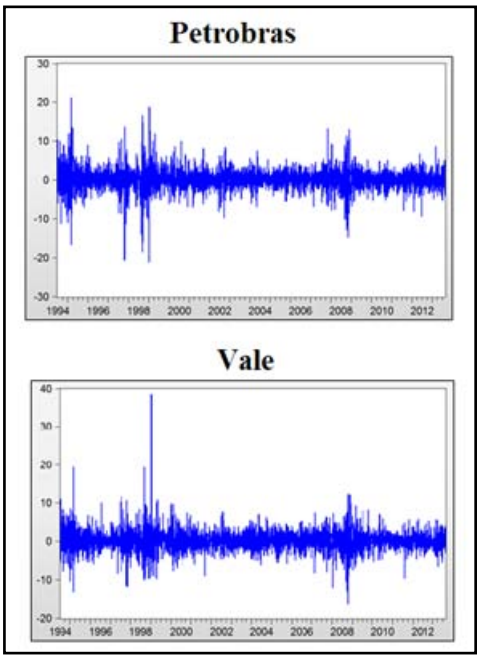


Figure 2 : Daily return of the Petrobras and Vale Shares from July 5, 1994 to August 27, 2013.

As can be seen from the data, the Petrobras returns suffered great variations in late 1994 (the Mexican crisis), early 1997 (the Asian crisis), 1998 (the Russian crisis), and late 2008 and early 2009 (the real estate crisis or subprime crisis in the United States), which generated high volatility on these dates with increasing risk aversion indicating the strong influence of international factors on the Brazilian domestic market. Analyzing the Vale returns, these followed a trend without suffering large oscillations, especially compared with the Petrobras share returns. The effects of the aforementioned crises were sharp. The returns obtained from the Petrobras and Vale shares are central in calculating and forecasting future volatility, as will be seen throughout this study.

II. Theoretical Framework

There are several definitions and concepts of volatility in the literature. According to Shiryaev (1999), there is no financial concept as discussed and as freely interpreted as volatility.

Usually this term is used in finance to denote the standard deviation of an asset's return. Thus, one of the variables for calculating volatility is the rate of return of an asset (ui) during a certain time interval i: $u_i = \ln(S_i / S_{i-1})$, where i = 1, 2, 3…, n. (1)

Where S_i is the asset price in time i and is the asset price in time i -1.

Considering n + 1 observations, it is possible to calculate the asset's average return (ū):

$$\bar{u} = \frac{1}{n}\sum_{i=1}^{n} u_i \quad (2)$$

The usual estimation that represents the variance of , is given by:

$$\sigma_n^2 = \frac{1}{n-1}\sum_{i=1}^{n}(u_i - \bar{u})^2 \quad (3)$$

Thus, volatility can be defined as σ_n.

a) Univariate and Bivariate Models of Historic Volatility

According to Katz and Cornick (2005), historic volatility is generally used to calculate option price. However, option value is not defined by historic volatility, but by future volatility.

Because of this, some experiments were conducted in order to calculate future volatility based on historic volatility. Two of these models are used in this study: univariate and multivariate models of historic volatility.

In the univariate model of historic volatility, two measures are used to calculate volatility: standard historic volatility based on the standard deviation of the logarithmic returns, as can be seen in equation (3); and average historic volatility, as can be seen in equation (4), according to Katz and Cornick (2005):

$$v = 0{,}627\left(\frac{1}{m}\right)\sum_{i=0}^{m-1} ln(H_{k-1} / L_{k-1}) \quad (4)$$

Where m represents the period selected, H_{k-1} is the maximum of the asset in the period and L_{k-1} is the minimum of the asset in a certain period.

On the other hand, the bivariate model of historic volatility uses a short-term historic volatility measurement and adds a long-term historic volatility measurement for future volatility forecasting.

Caspary (2011) uses both univariate and bivariate regressions to obtain a relationship between standard historic volatility and future volatility. In his study, he analyzed the twenty-seven most liquid shares of Bovespa, in addition to IBOVESPA, to forecast future volatility. In both models, the results were satisfactory and mean reversion was observed, i.e., lower values of historic volatility implied higher values of future volatility

and higher values of historic volatility implied lower values of future volatility.

b) GARCH and EGARCH Models

Engle (1982) introduced the autoregressive conditional heteroskedasticity model (ARCH), presenting the concept of conditional variance that proved to be used in many different models of economic phenomena.

Bollerslev (1986) expanded Engle's model in order to allow the conditional variance to be modeled as an autoregressive–moving-average process (ARMA). According to Gujarati (2005), the generalized autoregressive conditional heteroskedasticity model (GARCH), as the name implies, is a generalization of the ARCH model, where the conditional variance at a certain time depends on disturbances and past conditional variances.

GARCH (1,1) is the simplest and most used GARCH model. GARCH (1,1) was used in this study because it is the GARCH model series that best fits, and because there is autocorrelation between the residues found in AR(1) regression, whereas there is no autocorrelation between residues found in AR(2) regression.

Equation 5 follows, and represents this model:

$$\sigma_n^2 = \gamma VL + \alpha u_{n-1}^2 + \beta \sigma_{n-1}^2 \quad (5)$$

Where VL represents the long-term variance rate, u_{n-1}^2 represents more recent daily percentage variance, and σ_{n-1}^2 is the previous day's variance. Moreover, γ is the weight related to VL, α the weight related to u_{n-1}^2 , and β the weight related to σ_{n-1}^2 . The sum of these weights is 1, like the equation:

$$\gamma + \alpha + \beta = 1 \quad (6)$$

Besides being a more advanced model than ARCH, it can also be considered an extension of the exponentially weighted moving average model (EWMA), since the long-term variance rate is taken into account, which influences the calculation of today's variance.

Therefore, the GARCH model was used in this study and its results will be presented in the results section.

The exponential generalized autoregressive conditional heteroskedasticity model (EGARCH) will also be used because it is an even more developed model than GARCH, since it uses asymmetry, taking into consideration that each rise and fall in the asset's value is weighted differently in volatility.

This model created by Nelson (1991) aimed to develop a multivariate version of exponential ARCH and a satisfactory asymptotic theory for estimating parameters of maximum likelihood.

The representation of the EGARCH(p,q) model follows in equation 7:

$$Log\,\sigma_t^2 = \omega + \sum_{k=1}^{q} \beta_k\, g(Z_{t-k}) + \sum_{k=1}^{p} \alpha_k \log(\sigma_{t-k}^2) \quad (7)$$

Where g(Zt) = θ^{Z_t} + λ (| Zt | − E (| Z_t |)), σ_t^2 is the conditional variance, ω, β, α, θ and λ are coefficients, and Z_t can be a standard normal variable or come from generalized error distribution. As well as the GARCH model, EGARCH (1,1) will be used in this study, rather than the other EGARCH series, since it presents autocorrelation between the regression residuals, adjusting better to the model.

When Morais and Portugal (1999) analyze which model best predicts the volatility of IBOVESPA in stable or troubled periods, they conclude that the GARCH model (deterministic model) presents superior results in a certain period of calm in the market, while the stochastic model obtains more satisfactory results in periods of crisis.

Wang (2007), when analyzing historic models, moving average volatility, GARCH and EGARCH volatility, as well as implied volatility in order to forecast the future volatility of shares, government bonds and foreign exchange market, concludes that the implied volatility model had the best results in forecasting future volatility, although all models had low influence.

Figlewski (2004), on the other hand, when comparing several models for forecasting future volatility, concludes that, in general, the historic volatility model provides better results for predicting short-term and long-term future volatility. According to Figlewski (2004), the GARCH model requires a larger sample size to give a better estimate. Therefore, when daily data are used in the model, GARCH achieves satisfactory results for forecasting volatility in a horizon of less than three months.

III. Methodology and Database

The database used in the study is comprised of a history of share prices used in determining the historic volatility of the underlying asset for the different time horizons and consequent establishment of volatility according to predefined periods.

Economática was the system selected for the survey of the asset price database. Besides allowing the acquisition of information on various shares for long periods of time, it also enables the extraction of a history of share prices that is already adjusted to the payment of dividends. Thus, the calculation of variations in asset prices can be made directly, without additional adjustments, since it is possible to obtain them already adjusted.

For the current study, Petrobras (PETR4) and Vale (VALE5) shares were selected for being high liquidity shares, and presenting high daily trading volume with a long history, which provides a better

analysis. The series obtained consists of daily closing, opening, and, maximum and minimum values of the assets from July 5, 1994 to August 27, 2013. The selected period includes a good historic record for analysis because of the Real Plan (Plano Real - a Brazilian Economic Program) and, to an extent, controlled inflation, which allows for the acquisition of satisfactory results. It is noteworthy that both, periods of crisis and periods of economic expansion, were used, and all trading days were considered.

a) Univariate and Bivariate Models of Historic Volatility

For the application of these two models, the methodology suggested by Katz and Cornick (2005) was used.

First, a stock is selected. In this study, the Petrobras (PETR4) and Vale (VALE5) shares were selected. Then, the period of analysis, from July 5, 1994 to August 27, 2013 was selected.

Using each reference date selected, historic volatility was calculated for 30 days prior (m1 = 30) and future volatility was calculated for 10 days (n1 = 10) immediately after the reference date. Figure 3 shows an example with reference date 02/15/2005 (the next period will only count from 02/15/2005 on).

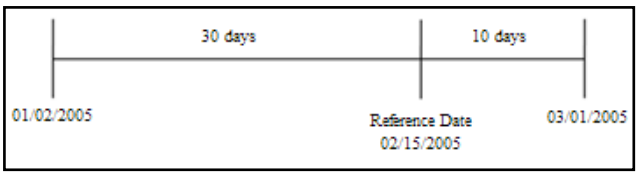


Figure 3 : Example of data selection for calculating volatility using the Univariate Model.

From this point on, another reference date is selected, and historic and future volatility are calculated as shown in the model. This process is repeated until the last reference date is selected.

In the univariate model, two measures of historic volatility are analyzed, namely, standard historic volatility and average historic volatility. With this, two series are used: one representing the relationship between standard historic volatility and standard future volatility, and the other representing the relationship between average historic volatility and standard future volatility.

This second study was done to assess if the multivariate model provides better estimates of future volatility than the model with a single variable.

In this study, two measures of historic volatility—a short-term one and a long-term one—were used to predict future volatility.

For each selected data on a certain date, m1 data preceding the reference data were selected, and historic volatility was short-term. After the last data of m1, m2 data were selected for calculating long-term historic volatility. In contrast, future volatility was calculated based on the m3 data selected after the reference data.

In this case, m1 was equal to 30, m2 was equal to 70, and m3 equal to 10.

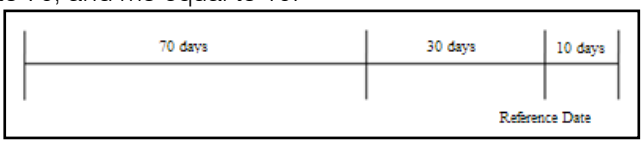


Figure 4 : Example of data selection for calculating volatility using the Bivariate Model.

After calculating these three volatilities, the next reference data was selected, the volatilities were calculated, and so on.

b) GARCH and EGARCH Models

To work with the GARCH and EGARCH models, EVIEWS was used to obtain long-term volatility.

Thus, from the returns of the Petrobras (PETR4) and Vale (VALE5) shares, the equation was estimated using the GARCH method. The daily variance for every share and therefore the annualized volatility for each of the periods were obtained as a result.

The same procedure was carried through for the EGARCH method, with long-term volatility as the final result.

IV. Results

Having obtained the historic series of the shares and applied the methodology presented above, historic and future volatilities were obtained. With these results, linear and quadratic regressions were applied to better analyze the results, verifying the reliability and comparing the various models used in the study.

As previously mentioned, some models were used to calculate the future volatility of the preferred shares of Petrobras and Vale: the univariate model of historic volatility, the bivariate model of historic volatility, GARCH and EGARCH. In this section, the results of each model will be described.

a) Univariate Model of Historic Volatility

First, the daily closing prices and daily minimum and maximum share prices of Petrobras and Vale from July 5, 1994 to June 30, 2011 were collected for the calculation of share returns.

Then, standard historic volatilities, average historic volatilities, and standard future volatilities were calculated.

Two series related to the Petrobras share are shown in the graph in figure 5: the first illustrating the relationship between standard historic volatility and standard future volatility, and the second illustrating the relationship between average historic volatility and standard future volatility. The x-axis (horizontal) represents historic volatility and the y-axis (vertical) future volatility.

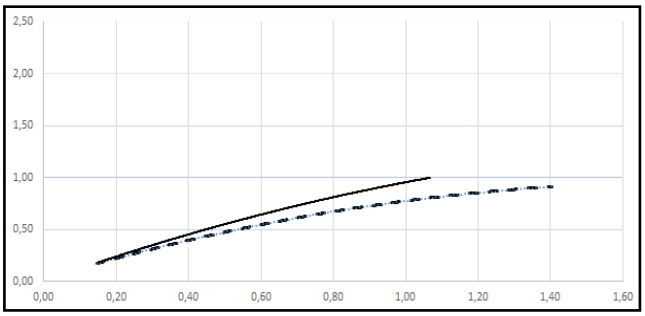


Figure 5 : Relationship between Standard Historic Volatility and Standard Future Volatility and between Average Historic Volatility and Standard Future Volatility for the Petrobras Share.

The dotted line represents the quadratic regression obtained from the relationship between standard historic volatility and standard future volatility and the solid line represents the quadratic regression obtained from the average historic volatility and standard future volatility. Tables 1 and 2 show the results of the regressions carried out using the SPSS statistical analysis tool.

Table 1 : Quadratic Regression of Standard Volatility for the Petrobras Shares using the Univariate Model.

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Erro	Beta		
(Constant)	0,026	0,012		2,090	0,037
Std. Historic Volatility	1,041	0,049	0,921	21,345	0,000
Std. Historic Volatility ²	-0,0293	0,038	-0,336	-7,788	0,000

	Sum of Squares	df	Mean Square	F	Sig.
Regression	86,298	2	43,149	1348,200	0,000
Residual	150,200	4693	0,032		
Total	236,498	4695			

R	R²	Ajusted R²	Std. Error
0,6041	0,3649	0,3646	0,1789

Table 2 : Quadratic Regression of Standard Volatility for the Petrobras Shares using the Univariate Model.

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Erro	Beta		
(Constant)	0,002	0,015		0,135	0,893
Avg. Historic Volatility	1,243	0,070	0,837	17,863	0,000
Avg. Historic Volatility ²	0,290	0,068	0,200	4,276	0,000

	Sum of Squares	df	Mean Square	F	Sig.
Regression	98,230	2	49,115	1667,017	0,000
Residual	138,268	4693	0,029		
Total	236,498	4695			

R	R²	Ajusted R²	Std. Error
0,6445	0,4154	0,4151	0,1716

From the graph in Figure 5, it is clear that the volatilities exhibit similar behavior for about 40% of each calculation after which there is a slight deviation from the average historic volatility. It can be noticed that the volatility displays mean reversion, i.e., low levels of historic volatility lead to higher levels of future volatility, while high levels of historic volatility imply lower levels of future volatility.

For almost all volatilities, the calculation using average volatility provides a better estimate of future volatility than the standard measurement. This occurs because there is a greater reliability upon the average as a measure of volatility, and its volatility better explains future volatility, since it has a slightly higher R^2, as detailed in the results obtained using regression.

Two series related to the Vale share were also used. Both series are shown in the chart in figure 6: the first illustrates the relationship between standard historic volatility and standard future volatility, and the second illustrates the relationship between average historic volatility and standard future volatility. The x-axis (horizontal) represents historic volatility and the y-axis (vertical) future volatility.

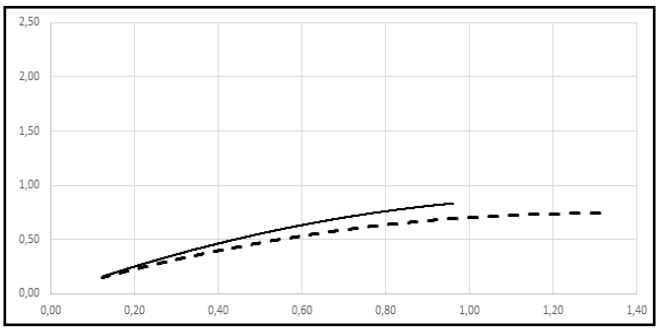


Figure 6 : Relationship between Standard Historic Volatility and Standard Future Volatility and between Average Historic Volatility and Standard Future Volatility for the Vale Share.

The dotted line represents the quadratic regression obtained from the relationship between standard historic volatility and standard future volatility and the solid line represents the quadratic regression obtained from the average historic volatility and standard future volatility. Table 3 shows the results of the regressions carried out using the SPSS statistical analysis tool.

Table 3 : Quadratic Regression of Standard Volatility and Average Volatility for the Vale Shares using the Univariate Model.

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Erro	Beta		
(Constant)	0,018	0,012		1,445	0,148
Std. Historic Volatility	1,116	0,049	0,955	22,718	0,000
Std. Historic Volatility ²	-0,432	0,041	-0,448	-10,651	0,000

	Sum of Squares	df	Mean Square	F	Sig.
Regression	59,683	2	29,8416	980,170	0,000
Residual	142,971	4696	0,0304		
Total	202,655	4698			

R	R²	Ajusted R²	Std. Error
0,5427	0,2945	0,2942	0,1745

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Erro	Beta		
(Constant)	-0,006	0,015		-0,405	0,686
Avg. Historic Volatility	1,381	0,077	0,872	17,914	0,000
Avg. Historic Volatility ²	-0,529	0,084	-0,306	-6,296	0,000

	Sum of Squares	df	Mean Square	F	Sig.
Regression	68,037	2	34,018	1186,699	0,000
Residual	134,618	4696	0,029		
Total	202,655	4698			

R	R²	Ajusted R²	Std. Error
0,5794	0,3357	0,3354	0,1693

As observed for Petrobras, from the graph with the Vale volatilities we observe that the volatilities exhibit a similar behavior up to approximately 45% of each calculation.. Additionally, the volatility displays mean reversion, i.e., low levels of historic volatility causing higher levels of future volatility, while high levels of historic volatility imply lower levels of future volatility, showing greater influence than in the Petrobras shares.

By having a slightly higher R^2 in the average historic volatility model, it can be seen that its volatility better forecasts future volatility, being a more reliable measure.

For the models shown above, taking into account the R^2 presented in this section, the Petrobras share provides better results than the Vale share when calculating future volatility.

b) Bivariate Model of Historic Volatility

In the multivariate model, in addition to short-term historic volatility, a long-term historic volatility was added, differing from the univariate model presented earlier.

As this model presents a two variable function, the result would be a three-dimensional graph. For ease of viewing, some short-term volatilities were established and a certain future volatility was obtained according to long-term volatility.

Both linear and quadratic methods were used for calculating future volatility, according to the study suggested above. The two models presented satisfactory results for both the Petrobras and Vale shares.

Using linear regression for the Petrobras shares, the results were: the higher the short- or long-term volatility, the higher the future volatility.

Table 4 shows the result of the linear regression of short- and long-term historic volatility for calculating future volatility and figure 7 shows it as a graph.

Table 4 : Linear Regression between Long-Term Historic Volatility and Short-Term Historic Volatility for the Petrobras Shares using the Bivariate Model.

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Erro	Beta		
(Constant)	0,096	0,007		14,446	0,000
L.T. Historic Volatility	0,091	0,018	0,075	5,176	0,000
S.T. Historic Volatility	0,622	0,016	0,551	37,975	0,000

	Sum of Squares	df	Mean Square	F	Sig.
Regression	82,970	2	41,485	1286,171	0,000
Residual	149,114	4623	0,032		
Total	232,084	4625			

R	R²	Ajusted R²	Std. Error
0,5979	0,3575	0,3572	0,1796

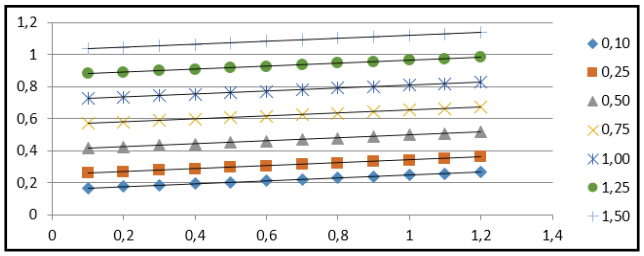


Figure 7 : Relationship between short- and long-term historic volatilities and future volatility for the Petrobras share from linear regression using the bivariate model of historic volatility.

As it is linear, if the short-term volatility is the same, an increase in long-term volatility generates an increase in future volatility.

As with the linear method, the same methodology was followed for calculating the results of the Petrobras shares using the quadratic method. The results can be seen in table 5 and figure 8.

Table 5 : Quadratic regression between long-term historic volatility and short-term historic volatility for the Petrobras shares using the bivariate model.

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Erro	Beta		
(Constant)	-0,027	0,019		-1,430	0,153
L.T. Historic Volatility	0,336	0,074	0,277	4,565	0,000
L.T. Historic Volatility ²	-0,231	0,060	-0,223	-3,834	0,000
S.T. Historic Volatility	0,919	0,054	0,814	17,142	0,000
S.T. Historic Volatility ²	-0,234	0,039	-0,270	-6,071	0,000

	Sum of Squares	df	Mean Square	F	Sig.
Regression	84,758	4	21,189	664,626	0,000
Residual	147,326	4621	0,032		
Total	232,084	4625			

R	R²	Ajusted R²	Std. Error
0,6043	0,3652	0,3647	0,1786

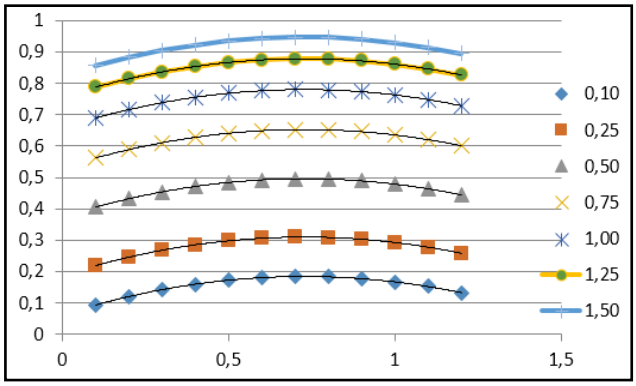


Figure 8 : Relationship between short- and long-term historic volatilities and future volatility for the Petrobras share from quadratic regression using the bivariate model of historic volatility.

Using the quadratic method, it can be seen that the higher the short-term volatility, the higher is the future volatility, presenting a proportional relationship. At a short-term historic volatility of 50% or less, any variation in historic volatility implies a larger variation in future volatility. After 50%, the variation in this volatility has less and less impact on the variation of future volatility. It can be observed that future volatility is very similar when short-term historic volatility is 125% or 150%.

Including long-term volatility in the analysis, it can be observed that at long-term volatility of approximately 70%, the higher the long-term volatility, the higher the future volatility. From then on, the increase in long-term volatility generates minor impact on future volatility, proving there is mean reversion. Considering a short-term volatility at 75%, when long-term volatility is at 50% or at 90%, future volatility is at 65%.

Thus, for the Petrobras PN shares, one instance of high volatility will barely remain in this baseline for a long period of time. Table 6 aids in understanding the aforementioned with regard to the analysis of volatility.

Table 6 : Relationship between short- and long-term historic volatilities and future volatility for the Petrobras shares from quadratic regression using the bivariate model of historic volatility.

Short-Term Volatility	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%
Long-Term Volatility	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	110%	120%
Future Volatility	41%	43%	45%	47%	48%	49%	50%	49%	49%	48%	46%	44%

Short-Term Volatility	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%
Long-Term Volatility	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	110%	120%
Future Volatility	56%	59%	61%	63%	64%	65%	65%	65%	65%	64%	62%	60%

Short-Term Volatility	150%	150%	150%	150%	150%	150%	150%	150%	150%	150%	150%	150%
Long-Term Volatility	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	110%	120%
Future Volatility	86%	88%	91%	92%	94%	94%	95%	95%	94%	93%	92%	90%

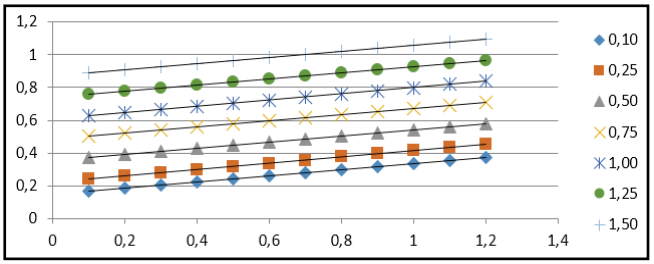


Figure 9 : Relationship between short- and long-term historic volatilities and future volatility for the Vale shares from linear regression using the bivariate model of historic volatility.

Table 7 : Linear regression between long-term historic volatility and short-term historic volatility for the Vale shares using the bivariate model.

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Erro	Beta		
(Constant)	0,098	0,008		12,857	0,000
L.T. Historic Volatility	0,188	0,021	0,145	9,120	0,000
S.T. Historic Volatility	0,513	0,019	0,440	27,699	0,000

	Sum of Squares	df	Mean Square	F	Sig.
Regression	56,070	2	28,035	849,522	0,000
Residual	138,769	4205	0,033		
Total	194,838	4207			

R	R²	Ajusted R²	Std. Error
0,5364	0,2878	0,2874	0,1817

Using linear regression to obtain the future volatility model for the Vale shares, the same results are found as in the application of linear regression for the Petrobras share, i.e., the higher the short- and long-term volatility, the higher the future volatility.

In order to check the results for the quadratic model, a regression between short-term historic volatility, short-term squared volatility, long-term volatility, and long-term squared volatility was performed to calculate future volatility. Table 8 and figure 10 show the results.

Table 8 : Quadratic regression between long-term historic volatility and short-term historic volatility for the Vale shares using the bivariate model.

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Erro	Beta		
(Constant)	-0,032	0,021		-1,527	0,127
L.T. Historic Volatility	0,334	0,083	0,258	4,037	0,000
L.T. Historic Volatility ²	-0,168	0,073	-0,142	-2,300	0,021
S.T. Historic Volatility	0,954	0,057	0,818	16,852	0,000
S.T. Historic Volatility ²	-0,365	0,044	-0,383	-8,377	0,000

	Sum of Squares	df	Mean Square	F	Sig.
Regression	58,634	4	14,659	452,332	0,000
Residual	136,204	4203	0,032		
Total	194,838	4207			

R	R^2	Ajusted R^2	Std. Error
0,5486	0,3009	0,3003	0,1800

It can be observed in figure 10 that, in applying the quadratic method of regression for the Vale shares, it becomes clear that at short-term historic volatility of 50% or less, any variation in short-term historic volatility generates greater variation in future volatility. After 50%, the volatility of this variation will have less and less impact on the variation of future volatility, until 125%, when an increase above this value in short-term historic volatility leads to lower future volatility.

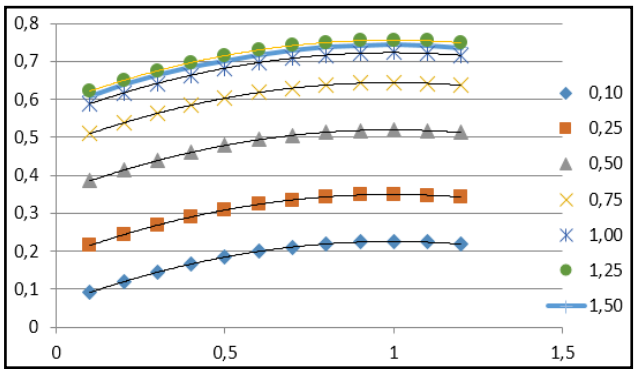


Figure 10 : Relationship between short- and long-term historic volatility and future volatility for the Vale Share from quadratic regression using the bivariate model of historic volatility.

By including long-term volatility in the analysis, it is clear that an increase in this volatility causes less and less variation in future volatility, with a tendency to remain constant during periods of high volatility. For instance, considering a short-term volatility at 50%, when there is a long-term volatility at 20%, the result is a future volatility of 41%. If long-term volatility is at 30%, future volatility is at 44%. By increasing long-term volatility to 40%, future volatility grows to 46%. Table 9 sums this up.

Table 9 : Relationship between short- and long-term historic volatilities and future volatility for the Vale shares from quadratic regression using the bivariate model of historic volatility.

Short-Term Volatility	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%
Long-Term Volatility	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	110%	120%
Future Volatility	39%	41%	44%	46%	48%	49%	51%	51%	52%	52%	52%	51%

As R^2 is higher with the quadratic model for both Petrobras and Vale, it can be seen that short- and long-term volatility that best determines future volatility is obtained by using this model, which presents more reliable results.

For the models shown above, the Petrobras share provides better results than the Vale share when calculating future volatility.

c) GARCH Model

For application of the GARCH model, EViews statistical package was used to calculate long-term historic volatility. From the data obtained with the bivariate model of historic volatility, the long-term historic volatility calculated for this model was replaced by the volatility calculated using EViews.

Linear and quadratic regressions were performed for both the Petrobras and Vale shares with the volatility results obtained.

Applying the linear regression method for the Petrobras shares, it is clear that there is a relationship between the dependent and independent variables, since they have high student's t-distribution, according to the results obtained in Table 10.

Table10 : Linear regression between long-term historic volatility and short-term historic volatility for the Petrobras shares using the GARCH model.

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Erro	Beta		
(Constant)	0,122	0,007		16,721	0,000
L.T. Historic Volatility	-0,032	0,016	-0,026	-2,043	0,041
S.T. Historic Volatility	0,680	0,014	0,603	48,243	0,000

	Sum of Squares	df	Mean Square	F	Sig.
Regression	82,242	2	41,121	1268,675	0,000
Residual	149,842	4623	0,032		
Total	232,084	4625			

R	R^2	Ajusted R^2	Std. Error
0,5953	0,3544	0,3541	0,1800

For a better understanding of the results, short-term volatility was fixed and future volatility was calculated using the variation of long-term volatility. Using the equation obtained from the regression, it can be seen that the higher the long-term volatility, the lower is the future volatility, and the higher the short-term volatility, the higher is the future volatility. The graph from figure 11 shows this relationship.

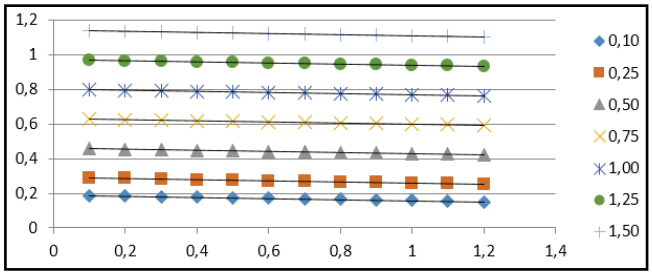


Figure 11 : Relationship between short- and long-term historic volatilities and future volatility for the Petrobras share from linear regression using the GARCH model.

This model presents different results than the bivariate model of historic volatility. Considering a short-term historic volatility at 50% and a long-term historic volatility at 30%, a future volatility of 45% is obtained using the GARCH model. Applying the same historic volatilities in the historic bivariate model, a future volatility of 43% is obtained.

When using a short-term historic volatility at 50% and a long-term historic volatility at 80%, a future volatility of 44% is obtained using the GARCH model. Applying the same historic volatilities in the historic bivariate model, a future volatility of 48% is obtained. That is, using the GARCH model, the higher the long-term historic volatility, the lower the future volatility. On the other hand, using the bivariate model, it can be seen that the higher the long-term historic volatility, the higher is the future volatility. Figure 12 depicts the aforementioned.

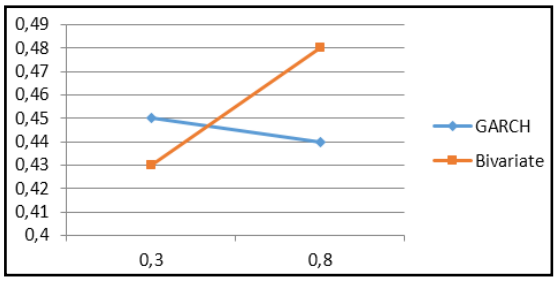


Figure 12 : Relationship between the GARCH Model and the bivariate model of historic volatility for the Petrobras shares from the linear regression result.

Applying quadratic regression for the results of the Petrobras share, it is concluded from student's t that linear and squared long-term volatility and linear and squared short-term volatilities influence future volatility.

Table 11 : Quadratic regression between long-term historic volatility and short-term historic volatility for the Petrobras shares using the GARCH Model.

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Erro	Beta		
(Constant)	0,009	0,016		0,526	0,599
L.T. Historic Volatility	0,110	0,053	0,087	2,064	0,039
L.T. Historic Volatility ²	-0,120	0,039	-0,127	-3,082	0,002
S.T. Historic Volatility	1,022	0,050	0,906	20,245	0,000
S.T. Historic Volatility ²	-0,275	0,038	-0,317	-7,219	0,000

	Sum of Squares	df	Mean Square	F	Sig.
Regression	84,496	4	21,124	661,391	0,000
Residual	147,588	4621	0,032		
Total	232,084	4625			

R	R^2	Ajusted R^2	Std. Error
0,6034	0,3641	0,3635	0,1787

For short-term volatility, the results were similar to those obtained from the bivariate model, i.e., the higher the short-term volatility, the higher the future volatility.

However, when analyzing long-term volatility, it is clear that, in the GARCH model, the higher the volatility, the lower the future volatility. On the other hand, the bivariate model displays mean reversion.

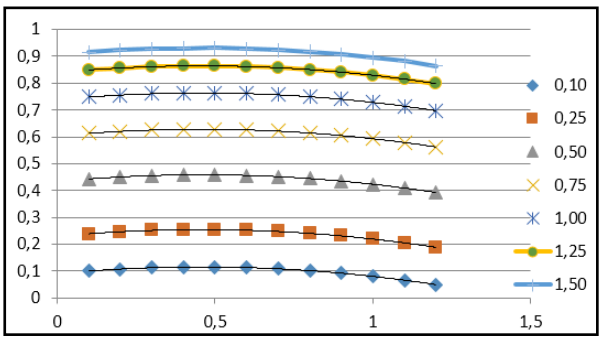


Figure 13 : Relationship between short- and long-term historic volatilities and future volatility for the Petrobras share from quadratic regression using the GARCH model.

A linear regression between the short- and long-term historic volatility was also performed to calculate the vale share's future volatility. The results were similar to those obtained for the Petrobras share, i.e., the higher the long-term volatility, the lower the future volatility. The result of this regression is in Table 12.

Table 12 : Linear regression between long-term historic volatility and short-term historic volatility for the Vale shares using the GARCH model.

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Erro	Beta		
(Constant)	0,152	0,008		18,347	0,000
L.T. Historic Volatility	-0,061	0,018	-0,047	-3,391	0,001
S.T. Historic Volatility	0,629	0,016	0,539	38,720	0,000

	Sum of Squares	df	Mean Square	F	Sig.
Regression	53,711	2	26,856	800,185	0,000
Residual	141,127	4205	0,034		
Total	194,838	4207			

R	R^2	Ajusted R^2	Std. Error
0,5250	0,2757	0,2753	0,1832

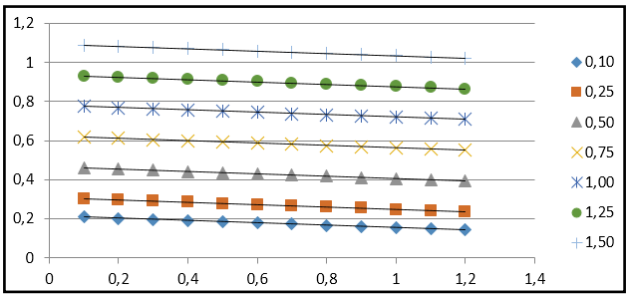


Figure 14 : Relationship between short- and long-term historic volatilities and future volatility for the Vale shares from linear regression using the GARCH model.

Table 13 : Quadratic regression between long-term historic volatility and short-term historic volatility for the Vale shares using the GARCH Model.

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Erro	Beta		
(Constant)	-0,022	0,017		-1,291	0,197
L.T. Historic Volatility	0,201	0,049	0,154	4,056	0,000
L.T. Historic Volatility ²	-0,203	0,035	-0,214	-5,743	0,000
S.T. Historic Volatility	1,108	0,053	0,950	20,989	0,000
S.T. Historic Volatility ²	-0,420	0,043	-0,440	-9,837	0,000

	Sum of Squares	df	Mean Square	F	Sig.
Regression	58,285	4	14,571	448,491	0,000
Residual	136,553	4203	0,032		
Total	194,838	4207			

R	R^2	Ajusted R^2	Std. Error
0,5469	0,2991	0,2985	0,1802

All variables explain future volatility, since they show student's t-distribution, according to the regression result in table 13.

As can be observed in figure 15, until short-term volatility reaches 125%, the increase in this volatility generates an increase in future volatility. From then on, it can be seen that an increase in short-term volatility generates a decrease in future volatility.

However, the increase in long-term volatility generates an increase in future volatility to 50% when the curve is reversed, and an increase in long-term volatility above 50% influences a decrease in future volatility, with mean reversion.

In fixing short-term volatility at 50% and using a long-term volatility of 40%, a future volatility of 47% is obtained. By applying the same short-term volatility and changing the long-term volatility to 90%, the result is a future volatility of 44%.

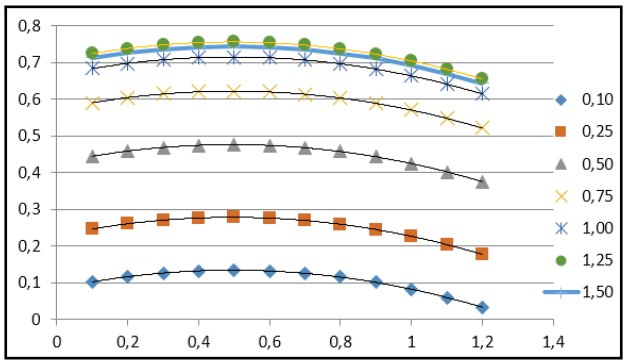


Figure 15 : Relationship between short- and long-term historic volatilities and future volatility for the Vale share from quadratic regression using the GARCH model.

By presenting a higher R^2, the quadratic models of Petrobras and Vale better determine future volatility. Moreover, the Petrobras share provided better results for calculating future volatility than the Vale share.

d) EGARCH Model

EViews statistical package was used to calculate long-term historic volatility in the EGARCH model, replacing long-term historic volatility.

In accordance with the results obtained in Table 14, it can be observed that there is a relationship between the dependent and independent variables, since they have a high student's t-distribution.

Table 14 : Linear regression between long-term historic volatility and short-term historic volatility for the Petrobras shares using the EGARCH model.

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Erro	Beta		
(Constant)	0,127	0,008		16,486	0,000
L.T. Historic Volatility	-0,049	0,018	-0,034	-2,723	0,006
S.T. Historic Volatility	0,685	0,014	0,607	48,126	0,000

	Sum of Squares	df	Mean Square	F	Sig.
Regression	82,346	2	41,173	1271,183	0,000
Residual	149,737	4623	0,032		
Total	232,084	4625			

R	R^2	Ajusted R^2	Std. Error
0,5957	0,3548	0,3545	0,1800

Short-term volatility was fixed and future volatility was calculated from the variation of long-term volatility. Through the equation obtained from the regression, the higher the long-term volatility, the lower the future volatility, and the higher the short-term volatility, the higher the future volatility.

However, the higher the long-term volatility, the lower the future volatility, since the coefficient of this

variable in the EGARCH model is more negative than in the GARCH model. That is, a 10% increase in long-term volatility generates a reduction of 0.32% using the GARCH model, while this reduction is 0.49% using EGARCH.

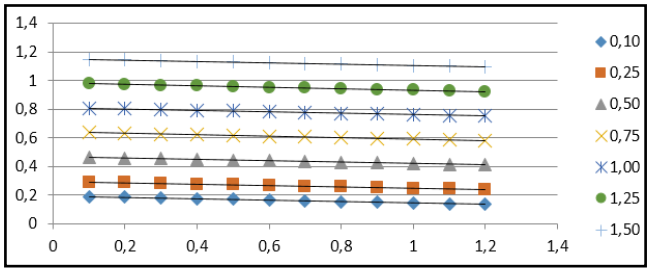


Figure 16 : Relationship between short- and long-term historic volatilities and future volatility for the Petrobras share from linear regression using the EGARCH model.

Using quadratic regression for the results of the Petrobras share, it is concluded that long-term volatility and squared long-term volatility do not influence future volatility. On the other hand, linear and squared short-term volatilities influence future volatility (table 15).

Table 15 : Quadratic regression between long-term historic volatility and short-term historic volatility for the Petrobras shares using the EGARCH model.

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Erro	Beta		
(Constant)	0,031	0,018		1,708	0,088
L.T. Historic Volatility	0,006	0,062	0,004	0,101	0,920
L.T. Historic Volatility ²	-0,055	0,050	-0,047	-1,087	0,277
S.T. Historic Volatility	1,042	0,050	0,924	21,034	0,000
S.T. Historic Volatility ²	-0,285	0,038	-0,329	-7,586	0,000

	Sum of Squares	df	Mean Square	F	Sig.
Regression	84,289	4	21,072	658,853	0,000
Residual	147,795	4621	0,032		
Total	232,084	4625			

R	R²	Ajusted R²	Std. Error
0,6026	0,3632	0,3626	0,1788

As observed in the chart in figure 17, the higher the short-term volatility, the higher the future volatility.

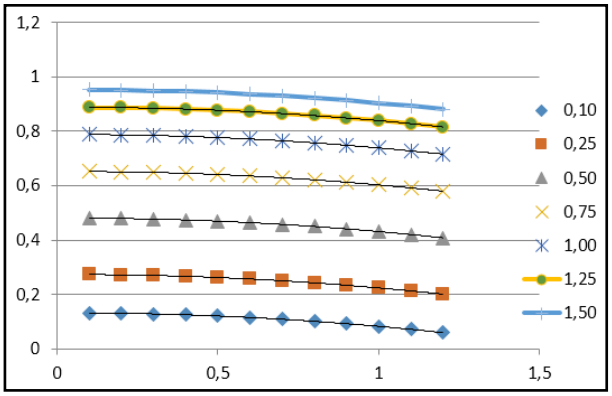


Figure 17 : Relationship between short- and long-term historic volatilities and future volatility for the Petrobras share from quadratic regression using the EGARCH model.

As mentioned above, long-term volatility does not explain future volatility, as it does not provide meaningful results.

A linear regression between short- and long-term historic volatility for calculating the vale share's future volatility was also used, as can be seen in table 16.

Table 16 : Linear regression between long-term historic volatility and short-term historic volatility for the Vale shares using the EGARCH model.

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Erro	Beta		
(Constant)	0,145	0,009		16,499	0,000
L.T. Historic Volatility	-0,036	0,021	-0,024	-1,726	0,084
S.T. Historic Volatility	0,621	0,016	0,532	37,712	0,000

	Sum of Squares	df	Mean Square	F	Sig.
Regression	53,426	2	26,713	794,320	0,000
Residual	141,413	4205	0,034		
Total	194,838	4207			

R	R²	Ajusted R²	Std. Error
0,5236	0,2742	0,2739	0,1834

Applying linear regression to obtain the future volatility model for the Vale shares, it was found that the results were similar to those from the GARCH model, i.e., according to the equation obtained using the regression, the higher the long-term volatility, the lower the future volatility.

However, using EGARCH, the higher the long-term volatility, the lower the negative influence in future volatility, since the coefficient of this variable in this model is bigger than the coefficient of this same variable using the GARCH model. That is, a 10% increase in long-term volatility generates a reduction of 0.61% using the GARCH model, while this reduction is 0.36% using EGARCH.

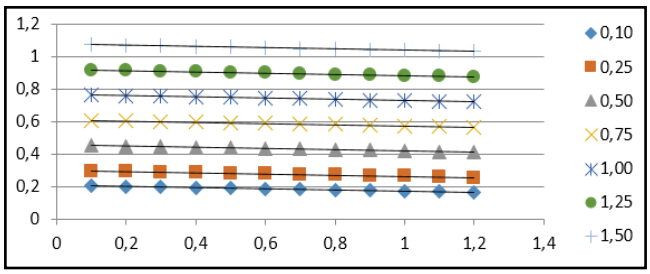


Figure 18 : Relationship between short- and long-term historic volatilities and future volatility for the Vale share from linear regression using the EGARCH model.

Unlike what happened in the application of the quadratic model for Petrobras, all variables for the Vale share explain future volatility, presenting high student's t. This can be seen in table 17.

Table 17 : Quadratic regression between long-term historic volatility and short-term historic volatility for the Vale shares using the EGARCH model.

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Erro	Beta		
(Constant)	-0,060	0,021		-2,849	0,004
L.T. Historic Volatility	0,403	0,080	0,274	5,041	0,000
L.T. Historic Volatility ²	-0,421	0,074	-0,307	-5,713	0,000
S.T. Historic Volatility	1,087	0,053	0,932	20,447	0,000
S.T. Historic Volatility ²	-0,402	0,043	-0,422	-9,336	0,000

	Sum of Squares	df	Mean Square	F	Sig.
Regression	57,965	4	14,491	444,987	0,000
Residual	136,873	4203	0,033		
Total	194,838	4207			

R	R^2	Ajusted R^2	Std. Error
0,5454	0,2975	0,2968	0,1805

Similar to what happened with the application of the GARCH model, the increase in short-term volatility generates an increase in future volatility up to 125%. From then onwards, it can be seen that the increase in short-term volatility generates a decrease in future volatility. In the chart above, the future volatilities resulting from short-term volatility of 150% are smaller to the future volatilities obtained through short-term volatility of 125%.

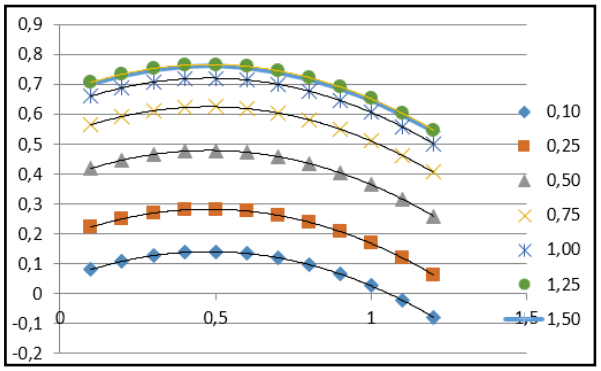


Figure 19 : Relationship between short- and long-term historic volatilities and future volatility for the Vale share from quadratic regression using the EGARCH model.

The increase in long-term volatility provides an increase in future volatility to 50% when the curve is reversed, and the increase in long-term volatility above 50% influences a decrease in future volatility, proving the mean reversion. Therefore, these results from the EGARCH model are similar to those of the GARCH model. However, it is clear that, with long-term future volatility at 80%, any increase in this volatility generates a negative variation in future volatility greater than in the GARCH model.

When using short-term volatility at 50% and a 10% future volatility, the EGARCH model's future volatility is 42%, while that of the GARCH model is 45%. Applying a 70% long-term volatility, the EGARCH model's future volatility is 46% while the GARCH model is 47%. In other words, the variation is small in both models. However, if the long-term volatility is 110%, the EGARCH model's future volatility is 32%, while the GARCH model's is 40%.

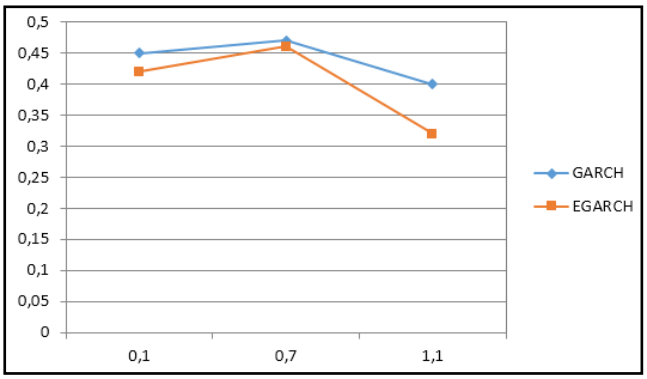


Figure 20 : Relationship between the GARCH Model and the EGARCH Model for the Vale shares using the quadratic regression result.

Similar to the GARCH model, the Petrobras and Vale quadratic models better explain future volatility than the linear models. Moreover, the Petrobras share provides better results for calculating future volatility than the Vale share.

V. Conclusion

This study sought to test the effectiveness of certain models in forecasting future volatility since volatility is one of the most difficult variables to calculate, in addition to having a significant impact on option price and on the estimation of future share value.

The results presented indicate that in all applied models, it is possible to better predict future volatility using the quadratic method rather than the linear method, since volatility models tend to be nonlinear and the R^2 from the regressions was higher when using the quadratic method.

It can also be concluded that the univariate model presents better results than the bivariate model. Additionally, the inclusion of another variable worsened the results, proving that it is more efficient to use only short-term volatility to forecast future volatility.

It was found that, in a similar way to what was reported by Caspary (2011), both the univariate and the bivariate models showed characteristics that lead to observing a mean reversion trend.

If there is a need to include long-term volatility, the bivariate model of historic volatility showed better results, despite the GARCH and EGARCH models producing very similar, although slightly lower, results. This contradicts the findings of Morais and Portugal (1999), who concluded that the GARCH model provided better results than the other models.

Taking R^2 into account, the model achieving the best results was the average historic volatility model using the univariate method of historic volatility. Therefore, it is the most suitable model for forecasting future volatility.

The results for the Petrobras share were better than the Vale share in all models, since Petrobras had a higher R^2 in all of them.

Future studies could improve results by using alternative models or even applying the models mentioned in this work on other shares with liquidity in the Brazilian market.

References Références Referencias

1. BMF&Bovespa. (2012). Relatório Anual 2012 do Bovespa. Retrived August 08, 2013, from [http://ri.bmfbovespa.com.br/ptb/1694/RELATORIOANUAL2012PORTUGUESVFINAL_raster.pdf];
2. Bollerslev, T. (1986). Generalized Autoregressive Conditional Heteroskedasticity. Journal of Econometrics, 31, 307-327;
3. Caspary, M. C. (2011). Modelo Genetic-Neural para Otimização de Carteiras com Opções Financeiras no Mercado brasileiro. [Dissertação de Mestrado, Pontifícia Universidade Católica do Rio de Janeiro, 2011] Retrived from Maxwell database [http://www.maxwell.lambda.ele.pucrio.br/Busca_etds.php?strSecao=resultado&nrSeq=19894@1];
4. Engle, R. F. (1982). Autoregressive Conditional Heteroskedasticity with Estimates of the Variance of United Kingdom Inflation. Econometrica, 50, 987-1007;
5. Figlewski, S. (1997). Forecasting Volatility. Financial Markets, Institutions & Instruments, 6, 1-88;
6. Gujarati, D. N. (2005). Essentials of Econometrics. New York: McGraw-Hill;
7. Katz, J. O.; Cornick, D. L. (2005). Advanced Option Pricing Models. New York: McGraw-Hill;
8. Morais, I. A. C., Portugal, M. S. (1999). Modelagem e Previsão de Volatilidade Determinística e Estocástica para a Série do Ibovespa. Estudos Econômicos (IPE/USP), 29, 303-341;
9. Nelson, D. (1991).Conditional Heteroskedasticity in Assets Returns: A new approach. Econometrica, 12, 347-370;
10. Shiryaev, A. N. (1999). Essentials of Stochastic Finance: Facts, Models, Theory. Singapore: World Scientific Publishing Co. Pte. Ltd.;
11. Wang, K. (2007). Forecasting volatility in equity, bond and money markets: A Market-based Approach. 21st Australasian Finance and Branking Conference 2008 Paper.[http://ssrn.com/abstract=1099585].

This page is intentionally left blank

Global Journal of Management and Business Research
Finance
Volume 13 Issue 11 Version 1.0 Year 2013
Type: Double Blind Peer Reviewed International Research Journal
Publisher: Global Journals Inc. (USA)
Online ISSN: 2249-4588 & Print ISSN: 0975-5853

Scenario and Incentives of Foreign Direct Investment (FDI) in Bangladesh

By Abdullah Al Mamun&Md. Hasebur Rahman
Pabna University of Science and Technology, Bangladesh

Abstract- FDI is considered as an important tool for economic development of developing country. The term foreign direct investment is considered as one of the important contributors for the economic development of a country in particular and the world in general with the concept of globalization. Foreign direct investment has great impact on the development of developing country like Bangladesh. Foreign Direct Investment increases trade and investment, labor mobility, capital inflow, technology and know-how to the recipient country.

Keywords: *Development, Foreign Direct Investment (FDI), Incentives.*

GJMBR-C Classification : *FOR Code:150304 JEL Code: O31, F31*

Strictly as per the compliance and regulations of:

Scenario and Incentives of Foreign Direct Investment (FDI) in Bangladesh

Md. Abdullah Al Mamun[α] & Md. Hasebur Rahman[σ]

Abstract- FDI is considered as an important tool for economic development of developing country. The term foreign direct investment is considered as one of the important contributors for the economic development of a country in particular and the world in general with the concept of globalization. Foreign direct investment has great impact on the development of developing country like Bangladesh. Foreign Direct Investment increases trade and investment, labor mobility, capital inflow, technology and know-how to the recipient country. The secondary data has been analyzed using tabular and graphical tools. Governments have now changed their policies from restricting towards promoting foreign investment. Though the government of Bangladesh provides fiscal, financial and other incentives, the actual flow of FDI is below the desired level.

Keywords: Development, Foreign Direct Investment (FDI), Incentives.

I. Introduction

Bangladesh is a developing country. Government of Bangladesh is looking forward to be a middle income country within 2021. In order to do that requires huge investment. There exists a saving investment gap. Investible fund may come from internal as well as external. External sources may foreign direct investment and foreign aid. Foreign Direct Investment is considered as one of the crucial ingredients for fostering economic development of developing country. The gap between actual flow of total investment and target of Government articulated in the medium term macroeconomic framework is on the rise and might grow sharply in the upcoming years [1]. FDI plays an important part in creating jobs but also considered as a source of income. But the strong argument in favor of public support to FDI is based on the prospect for knowledge spillovers. Indeed, FDI appears as the way to get capital without assuming the risk linked to the debt. Despite the controversies surrounding the benefits and cost of FDI a number of developing. Governments have now changed their policies from restricting towards promoting foreign investment [2]. The gains from FDI inflows are unquestionable as it contributes to economic growth through an increase in productivity by providing new investment, better technologies and managerial skills to the host countries. The impact of FDI on economic growth depends on the degree of capacity of the host country to use FDI efficiently. Similarly, trade liberalization may facilitate economic growth through efficiency in production by utilizing the abundant factors of production more effectively and absorbing better technologies from advanced countries. On the one hand, it may harm the growth process through various forms of macroeconomic instability such as terms of trade deterioration and balance of payments crisis. Therefore, it is a challenge for developing countries to find out the appropriate direction of the role of FDI and trade liberalization in economic growth [3]. FDI is considered as an important tool for economic development of developing country. If the investing country is wealthier than the host country then capital will flow to the host country [4].

Authors σ ρ: Faculty, Department of Business Administration, Pabna University of Science and Technology, Bangladesh.

II. Literature Review

Foreign direct investment has great impact on the development of developing country like Bangladesh. Several studies have been conducted on FDI. Faruk in his study "Effect of FDI to accelerate the economic growth of Bangladesh and some problem and prospect of FDI"found that FDI has greater impact on GDP or economic growth of Bangladesh [5]. Saha has seen that market instability, natural disaster, political instability, corruption, bureaucratic difficulties, power generation, inefficient labor, poor infrastructure, lack of joint effort, investors suspicious sentiments, regional and international politics are considered to be the hindrance in getting the sound FDI in Bangladesh[6]. Macroeconomic environment, governance, infrastructure, financial incentives, international integration, political stability, human resources, technological infrastructure plays vital role to bring more FDI in Bangladesh [7]. Nasrin et al in the paper "Major determinants and hindrance of FDI inflow in Bangladesh: perceptions and experience of foreign investors and policy maker" cheap labor, government incentives, investment friendly public policy and geographical location attract FDI[8]. Bhattacharya in his article he shown that industrious low cost workforce, strategic location, regional connectivity, strong vibrant local market and growth, openness to trade, low cost energy, proven export competitiveness, export and economic zones financial and fiscal incentives brings more FDI[9]. Alam in his paper shown that Bangladesh offers various fiscal, financial and other facilities to

increase flow of FDI in Bangladesh [10]. Bouoiyour in his research found that market size, labor cost, human resources, macroeconomic instability, regulatory policy, trade performance and competitiveness affect FDI[2]. Kafi et al in their study opined that infrastructure, macroeconomic environment, governance, international integration, political stability, human resources, technological infrastructures, bureaucracy, political unrest, corruption, insufficient power supply are fundamental ingredients to secure FDI[11]. Shahabuddin et al the study investigated that Bangladesh provides tax incentives, direct financial grants subsidies, loan guarantees to find more FDI[12].

III. Objective of the Research Work

The study is conducted for attaining the following objectives,

- To show the scenario of FDI.
- To analyze the incentives available for investor in Bangladesh.

IV. Research Methodology

The present study is conducted based on secondary data. These data have been collected from various sources. They are -journal, books, Daily news paper, Bangladesh economic review, Bangladesh bank, Bureau of statistics, various websites. The analysis has been performed through tabular form, charts, and diagrams on the basis of available data. Specially methodology is known as content analysis.

V. Foreign Direct Investment in Bangladesh

a) Present Status of FDI

After independence Bangladesh is seeking foreign capital. For that reason in nineties it liberalizes investment policy. As a result FDI has increased over the period. FDI in Bangladesh comprises of 100% Direct Investment and Joint Venture. The below table depicts the scenario of FDI in Bangladesh. The number of units registered to board of investment is 1597 to which 418 totally foreign owned and 1179 are joint venture. Total investment USD 17185.238 million and it generated 401164 persons employment opportunities.

Table 1 : FDI registered in Board of Investment from 1977-2010

Sl	Particulars	No. units registered	Investment in (USD million)	Employment (person)
A	100%Foreign Investment	418	7012.768	141957
B	Joint Venture Investment	1179	10172.470	259207
	Total	1597	17185.238	401164

Source: Investment Implementation Monitoring Cell (IIMC), Board of Investment

b) 100% Foreign Investment.

The below table shows yearly 100% foreign investment registered in Bangladesh employment opportunities for the period of 1990-2010.and appears that there is fluctuation in investment. The year 2005 has received the highest USD 3197.623 million and year 1994 received lowest USD 0.200 million investment. The fluctuation may cause of political unrest and incentives to the investor.

Table 2 : Year wise flow of 100% direct investment from 1990-2010

Year	Investment in (USD million)	Employment Opportunities(Person)
1990	0.623	100
1991	2.841	344
1992	18.919	206
1993	0.200	150
1994	28.037	2521
1995	10.318	252
1996	22.257	4125
1997	191.242	3998
1998	1018.871	3887
1999	436.907	13116

2000	406.695	1012
2001	11.258	1761
2002	35.963	9709
2003	83.516	8042
2004	224.806	20775
2005	3197.623	14439
2006	1120.820	11688
2007	55.163	23779
2008	65.584	6208
2009	44.688	11050
2010	36.437	4795
Total	7012.768	141957

Source: Investment Implementation Monitoring Cell (IIMC), Board of Investment

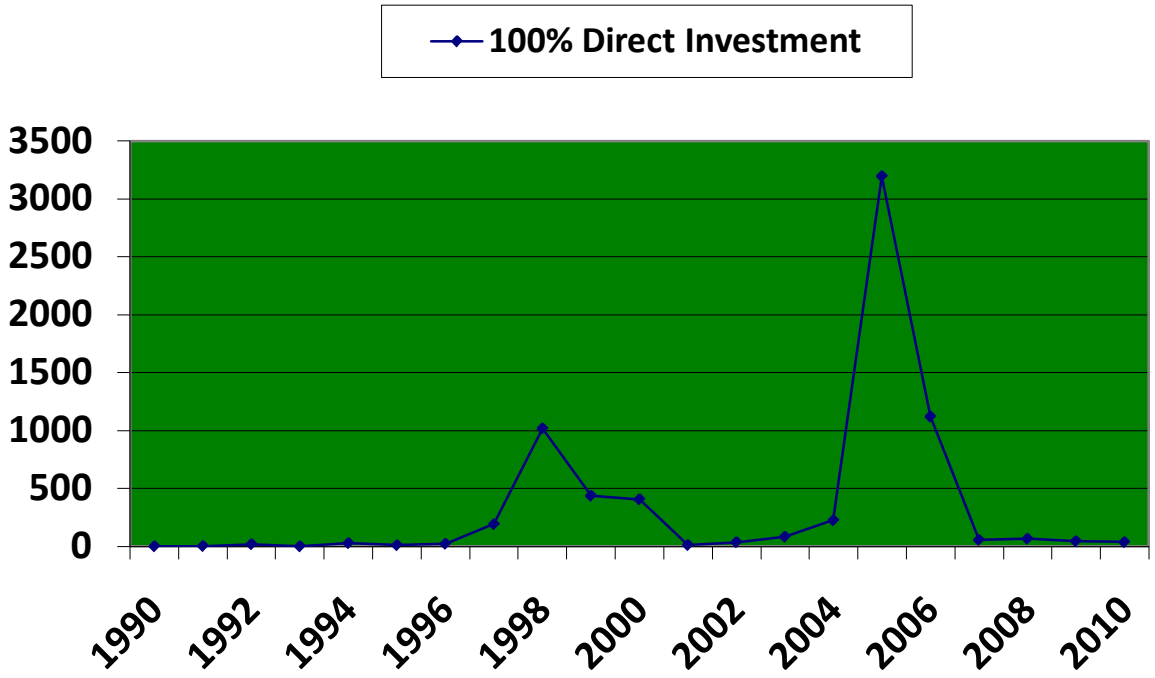


Figure1 : Shows 100% foreign investment trend from 1990-2010

The figure shows inconsistent proceedings of 100% foreign investment in Bangladesh since 1990. In spite of having incentives, friendly investment policies, low labor cost, comparative advantages, establishment of EPZs Bangladesh not attain desirable investment. The above figure shows an increasing trend from year 1995 to 1999. But after that there is a decreasing up to 2001 and again upward trend to year 2005 and again a down ward trend up to 2010.

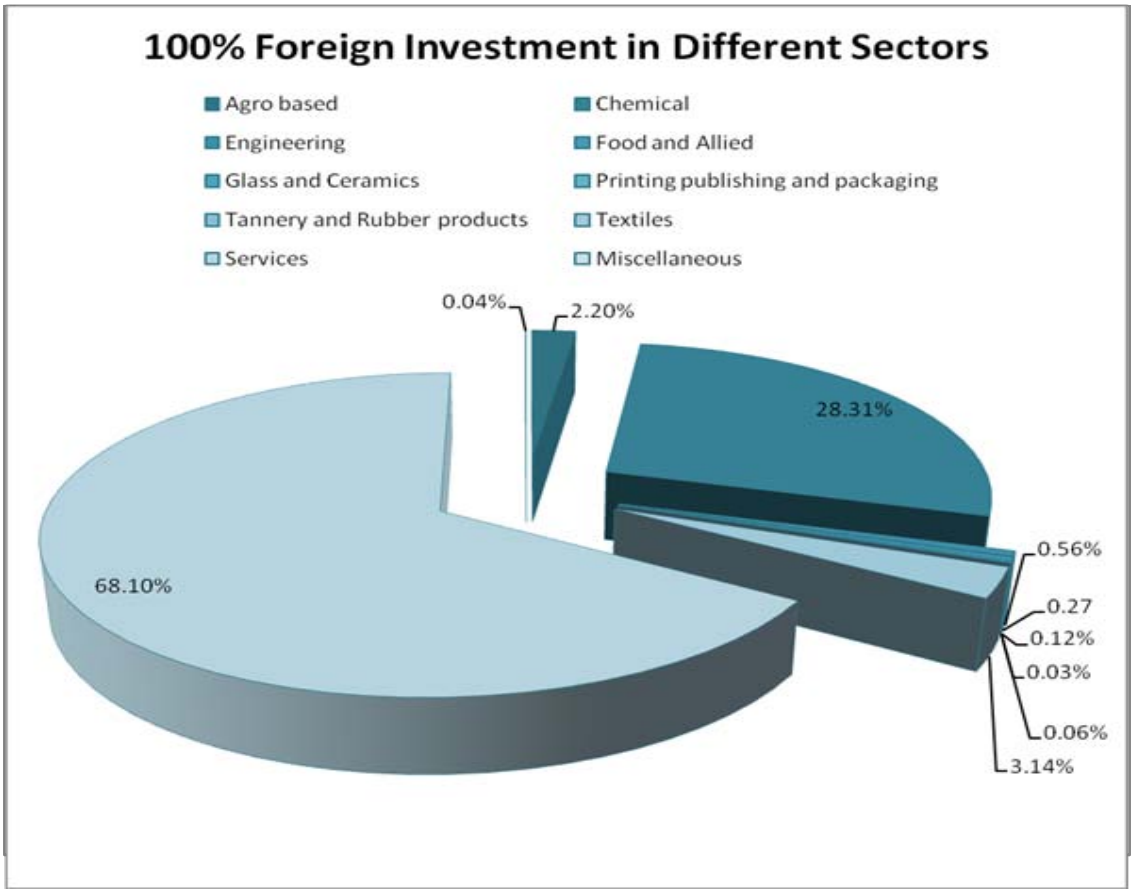
c) Contribution of Different Sectors in 100% Foreign Investment

The below table shows sector wise distribution 100% foreign investment from year 1990-2010. From table it appears that service sector has received the highest USD 4575.901 million which is 68.10% of total investment. Printing publishing and packaging sector received the lowest investment only 0.03% of total investment. The second highest investment is USD 1985.938 million in chemical sector.

Table 3 : 100% foreign investment in different sector.

Sl	Sectors	No. of units	Investment in(USD million)	Percentage of total investment	Employment opportunities (person)
1	Agro based	59	154.291	2.20	24434
2	Chemical	65	1985.938	28.31	6147
3	Engineering	57	38.963	0.56	4388
4	Food and Allied	13	19.112	0.27	1662
5	Glass and Ceramics	3	8.188	0.12	328
6	Printing publishing and packaging	7	2.269	0.03	325
7	Tannery and Rubber products	4	4.013	0.06	602
8	Textiles	115	221.259	3.16	84578
9	Services	91	4775.901	68.10	18758
10	Miscellaneous	7	2.834	0.04	735
	Total	418	7012.678	100	141957

Figure 2 : Shows 100% foreign investment in different sector from 1990-2010



The figure-2 shows 100%foreign investment in different sector. The service sector investment alone 68.10% and investment in chemical secctor is 28.31%. The lowest investment in Printing publishing and packaging is accounted only 0.03% of total investment.

d) Joint Venture Investment

Joint venture investment refers to investment by Bangladeshi investor and foreign investor. The investment comes in the form of equity, borrowings and reinvested earnings of existing the projects. The highest joint venture investment had come in the year of 2008 of USD 2403.328 million and the lowest investment USD 1.938 million in year of 1981

Table 4 : Joint venture investment from year 1977-2010

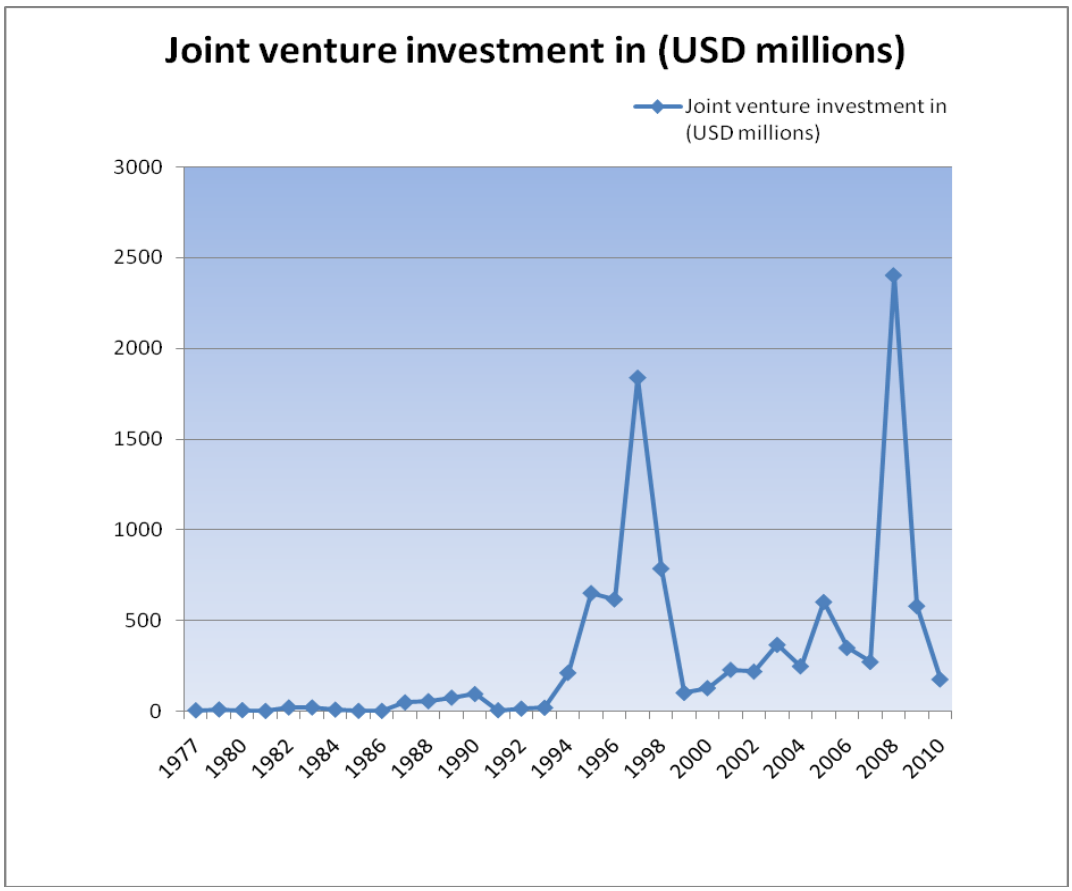
Year	Joint venture investment in (USD	Employment opportunities(person)
1977	5.031	60
1979	10.160	260
1980	6.203	327
1981	1.938	140
1982	21.118	680
1983	21.111	110
1984	9.284	229
1985	2.490	210
1986	2.228	136
1987	49.133	480
1988	55.620	330
1989	75.085	280
1990	95.377	1011
1991	5.617	415
1992	14.545	1248
1993	19.608	717
1994	211.622	1522
1995	651.816	1313
1996	616.978	6692
1997	1838.911	10820
1998	786.090	8713
1999	101.657	4851
2000	127.779	4670
2001	228.445	4679
2002	218.827	10786
2003	365.974	18925
2004	247.894	13180
2005	602.498	22081
2006	349.148	40516
2007	271.687	39037
2008	2403.328	36677
2009	579.750	22590
2010	175.518	5522
Total	10172.47	259207

Source: Investment Implementation Monitoring Cell (IIMC), Board of Investment

e) *Trend of Joint Venture Investment from Year 1977-2010*

Like 100% foreign investment joint venture investment also shows no specific trend. There is a upward trend up to year 1990 again a drift in trend line and again upward trend to 1997. The trend line in at the peak in year 2008. The reason for that are incentives and change of Government and change of regulations.

Figure 3 : Shows Joint Venture Investment trend from 1977-2010



f) Contribution of Different Sectors in Joint Venture Investment.

The chemical, engineering, textile and service sector received most of the investment. The service sector represents the highest joint investment of 301 proposal amounting USD 6693.352 million. The lowest contribution to the total is printing publishing and packaging sector of USD 17.159 million.

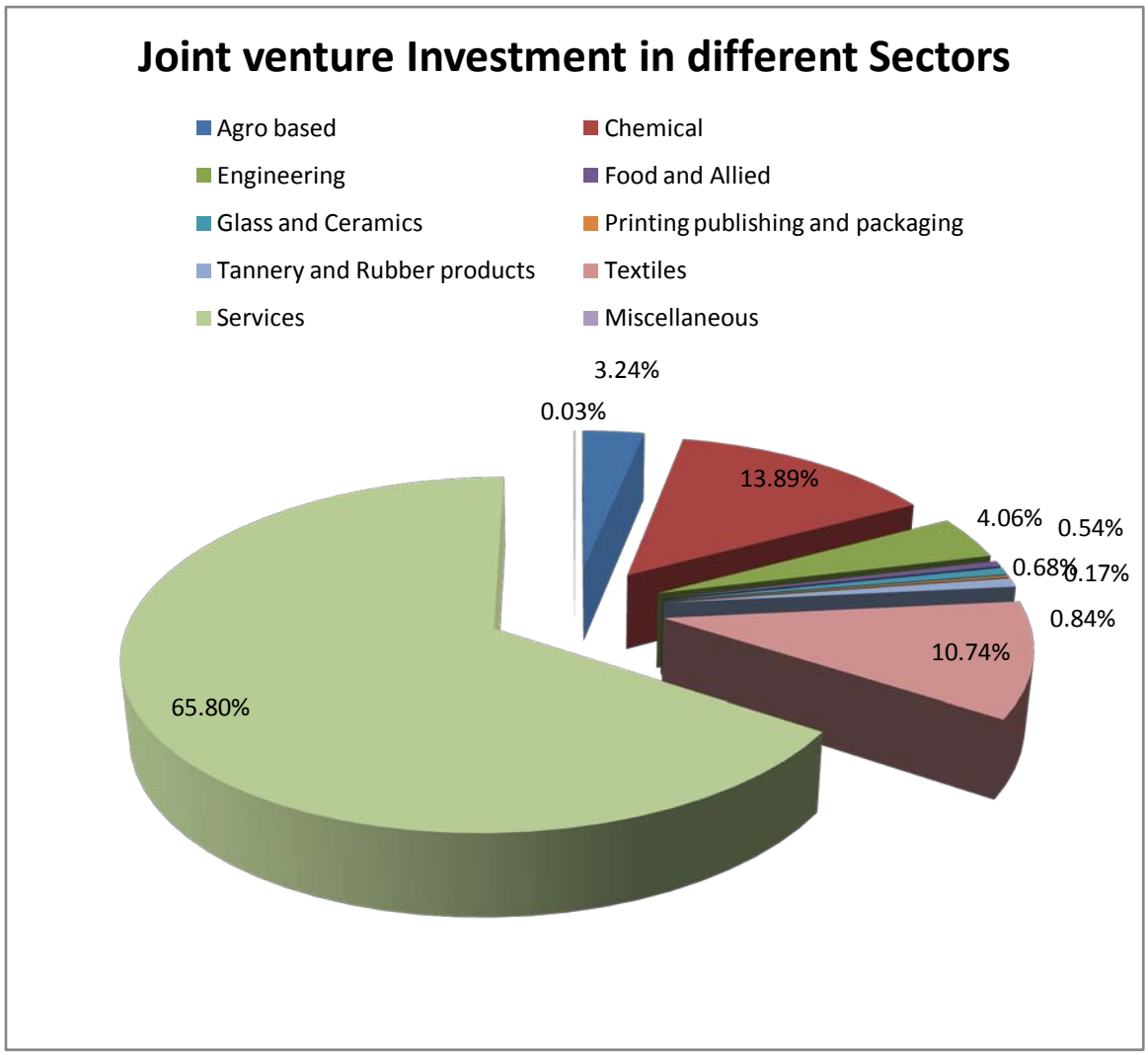
Table 5 : Sectoral distribution joint venture investments

Sl	Sectors	No. of units	Investment in(USD million)	Percentage of total investment	Employment opportunities(person)
1	Agro based	111	329.807	3.24	12588
2	Chemical	169	1413.025	13.89	21319
3	Engineering	151	412.821	4.06	18847
4	Food and Allied	50	54.650	0.54	3069
5	Glass and Ceramics	15	69.424	0.68	2334
6	Printing publishing and packaging	13	17.159	0.17	877
7	Tannery and Rubber products	42	85.754	0.84	17219
8	Textiles	320	1093.168	10.74	135053
9	Services	301	6693.352	65.79	47394
10	Miscellaneous	8	3.310	0.03	507
	Total	1179	10172.47	100	259207

Source: Investment Implementation Monitoring Cell (IIMC), Board of Investment

The figure-IV shows joint venture investment in different sector. The service sector investment alone 65.80% and investment in chemical secctor is 13.89%. The lowest investment in Printing publishing and packaging is accounted only 0.17% of total investment.

Figure 4 : Shows joint venture investment in different sector from 1977-2010



g) Registered FDI Inflows and Actual FDI Investment

Table 6 : Registered FDI inflows and Actual FDI investment during 1996-2009

Year	Registered FDI investment	Actual FDI investment in USD
1996	639	232
1997	2030	575
1998	1805	576
1999	538	309
2000	534	579
2001	240	355
2002	255	328
2003	450	350
2004	473	460

2005	3800	845
2006	1470	793
2007	327	666
2008	2469	1086
2009	624	700

Source: Investment Implementation Monitoring Cell (IIMC), Board of Investment

Table VI shows the registered FDI investment inflows and actual FDI investment inflows from 1996-2009. Actual inflows in Bangladesh are lower than registered FDI except in the year 2000, 2001, 2002, 2007 and 2009. The reason may be less political problem in the country.

inflows. To be a middle income country, the Government of Bangladesh has also given wide range of incentives to attract more FDI inflows (Foreign Direct Investment in Bangladesh, 1971-2010) [13]. These incentives are fiscal incentives, financial incentives and additional incentives:

Fiscal incentives for industries

- Corporate tax holiday of 5 to 7 years for selected sectors.
- Reduced tariff on import of raw materials capital machinery.
- Bonded warehousing
- Accelerated depreciation on cost of machinery is admissible for new industrial undertaking(50%in the first year of commercial production, 30%in the second year, and 20%in the third year)
- Tax exemption on capital gains from the transfer of shares of public limited companies listed with a stock exchange.
- Reduced corporate tax for 5 to 7 year in lieu of tax holding and agricultural depreciation.

Financial incentives for export oriented industries:

VI. The package of Incentives is Listed Below

Many developing countries have developed their economy tremendously through attracting FDI

- Cash incentives and export subsidies ranging from 5% to 20% granted on the FOB value of the selected products
- 90% loans against letter of credit (by banks)
- Funds for export promotion
- Export credit guarantee scheme
- Permission for domestic market sales up to 20%of export oriented companies outside EPZ Additional incentives:
- 100%foreign equity allowed
- Unrestricted exit policy
- Remittance of royalty, technical know-how and technical assistance fees
- Full repatriation facilities of dividends and Capital at exit
- Citizenship by investing a minimum of USD 500000.
- Permanent resident permits on investing USD 75000.
- An investor can wind up investment either through a decision of AGM or EGM. He or she can repatriate the sales proceeds after securing proper authorization from the Central Bank.

Special incentives for power sector

Incentives for private sector power generation for private sector power generation policy of Bangladesh (revised in Nov 2004) provide a number of fiscal incentives for foreign investment in power sector [14]. Some of them are depicted below.

- The private power companies shall be exempted from corporate income tax for a period of 15 years.
- The companies will be allowed to import plant and equipment and spare parts up to ten percent of original value of total plant and equipment within a period of twelve year of commercial operation.
- Repatriation of equity along with dividends will be allowed freely.
- Exemption from income tax in Bangladesh for repatriation of equity along with dividends will be allowed freely.
- Exemption from income tax in Bangladesh for foreign lenders to such companies.
- Tax exemption on interest on foreign loans.
- Avoidance of double taxation incase of foreign investors.
- Remittance of up to 50% of salary of the foreigners employed in Bangladesh and facilities of for repatriation of their savings and retirement benefits at the time of their return.
- No restriction on issuance of work permit.
- Provision of transfer of shares held by foreign shareholders to local shareholder.
- Re-investment of remittable dividend to be treated as new foreign investment.
- Facilities for repatriation of invested capital, profits and dividends.
- Free importing of furnace oil, equipments, and spare parts for captive and commercial power plants entrepreneurs.
- License fee for captive power of taka 500000 is waivered.

VII. Conclusion

There are number of positive factors which can draw attention of foreign investor from developed and developing country. Factors those make Bangladesh distinct from other country are availability of skilled and unskilled labor, relative low wage, natural resources, port, geographical location, large size of local market, reasonable macroeconomic environment. To attract more FDI, the Government of the People's Republic of Bangladesh has offered many fiscal, financial and other incentives for foreign investors. Still, it is seen in the study that actual FDI investment has been remain at very insignificant level compared to registered FDI investment proposal.

References Références Referencias

1. Bangladesh Economic Update, Vol.3, No.2 February 2012.
2. J. Bouoiyour, "The Determining Factors of FDI in morocco"; University de pau et des pays del. (2003)
3. M. Salauddin, M Shahbaz, I.M.Chani M.I: "A note on casual relationship between FDI and Savings in Bangladesh"; Theoretical and Applied Economics, Vol.XVII, No.11 (552) (2010), pp.53-62
4. L. Zhao, "The impact of Foreign Direct Investment on wages and employment"; Oxford Economic Papers, Vol.50 (1998), pp.284-30
5. M. Faruk "The Effect of FDI to Accelerate the Economic Growth of Bangladesh and some problems and prospects of FDI"; Asian Business Review.Vol.2, Issue.4 (2013) p.p .37-43.
6. A. K. Saha, "Scenario of Foreign Direct Investment in Bangladesh: An Evaluation"; ISOR Journal of Business and Management, Vol. 5 Issue.6 (2012), pp19-26.
7. M. A. Billah "Foreign Direct Investment Scenario: Bangladesh Perspective"; Thoughts on Economics, Vol.22, No.01 (2010) pp.69-85.
8. S. Nasrin, A. Baskaran and M. Muchie "Major Determinants and Hindrance of FDI inflow in Bangladesh: Perceptions and Experiences of Foreign Investors and Policy Makers" GLOBELICS-8th International Conference, University of Malaya, Kuala Lumpur, Malaysia. Nov.1-3
9. D. Bhattacharya, "FDI in Bangladesh: An Overview" Journal of the American Chamber of Commerce in Bangladesh, Vol.5 No. 1(2012) pp.15-22
10. M. S. Alam, "Incentives: Tools for Attracting Foreign Direct Investment in Bangladesh" www.wbiconpro.com/218-Alam.pdf.
11. M. A. Kafi, M. M. Uddin and M. M. Islam M "Foreign Direct Investment in Bangladesh: Problems and Prospects" The Journal of Nepalese Business Studies, Vol.4 No.1 (2007), pp.47-61.
12. M. A. Shahabuddin, M. M. Chowdhury and G. M. Azam "An Analysis of Tax Incentives to Attract FDI in Bangladesh: An Empirical Study" China-USA Business Review, Vol.12 No.8,(2013) pp.756-761.
13. Foreign Direct Investment in Bangladesh (1971-2010), Board of Investment, Prime Minister's Office, Government of the People's Republic of Bangladesh.
14. http://www.boi.gov.bd/index.php/cost-of-doing-business/creating-a-workforce/27-about- bangladesh /investment-and-trade/156-investment-incentives.

This page is intentionally left blank

Global Journal of Management and Business Research
Finance
Volume 13 Issue 11 Version 1.0 Year 2013
Type: Double Blind Peer Reviewed International Research Journal
Publisher: Global Journals Inc. (USA)
Online ISSN: 2249-4588 & Print ISSN: 0975-5853

CEO's Commitment Bias and its Firm R&D Level Bayesian Network Method: Evidence Form Tunisia

By Hamza Fadhila, Azouzi Mohamed Ali & Jarboui Anis
University of Sfax, Tunisia

Abstract- In this paper we approach as to whether CEO's incentives may lead to a positive manager's innovation behavior. We search in this work to study this relationship conforming to the prediction of the theory of commitment. Accordingly, we hypothesize that CEO's incentives can persuade a favorable attitude toward innovation but it can lead to an authentic behavior only with the presence of commitment bias. The proposed model of this paper uses Bayesian Network Method to examine this relationship. CEO's attitude has been measured by means of a questionnaire comprising several items.

Keywords: commitment bias, managerial discretion, innovation, CEO's incentives, optimism, myopia, loss aversion, executive power, overconfidence, Bayesian Network Method.

GJMBR-C Classification : FOR Code:150304 JEL Code: G32

Strictly as per the compliance and regulations of:

CEO's Commitment Bias and its Firm R&D Level Bayesian Network Method: Evidence form Tunisia

Hamza Fadhila [α], Azouzi Mohamed Ali [σ] & Jarboui Anis [ρ]

Abstract- In this paper we approach as to whether CEO's incentives may lead to a positive manager's innovation behavior. We search in this work to study this relationship conforming to the prediction of the theory of commitment. Accordingly, we hypothesize that CEO's incentives can persuade a favorable attitude toward innovation but it can lead to an authentic behavior only with the presence of commitment bias. The proposed model of this paper uses Bayesian Network Method to examine this relationship. CEO's attitude has been measured by means of a questionnaire comprising several items. As for the selected sample, it has been composed of some 220 Tunisian executives. Our results have revealed the efficient role of governance mechanism as a persuasive communication on the CEO's attitude; however, only managers who note a high commitment level behave authentically to their attitude and decide R&D investment. This article has implications for the development of new referential in building corporate governance system by incorporating the commitment dimension to manage well the managerial discretion.

Keywords: *commitment bias, managerial discretion, innovation, ceo's incentives, optimism, myopia, loss aversion, executive power, overconfidence, bayesian network method.*

Jel Classification Code: g14, g31, g32, d80

I. Introduction

The most polemic financial issue that is mainly discussed is the "Managerial discretion", or also "Latitude of action". This issue persists because both executives and shareholders diverge in how much discretionary space managers should have.

Consequently, many of researches are conducted in order to studying the managerial latitude's determinants and its effect on a firm's performance and strategic choices (Hambrick and Abrahamson, 1995).

According to wirtz (2011), Charreaux (2008) and Hambrick and Finkelstein (1987), managerial latitude is determined by three levels: firm's external environment, organizational features and personal characteristics. Firstly, at the firm's external environment level, factors determining managerial latitude comprise non specific governance mechanisms; secondly, at the organizational structure level, managerial discretion determinants include specific governance mechanisms; and, finally, at the personal level, characteristics that leading to managerial latitude contains: professional aspiration, locus of control, cognitive pattern, power factors (Hambrick and Finkelstein, 1987).

Consequently to this theoretical development, there have been an increasing number of researches on managerial latitude at all three levels. Each of these levels has a great role in increasing or decreasing managerial discretion. While, from the three determinants of managerial latitude; organizational structure level have been most intensively considered (wirtz, 2011; Charreaux, 2008). They are mainly resumed in governance mechanisms.

Our study contributes to the literature examining the relationship between manager's remuneration (as a latitude determinant) and innovation (as a CEO's behavior). Numerous other study investigate this issue such one advanced by Lerner and Wulf (2007) that empirically examines this relationship.

Thus, it is proved that incenting managers for good performance and protecting them from bad performance wished have an encouraging effect on innovation. Though, when an important part of manager's wealth is linked to the stock price, managers can make significant profit when the market rise but parallel they are uncovered in moment of downswings. Companies can decide to protect managers from reversals in stock price particularly if poor firm performance creates external opportunities more attractive (Oyer 2004; Bizjak, et al., 2008).

This literature approaches direct effect of the incentives system (persuasion) on the CEO's innovation decision (behavior). However, by referring to theories of behavior changing (theory of persuasion, theory of commitment), the existence of a cause-effect relationship between persuasion (using motivation) and behavioral change is profusely challenged.

Accordingly to the theory of commitment (Joule et al., 2007; Girandola, 2005, Girandola et al, 2008), persuasion may conducts, consistently, to an attitude

Author α: Phd Student in Finance and Accounting Methods University of Sfax, ISAAS 3018, TUNISIA. e-mail:fadhila.hamza@yahoo.com

Author σ: Associate Professor in Finance and Accounting Methods Higher Institute of Business Administration (ISAAS) University of SFAX Postal Address: ISAAS, BP 1013 - 3018 Sfax-Tunisia. e-mail: Mohamed_azouzi@yahoo.fr

Author ρ: Doctor and HDR financial and accounting Associate Professor of Universities Higher Institute of Business Administration (ISAAS) University of Sfax Postal Address: ISAAS, BP 1013 - 3018 Sfax-Tunisia.e -mail:anisjarboui@yahoo.fr

changes, rarely, to a behavioral intention, but, not necessarily, to authentic behavior. The authentic behavior can be contracted only when there is a solid link of commitment between individual and this act. Therefore, our interest here is to mediate CEO's cognitive characteristics (attitude) in the relationship between the CEO's incentives (persuasion) and decisional latitude on innovation investment (authentic behavior)

While, in our study we are interested in reviewing the role of CEO's incentives as a determinant of managerial discretion in companies R & D investment through their impact on CEO's attitude (optimism, myopia, loss aversion, executive power and overconfidence). Although this investigated impact of CEO's incentives on the CEO's mental patterns and consequently on their behavior is conditioned by the clause of the existence or not of the CEO's cognitive commitment.

The article is structured as follows: Section 1 presents the related literature and the theories which motivate the empirical work, section 2 discusses the empirical strategies that were adopted and section 3 presents the main results and discussion.

II. Litterature Review

a) *CEO's Incentives, CEO's Optimism, CEO's Commitment and Innovation Decision*

Numerous researches have been using the agency theory, as well as a number of other psychological/sociological theories, to explicate the relationship between remuneration packages, CEO's behavior and interest alignment.

The principal can discipline the agent if he fails to create output. The menace of turnover can be harmful to innovation because innovative projects are threatened by a high risk of failure.

Given the character of innovation, Holmstrom (1989) and Manso (2007) advance that incentive compensations which persuade this sort of investment should have a high tolerance of failure. If the manager is disciplined for first time failures, he is disheartened from investing effort on tasks that have a larger probability of failing. In the same manner, if the manager is rewarded for first time success he become more optimistic about these activities and their own skills, also, he will be encouraged to develop and employ the same talents rather than investigate new ideas.

In firms that threatened by takeover, using golden parachutes seem to be more pertinent when investigating the role of CEO's incentives in promoting in innovations investments. Additional to the takeover perspective, golden parachutes can also be considered as long-term incentives which create optimistic behavior. For example, Brusa et al., (2007) show that firms who use golden parachutes perform more than other don't use this sort of incentives either in short or long term. Brusa et al., (2007) demonstrate that golden parachutes are an efficient instrument in reducing agency costs related to under-investment and shirking. As encouraging optimistic attitudes and behaviors by protecting manager from failure and persuading executive to invest in innovation, Francisa et al., (2012) predict a significant relationship between golden parachutes and research and development initiatives.

Authors argue that manager's compensation systems composed by incentives that are more tolerant to failure are more appropriate for innovation. It help to absorb the shock that manager may feel while deciding risky investment and, so, encouraging optimistic behavior.

Contrary, Holmstrom (1989) show that CEO's incentives exhibit high level of optimism and motivate executive to invest in innovation. However, too much manager's incentives could distort managerial right goals and lead to non performance. Author concludes that such underinvestment might be the result of increasing the incentives intensity.

In our study we try to present evidence consistent with this logic through inserting the further logic confirmed by the psychological theory of persuasion and earlier the theory of commitment.

Therefore, number of researchers on the persuasion paradigm (Girandola et al, 2008; Chappé et al, 2007) show that motivation arise the sense of "efficacy" of the polemic task. The motivated individual is affected by a "comparative optimism" than non motivated one (Chappé et al, 2007). Thus face to a certain level of motivation individual doesn't have, habitually, a pessimist attitude.

While the theory of commitment, (Joule et al., 2007; Girandola, 2005, Girandola et al, 2008), demonstrate that motivation might be efficient in changing attitude but cannot modify behavior. Argued, the link between attitude and behavior is activated, only, by means of commitment bias (Deschamps and Joule, 2005). Based on this affirmation, we hypothesize that if the relationship between manager and R&D decision is qualified by a high level of cognitive and psychological commitment, the influence of the nature of CEO's compensation on the CEO's optimism, affect consequently his behavior. In the other hand, with the absence of commitment link between manager and R&D decision, the effect of motivation on CEO's optimism cannot lead to a positive CEO's innovation behavior.

So, our hypothesis is as follow:

H1: *The presence of based-on performance remuneration increases generally the CEO's optimism attitude.*

H1': With the presence of commitment bias the influence of based-on performance remuneration on CEO's optimism lead to an effective behavior in favor of R&D investment.

b) *CEO's Incentives, CEO's Myopia, CEO's Commitment Bias and Innovation Decision*

Long-term remuneration packages are more appropriate for innovation. Further, with long-term compensation, Manso (2007) affirm that regardless to the risk of agent opportunism it is perceived less costly for agents to innovate than to avoid. Manso (2007) also shows that in the innovation decision manager can make deviation, moreover he could have more information about the project's rate of success. Thus, optimal incentive compensation for innovation should engage the agent to long-term commitment and protect him from failure. Manso (2007) construct model in which he provides a logical explanation and validation for the existence of commitment, partition packages, bankruptcy codes and excessive remuneration with stock option.

Kole (1997) also argues that long-term compensations incite managers to be engaged with the firm and constraint them from making myopic decisions. Therefore, manager's remuneration could be the major link in the relationship between long-term commitment and innovation. For innovation projects, which need particular expertise and have long growth periods, firms should provide long-term remuneration.

Chi and Johnson (2008) affirm that incentives influence largely firm-value better for unvested options and they rise with the duration of the vesting period. Following Francisa et al., (2012) show a positive relationship between options, unvested and vested options, which correspond to long-term commitment and innovation.

Companies can also apply deferred compensation and stock grants to guarantee long-term manager's commitment. Though, remuneration based on options and deferred compensation does not automatically encourage the manager to long-term invest and innovate.

Manso (2007) argues that the use of stock options offers to managers the needed incentives to decide innovation. Also, stock options cover a lengthy expiration period, which guarantees long-term CEO's commitment, and they generate convex pay-offs, which persuade long-term and risk-taking behavior.

In addition to stock options, the author suggests others type of incentives as provisions, for example, golden parachutes, which support managers face to minor shareholders exigencies and protect them in case of involuntary turnover. Golden parachutes are considered, also, as greater incentives for executives to invest in log-term projects with higher risk level.

Furthermore, Dodonova and Khoroshilov (2006) study the nature of the absolute/relative optimal motivation compensation for both loss-averse and myopic executive's attitude. The authors show that the use of stock options grants offer the best incentive for loss-averse executive in the short term. However in the long-term this type of incentive engenders an inefficient equilibrium as it risk over compensating managers. Also authors argue that in various industries, managers with low pay-to-performance compensations desire more options to profit from the long-term upside. In contrast, those with high pay-to-performance compensations don't accept to substitute their base salary with restricted stocks, because accepting this will expose them to larger losses.

According to the theory of persuasion (Girandola et al., 2008), motivation may changes person' attitudes by rising level of stimulation and, so, the behavioral intention (Locke and Latham, 1990 "the goal-setting theory"). So, the CEO's attitude toward decision horizons is conditioned by the importance of motivation produced by the CEO's incentives. Managers' attitudes become less (more) "myopic", in the sense that they tend to overestimates (underestimates) the weight of cash flows occurring after their employment time horizon, when the CEO's incentives is based on performance (fixed).

Referring to the theory of commitment (Joule et al., 2007; Girandola, 2005), motivating person and aligning his attitude cannot effectively produces desired behaviors especially in situations where the tasks don't require high involvement from the part of subjects. Whereas, Deschamps and Joule (2005) suggests that the individual attitude is perceived, only, as a motivation of his behavior. So, they demonstrate that attitude should be supported by the main determinants of the action: "the preparatory act" which refers to the commitment of the subject in the task.

While the absence of correlation between attitudes and behaviors and the polemic role of the motivation (CEO's incentives) and the commitment bias on the attitude change (myopia) and the behavior choice alignment (R&D investment decision), our hypotheses is as follow:

H2: The presence of based-on performance remuneration reduces generally the CEO's myopia attitude.

H2': With the presence of commitment bias the influence of based-on performance remuneration on CEO's myopia lead to an effective behavior in favor of R&D investment.

c) *CEO's Incentives, CEO's Loss Aversion, Commitment Bias And Innovation Decision:*

Agency theory presumes that beliefs towards risk diverge between shareholders and managers. In a traditional principal-agent model the principal contracts

with an agent to exercise hard effort to involve an uncertain result. Therefore, remuneration components should be used to link executive and shareholders' tolerance to risk.

Stock options and further performance-linked CEO's incentives are used to align shareholders' long-term risk attitude to manager risk-taking behavior. Holmstrom (1989) demonstrates that trade-off between compensations and risk is fundamental to innovation. Consequently, these necessitate to be considered when challenging to align the two parties' risk behavior. Nevertheless, stock options recompense good performance, but normally do not discipline failure; they serve as a valuable instrument for talent preservation. Similar to Holmstrom's evidence (1989), Manso (2007) finds that traditional principal-agent contracts do not generally give incentives for manager to perform in innovation.

Moreover, March (1991) shows that companies perform two sorts of actions: one is exploration, which requires risk-taking, specific skills and innovational behavior. The second is exploitation, which requires refinement, operational knowledge, efficiency and accomplishment. These actions compete, together, for resources' allocation. The traditional principal-agent contracts persuade agents to decide activities with lower riskiness. Consequently, the agent would shift effort and resources from innovative projects to actions that entail exploitation of current skills.

Holmstrom (1989) verifies that, as the riskiness of the project augments, the executive's share in the result simultaneously declines. In fact, this engenders weaker effort which necessitates, then, superior monitoring costs. As innovation decision is risky, durable, specific and idiosyncratic; manager, generally, avoid innovative projects for less risky ones.

Reed (2007) affirms that compensation with stock-option grants persuade manager to adopt a risky behavior, because there is no penalization mechanism of failure. The author's model shows that a superior amount of stock options arise the probability of CEO's risk-taking and on the total negative investments. Consequently, the author proposes alternative compensation incentives such as: oblige executive to acquire a certain number of stocks, which will link more directly their remuneration to shareholders' wealth. At the same, Walter (2009) suggests a bonus/malus compensation structure where bonuses might be ignored when goals are not fulfilled. Author suppose that when good performances are added to the bonus pool in the same way that bad performances deduct to it, this participate greatly to align the CEO's risk-taking behavior with those of shareholders.

Surprisingly, Sawers et al. (2006); by comparing the role of stock options/restricted stock on manager behavior; find that managers compensated with stock options are less risk-taking than managers remunerated with restricted stock.

The authors affirm that in general, managers are less risk-averse in the loss context than the gain context. These results propose that as executive have larger wealth at risk, they become more risk-averse. Basing on the behavioral agency model, authors consider that the relation between the decision context and the stock-based compensation describe well the CEO's risk behavior.

Some researches in the psychology literature offer a number of insights into the role of compensation on the CEO's stimulus to innovate. Amabile (1996) argues that for projects that need originality, setting up too much incentive systems can reduce performance because they could closely focus the executive on a certain goal and affect negatively his risk-taking behavior. McGraw (1978) and McCullers (1978) show, also, that pay for performance persuades operational activities in a firm.

This negative impact of performance-based incentive on CEO's risk-taking behavior results from the hidden costs of incentives such the corruption effect and cognitive evaluation theory (Deci, 1975). The majority of these views discuss the "crowding out effect" which argues that there is a regular relationship between intrinsic and extrinsic motivation. The pay for performance (extrinsic motivation contracts) weakens the intrinsic motivation to work.

In term of the theory of persuasion (Girandola et al., 2008; Chappé et al, 2007), motivation play a great role on changing subject's attitude by inserting the sight of the "efficacy" of the risky behavior. In the prospect theory, Kahneman and Tversky, (1979); Tversky and Kahneman, (1992) present the notion of "framing" which consists to present simultaneously information concerning risk and others motivation consequences (the presence of gain or absence of loss). The "framing" affects the individual risk's attitude. Referring to Rothman and Salovey, (1997), motivation activates relationship between expected behavior and the attitude toward the task.

As a result, managerial attitude toward risky behavior is conditioned by the importance of the incentives. Managers' attitudes become risk-taking (loss-averse) in the sense that they choose (avoid) innovation decision, when the CEO's incentives is based on performance (fixed).

Although, relate to the argument of the theory of commitment, (Joule et al., 2007; Girandola, 2005, Girandola et al, 2008), the individual final behavior don't normally be conform to its attitude toward behavior. It is conform only when person attain a high level of commitment bias (Deschamps and Joule, 2005). Based on this affirmation, we hypothesize that if the relationship between manager and risk investment decision is qualified by a high level of cognitive and psychological

commitment, the role of remuneration based-on performance on the CEO's loss aversion attitude, affect consequently his behavior. In the other hand, with the absence of commitment link between manager and risk investment decision, the motivation have not influence on CEO's risk investment behavior.

So, our hypothesis is as follow:

H3: *The presence of based-on performance remuneration reduces generally the CEO's loss aversion attitude.*

H3': *With the presence of commitment bias the influence of based-on performance remuneration on CEO's loss aversion lead to an effective behavior in favor of R&D investment.*

d) CEO's Incentives, CEO's Executive Power And Innovation Decision

Of the three levels of managerial latitude determinants, the manager's executive power has received the great attention as a person feature, (Hambrick and Abrahamson, 1995; Mitchell et al., 2009). Authors propose that if manager has a strong belief that decisions and choices are under his control, he has an internal locus of control. Therefore, basing on his executive power perception he tends to reveal more authority while making decisions and consequently has more discretionary space.

Executive power is often associated to organizational tenure (Chen et al, 2011). It is habitually demonstrated that the longer a manager has been employed at a firm, the more power he has in his decision making process, and thus, the more discretion he manage.

The CEO's executive power lead him believe to have an excellent ability to predict the potential state of nature. As a result, Haleblian and Finkelstein (1993) show that powerful managers may damage the organizational learning because they may "restrict the flow of information", and so, they take in hand all decision making rights and consequences.

Finkelstein and Hambrick (1989) discover that CEO's tenure is related to CEO's incentives system because executive power "accrues for a while and then diminishes, due to the CEO's reduced mobility" in the market.

Similarly, by studying the relationship between incentives and CEO's performance in innovation decision, Francisa et al., (2012) approach as to whether particular form of the CEO's pay package can persuade their innovation behavior.

Linking manager's wealth to the stock price affects executive's power towards risk (Jensen and Meckling 1976; Haugen and Senbet 1981). Stock options incentivize managers to support more risk, it is looked as a mechanism encouraging positive attitude in favor to innovation. Subsequently to the literature on stock options (Agarwal and Mandelkar 1987; Coles, et al., 2006), Francisa et al., (2012) investigate the relationship between CEO's wealth sensitivity in options to a unit adjust in volatility (vega) and innovation, they find that the vega has a positive liaison with innovation.

As the same of the theory of persuasion (Girandola et al., 2008), motivation may affect person' attitudes by rising level of stimulation and, so, increasing his executive's power. Consequently, the CEO's attitude toward decision executive's power is conditioned by the importance of motivation produced by the CEO's incentives.

Although, according to the theory of commitment (Joule et al., 2007; Girandola, 2005), stimulating a person's positive attitude and a high executive's power perception cannot effectively produces authentic behaviors especially when the action has not a high involvement from the part of decider. Whereas, Deschamps and Joule (2005) demonstrate that attitude should be supported by "the preparatory act" which refers to the commitment link between individual attitude and action.

So, our hypothesis is as follow:

H4: *The presence of based-on performance remuneration arises generally the CEO's executive power perception.*

H4': *With the presence of commitment bias the influence of based-on performance remuneration on CEO's executive power perception lead to an effective behavior in favor of R&D investment.*

e) CEO's Incentives, CEO's Overconfidence and Innovation Decision

As Li and Tang (2010) consider that when the "individual's certainty about his or her own predictions exceeds the accuracy of those predictions" he is an overconfident person. When there is a positive and considerable deviation between one's predictions and the real state of position, their actions become over-confident.

Generally, overconfident executives' decisions lead to commit such errors because they overestimate their ability of success higher than that of failure (Audia et al., 2000). Ben-David et al. (2007) demonstrate that companies with overconfident managers tend to overinvest using more debt and lower discount rates; also, they frequently invest in the long-term more than short-term.

Hackbarth (2008) shows that overconfident executive has, generally, a risk-taking attitude. Such attitude participates, mainly, in reducing agency cost, and, converging executives and shareholders interests. Moreover, over-confidence is often sign of person's ability (Gilovich et al., 2002), as a result, over-confident managers are more likely to promote in corporate specific investment.

Such advanced by Gervais et al., (2003), overconfidence and optimism can arise the

performance of the firm. Therefore, in the case of innovation decision, the overconfident manager, compared to rational manager, perform better in the profit of shareholders interests. In the purpose of promoting innovation, authors consider that encouraging rational manager to behave as overconfident manager and, so, protecting the shareholders' interest, can be made by employing convex remuneration system.

However, Shefrin (2001) notes that CEO's incentive mechanism promotes the firm's value maximization by encouraging the CEO's overconfidence attitude; but, the motivation (persuasion) alone cannot surmount the effect of behavioral obstacles (Joule et al., 2007; Girandola, 2005). Therefore, with referring to commitment theory (Deschamps and Joule, 2005), CEO's incentives can produces both behavioral and altitudinal change if there is a commitment link between manager and the innovation decision.

So, our hypothesis is as follow:

H5: The presence of based-on performance remuneration arises generally the CEO's overconfidence.

H4': With the presence of commitment bias the influence of based-on performance remuneration on CEO's overconfidence lead to an effective behavior in favor of R&D investment.

III. Methodology

a) Data Sample Selection

Our empirical study is based on quantitative research. We use a questionnaire as a method of data collection. Our questionnaire consists of four main parts, based on treated areas in theory:

The first part aims to collect some company's information from firm's statute and financial annual statement: CEO's CEO's incentives, total assets, R&D expense, …

The second part focuses on determination of the level of CEO's commitment bias.

The third part focuses on determination of the CEO's emotional bias.

Part four aims to knowing the level of CEO's executive power.

The questionnaire is addressed to managers in 220 non-financial Tunisian companies during the revolution period (2010-2011 fiscal year), 29 are listed companies and 191 are non-listed companies chosen from the list of firms implanted in the region of Tunis and Sfax provided by "Agency of promotion of industry" in these region (table 1). All financial firms were eliminated to the fact that this sector is regulated and have particular governance system and characteristics. Firms with insufficient data regarding about CEO's emotional bias are also excluded.

Table 1 : Visited Companies

	Total	Number
Initial BVMT sample		50
Financial firms		(22)
	28	
Other non financial firms		270
	298	
Insufficient data to emotional biases		78
Final sample	220	

The selected sample correspond to firm managers or CEO's representing ranging in age from 30 to 70 (table 2). In some firms questionnaires have been distributed by the method of door to door to been delivered to the concerned person, few among them have been mailed and most of them have been contacted via two accounting firm with which we have a great relationship.

Table 2 : Profile of subjects

	Total	Percentage
Firm's Activity		
Agriculture and crafts	16	7
Industry	128	58
Commerce and Service	76	35
CEO's tenure		
<5 years	33	15
5–10 years	125	57
> 10 years	62	28
CEO's Age		
<46	146	66
≥46	74	34
Total	220	100

b) Variables' Measurement

On this context we aim to determine the endogens and exogenesis variables' measurement.

i. *Managerial latitude: innovation decision*

We use the research and development (R&D) intensity as a proxy for firm specific assets.

As Francis and Smith (1995), Cho (1988), Abdullah et al. (2002) and Hamza and Jarboui (2012), we evaluate innovation decision by the ratio of a firm's R&D expense divided by total assets.

The R&D intensity takes 2 follows:

1 if this ratio> 50%;

0 if not.

ii. *CEO's incentives*

The remuneration incentives are usually measured using delta and/or vega. Delta is the

sensitivity of CEO portfolio wealth to a 1% change in stock price. However, vega is the sensitivity of CEO portfolio wealth to a 0.01 change in the standard deviation of stock return. Numerous studies are using these measures, we cite for example, Knopf et al. (2002), Rajgopal and Shevlin (2002), Coles et al. (2006) and Core and Guay (2002).

Although, to proceed easily we decide to calculate this variable as dichotomous; it takes 1 when the manager's CEO's incentives is based on firm's performance; and, 0 when it is fixed.

iii. *CEO's Commitment bias*

To measure the CEO's commitment bias, we takes the same steps than the most of studies have using an adaptation of the original questionnaire elaborated by Meyer and Allen (1991) to evaluate organizational commitment (Organizational Commitment Scale). This instrument is chosen because of its validity and its multidimensional character shown by several researches (Meyer and *al.*, 2002) and Hamza and Jarboui (2012). The commitment bias takes 2 follows:

2 if the manager has a high level of this bias
1 if not

iv. *CEO's emotional bias*

To determinate the CEO's three emotional biases (optimism, loss aversion, myopia and overconfidence). The questions have been inspired from the questionnaires formulated by the Fern Hill and Industrial Alliance companies.

The emotional bias takes 2 follows:

2 if the manager has a high level of this bias
1 if not

v. *CEO's executive power*

To determinate the CEO's executive power we elaborate questionnaire with---- items in the

Based on this ratio, the CEO's expertise power is as follows:

1 if it is high;
0 if it is low.

c) Methods

The objective of this part is to test the diverse correlations between the innovation investment decision and the above variables. The employed methodology is a probabilistic graphical model called Bayesian network. This methodology is inserted on the artificial intelligence explanatory method. Bayesian network is used in this paper to explain quantitatively the effect of commitment bias on the CEO's behavior in innovation investment decision.

The basic definition of a Bayesian network is given by (Pearl, 1986) who is declared that a Bayesian network is an explicit probability graph, which joins the estimated variables with arcs. This type of association articulates the conditional relationship between the variables. The formal description of Bayesian network is expressed as the set of {D, S, P}, where.

- D is a designation of variables or "nodes": in our case it refers to Firm's investment decision escalation, CEO's commitment level, CEO's risk profile, CEO's cognitive dissonance, Firm board of director's independency, Firm ownership concentration, CEO's CEO's incentives, Firm financial strength indicators, Firm's leverage rate, and, Firm's R&D intensity.
- S is a designation of "conditional probability distributions" (CPD). $S = \{p (D /Parents(D) / D \in D\}$, $Parents(D) \subset D$ means that for all the parent nodes for D, p(D/Parents(D) is the conditional distribution of variable D. Firm's investment decision escalation.
- P is design the "marginal probability distributions". $P = \{p(D) / D \in D \}$ refers to the probability distribution of variable D.

In the Bayesian network method, the problematic may be modeled with the actions of all variables. In general, three levels in modeling process are applied: initially we approximate the probability distribution of each variable and the conditional probability distribution between them. Secondly, basing on these estimations we can acquire the combined distributions of these variables. Finally, we can exercise some deductions for some variables in the objective to use some other important variables.

d) Result Analysis

i. *Model Construction and Parameterization*

The idea of this paper is to precise the importance of CEO's commitment bias as a first-order feature of firm's innovation decision. Also we aim to prove that, the presence of a solid incentive system (persuasive communication), has a great effect on manager's innovation attitude but not on manager's innovation behavior. The relationship between CEO's incentive, CEO's innovation attitude (optimism, myopia, loss aversion, expertise power and overconfidence) and CEO's innovation behavior may be activated only with the existence of commitment bias. Thus, it has been shown theoretically that the firm innovation decision depends on:

- CEO's CEO's incentives
- CEO's commitment bias
- CEO's optimism
- CEO's myopia
- CEO's loss aversion
- CEO's executive power
- CEO's overconfidence

ii. *Definition of Network Variables and Values*

The initial step in constructing a Bayesian network model is to list all variables respectively, classified from the target variable to the causes. The variables definition is presented in the table below:

Table 3 : The network variables' definition and mesures

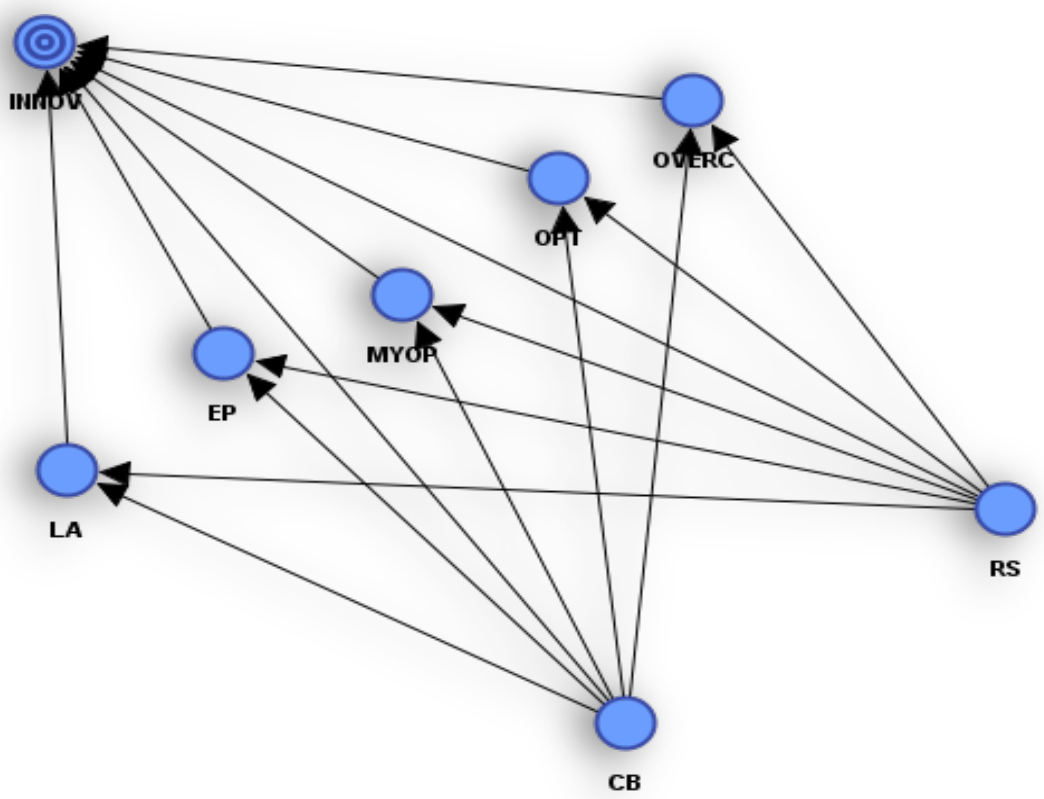
Variables	Type
Innovation decision	Discret : YES/NO
CEO's incentives	Discret : fixed/based on performance
Commitment bias	Discret : YES/NO
CEO's optimism	Discret: YES/NO
CEO's myopia	Discret: YES/NO
CEO's loss aversion	Discret : YES/NO
CEO's executive power	Discret : WEAK/MODERATE/STRONG

IV. Results Analysis and Discussion

a) Graphical Model

The second step in constructing a Bayesian network model is to test the relationships between variables. The Bayesian network constructed using the BayesiaLab program is the result of the total variables database. The graphical relationship established between variables attaching to the data that we have obtained through the questionnaire, is shown in this figure.

Figure 1 : Graphical model presentation



b) Analysis of the Discovered Relationships

The relationships between the variables in the parent node and child node are measured using three indicators: the Kullback-Leibler, the relative weight and the Pearson correlation. The Kullback-Leibler and the relative weight are two indicators that show the concreteness of relationships and the importance of correlation between variables. Whereas the Pearson correlation, which progresses from 0 to 1; indicates the significance of variables relationship. Thus, the table 4 shows the relationships analysis between variables across the Bayesian network.

Table 4 : The relationships analysis

PARENTS NODES	CHILDS NODES	KULLBACK-LEIBLER DIVERGENCE[(a)]	RELATIVE WEIGHT[(b)]	PEARSON CORRELATION[(c)]
EP	INNOV	0,3069	1,0000	0,0956*
RS	INNOV	0,2594	0,8454	0,0634**
CB	INNOV	0,2538	0,8270	0,0461**
LA	INNOV	0,2523	0,8223	0,0684**
MYOP	INNOV	0,2457	0,8008	0,1159
OPT	INNOV	0,2440	0,7950	0,0729*
OVERC	INNOV	0,1862	0,6069	-0,0049***
CB	EP	0,0160	0,0523	0,0590**
RS	EP	0,0135	0,0438	-0,0191***
RS	OPT	0,0059	0,0192	-0,0700**
CB	OPT	0,0055	0,0181	-0,0665**
RS	LA	0,0044	0,0143	0,0244**
CB	LA	0,0040	0,0130	-0,0034***
RS	MYOP	0,0028	0,0092	0,0624**
CB	MYOP	0,0018	0,0057	0,0491**
RS	OVERC	0,0027	0,0087	-0,0606**
CB	OVERC	0,0008	0,0027	0,0333**

Notes:

(a) Kullback-Leibler close to 1: important correlation between the variables

(b) Relative weight close to 1: important correlation between the variables.

(c) Pearson correlation:*, **, *, respectively at 10%, 5%, and 1%.**

Concerning the influence of CEO's incentives on the innovation decision, analysis advanced in table 4 shows the presence of direct, strong (Kullback-Leibler = 0,2594 / relative weight= 0,8454), positive and significant (β = 0,0634**) relationship.

Furthermore there is an indirect influence of CEO's incentives on the innovation decision via the managerial discretion determinants. CEO's incentives has a weak (Kullback-Leibler = 0,0135/ relative weight= 0,0438), negative and significant (β = -0,0191***) effect on CEO's expertise power. It has a weak (Kullback-Leibler = 0,0059/ relative weight= 0,0192), negative and significant (β = -0,0700**) effect of CEO's optimism. Also, CEO's incentives has a weak (Kullback-Leibler = 0,0044/ relative weight= 0,0143), positive and significant (β=0,0244**) effect on CEO's loss aversion. It has a weak (Kullback-Leibler = 0,0028/ relative weight= 0,0092), positive and significant (β = 0,0624**) effect of CEO's myopia. Finally, CEO's incentives has a weak (Kullback-Leibler = 0,0027/ relative weight= 0,0087), negative and significant (β=-0,0606**) effect on CEO's overconfidence.

Concerning the influence of CEO's attitude on the innovation decision, analysis advanced in table 4 shows the presence of strong (Kullback-Leibler = 0,3069/ relative weight= 1,0000), positive and significant (β = 0,0956*) effect of CEO's expertise power. It shows also, a strong (Kullback-Leibler = 0,2523/ relative weight= 0,8223), positive and significant (β = 0,0684**) effect of CEO's loss aversion. Moreover, there is a strong (Kullback-Leibler = 0,2457/ relative weight= 0,8008), positive and insignificant (β = 0,1159) effect of CEO's myopia. Analysis shows also, the presence of strong (Kullback-Leibler = 0,2440/ relative weight= 0,7950), positive and significant (β = 0,0729*) effect of CEO's optimism. Finally, CEO's overconfidence has a moderate (Kullback-Leibler = 0,1862/ relative weight= 0,6069), negative and significant (β = -0,0049***) effect on innovation decision.

Concerning the influence of CEO's commitment bias on the innovation decision, analysis advanced in table 6 shows the presence of direct, strong (Kullback-Leibler = 0,2538/ relative weight= 0,8270), positive and significant (β = 0,0461**) relationship.

Additionally there is an indirect influence of CEO's commitment bias on the innovation decision via the managerial discretion determinants. CEO's incentives has a weak (Kullback-Leibler = 0,0160/ relative weight= 0,0523), positive and significant (β = 0,0590**) effect on CEO's expertise power. It has a weak (Kullback-Leibler = 0,0055/ relative weight= 0,0181), negative and significant (β = -0,0665**) effect of CEO's optimism. Also, CEO's incentives has a weak (Kullback-Leibler = 0,0040/ relative weight= 0,0130),

negative and significant (β=-0,0034***) effect on CEO's loss aversion. It has a weak (Kullback-Leibler = 0,0018/ relative weight= 0,0057), positive and significant (β = 0,0491**) effect of CEO's myopia. Finally, CEO's incentives has a weak (Kullback-Leibler = 0,0008/ relative weight= 0,0027), positive and significant (β=0,0333**) effect on CEO's overconfidence.

c) Analysis of the Firm's Innovation Decision (RDI)

To analyze the firm's innovation decision, we express, firstly, the innovation decision variable as a target in the Bayesian network. Secondly, we use the function that produces the analysis report of the target firm's innovation decision. According to this report, the correlation between firm's innovation decision and other variables are approximated by binary mutual information and the binary relative importance.

Table 5 : Target variable analysis

INNOV = YES (57, 6908%)				
Nodes	**Binary mutual information[(a)]**	**Binary relative importance[(b)]**	**Modal value(c)**	
MYOP	0,0097	1,0000	NO	59,9134%
EP	0,0080	0,8263	AVERAGE	69,1260%
OPT	0,0038	0,3950	YES	57,9622%
LA	0,0034	0,3474	YES	61,5656%
RS	0,0029	0,2984	PERFBASED	56,3419%
CB	0,0015	0,1584	YES	53,7926%
OVERC	0,0000	0,0018	NO	73,8025%
INNOV = NO (42, 3092%)				
Nodes	**Binary mutual information[(a)]**	**Binary relative importance[(b)]**	**Modal value(c)**	
MYOP	0,0097	1,0000	YES	51,7628%
EP	0,0080	0,8263	AVERAGE	58,9186%
OPT	0,0038	0,3950	YES	50,6196%
LA	0,0034	0,3474	YES	54,7489%
RS	0,0029	0,2984	FIXED	50,0527%
CB	0,0015	0,1584	NO	50,8741%
OVERC	0,0000	0,0018	NO	73,3682%

(a) Mutual information: is the amount of information given by a variable on the target value. It is calculated in bits.

(b) Relative importance: presents the importance of a variable with respect to the target value.

(c) Modal value: is the average value of the explanatory variable for each target value.

The target variable analysis « investment decision escalation » show that 57,6908% of Tunisian companies decide innovation in the post revolution period (2010-2011).

Moreover, results show, for each value of the target, the list of nodes that have a probabilistic dependence with the target, sorted by descending order according to their relative contribution to the knowing of the target value.

In the case of innovation the most important nodes in term of informational relative contribution is, consecutively, the CEO's long-term attitude (myopia=no) (Binary relative importance=1.000), the importance=0,8263), the CEO's optimism (Binary relative importance=0,3950), the CEO's loss aversion (Binary relative importance=0,3474), the based on performance remuneration system (Binary relative importance=0,2984), the CEO's commitment bias (Binary relative importance=0,1584) and, finally, the absence of CEO's overconfidence (Binary relative importance=0,0018).

While, in the case of no innovation the most important nodes in term of informational relative contribution is, consecutively, the CEO's short term attitude (myopia=yes) (Binary relative importance=1.000), the CEO's moderate expertise power (Binary relative importance=0,8263), the CEO's optimism (Binary relative importance=0,3950), the CEO's loss aversion (Binary relative importance=0,3474), the fixed remuneration system (Binary relative importance=0,2984), the absence of CEO's commitment bias (Binary relative importance=0,1584) and, finally, the absence of CEO's overconfidence (Binary relative importance=0,0018).

Additionally, the profile for each value of the target is described by the modal value of each influencing

nodes. These profiles are compared with the a priori modal values of the nodes i.e. when the target variable is unobserved.

In the case of innovation the most important modal value is given by the node of the CEO's long term attitude (myopia= no) (modal value =59,9134%), the CEO's moderate expertise power has a great influence on the target profile (modal value =69,1260%), the CEO's optimism has a considerable effect on the target profile (modal value =57,9622%), the CEO's loss aversion determinate the target profile (modal value =61,5656%), the based on performance's remuneration system describe well the target profile (modal value =56,3419%), also, the CEO's commitment bias describe mainly the target profile (modal value =53,7926%), finally, the absence of CEO's overconfidence explain greatly the target profile (modal value =73,8025%).

While, in the case of no innovation the most important modal value is given by the node CEO's short term attitude (myopia= yes) (modal value =51,7628%), the CEO's moderate expertise power has a great influence on the target profile (modal value =58,9186%), the CEO's optimism has a considerable effect on the target profile (modal value =50,6196%), the CEO's loss aversion determinate the target profile (modal value =54,7489%), the fixed remuneration system describe well the target profile (modal value =50,0527%), also, the absence of CEO's commitment bias describe mainly the target profile (modal value =50,8741%), finally, the CEO's underconfidence explain greatly the target profile (modal value =73,3682%)

d) Maximization of the Target Average (RDI)

The target dynamic profile capability software is a test enhanced by BayesiaLab program to provide the percentage of explanatory variable to maximize the target variable value. Table 6 presents the dynamic profile of the Firm's innovation decision (RDI)

Table 6 : Target dynamic profile analysis

INNOV = YES			
Noeud	**Modalité optimale**	**Probabilité**	**Probabilité jointe**
A priori		57,6908%	100,0000%
MYOP	NO	62,8751%	54,9733%
EP	AVERAGE	67,8484%	35,6709%
LA	YES	73,2487%	20,9030%
RS	PERFBASED	85,7370%	11,8477%
OPT	NO	95,0628%	5,7373%
OVERC	NO	100,0000%	4,3593%
INNOV = NO			
Noeud	**Modalité optimale**	**Probabilité**	**Probabilité jointe**
A priori		42,3092%	100,0000%
EP	STRONG	50,4692%	1,0248%
MYOP	YES	56,2013%	0,4679%
LA	NO	63,6986%	0,2118%
CB	NO	73,4721%	0,1236%
OPT	YES	86,0465%	0,0805%
OVERC	NO	100,0000%	0,0580%

The target dynamic profile analysis presented in table 6 show two following results:

First, with the 57,6908% augmentation in innovation decision it is associated an augmentation of the effect of CEO's long term attitude, CEO's moderate expertise power, CEO's loss aversion, based on performance remuneration system respectively with (62,8751%, 67,8484%, 73,2487%, 85,7370%). In the other hand this augmentation is associated with the decrease of optimism and overconfidence respectively with (95,0628%, 100,0000%)

Secondly, with the 42,3092% decrease in innovation decision its associated an augmentation of the effect of CEO's strong expertise power, CEO's myopia, CEO's optimism respectively with (50,4692%, 56,2013%, 86,0465%). In the other hand this decrease is associated with the decrease of loss aversion, commitment bias and overconfidence respectively with (63,6986%, 73,4721%, 100,0000%).

V. Conclusion

This research examines the relationship between CEO's incentives as an organizational managerial discretion's determinants and firms' innovation decision. The originality of this work is that we investigate this relationship in the setting of both psychological theory of persuasion and theory of commitment. For that, we mediate the CEO's attitude variables (optimism, myopia, loss aversion, executive power and overconfidence) in the relationship between

CEO's incentives and firms' innovation decision. For this goal we have implement a survey conducted around some executives of large private companies in Tunisia in the post revolution period.

Actually, the collected data analysis has confirmed the theoretical analysis which indicates that CEO's innovation behavior is the consequences of the impact of motivational and persuasive effort exerted by remuneration mechanism on CEO's attitude, and, principally, the result of an important commitment link existing between manager and innovation tasks.

Furthermore, the empirical analysis of the relationship between governance mechanisms (CEO's incentives), CEO's attitude and CEO's behavior show that associating manager's remuneration to the firm performance influences his attitude and, in case of committed manager, his behavior in corporate R&D and innovation. In our analysis we find that in presence of based on performance incentives, R&D investments have increased over time. While, this role of incentives is authentically only when there is a strong commitment which link executives and innovation decision. In this paper we approach as to whether CEO's pay for performance can persuade a positive manager's attitude toward innovation, however, this attitude cannot lead to an authentic behavior only in the presence of commitment bias.

Indeed, we can said that the main lesson of this study for Tunisian companies is to incorporate the commitment aspect in the persuasive process by introducing the binding communication in order to align both the CEO's and shareholders' interest and managing the executive discretionary space.

References Références Referencias

1. Abdullah, F., Weiyu G., and Vivek M. (2002). The relation of managerial holdings with Tobin's Q and R&D expenditures: Evidence from Japanese firms. *Multinational Business Review*, *10* (1), 66-71.
2. Agrawal, A. and Mandelker, G. (1987). Managerial incentives and corporate investment and financing decisions. *Journal of Finance* 42, 823-37.
3. Amabile, T. (1996). Creativity in context: Update to the social psychology of creativity. *Boulder, Co: Westview Press*.
4. Audia PG, Locke EA, Smith KG (2000). The paradox of success: An archival and laboratory study of strategic persistence following radical environmental change. *Acad. Manage*. J., 43: 837–853.
5. Ben-David I, Graham J, Harvey G (2007). Managerial Overconfidence and Corporate Policy. *AFA 2007 Chicago Meeting Paper*, 11, 55-190
6. Bizjak, J.M., Lemmon, M.L. and Naveen, L. (2008). Does the use of peer groups contribute to higher pay and less efficient compensation? *The Journal of Financial Economics* 90. 152-168
7. Brusa, J., Lee, W.Y., Shook, C., (2007). Golden parachutes as managerial incentives. *Working paper*.
8. Chappé J., Verlhiac J.-F. and Meyer T. (2007) Optimisme et pessimisme comparatifs consécutifs à l'exposition à plusieurs messages menaçants. *Revue européenne de psychologie appliquée* 57 (2007) 23–35
9. Charreaux .G (2008). À la recherche du lien perdu entre caractéristiques des dirigeants et performance de la firme : gouvernance et latitude managériale. *Cahier du FARGO* n° 1080502
10. Chen S., Zheng H., and Wu S., (2011) Senior manager overconfidence, managerial discretion and dividend policy: A study of Chinese listed companies. *African Journal of Business Management* Vol. 5(32), pp. 12641-12652.
11. Chi, J. and Johnson, S.A. (2008). The value of vesting restrictions on managerial sock and option holdings. *Working Paper*.
12. Cho, M.H. (1998). Ownership structure, investment, and the corporate value: an empirical analysis. *Journal of Financial Economics*, *47*(1), 103-121.
13. Coles, J.L., N.D. Daniel and L. Naveen, (2006). Managerial incentives and risk-taking. *Journal of Financial Economics* 79, 431-468.
14. Core, J.E. and W.R. Guay, (2002). Estimating the value of employee stock option portfolios and their sensitivities to price and volatility. *Journal of Accounting Research* 40, 613-630.
15. Deci, E.L. (1975). Intrinsic motivation. *New York: Plenum*.
16. Deschamps, J. C. et Joule, R.V. (2005), La communication engageante au service de la réduction de l'abstentionnisme électoral: une application en milieu universitaire. *Revue européenne de psychologie appliquée 55 pp : 21–27*
17. Dodonova, A. and Khoroshilov, Y. (2006). Optimal Incentive Contracts for Don Durfee (2006).Pay Daze: Linking pay to performance is harder than it looks. *CFO Magazine (www.cfo.com)*.
18. Francis, B., Hasan, I., and Wu, Q. (2012). Do corporate boards affect firm performance? New evidence from the financial crisis. *Bank of Finland Research Discussion Papers* 11 2012.
19. Francis, J. and Smith. A. (1995). Agency costs and innovation: Some empirical evidence. *Journal of Accounting and Economics*, *19*(2-3), 383-409.
20. Gervais S, Heaton JB, Odean T (2003). Overconfidence, investment policy and executive stock options. *University of Pennsylvania*, PA.
21. Gilovich T, Griffin D, Kahneman D. (Eds.). (2002). Heuristics and biases: The psychology of intuitive judgment. *Cambridge, UK: Cambridge University Press*

22. Girandola, F. (2005). Action and Commitment theory. *In. V. Alexandre., et W. asparski (Eds.), French and other perspectives in praxeology (Vol.12, pp. 117–130). Transaction Publishers, NJ.*
23. Girandola, F., Michelik, F., and Joule, R.-V. (2008). Promouvoir la pratique physique chez les étudiants: communication et communication engageante. *4ème Journées de la prévention INPES, 10-11 avril, Paris (France).*
24. Hackbarth D (2008). Managerial traits and capital structure decisions. J*. Finan. Quant. Anal.*, 43: 843-881.
25. Haleblian J, Finkelstein S (1993). Top Management Team Size, CEO Dominance, and Firm Performance: The Moderating Roles of Environmental Turbulence and Discretion. *Acad. Manage. J.*, 36(4): 844-863.
26. Hambrick D.C. and Finkelstein S. (1987), Managerial Discretion: A Bridge between Polar Views of Organizational Outcomes. *Research in Organizational Behavior*, vol. 9, p. 369- 406.
27. Hambrick DC, Abrahamson E (1995). Assessing the Amount of Managerial Discretion In Different Industries. *Acad. Manage. J.,* 38: 1427–1441.
28. Hamza, F. and Jarboui, A. (2012). Investor's Commitment Bias and Escalation of Firm's investment decision. *Economia. Seria Management Volume 15, Issue 2, 2012,* 328-345.
29. Haugen, R. and Senbet, L. (1981). Resolving the agency problems of external capital through option. *The Journal of Finance* 36, 629-47
30. Holmstrom, B. (1989). Agency costs and innovation. *The Journal of Economic Behavior and Organization* 12, 305-327.
31. Jensen, M.C. and Meckling, W.H. (1976). Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure, *Journal of Financial Economics* 3, 305-360.
32. Joule, R.V., Girandola, F., and Bernard, F. (2007). How can people be induced to willingly change their behavior? The path from persuasive communication to committing communication. *Social and Personality*
33. Kahneman, D., Tversky, A., (1979). Prospect theory: an analysis of decision under risk. *Econometrica* 47, 263–291
34. Knopf, J.D., Nam, J. and Thornton, J.H.J. (2002). The volatility and price sensitivities of managerial stock option portfolios and corporate hedging. *Journal of Finance* 57, 801-813.
35. Kole, S. (1997). The complexity of compensation contracts. *The Journal of Financial Economics* 43, 79-104.
36. Lerner, J., and Wulf, J. (2007). Innnovation and incentives: Evidence from corporate R&D. *Review of Economics and Statistics* 89, 634-644.
37. Li JT, Tang Y (2010). CEO Hubris and Firm Risk Taking in China: The Moderating Role of Managerial Discretion. *Acad. Manage*. J., 53(1):45-69
38. Manso, G. (2007). Motivating innovation. *Working paper, MIT Sloan School of Management*.
39. March, J. (1991). Exploration and exploitation in organizational learning. *The Organization Science* 2, 71-87.
40. McCullers, J.C. (1978). Issues in learning and motivation. *In the hidden costs of reward*, eds. *M.R. Lepper, and D. Greene. Hillside, NJ, Lawrence Erlbaum Associates*.
41. McGraw, K.O. (1978). Issues in learning and motivation. *In The hidden costs of reward, eds. M.R. Lepper, and D. Greene. Hillside, NJ, Lawrence Erlbaum Associates*
42. Meyer J P, Stanley D J, Herscovitch L and Topolnytsky L. (2002). Affective, Continuance and Normative Commitment to the Organization: A Meta-analysis of Antecedents, Correlates, and Consequences*, Journal of Vocational Behavior*, Vol. 61, 20-52.
43. Meyer, J.P. and Allen, N.J. (1991). A Tree-component conceptualitazation of organizational commitment. *Human Resource Management Review*, vol. 1. 61-89.
44. Mitchell JR, Hart TA, Valcea S, Townsend DM (2009), Becoming the boss: Discretion and post-succession success in family firms. *Entrep. Theory Pract.*, 33(6): 1201-1218
45. Oyer, P. (2004). Why do firms use incentives that have no incentive effects? *The Journal of Finance* 59, 1619-1649..
46. Rajgopal, S. and Shevlin, T. (2002). Empirical evidence on the relation between stock option compensation and risk taking. *Journal of Accounting & Economics* 33, 145-171.
47. Reed, B. (2007). Stock-option packages spur risky CEO behavior; CEOs have less incentive to carefully analyze risk. *Network World Fusion*.
48. Rothman, A. J., and Salovey, P. (1997). Shaping perceptions to motivate healthy behavior: The role of message framing. *Psychological Bulletin,* 121, 3–19.
49. Sawers, KM., Wright, A. and Zamora, V. (2006). Loss Aversion, Instant Endowment and Risk-Bearing: The Relation between Stock-Based Compensation and Managerial Risk-Seeking Behavior. *AAA 2007 Management Accounting Section (MAS) Meeting*.
50. Shefrin, H. (2001), Behavioral corporate finance, *Journal of Applied Corporate Finance* 14(3), 113–124.
51. Tversky, A., Kahneman, D., (1992). Advances in prospect theory: cumulative representation of

uncertainty. *Journal of Risk and Uncertainty* 5, 297–323.
52. Walter, Ingo (2009). Wholesale Banking Compensation and Systemic Risk. *Vox.*
53. Wirtz P., (2011): The cognitive dimension of corporate governance in fast growing entrepreneurial firms. *European Management Journal* (2011) 29, 431– 447.

Global Journal of Management and Business Research
Finance
Volume 13 Issue 11 Version 1.0 Year 2013
Type: Double Blind Peer Reviewed International Research Journal
Publisher: Global Journals Inc. (USA)
Online ISSN: 2249-4588 & Print ISSN: 0975-5853

Self Help Groups - A Financial Model: Perceptions of Stakeholders

By Sanjay Kanti Das & Prof. Amalesh Bhowal
Lumding College, India

Abstract- In India, SHGs represent a unique approach to financial intermediation and innovation of credit delivery technique to enhance income generating activities. Sa-Dhan (2003) has sort out some of the unresolved issues in the context of quality assessment of SHGs. The main objective of this paper is to assess the opinion of the direct stakeholders (i.e. Promoters, Donors, Financial Institutions and the Group members) of SHGs regarding the issue whether SHG is a financial model. The study is conducted by using multi-stage random sampling method to collect primary data from the selected Development Blocks of Nagaon districts of Assam.

Keywords: direct stakeholders, financial model, micro finance, perceptions of stakeholders, self help groups.

GJMBR-C Classification : FOR Code:150304 JEL Code: P45, D92

Strictly as per the compliance and regulations of:

Self Help Groups – A Financial Model: Perceptions of Stakeholders

Sanjay Kanti Das [α] & Prof. Amalesh Bhowal [σ]

Abstract- In India, SHGs represent a unique approach to financial intermediation and innovation of credit delivery technique to enhance income generating activities. Sa-Dhan (2003) has sort out some of the unresolved issues in the context of quality assessment of SHGs. The main objective of this paper is to assess the opinion of the direct stakeholders (i.e. Promoters, Donors, Financial Institutions and the Group members) of SHGs regarding the issue whether SHG is a financial model. The study is conducted by using multi-stage random sampling method to collect primary data from the selected Development Blocks of Nagaon districts of Assam. From the ANOVA test on overall score of variables on financial model, it is concluded that all four groups' means are not equal. It is observed that there exists enough evidence to conclude that there is significant association in the opinion of the direct stakeholders of SHGs regarding the issue whether SHG is a financial model. Further, it is observed that on thirteen (13) elements relating to financial model construct whose mean value is positive are considered as the key elements that recognise SHGs as the financial model of development.

Keywords: direct stakeholders, financial model, micro finance, perceptions of stakeholders, self help groups.

I. Introduction

Self Help Groups (SHGs) are an outcome of the neo-liberal paradigm of development [ ], where the poor take charge of their lives and fashion new improved future through self-reliant and socially sustainable efforts. SHGs emerge as an important strategy for empowering women and in alleviating poverty. The women SHGs have enhanced the status of women as participant decision makers and beneficiaries on the democratic, economic, social and cultural spheres of life and sensitised the women members to take active part in socio-economic progress of rural India. SHGs in social change imply not only the change of outer form of a community or a society but also in the social institutions as well as ideas of the people living in that society.

In recent year SHGs are emerging as alternative credit source to the poor (e.g. Kumar, 2004\[ ]; Bharathi, 2005\[ ];Singh, 2009\[ ]; Nabavi, 2009\[ ]).NABARD views theSHG as essentially a financial model facilitating supplementary creditdelivery mechanism for poor families that had not been reached by the banking system (Tankha, 2002 [ ]; Sinha and Patole, 2002 [ ]). SHG-Banking is a programme that helps to promote financial transactions between the formal rural banking system in India comprising of public and private sector commercial banks, regional rural banks and cooperative banks with informal SHGs as clients. SHGs are financial intermediaries owned by the poor.

They usually start by making voluntary thrift on a regular- mostly fortnightly or monthly basis (contractual savings. They use this pooled resource (as quasi-equity) together with the external bank loan to provide interest bearing loans to their members. Such loan provides additional liquidity or purchasing power for use in any of the borrower's production, investment, or consumption activities. SHGs are currently seen as an essential and integral part not only of financial services delivery, but also as a channel for the delivery of non-financial services within larger objectives of livelihood promotion, community development and women's empowerment. SHGs are potential 'micro-banks', either on their own, or through higher levels of association, capable of using their own resources, grants and borrowed funds for financial intermediation (Tankha, 2002[ ]). Apart from accessing funds from the formal financial sector, SHGs can also become a forum for dissemination of development ideas and information, an association for community mobilisation or an organisational unit for linking up with other economic, social and political interventions.

To increase the number of SHGs who start to make voluntary thrift on a regular basis is the most essential strategic variable in the Linkage Banking system. About 75% of the SHGs have been formed and are continuously supported by NGO staff not only exclusively to get access to bank loans but also to achieve other development goals through joint actions: educational, health, family planning, access to land and water, forming a social movement of women etc. (Kropp & Suran, 2002 [ ]. Those SHGs formed on the initiative of the Banking System have the overwhelming objective to help SHGs get access to banking (saving and credit) services to improve the economic condition of their members and to wean them away from moneylenders. They may be called financial SHGs (Kropp & Suran, 2002[ ]). SHGs are initiated by agents (bank clients, volunteers of farmers clubs, social workers etc.) or taken over from NGOs to offer bank services to them. Linkage

Author α: Head, Department of Commerce, Lumding College, Lumding, Nagaon, Assam -782447, India.
e-mail: sanjay19711123@rediffmail.com/das.sanjaykanti@gmail.com
Author σ: Professor, Dept. of Commerce, Assam University, Diphu Campus, Assam -782462, India. e-mail: profabhowal@gmail.com

Banking in India is, therefore, not exclusively working through existing informal SHG-institutions but predominantly with the formal banking system. Thus, SHGs have the feature based on which it may be argued that SHGs are Financial Model of Development.

II. Operationalising the Concepts: SHG as Financial Intermediaries

Finding innovative ways to provide financial services to the poor so that they can improve their productive capacity and quality of life is the role of the financial intermediaries in the 21st century. Most formal financial institutions do not serve the poor because of perceived high risks, high costs involved in small transactions, low profitability, and most importantly, inability to provide the physical collateral generally required by such institutions. However, Government of developing economies has made serious effort to bring the 'unreachable' within the formal banking net through the directives and also offered a number of fiscal & monetary mechanism to shorten the credit gap. Despite this progress, as of 2008 (2005 statistics), the World Bank has estimated that there were an estimated 1,345 million poor people in developing countries who live on $1.25 a day or less (Headey, 2011[ ]).The demand for financial services from these low-income households is substantial, and their demand covers a wide range of products and services (ADB, 2007[ ]). Most poor and low-income households continue to rely on meager self-finance or informal sources of finance.

In India, SHGs represent a unique approach to financial intermediation (e.g. EDA, 2007[ ]; Solomon, 2010[ ]; Venkatalakshmi & Ambujam, 2012 [ ]). The approach combines access to low-cost financial services with a process of self management and development for the women who join as members of an SHG (Kulkarni & Sonawane, 2012[ ]). The SHGs are formed and supported usually by NGOs, or (increasingly) by Government agencies and sometimes directly by banks. SHGs are linked to banks first with a group deposit account, then for credit, which is disbursed to the group and in turn distributed to the members. SHGs encourage the saving habit which indirectly enhances the financial ability of the members and ensures prompt repayment. This is a very good substitute for the collateral insisted by the traditional bankers. Micro-finance through its SHG Linkage model is considered as a potential alternative for extending the financial services to the poor for various reasons like the ability of these institutions in providing credit and other financial services to the poor and the weaker sections, help them in overcoming financial shocks, support them in venturing into profitable entrepreneurial activities and encourage small savings. They also provide other financial services like Micro insurance and transfer of funds. SHG as financial intermediaries provides the following financial functions.

a) Savings Function in SHGs

Thrift contributions by members to the group which sometimes mandatory or optional must be perceived as a savings product serving long term financial security needs. Pooled savings are either used for income generating activities or made available to members as per requirements. Such savings are generated by poor households either by refraining from consumption or postponement of their not so urgent needs. The thrift contribution reflects confidence of members on the group and is seen as an index of their stake in the process.

b) Credit Function in SHGs

Providing credit access to members of poor household on sustainable basis is the primary objective of SHG. A well conceived loan programme in SHG viz. one time loan, productive loans etc. are the major elements of credit policy of SHGs which enhance its attractiveness to the members. Loans are often given for various purposes with/ without collateral security.

c) Fund Management in SHG

Management of fund is an important task. The SHGs generally accommodate funds to the members on need based and only for productive purposes along with a fixed repayment scheduled. Small savings from resource-poor households need operative protection against loss of deposits. Misappropriations in savings and credit groups as well as imprudent lending from internally generated deposits threaten the security of savings programme. They have to be shielded against the financial and non-financial risks.

d) Record Keeping in SHGs

Record keeping is possibly the most crucial function in a SHGs often confined to the periphery. An efficient record keeping assumes significance for promoting transparency in the system considering the need for providing safety of micro-deposits pooled in savings and credit programmes.

e) Banking Relationship and Shgs

SHGs are primarily savings and credit groups and availing savings and credit services from local banks is a logical extension of their growth strategy to meet increasing credit demand from members. Moreover accessing savings services from banks will provide safety to the pooled funds. It is expected that groups will demonstrate desired maturity in terms of group and financial dynamics leading to inculcation of banking habits in the groups. It would also make possible the bringing about of general improvement in the nature and scale of operations that would accelerate economic development.

f) Promotion of Financial Literacy

But lack of information and guidance regarding practices of savings and credit result in women taking wrong financial decisions; this stands in the way of their empowerment. Wise financial practices and right financial decision-making go hand in hand. To achieve this, increased information dissemination, knowledge sharing and promoting the practice of financial planning SHG organises such training. Generally SHGs provides training on budgeting, savings, debt management and other banking services.

g) Promotion in Financial Inclusion

SHGs are financed by bank without any collateral. Here peer group pressure is considered as collateral by the lenders. SBLP also helps to reduce transaction costs facilitates proper monitoring of funds by group members, economic empowerment of SHG members by collective decision making etc. In spite of the increased spread of formal banking network in the recent past, access to basic financial services are still beyond the reach of large sections of society. Saving Bank Linkage Programme (SBLP) model exhibits the potential to provide an alternative mechanism to extend financial services to large unbanked sections of the society.

The micro-credit programme in general and SBLP in particular is a unique innovation of credit delivery technique to enhance income generating activities. The programme extends small loans to poor people for self-employment activities, thus, allowing the clients to achieve a better quality of life (Rahman, 1995[ ]; Hussain, 1998[ ]; Morduch, 2000[ ]). It is the most sensational anti-poverty tool for the poorest, especially for women (Micro Credit Summit, 1997[ ]). It has been quite well recognised that micro-finance smoothens consumption, reduces the vulnerability of the poor and leads to increase in their income. By giving the world's poor a hand up, micro-finance can help break the vicious cycle of poverty in as little as a single generation (Maheswaranathan & Kennedy, 2010[ ]).

In this study, when developing the questionnaire and interview guidelines, the notion of degrees of financial model introduced by Tankha, 2002[ ]; Kropp & Suran, 2002[ ]; Sinha and Patole, 2002[ ] and other researchers were used. The domain of financial intermediaries is limited to savings function, credit function, fund management, record keeping, banking relationship, insurance function, investment function, financial literacy, financial management and portfolio management. In this way a list of thirty (30) indicators relating to financial intermediation are included in this study to access the perceptions of different stakeholders of SHG whether SHG is a financial model (Figure 1).

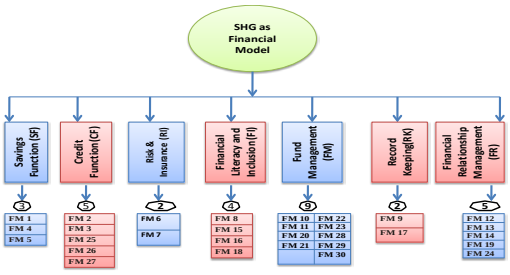


Figure 1 : Components of SHG as Financial Model
Source: Designed based on Survey of Literature

III. Statement of the Problem

Different organisations have promoted or supported SHGs from a different perspective and agenda. It is observed that different stakeholders have promoted SHGs with different expectations and understanding, and have sorted different parameters of quality of SHGs. One modest effort in this context has been initiated by Sa-Dhan (2003[ ]) in preparing and publishing a discussion paper on "Quality Parameters of SHGs", wherein a lot of issues sets out in the quality assessment of SHGs. Moreover, this paper also set out some unresolved key issues for further discussion and research to develop quality indicators for SHGs. Thus, the present study is limited to one of the unresolved issue of Quality Assessment of SHGs as raised by Sa-Dhan.

IV. Objective of the Study

The study is pursued keeping in view the following main objectives

1. To examine the perception of the direct stakeholders i.e. Promoters, Donors, Financial Institutions and the Group members of SHGs regarding the issue whether SHG is a financial model.
2. To forward conclusion based on the findings of the study.

V. Research Hypotheses

Given the survey of literature and objectives, the study is pursued to test the following statistical hypothesis:

Ho: There is no significant association in the opinion of the direct stakeholders (i.e. Promoters, Donors, Financial Institutions and the Group members) of SHGs regarding the issue whether SHG is a financial model.

VI. Methodology

The study uses both primary data and secondary data. Multi-stage random sampling method is used for the present study to collect primary data. As

no such study were conducted in the context of Nagaon district of Assam and this study area being the native district of the scholar was purposively chosen for the present study. At the next level, five Development Blocks are selected randomly. In the later stage, three revenue villages from each of the selected Development Blocks are purposively selected. From each revenue village, three SHG members, who are associated actively, are selected randomly. Further, 12 Financial Institutions i.e. nationalised commercial bank and RRBs (operating in the study area); 10 Donors and 34 Promoters including banks, NGOs, NGO-MFI, Farmers Club and Government Departments are also selected randomly who are directly associated with the sampled SHGs (Table 3). Thus, the total sample size is 100 (Considered adequate by researchers like Comrey, 1973[ ]; Nunnally, 1978[ ]; Gorsuch, 1983[ ] and Oppenhein, 1992[ ]; Coakes and Steed, 1997[ ]). Primary data was collected from the 100 sample respondents using pre-tested questionnaire. The study was conducted during 2012. Secondary data was collected from report on Micro-finance Status by NABARD, Branch Banking Status of RBI, NEDFi Databank on Northeast, SBI Local Head Office, Zonal and Regional Offices of Commercial Banks, Head Offices of Regional Rural Banks, Census India, NSSO, Directorate of SGSY (Guwahati- Assam), DRDA (Nagaon-Assam), Government of Assam, Reports of State Level Bankers Committee, Assam and Economic Survey, and literature published by different institutions on micro-finance have been used. The important variables were formulated and the relevant data collected from the field were coded and analysed using SPSS (Statistical Package for Social Sciences) software.

Perceptions of direct stakeholders whether SHG is a financial model were expressed based on 5 Point Scale where SA= Strongly Agree (2), A = Agree (1), NAND = Neither agree nor disagree (0), DA = Disagree (-1), and SDA = Strongly disagree (-2). Further, the data collected was analysed using the measure of descriptive statistics like mean, variance, standard deviation, maximum, minimum etc. Further, Cronbach alpha, Normality Test i.e. Kolmogorov- Smirnov Test, and ANOVA were applied in analysing and interpreting the data.

a) Profile of the Study Area

The Central Assam District of Nagaon (spelled by the British as Nowgong) is one of the largest districts of Assam. It sprawls across almost four thousand square kilometers of fertile alluvial plains and thickly forested hills. Nagaon extends from 250-45' to 260 -45' North Latitude and 920 -33' -6" East Longitude. The district is bounded by Sonitpur district and the river Brahmaputra in the north, West Karbi Anglong and North Cachar Hills in the south and East Karbi Anglong and Golaghat district in the east. The mighty river Brahmaputra flows along the northern periphery of the district. Other major tributaries meandering through the district such as Kolong, Kopili drain into the Brahmaputra. Lying at a distance of 123 Kilometers by road from Guwahati, Nagaon town constitutes a vital corridor linking the Upper Assam districts of Golaghat, Jorhat, Sivasagar, Dibrugarh, Tinsukia and the North Assam districts of Sonitpur and North Lakhimpur. Nagaon has covered total area of 3,993 sq. km. The map of the study area is sketched on Figure 2 and the demographic profiles of the study district are briefed in Table 1.

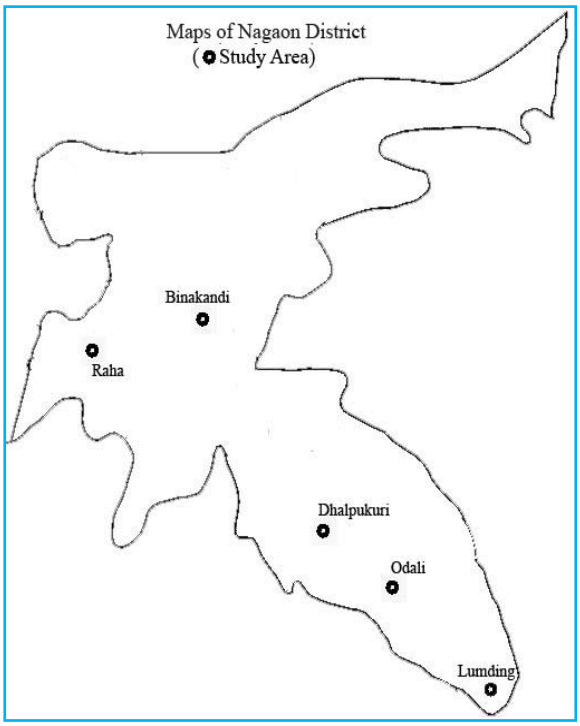


Figure 2 : Maps of Nagaon Districts of Assam (India) and the study Area

Table 1 : Demographic Profile of Nagaon District of

Table 1. Demographic Profile of Nagaon District of Assam, India		
Total Population	2,826,006	1,440,307 (Males) / 1,385,699 (Female)
Total ST Population		89394
Total SC Population		215209
Male literacy		78.19%
Female literacy		69.21%
Population Density		711 per sq. km
Total House Holds		378778
BPL House Holds		177697
BPL P/C		46.91
No. of SHG Formed		24156*
*Up to March 2011; Source: Census Report 2011 and Microfinance Status Report, NABARD 2010-11		

Assam

Table 2 : Progress of SHGs in Nagaon, Assam (As on 31st March 2011)

Promoter	No. of SHG Formed	No. of SHG taken up Economic activity	No. of Women SHGs Formed
	Total*	Total	Total
SGSY	20590	5592	12630
Asomi-MFI	24	15	22
Prochesta- MFI	64	35	37
RGVN- MFI	87	56	64
NGO-MFI			
SK Human Welfare Assoc.	50	27	44
Gharoa**	50	28	38
Jana Chetana Samity Asom	62	24	48
Zeal Thrill Friend-ship Group**	50	10	40
Gramya US	31	11	26
Bank ***	165	56	132
Farmer Club /SHG as Cooperative society	258	123	168
Others including Govt. Depts.	2725	121	87
Total	24156	6098	13336

*Total since 1st April, 1999;**Promoted with Banks,
***Reported from SLBC Report, March 2010.
Source: Microfinance Status Report, NABARD 2010-11, and SLBC Report, March 2010

The SHG linkage approach operating in the districts of Nagaon is too some extent similar with the state structure. While we undertook pilot survey at preliminary stage in order to examine whether all models exist in practice, we found NGO as MFIs and NGO as financial intermediary did not exist separately. Therefore, Model II A and Model II B have been clubbed together into a single category termed as Model II (NGO as Financial Intermediary). Further, three MFI and fifty four Farmer Clubs have also promoted SHGs in the district. Besides, there are five Cooperative SHGs in the district of Nagaon (Micro Finance Status Report, NABARD 2010-11, and SLBC Report, March 2010). Further, the overall progress of SHGs under SHG-Bank linkage and MFI-Bank linkage in the study district are shown in the above Table 2. In Nagaon district, SHGs are formed and organised less than one or the other umbrella programmes of the Government, NGOs, banks and sometimes, even by the people themselves.

Table 3 : Sample SHGs, NGOs, MFIs and Financial Institutions (Promoter, Donor, Financer and SHG members)

Name of Development Block	Name Revenue Villages	No of Sample SHGs	NGO/ NGO-MFI/ Promoter	No of Sample	Govt. Stakeholders	No of Sample	Name of the Financier/ Promoter	No of Sample
Raha	Raha Bazar, Rajagaon, Amsoi	3*3= 9	NGO	3	Agr. Extension Officers	1	PNB, SBI	2
Binakandi	Ambari, Ruhini Pather, Pachim Jamunagaon	3*3= 9	Farmers Club	2	Agr. Extension Officers	1	UBI, SBI, AGVB	3
Dhalpukhuri	Kapilipar, Howaipur, Pachim Lankagaon	3*3= 9	Farmers Club	2	Field Officer, Dist Vet & Animal Hus, Nagaon	1	SBI, AGVB	2
Odali	No. 2 Pipal pukhuri, Lankajan, Ranipukhuri,	3*3= 9	Farmers Club	2	Village Extension officers	1	UBI, UCO	2
Lumding	3 No. Derapather, 2 No. kaki, Narayanpue,	3*3= 9	NGO	2	Agr. Extension Officers	1	Allahabad Bank, SBI, AGVB	3
District level (Nagaon)	Nil		NGO-MFI= 3 Govt. Depts.= 7		DRDA Officials= 1 Programme Officer-NERCRMP, Nagaon= 1		Financer = Nil	

			Field Officer, SIRD=1 Field Officer, ASFABC= 1	
State Level (Assam)	NIL	MFI = 3	NABARD = 1	NIL
Total	45	24	10	12
Total Sample Respondents	100 (Promoter= 34, Donor = 10, Financial institutions = 12 and Group members = 44)			
Total Sample consists of 100 since Bank and NGO have different status and one group member declined to give information				

VII. Profile of the Respondents

This section explains profile of sample respondent's who are direct stakeholders of SHGs viz. Promoters, Donors, Financial Institutions and the Group members.

a) Socio-Economic Profile of Group Members

i. *Gender of group members*

The study consists of respondents from all groups i.e. both male and female as shown in Table 4. Out of 44 respondents belonging to Group members, 24 (54.5%) are male and 20 (45.5%) are female. Sincere effort is given to cover reasonable number of members from each category so that study is free from gender bias. Further, it is observed from the field report and other secondary resources that in the study area there are ample number of women SHGs.

Table 4 : Distribution of the Sample Respondents by Gender

			Group Members
Gender of SHG Member	Male	Count	24
		% of Total	54.5%
	Female	Count	20
		% of Total	45.5%
Total		Count	44
		% of Total	100.0%
Source: Compiled from the Questionnaire			

ii. *Age composition of the sample respondents*

The study consists of respondents from all age groups. Distribution of the sample respondents by age composition is furnished in Table 5. It is pertinent from the table that majority of the sample respondents belong to 40 & above age group (47.7%). At the next level, majority of the respondents are 30- 40 years of age (27.3%), while study also consists of 25% of the respondents, who are below 30 years of age. Thus, it is revealed from the study that relatively aged people are actively participating in SHGs.

Table 5 : Distribution of the Sample Respondents by Age

			Group Members
Age of SHG Member in Years	Below 30 yr	Count	11
		% of Total	25.0%
	30-40 yr	Count	12
		% of Total	27.3%
	40 & above	Count	21
		% of Total	47.7%
Total		Count	44
		% of Total	100.0%
Source: Compiled from the Questionnaire			

iii. *Caste of group members*

Caste is the social variable. Table 6 present distributions of the sample respondents by caste. It is observed from the table that the study covers all caste groups namely General Castes, Scheduled Castes (SCs) and Scheduled Tribes (STs). It is depicted from the table that 50% of the sample respondents are from general category, followed by 29.5% of the respondents from SC category, 15.9% of the respondents from ST category and the rest 4.5% of the respondents are from other categories.

Table 6 : Distribution of the Sample Respondents by Caste

			Group Members
Caste & Sub Caste of SHG Member	General	Count	22
		% of Total	50.0%
	Schedule Caste	Count	13
		% of Total	29.5%
	Schedule Tribes	Count	7
		% of Total	15.9%
	Others	Count	2
		% of Total	4.5%
Total		Count	44
		% of Total	100.0%
Source: Compiled from the Questionnaire			

iv. *Social status of group members*

The study constitutes respondents from different members from all community having different social status, namely, Most Backward Community, Backward Community and Forward Community. Distribution of the sample respondents by social status is provided in Table 7. It is delineated from the table that largest percentage of the sample respondents belong to

Backward Community (61.4%), while 31.8% of the respondents belong to Forward Community and 6.8% of the respondents belong to Most Backward Communities.

Table 7 : Distribution of the Sample Respondents by Social Status

			Group Members
Social Status of SHG Member	Most Backward Community	Count	3
		% of Total	6.8%
	Backward Community	Count	27
		% of Total	61.4%
	Forward Community	Count	14
		% of Total	31.8%
Total		Count	44
		% of Total	100.0%
Source: Compiled from the Questionnaire			

v. *Economic status of group members*

Table 8 presents distribution of the sample respondents by Economic status of family. It is portrayed from the table that huge proportion of the sample respondents are from 'others groups' i.e. wage earner, disguised labour, non-agricultural labourers, private employees, job seeker (44%), 34.1% belongs to 'Below poverty level', 15.9% belongs to 'Green card holder' and only 9.1% of the sample respondents are the 'Job card holder'.

Table 8 : Distribution of the Sample Respondents by Economic Status

			Group Members
Economic Status of SHG Member	Below Poverty Level	Count	15
		% of Total	34.1%
	Green Card Holder	Count	7
		% of Total	15.9%
	Job Card Holder	Count	4
		% of Total	9.1%
	Others	Count	18
		% of Total	40.9%
Total		Count	44
		% of Total	100.0%
Source: Compiled from the Questionnaire			

vi. *Duration of membership in SHG of group members*

Table 9 below depicts the number of years a sample respondent being a member of the SHG. It is observed that 38.6% of the sample respondents remain a member of SHG during 1-4 years, 34.1% of the respondents are members of SHG during 4-5 years, 18.2% of the respondents are members of SHG more than 6 years while only 9.1% of the respondents are members of SHG during 5-6 years.

Table 9 : Distribution of the Sample Respondents by Duration of Membership

			Group Members
Duration of Membership in SHG	1-4 yr	Count	17
		% of Total	38.6%
	4-5 yr	Count	15
		% of Total	34.1%
	5-6 yr	Count	4
		% of Total	9.1%
	Above 6 yr	Count	8
		% of Total	18.2%
Total		Count	44
		% of Total	100.0%
Source: Compiled from the Questionnaire			

vii. *Literacy level of group members*

Table 10 shows distribution of the sample respondents by educational level. It is interesting to note from the table that only 45.5% of the sample respondents are above 10th Standard and the rest of the respondents are either neo-literates or literates. The study comprises 25% of the respondents, who are neo-literates i.e. 10th Standard. It is found from the table that 9.1% of the respondents among literates have completed above primary education but less than 10th standard. Of the sample surveyed, 20.5% of them have studied up to primary education level.

Table 10 : Distribution of the sample respondents by Education level

			Group Members
Educational Level of SHG Member	Primary	Count	9
		% of Total	20.5%
	Below 10th Std.	Count	4
		% of Total	9.1%
	10th Std.	Count	11
		% of Total	25.0%
	Above 10th Std.	Count	20
		% of Total	45.5%
Total		Count	44
		% of Total	100.0%
Source: Compiled from the Questionnaire			

viii. *Annual income of group members*

Distribution of the sample respondents by annual income is presented in Table 11. It is inferred from the table that annual income of the majority of the sample respondents ranges up to Rs.50, 000 (56.8%). At the next level, 43.2% of the sample respondents' annual income of the sample respondents ranges from Rs. 50,000 - Rs. 1 lakhs.

Table 11 : Distribution of the Sample Respondents by Annual Income

			Group Members
Annual Income of SHG Member	Upto Rs. 50 Thousand	Count	25
		% of Total	56.8%
	Rs. 50- Rs. 1 lakhs	Count	19
		% of Total	43.2%
Total		Count	44
		% of Total	100.0%
Source: Compiled from the Questionnaire			

b) Proile of other Stakeholder

'Stakeholders' means the persons or institutions with whom any stake or interest is vested or created to facilitate the promotion of SHG movement, which shall include the regulators, promoters, donor, financier, educators and facilitators of the SHG movement. Major stakeholders in SHGs are, therefore includes all Self Help Promoting Institutions (SHPIs) i.e. Promoter, Donor, Financier and the SHGs itself.

From survey of literature and field study, it is observed that there is no specific boundary regarding the nature and functioning of SHPIs. It is observed that an SHPI can act both as promoter & donor. Similarly, Government departments are also acting both promoter and Donor vis-a-vis financier. Therefore, the investigator collected information from stakeholders separately under different status who performed different tasks.

SHPIs, whether Farmers club, NGOs, banks or State governments, have been playing a vital role in promoting, nurturing and sustaining the SHG movement under SBLP in Assam. It is observed that the major promoter of SHGs in the study districts are DRDA (for SGSY scheme), followed by NGOs and Banks. A few NGO-MFI are also promoting SHGs in the study district. In this study respondent as promoter includes some officials of NGOs such as ASOMI, Prochesta-MFI, RGVN-MFI, Commercial banks, SIRD, DDM-NABARD, ASFABC, Agriculture Departments, Farmers Club etc. who are engaged in SHG promotion. In this way out of 100 respondents, 34 respondents belong to Promoter category.

'Donors and investors' encompasses a range of funding agencies, including bilateral donors, foundations, multilateral development banks, and socially oriented private investors. While NABARD and RMK etc. remains a major donor to NGOs and SHG institutions in India and have been receiving a fraction of required funds for their development. In the study district, NABARD, State Government under SGSY and NGO-MFIs are the major donors of SHGs. In this study respondents belonging to Donor includes some officials of NGO-MFI such as ASOMI, Prochesta-MFI, RGVN-MFI, Dristi Foundation, RuTAG-NE, Srimanta Sankardeb Sangstha; Officials of District Veterinary & Animal Husbandry, NABARD, NERCRMP, SIRD, Agriculture Departments etc. In this way out of 100 respondents, 10 respondents comprises of Donor category.

SHPIs include banks, NGOs, NGO-MFIs and state governments. Here in the state of Assam and even in the study district SHPIs acts both promoter and financier. However for the sake of convenience of study, we have collected perceived opinions of different stakeholders on different scale of capacity, i.e. bank is considered financier, promoter and donor. In this study respondents belonging form Financial Institutions includes Officials of nationalised commercial banks including SBI, RRBs i.e. AGVB etc. In this way out of 100 respondents, 10 represented from Financial Institutions. Below section below depicts the detailed profile of Promoter, Donor, and Financial Institutions.

i. *Nationality of stakeholders*

It is observed from the Table 12 below that all the respondents belong to different categories are originated from India.

Table 12 : Distribution of the Sample Respondents by Originality/Nationality of Stakeholders

			Stakeholders Category			Total
			Promoter	Donor	FIs	
Nationality	Indian	Count	34	10	12	56
		% of Total	100.0%	100.0%	100.0%	100.0%
Total		Count	34	10	12	56
		% of Total	100.0%	100.0%	100.0%	100.0%
Source: Compiled from the Questionnaire						

ii. *Nature of promoting organisation*

Distribution of the sample respondents by Nature of Promoting Organisation is presented in Table 13. It is observed that majority of respondents comes from other Government agencies (55.9%) and Government departments (20.6%). The share of other promoting organisation includes NGO- Universal (2.9%), NGO- Nation hood (8.8%) and NGO-Region hood (5.9%). Therefore, it may also be concluded that a large variety of institutions that are engaged in the promotion of SHGs in the study districts are basically promoted by other government agencies i.e. DRDA (SGSY) is the major promoter of SHG in the study district.

Table 13 : Distribution of the Sample Respondents by Nature of Promoting Organisation

			Promoter
Nature of Promoting Organisation	Govt. Depts.	Count	7
		% of Total	20.6%
	Other Govt. Agencies	Count	19
		% of Total	55.9%
	NGO- Universal	Count	1
		% of Total	2.9%
	NGO- Nation hood	Count	3
		% of Total	8.8%
	NGO-Region hood	Count	2
		% of Total	5.9%
	NGO- Statehood	Count	2
		% of Total	5.9%
Total		Count	34
		% of Total	100.0%

Source: Compiled from the Questionnaire

iii. *Place of location of stakeholders*

Distribution of the sample respondents by Place of Location of Stakeholders is presented in Table 14. It is observed that majority of respondents belonging to Promoter located in Assam (52.9%), 41.2% of the respondents belonging to Promoter originated from outside North East India while 5.9% of the respondents belonging to Promoter originated from Outside Assam but within NER. Similarly, majority of respondents belonging to Donor located in Assam (60%) and equal number of respondents belonging to Donor originated from outside North East India and from Outside Assam but within NER (20% each). Further, it is observed that majority of respondents belonging to Financial Institutions have functioning at all India level (66.7%) while 33.3% of the respondents belonging to Financial Institutions are originated within Assam. However, majority of stakeholder have originated from Assam (50%), 7.14% respondents from other states of North-eastern region of India and 42.86% respondents whose existence is situated at all India level.

Table 14 : Distribution of the Sample Respondents by Place of Location where from Stakeholders Functioning

			Stakeholders Category			Total
			Promoter	Donor	FI	
Place of Location	Assam	Count	18	6	4	28
		% of Total	52.9%	60.0%	33.3%	50%
	Outside Assam but within NER	Count	2	2	0	4
		% of Total	5.9%	20.0%	0	7.14%
	Outside NER	Count	14	2	8	24
		% of Total	41.2%	20.0%	66.7%	42.86%
Total		Count	34	10	12	56
		% of Total	100.0%	100.0%	100.0%	100.0%

Source: Compiled from the Questionnaire

iv. *Nature of programme/ project of stakeholders*

Distribution of the sample respondents by Nature of Programme is presented in Table 15. It is observed that majority of respondents promoting or linked with SGSY (53.33%), while 60.71% of respondents linked other programmes. Further, it is observed that majority of the respondents belonging to Promoter and Donor connected with others programme i.e. not connected with SGSY while cent percent financial institutions are connected with Government sponsored SGSY scheme.

Table 15 : Distribution of the Sample Respondents by Nature of Programme of Stakeholders

			Stakeholders Category			Total
			Promoter	Donor	FI	
Name of Project	SGSY	Count	19	3	12	34
		% of Total	55.9%	30.0%	100.0%	60.71%
	Others	Count	15	7	0	22
		% of Total	44.1%	70.0%	0	39.29%
	Total	Count	34	10	12	56
		% of Total	100.0%	100.0%	100.0%	100.0%

Source: Compiled from the Questionnaire

v. *Nature of promotion by stakeholders*

Distribution of the sample respondents by Nature of Promotion is presented in Table 16. It is observed that majority of respondents promoting or linked with financial assistance (53.57%), while 46.43% of respondents linked both financial & non-financial i.e. financial and training. Further, it is observed that majority of the respondents belonging to Donor category are connected with financial and non-financial assistance (90%) while 91.7% of respondents belonging to

Financial Institutions are provided only financial assistance.

Table 16 : Distribution of the Sample Respondents by Nature of Promotion by Stakeholders Category

			Stakeholders Category			Total
			Promoter	Donor	FI	
Nature	Financial	Count	18	1	11	30
		% of Total	52.9%	10.0%	91.7%	53.57%
	Both	Count	16	9	1	26
		% of Total	47.1%	90.0%	8.3%	46.43%
Total		Count	34	10	12	56
		% of Total	100.0%	100.0%	100.0%	100.0%
Source: Compiled from the Questionnaire						

vi. *Recovery percentage of SHG promoted by stakeholders*

Distribution of the sample respondents by Recover Percentage of SHG Promoted is presented in Table 17. It is observed the table that majority of respondents from all categories of stakeholders (63.64%) whose recovery percentage is ranged within 50%-75%. Further, it is observed that 16.7% respondents belonging to financial institutions who reported recovery percentage is above 75%.

Table 17 : Distribution of the Sample Respondents by Recovery Percentage of SHG Promoted by Stakeholders

			Stakeholders Category		Total
			FIs	Donor	
Recovery Percentage	Below 25%	Count	0	0	0
		% of Total	0%	0%	0%
	25-50%	Count	0	6	6
		% of Total	0%	60.0%	27.27%
	50-75%	Count	10	4	14
		% of Total	83.3%	40.0%	63.64%
	Above 75%	Count	2	0	2
		% of Total	16.7%	0%	9.09%
Total		Count	12	10	22
		% of Total	100.0%	100.0%	100%
Source: Compiled from the Questionnaire					

vii. *Impact assessment by stakeholders*

Distribution of the sample respondents by performing of Performance Assessment is presented in Table 18. It is observed from the table that 21.43% of respondents from all categories of stakeholders conducted impact assessment. Only 50% of Donor and 20.6% of respondents belonging to Promoter reported that they conducted such impact assessment.

Table 18 : Distribution of the Sample Respondents by Impact Assessment Conducted*Quality assessment conducted by stakeholders*

			Stakeholders Category			Total
			Promoter	FIs	Donor	
Impact Assessment	No	Count	27	12	5	39
		% of Total	79.4%	100.0%	50.0%	69.64%
	Yes	Count	7	0	5	12
		% of Total	20.6%	0%	50.0%	21.43%
Total		Count	34	12	10	56
		% of Total	100.0%	100.0%	100.0%	100.0%
Source: Compiled from the Questionnaire						

Distribution of the sample respondents by performing of Quality Assessment is presented in Table 19. It is observed from the table that 32.14% respondents from all categories of stakeholders conducted quality assessment. Only 32.4% of promoter respondents and 25 of Financial Institutions respondents and 40% of Donor respondents reported that they perform such quality assessment.

Table 19 : Distribution of the Sample Respondents by Quality Assessment Conducted

			Stakeholders Category			Total
			Promoter	FIs	Donor	
Quality assessment	No	Count	23	9	6	38
		% of Total	67.6%	75.0%	60.0%	67.86%
	Yes	Count	11	3	4	18
		% of Total	32.4%	25.0%	40.0%	32.14%
Total		Count	34	12	10	56
		% of Total	100.0%	100.0%	100.0%	100.0%
Source: Compiled from the Questionnaire						

viii. *Performance assessment conducted by stakeholders*

Distribution of the sample respondents by performing of Performance Assessment is presented in Table 20. It is observed from the table that 57.14% of respondents from all categories of stakeholders conducted Performance assessment.

Table 20 : Distribution of the Sample Respondents by Performance Assessment Conducted

			Stakeholders Category			Total
			Promoter	FIs	Donor	
Performance Assessment	No	Count	15	5	4	24
		% of Total	44.1%	41.7%	40.0%	42.85%
	Yes	Count	19	7	6	32
		% of Total	55.9%	58.3%	60.0%	57.14%
Total		Count	34	12	10	56
		% of Total	100.0%	100.0%	100.0%	100.0%
Source: Compiled from the Questionnaire						

ix. *Nature of Donor organisation*

Distribution of the sample respondents by Nature of Donor Organisation is presented in Table 21. It is observed that majority of respondents comes from Government Departments (50%), while 20% respondents belong to NGO and 30% belong to Trust.

Table 21 : Distribution of the Sample Respondents by Nature of Donor Organisation

			Donor
Nature of Donor Organisation	Govt. Dept	Count	5
		% of Total	50.0%
	Trust	Count	3
		% of Total	30.0%
	NGO	Count	2
		% of Total	20.0%
Total		Count	10
		% of Total	100.0%
Source: Compiled from the Questionnaire			

x. *Nature of financial institution*

Distribution of the sample respondents by nature of financial institution is presented in Table 22. It is observed that majority of respondents comes from Public Sector Financial Institutions like SBI and Other nationalised commercial banks available in the study district (75%), while 25% respondents belong to Regional Rural bank i.e. AGVB.

Table 22 : Distribution of the Sample Respondents by Nature of Financial institution

			Financial Institutions
Nature of Financial Institutions	Public Sector FI	Count	9
		% of Total	75.0%
	RRBs	Count	3
		% of Total	25.0%
Total		Count	12
		% of Total	100.0%
Source: Compiled from the Questionnaire			

VIII. Analysis & Discussion

a) Reliability Test on the Score on Perceptions of Stakeholder About SHG as Financial Model

To understand the reliability of the field data Cronbach's alpha test was conducted. The result of reliability statistics on the score on perception of stakeholders about SHG as financial model reveals that Cronbach's Alpha is 0.892 which is assumed 'good' and further denotes that there are the presences of internal consistency (Cronbach, 1951[ ]; Nunnally & Bernstein, 1994[ ] and George and Mallery, 2003[ ]).

b) Validity of the Instrument to Assess Perceptions of Stakeholder About SHG as Financial Model

Content validity was assessed after considering the findings of an extensive review of the literature on SHGs as financial intermediaries, and then discussing it with experts in the field (two academicians and two micro finance practitioners). Some items of the sub-scales were revised according to appropriate demographic circumstances of the study district.

c) Descriptive Statistics on The Score on Perceptions of Stakeholder About SHG as Financial Model

The descriptive scale statistics on the perception of different stakeholders of SHGs as financial model denotes the mean is -3.76, variance 149.578 and standard deviation 12.230 (Table 23).

Table 23 : Descriptive on Overall Score on Perception of Stakeholders about SHG as Financial model

			Statistic	Std. Error
Overall Score on Financial Model	Mean		-3.760	1.223
	95% Confidence Interval for Mean	Lower Bound	-6.187	
		Upper Bound	-1.333	
	Median		-6.000	
	Variance		149.578	
	Std. Deviation		12.230	
	Minimum		-30.00	
	Maximum		26.00	
Source: Compiled from the Questionnaire				

d) Normality Test of the data on Perception of Stakeholders about SHG as Financial model

Further, to evaluate the normality of distribution of data on the perceptions of different stakeholders on different variables relating to SHGs as financial model, Kolmogorov–Smirnov test was conducted on the total score on opinion about SHGs as financial model (Table 24). Since the p-value is 0.138 for overall score of variables on financial model, there is no reason to doubt that the data come from population with a normal distribution. Given the hypothesis & methodology, ANOVA Test is applied to test the main hypothesis.

Table 24 : One-Sample Kolmogorov-Smirnov Test on Perception of Stakeholders about SHG as Financial model

		Overall Score on Financial Model
N		100
Normal Parameters[a,b]	Mean	-3.76
	Std. Deviation	12.230
Most Extreme Differences	Absolute	.116
	Positive	.116
	Negative	-.062
Kolmogorov-Smirnov Z		1.156
Asymp. Sig. (2-tailed)		.138

a. Test distribution is Normal.
b. Calculated from data.
Source: Compiled from the Questionnaire

e) ANOVA analysis on the score on perceptions of stakeholder about SHG as Financial model

Further, from the ANOVA output (Table 25) relating to overall score on SHGs as financial model is significant. In case of overall score of variables on SHGs as Financial model, F ratio (5.816) is significant (p = 0 .001) at the 0.05 alpha level. We conclude that at least one of the group mean is significantly different from the others (or that at least two of the group means are significantly different from each other).

Table 25 : ANOVA on Perception of Stakeholders about SHG as Financial model

		Sum of Squares	df	Mean Square	F	Sig.
Financial Model	Between Groups	2277.524	3	759.175	5.8160.001	
	Within Groups	12530.716	96	130.528		
	Total	14808.240	99			

Source: Compiled from the Questionnaire

Further, the stakeholder-wise descriptive statistics (Table 26) on overall score on SHGs as Financial Model depicts that Promoters shows highest mean value followed by Financial Institutions on overall score on SHGs as Financial Model. The group members reported negative mean on overall score on SHGs as Financial Model.

Since in case of overall score on SHGs as Financial model wherein the means form all four groups are not equal hence, we resorted to find out item-wise analysis on variables relating to financial model wherein the means are not equal (Table 27) which are self explanatory. It is observed from the Table 27 that the direct stakeholders have negative perception on the statements which does not recognise SHGs as Financial model viz. Helps in money transfers (FM 4), Helps in insurance to group members (FM 6), Ability to take financial risk (FM 7), Helps in preparation of cash book and other ledger books (FM 9), Helps in acquiring the skill of cash management (FM 10), Helps in acquiring the skill budgeting (FM 11), Helps in special loan products for women from funding agencies (FM 12), Helps in pre-loan help with business planning by fund provider to the groups (FM 13), Helps in special loan guarantee and collateral arrangements for groups (FM 14), Understand and manage commercial rate of interest on loan (FM 19), Understand and manage investment of SHGs Understand and manage investment of SHGs (FM 20), Understand and manage assets of SHG (FM 21), Understand and manage liability of the SHG (FM 22), Understand and manage financing portfolio of SHG (FM 23), Understand and manage cash flow projection (FM 28), Understand and manage return on earning (FM 29) and Understand and manage operating expenses (FM 30).

Table 26 : Descriptive on Perception of Stakeholders about SHG as Financial model

		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
						Lower Bound	Upper Bound		
Overall Score on Financial Model	Promoter	34	.736	10.766	1.846	-3.021	4.492	-14.00	26.00
	Donor	10	.00	10.360	3.276	-7.411	7.411	-10.00	20.00
	Financial Institutions	12	.083	9.239	2.667	-5.787	5.954	-13.00	14.00
	Group Members	44	-9.136	12.576	1.896	-12.96	-5.313	-30.00	20.00
	Total	100	-3.76	12.23	1.223	-6.187	-1.333	-30.00	26.00

Source: Compiled from the Questionnaire

Table 27 : Descriptive Statistics on Perception of Stakeholders about SHG as Financial Model

FM -ID	Statements relating to Financial Model	Minimum	Maximum	Mean		Std. Deviation
		Statistic	Statistic	Statistic	Std. Error	Statistic
FM -1	Helps in collection of deposits.	1	2	1.72	.045	.451
FM -2	Helps in providing loans without security.	1	2	1.57	.050	.498
FM -3	Helps in providing loans with security.	-2	2	.57	.155	1.552
FM -4	Helps in money transfers.	-2	2	-.51	.108	1.078
FM -5	Helps in cash deposit in Bank at the earliest possible time.	-1	2	1.12	.077	.769
FM -6	Helps in insurance to group members	-2	1	-.51	.113	1.133
FM -7	Ability to take financial risk.	-2	2	-.18	.101	1.009
FM -8	Helps in increases the capacity to spend more.	-1	2	.35	.074	.744
FM -9	Helps in preparation of cash book and other ledger books.	-2	1	-.48	.102	1.020
FM -10	Helps in acquiring the skill of cash management.	-2	1	-.63	.099	.991
FM -11	Helps in acquiring the skill budgeting.	-2	1	-1.02	.091	.910
FM -12	Helps in special loan products for women from funding agencies.	-2	1	-1.35	.088	.880
FM -13	Helps in pre-loan help with business planning by fund provider to the groups	-2	1	-1.36	.094	.938
FM -14	Helps in special loan guarantee and collateral arrangements for groups.	-2	1	-1.45	.087	.869
FM -15	Helps in launching of financial literacy projects for SHG members by promoters, donors and FI	-2	2	.38	.085	.850
FM -16	Helps in women members having workable knowledge of calculations	0	2	1.03	.026	.264
FM -17	Helps women members maintaining records of financial transactions.	-1	2	.75	.074	.744
FM -18	Helps women members understanding of basic banking process.	-1	2	.91	.047	.473
FM -19	Understand and manage commercial rate of interest on loan.	-2	1	-.75	.073	.730
FM -20	Understand and manage investment of SHGs.	-2	1	-.82	.070	.702
FM -21	Understand and manage assets of SHG.	-2	1	-1.01	.056	.559
FM -22	Understand and manage liability of the SHG.	-2	2	-.90	.081	.810
FM -23	Understand and manage financing portfolio of SHG.	-2	2	-1.00	.085	.853
FM -24	Understand and manage compulsory saving requirement.	-1	2	1.06	.040	.397
FM -25	Understand and manage repayment methods.	-1	2	.87	.061	.614
FM -26	Understand and manage revolving of credit mechanism.	-1	2	.63	.073	.734
FM -27	Understand and manage loan utilization check.	-2	2	.24	.095	.955
FM -28	Understand and manage cash flow projection.	-2	1	-.97	.074	.745
FM -29	Understand and manage return on earning.	-2	1	-1.01	.075	.745
FM -30	Understand and manage operating expenses.	-2	1	-1.01	.075	.745
	Valid N (list wise)			100		

Source: Compiled from the Questionnaire

From the above Table 27 of descriptive statistics on item wise perception of stakeholders about SHG as financial model, it is observed that out of 30 elements representing SHGs as financial model, in seventeen (17) elements where mean value is negative and only in thirteen (13) elements whose mean value is positive. Therefore, thirteen (13) elements relating to financial model construct whose mean value is positive are considered as the main elements to recognise SHGs as financial model of development.

IX. Conclusion

SHGs emerge as an important strategy for empowering women and alleviating poverty. They are an effective strategy for poverty alleviation, women development and social empowerment. The women SHGs have enhanced the status of women as participant decision makers and beneficiaries on the democratic, economic, social and cultural spheres of life and sensitised the women members to take active part in socio-economic progress of rural India.

In recent year SHGs are emerging as alternative credit source to the poor. NABARD views the SHG as essentially a financial model facilitating a supplementary credit delivery mechanism for poor families that had not been reached by the banking system. A lot of literature are found on the role of SHGs in empowering women and also have cross world evidences that SHGs are helpful in reducing poverty. Economic empowerment through SHGs is in fact different from financial intermediation function of SHGs. A few studies also supported that the SHG is considered as financial model too and ensures low cost means of rural lending in the absence of formal financial institutions.

The one-way analysis of variance (ANOVA) on overall score of variables on SHGs as financial model is used to determine whether there are any significant differences between the means of two or more independent (unrelated) groups. From the ANOVA test on overall score of variables on SHGs as financial model, we have rejected the null hypothesis that all four groups' means are equal. We conclude that at least one of the group means is significantly different from the others (or that at least two of the group means are significantly different from each other).

Since it is statistically proved that the means form all four groups are not equal hence, we resorted to find out item wise analysis on variables relating to financial model wherefrom it is observed that the means are not equal. The descriptive statistics on item wise perception of stakeholders about SHG as financial model, narrated that out of thirty (30) elements, on seventeen (17) elements where mean value is negative and on thirteen (13) elements whose mean value is positive. Therefore, these thirteen (13) elements whose mean value is positive are considered as the main elements to consider SHGs as the financial model of development.

References Références Referencias

1. Chitagubbi, Geeta, Rajeshwari Shivalli and S. Devendrappa (2011). A study on the usefulness of Self Help Group membership to women for empowerment. Journal of Farm Sciences 1(1), 112-119.
2. Kumar, P. Amala (2004). Concept of Sustainability in Self Help Groups. India: Andhra University press.
3. Bharathi, R. A. (2005). Assessment of self help groups promoted under NATP. Retrieved from http://www. etd.uasd.edu/ft/th8425.pdf.
4. Singh, N. Tejmani (2009). Micro Finance Practices in India: An Overview. International Review of Business Research Papers, September, 5(5), 131-146.
5. Nabavi, S. Abdol Hossein (2009). Poverty and Micro Enterprise Development. European Journal of Social Sciences, 9(1), 120-128.
6. Tankha, Ajay (2002). Self Help Groups as Financial Intermediaries in India: Cost of Promotion, Sustainability and Impact: A study, Paper presented for ICCO and Cordaid, The Netherlands. Retrieved from http://www.aptsource.in/admSHG%20as%20Fin%20Intermediary%20Cost%20of%2PDF
7. Sanjay and Meenal Patole (2002). Microfinance and the Poverty of Financial Services: How the poor in India could be better served. Working Paper Series 56. Gurgaon, India: EDA Rural Systems Pvt. Ltd.
8. Tankha, Ajay (2002). Self Help Groups as Financial Intermediaries in India: Cost of Promotion, Sustainability and Impact: A study. Paper presented for ICCO and Cordaid, The Netherlands. Retrieved from http://www.aptsource.in/admSHG%20as%20Fin%20Intermediary%20Cost%2of%.PDF
9. Kropp, Erhard. W. & Suran, B. S. (2002, November). Linking Banks and (Financial) Self Help Groups in India: An Assessment. Paper presented at the Seminar on SHG-bank Linkage Programme, on 25th and 26th, at New Delhi. Retrieved from http://ssrn.com/abstract=1170845
10. Kropp, Erhard W. & Suran, B. S. (2002, November). Linking Banks and (Financial) Self Help Groups in India: An Assessment. Paper presented at the Seminar on SHG-bank Linkage Programme, on 25th and 26th, at New Delhi. Retrieved from http://ssrn.com/abstract=1170845
11. Headey, Derek (2011). Was the Global Food Crisis Really a Crisis? Simulations versus Self-Reporting, IFPRI Discussion Paper 01087. Retrieved from

www.ifpri.org/sites/default/files/publications/ifpridp01087.pdf

12. Asian Development Bank (2007). Low-Income Households' Access to Financial Services International Experience, Measures for Improvement, and the Future, EARD Special Studies. Retrieved from http://www.adb.org/microfinance
13. EDA (2007). The Lights and Shades of SHGs in India, Study by EDA in association with APMAS in Microfinance Self Help Groups in India: living up to their promise? UK: Practical Action Publishing.
14. Solomon, R. Bhakther (2010, March). Self Help Groups in India. Paper presented on CEO Workshop on Credit Unions Providing Financial Services to the Bottom line Pyramid on 13th to 17th at Delhi. Retrieved from http://www.aaccu.asia/download.php?path_id=1...name...solomon
15. Venkatalakshmi, K. & N. K. Ambujam (2012). Information and Communication Technology use Frameworks among Self-Help Group Women. European Journal of Social Sciences, 27(2), 206-212.
16. Kulkarni, S. N. & Ashalata Sonawane (2012). Empowerment of Rural Poor in India through SHGs. National Monthly Referred Journal of Research in Arts & Education, 1(1), 42-54
17. Rahman, H. (1995). Mora Kartik: Seasonal deficits and the vulnerability of the rural poor. In H. Rahman, & M. Hossain (Eds.), Rethinking rural poverty Bangladesh as a case study (pp. 54-67). Dhaka: University Press Limited.
18. Hussain, A. M. (1998). Poverty Alleviation and Empowerment: The Second Impact Assessment Study of BRAC's, Rural Development Programme. Dhaka: BRAC.
19. Morduch, J. (2000). The Micro finance Schism. World Development, 28(4), 617- 629.
20. Micro-Credit Summit (1997). The Micro-Credit Summit: Declaration and Plan for Action. Washington, DC: Grameen Foundation.
21. Maheswaranathan, S. & Kennedy, F. B. (2010). Impact of Micro-Credit Programmes on Eliminating Economic Hardship of Women. ICBI 2010. Sri Lanka: University of Kelaniya. Retrieved from http://www.kln.ac.lk/uokr/ICBI2010/7.pdf
22. Tankha, Ajay (2002). Self-help Groups as Financial Intermediaries in India: Cost of Promotion, Sustainability and Impact: A study prepared for ICCO and Cordaid, The Netherlands. Retrieved from http://www.aptsource.in/admSHG%20as%20Fin%20Intermediary%20Cost%20of%2PDF
23. Kropp, Erhard. W. & Suran, B. S. (2002, November). Linking Banks and (Financial) Self Help Groups in India: An Assessment. Paper presented at the Seminar on SHG-bank Linkage Programme, on 25th and 26th, at New Delhi. Retrieved from http://ssrn.com/abstract=1170845
24. Sinha, Sanjay and Meenal Patole (2002). Microfinance and the Poverty of Financial Services: How the poor in India could be better served. Working Paper Series 56. Gurgaon, India: EDA Rural Systems Pvt Ltd.
25. Sa-dhan (2003). Discussion Series 2, Quality Parameters of SHGs: A Discussion Paper. [Online]. Available: http://www.sa-dhan.org. [Accessed February 15, 2009].
26. Comrey, A. L. (1973). A first course in factor analysis. New York: Academic Press.
27. Nunnally, J. C. (1978). Psychometric Theory (2nd ed.). New York: McGraw-Hill.
28. Gorsuch, R. L. (1983). Factor analysis (2nd ed.). Hillsdale, NJ: Lawrence Erlbaum.
29. Oppenheim, A. N. (1992). Questionnaire Design, Interviewing and Attitude Measurement. London: Pinter Publishers.
30. Coakes, S. J. and Steed, L. G. (1997). SPSS Analysis without Anguish. Brisbane: John Wiley & Sons.
31. Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests. Psychometrika, 16(3), 297–334
32. Nunnally, J. C. and Bernstein, I. H. (1994). Psychometric Theory (3rd ed.). McGraw-Hill: New York
33. George, D., & Mallery, P. (2003). SPSS for Windows step by step: A simple guide and reference. 11.0 update (4th ed.). Boston: Allyn & Bacon, 231.

This page is intentionally left blank

Global Journal of Management and Business Research
Finance
Volume 13 Issue 11 Version 1.0 Year 2013
Type: Double Blind Peer Reviewed International Research Journal
Publisher: Global Journals Inc. (USA)
Online ISSN: 2249-4588 & Print ISSN: 0975-5853

Impact of Sustainability Performance of Company on its Financial Performance: A Study of Listed Indian Companies

By Priyanka Aggarwal
University of Delhi, India

Abstract- Sustainability is a crucial issue for corporate world today. The interest of investors in Socially Responsible Investment (SRI) has grown substantially over last decade. Thus, sustainability has potential to influence company performance. The purpose of this paper is to find "whether sustainable companies are more profitable". Various researches were conducted in past for examining this relationship. Results, however, have been mixed and inconclusive. Moreover, most of the studies have been conducted in context of developed countries.

Keywords: Corporate Sustainability, Financial Performance, Corporate Social Responsibility (CSR), Sustainability Reporting, Socially Responsible Investment (SRI), Global Reporting Initiative (GRI).

GJMBR-C Classification : FOR Code:150304 JEL Code: D92, F65

Strictly as per the compliance and regulations of:

Impact of Sustainability Performance of Company on its Financial Performance: A Study of Listed Indian Companies

Priyanka Aggarwal

Abstract- Sustainability is a crucial issue for corporate world today. The interest of investors in Socially Responsible Investment (SRI) has grown substantially over last decade. Thus, sustainability has potential to influence company performance. The purpose of this paper is to find "whether sustainable companies are more profitable". Various researches were conducted in past for examining this relationship. Results, however, have been mixed and inconclusive. Moreover, most of the studies have been conducted in context of developed countries. The purpose of this paper is to examine impact of sustainability rating of company on its financial performance in an Indian context using secondary data. We also separately analyze impact of four key components of sustainability (i.e. Community, Employees, Environment and Governance) on financial performance. We find no significant association between overall sustainability rating and financial performance. However, further analysis reveals that four components of sustainability have significant but varying impact on financial performance.

Keywords: corporate sustainability, financial performance, corporate social responsibility (CSR), sustainability reporting, socially responsible investment (SRI), global reporting initiative (GRI).

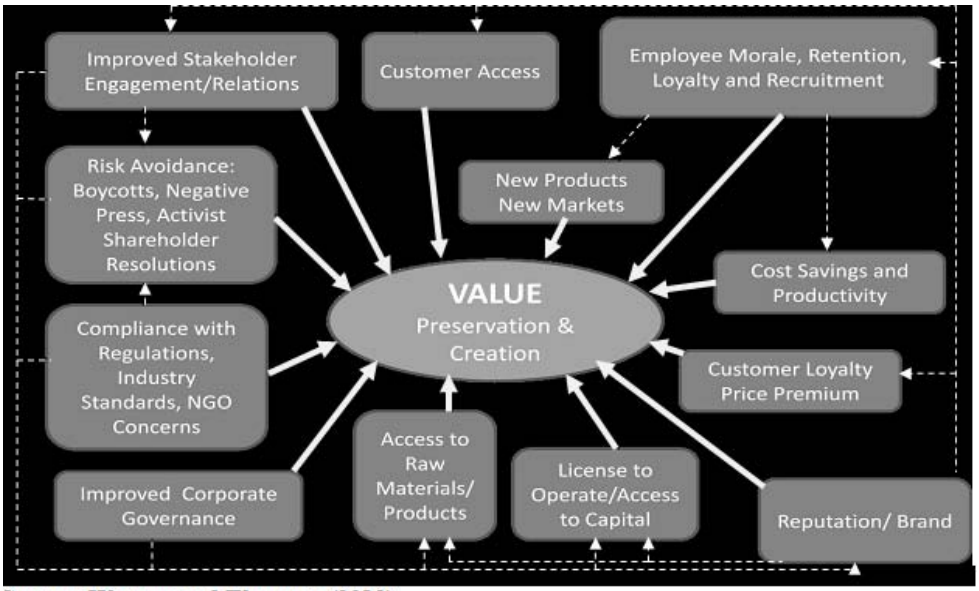
I. Introduction

Sustainability is currently a burning issue and a major cause of concern across the globe. At the World Commission on Environment and Development (WCED), Brundtland (1987) defined sustainability as – "meeting the needs of the present generation without compromising the ability of future generations to meet their own needs." The interest of investors in company's non-financial performance has grown significantly over the past few years (Ernst & Young, 2009). In the wake of increased regulations and growth in level of awareness of stakeholders, the concept of corporate sustainability has been assuming great importance. World Business Council for Sustainable Development (2002) defined Corporate Sustainability as - "the commitment of business to contribute to sustainable economic development, and to work with employees, their families, the local community and society at large to improve their quality of life."

Author: Research Scholar, Department of Commerce, Delhi School of Economics, University of Delhi, Delhi, India
e-mail: priyanka_aggarwal6889@yahoo.in

Today, the firms should take accountability for various beneficial and harmful impacts of their activities on the overall society and environment in which they exist. Moreover, the firms should make proper disclosure of these impacts in an appropriate sustainability report, which provides a detailed description of their governance structure, stakeholder engagement approach and triple bottom line performance. Elkington (1998) developed the term 'triple bottom line' to emphasize on three aspects - people (social), profits (economic) and planet (environmental). Global Reporting Initiative (2011) defines Sustainability Reporting as – "the practice of measuring, disclosing, and being accountable to internal and external stakeholders for organizational performance towards the goal of sustainable development."

It is widely believed and suggested by researchers that in today's dynamic and complex business environment, the corporate sustainability is likely to influence corporate profitability and overall performance. It lays a foundation for preserving and enhancing value of firm. The firms reap plenty of strategic benefits as a result of embedding sustainability in their core strategies. These various benefits of corporate sustainability are shown in Figure 1 below.



Source: Warren and Thomsen (2012)

Figure 1 : Benefits of corporate sustainability

Corporate Sustainability and its impact on financial performance have emerged as important areas for research in recent years. Various studies have been performed over the last decade for examining this relationship. However, the results have been mixed and inconclusive. Moreover, most of the previous studies have been conducted in the context of developed countries (like US, Europe, UK, Australia, etc.). Therefore, this paper attempts to analyze the impact of overall sustainability and its four major components on corporate financial performance in an Indian context.

II. Objectives of Study

The primary objective of this paper is to find "whether sustainable companies are more profitable or not". Some specific objectives have been formulated to achieve this main object, which are as follows:

- To provide an overview of the concept of corporate sustainability and its various components.
- To present various related theories establishing relationship between corporate sustainability and financial performance.
- To provide literature review on the relationship between corporate sustainability and corporate financial performance.
- To empirically analyze the impact of overall sustainability rating of company on its financial performance.
- To examine and analyze separately the impact of each of the four major components of sustainability, i.e. Community, Employees, Environment and Governance on financial performance of company.
- To analyze whether companies with higher sustainability ratings are more profitable or not.

III. Concept of Corporate Sustainability

As per the report by Mays (2003),'Corporate Sustainability' means creating long-term shareholder value by embracing opportunities and managing risks arising from social, environmental and economic factors. The Mays Report also specified advantages of corporate sustainability. Sustainable behavior adds value to commercial endeavor and makes for good business sense. It is specifically a helpful instrument to manage corporate image. It helps in assessing the capabilities and effectiveness of business administration and management. It leads to shift in the organizational focus from short-term to long-term goals. Transparency is an essential element of corporate sustainability. It can be assessed along various dimensions like: energy efficiency, community relations, eco design, materials efficiency, product recyclability, and employee relations. The four major components of corporate sustainability have been described in Table 1 below.

Table 1 : Components of corporate sustainability

Components	Description
1) COMMUNITY Human rights, supply chain, product quality & safety, product sustainability, community development, philanthropy.	The **Community Component** covers the company's commitment and effectiveness within local, national and global community in which it does business. It reflects company's citizenship, charitable giving and volunteerism. This component covers company's human rights record and treatment of its supply chain. It also covers the environmental and social impacts of company's products and services, and development of sustainable products, processes and technologies.
2) EMPLOYEES Diversity, labor rights, treatment of unions, compensation, benefits, training, health, worker safety	The **Employees Component** includes disclosure of policies, programs, and performance in diversity, labor-relations and labor-rights, compensation, benefits, and employee training, health and safety. It focuses on compliance with national laws and regulations, fair treatment of all employees, disclosure of workforce diversity data, strong labor codes, comprehensive benefits, training and development opportunities, and employee health and safety policies.
3) ENVIRONMENT Environmental policy, environmental reporting, waste management, resource management, energy use, climate change policies and performance.	The **Environment Component** data covers company's interactions with the environment at large, including use of natural resources, and company's impact on Earth's ecosystems, compliance with environmental regulations, leadership in addressing climate change, energy-efficient operations, renewable energy, natural resource conservation, pollution prevention programs, strategy towards sustainable development and programs to engage stakeholders for environmental improvement.
4) GOVERNANCE Leadership ethics, board composition, executive compensation, transparency and reporting, and stakeholder treatment.	The **Governance Component** covers disclosure of policies, procedures, board independence and diversity, executive compensation and evaluation of company's culture of ethical leadership and compliance. This component rates factors such as – alignment of corporate policies and practices with sustainability goals; transparency to stakeholders; integration of sustainability principles from top down into day-to-day operations of company. Governance focuses on how management is committed to sustainability and corporate responsibility at all levels.

Source: CSRHub (www.csrhub.com)

IV. Related Theory

There are three major theories, namely, Legitimacy Theory, Stakeholder Theory and Agency Theory, which suggest that companies should be sustainable and should incorporate corporate sustainability in their core strategic goals. The companies should disclose their sustainability performance in a proper sustainability report. These theories primarily suggest positive relationship between corporate sustainability and company performance. These theories are briefly shown in Figure 2 below.

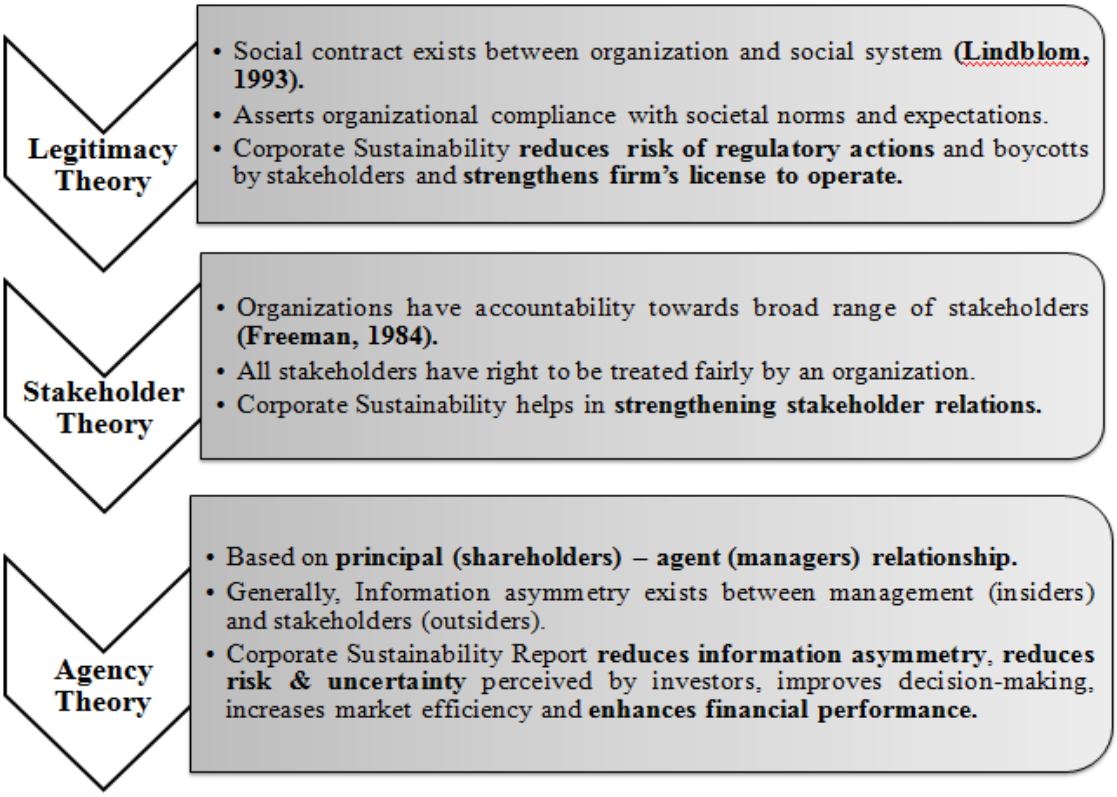


Figure 2 : Related theories

V. Literature Review

Corporate sustainability and its impact on financial performance have emerged as key areas for research in recent years. Various research studies have been performed over the last decade for examining this relationship. However, the results have been inconclusive, inconsistent, and often contradictory. It ranges from positive (Greenwald, 2010; Eccles et al., 2012; N. Burhan & Rahmanti, 2012; Khaveh et al., 2012; de Klerk & de Villiers, 2012; Ngwakwe, 2009; Ameer & Othman, 2012; Guindry & Patten, 2010; Schadewitz & Niskala, 2010) to negative (Lopez et al., 2007; Detre & Gunderson, 2011) to mixed (Jones, 2005; Brammer et al., 2006; Mohd Taib & Ameer, 2012; Manescu, 2011; Semenova et al., 2009) and even to insignificant relationship (Van de Velde et al., 2005; Buys et al., 2011; Adams et al., 2012; Venanzi, 2012; Humphrey et al., 2012). The researchers use various types of measures for financial performance - Accounting - based measures such as ROA, ROE, PBT, etc. and Market-based measures such as Stock Returns, Share Prices, MVA, etc. The various measures for firm's Sustainability Performance used by researchers are – GRI-based Disclosure Index Scores, Existence of firms' GRI Sustainability Reports, External Sustainability Ratings (from KLD, Vigeo, or Asset 4 database), etc. The review of literature has been presented in Table 2 given below.

Table 2 : Relationship between corporate sustainability and financial performance

S.No.	Study & Country	Measure of Corporate Sustainability	Measure of Financial Performance	Relationship
1	Jones (2005) - Australia	GRI Sustainability Reporting Index Score	Market adjusted returns; other financial ratios; and financial distress probability scores.	Mixed Results with different measures of company performance
2	Van de Velde et al. (2005) - Europe	Vigeo Sustainability Scores on - Human Resources, Environment, Customers & Suppliers, Community & Society, and	Average Monthly Returns on portfolio	Positive, but not significant
		Corporate Governance		
3	Brammer et al. (2006) - UK	Composite/Aggregate Sustainability Score from EIRIS database	Stock Returns	Negative

4	Moneva and Ortas (2008) – Europe	Disclosures in GRI Sustainability Report	Share Price Returns	Not Significant
5	Buys et al. (2011) - South Africa	Submission of Sustainability reports to GRI	ROA, ROE, EVA and MVA	Slightly positive, but not significant
6	Dhaliwal et al. (2011) – US	KLD Ratings	Cost of Equity Capital	Negative
7	Ameer and Othman (2012) - Developed Countries	Scores on 4 Indices – Environment, Diversity, Community and Ethics	Sales revenue growth (SRG), ROA, PBT and CFO	Positive & bi-directional relationship
8	Bayoud et al. (2012) - Libya	Disclosure of Environmental, Consumer, Community Involvement, Employee Performance	ROA, Revenue, ROI	Positive
9	Eccles et al. (2012) - US	ESG disclosure scores from Asset4, Bloomberg and SAM database	Stock returns, ROA, ROE	Positive
10	N. Burhan and Rahmanti (2012) - Indonesia	GRI based Disclosure Index Score	ROA	Positive
11	Venanzi (2012) - Europe	Social ratings on community, corporate governance, customers, employees, environment, suppliers, business ethics, & controversies.	ROE, ROA, ROS.	Not Significant

VI. Hypotheses

Based on theoretical arguments and review of literature, and keeping the research objectives in mind, the following five hypotheses have been formulated and these are shown in Table 3 below.

Table 3 : Description of hypotheses

S. No.	Hypothesis
1)	Ho1: Overall sustainability performance of company has no impact on its financial performance. Ha1: Overall sustainability performance of company has an impact on its financial performance.
2)	Ho2: Community-related performance of company has no impact on its financial performance. Ha2: Community-related performance of company has an impact on its financial performance.
3)	Ho3: Employees-related performance of company has no impact on its financial performance. Ha3: Employees-related performance of company has an impact on its financial performance.
4)	Ho4: Environment-related performance of company has no impact on its financial performance. Ha4: Environment-related performance of company has an impact on its financial performance.
5)	Ho5: Governance-related performance of company has no impact on its financial performance. Ha5: Governance-related performance of company has an impact on its financial performance.

VII. Research Methodology

The present study makes use of secondary data. The average data over a period of two years from FY 2010-11 to FY 2011-12 has been used to enable cross-sectional analysis. A series of statistical tools like – multiple regression, correlation, t-test and F-test have been used to analyze the data and to investigate the impact of corporate sustainability on financial performance.

a) Sample Description

The following criteria have been used to select companies eligible to be included in sample:

Companies continuously included in S&P CNX Nifty 50 Index from 1st April, 2010 to 31st March, 2012 = 45
Less: Banks and Financial Companies = 08 Less: Companies whose annual financial data as on 31st March is not available = 05
Less: not available = 01 Less: Companies not publish Sustainability Report as per GRI guidelines = 11 **Total Companies Eligible for Sample = 20**

Thus, the final sample comprises of non-financial companies; listed on the NSE; which have continuously been included in NIFTY 50 Index during 1st April, 2010 to 31st March, 2012, with easily available financial and sustainability data, and which issue sustainability report as per GRI guidelines. The 20 sample companies and the industry to which they belong are shown below in Table 4.

Table 4 : Sample description

S.N.	Sample Companies	Industry
1	Bharat Petroleum Corporation Ltd. (BPCL)	Petroleum Refineries
2	Bharti Airtel Ltd.	Telecommunications
3	GAIL (India) Ltd.	Natural Gas Distribution
4	Hindalco Industries Ltd.	Mining (Except Oil & Gas)
5	Hindustan Unilever Ltd.	Food Products
6	Infosys Ltd.	IT & Network Services
7	ITC	Conglomerates (FMCG, Hotels and Agri Business)
8	Larsen & Toubro Ltd.	Heavy & Civil Engineering Construction
9	Mahindra & Mahindra Ltd.	Motor Vehicle Manufacturing
10	Maruti Suzuki India Ltd.	Motor Vehicle Manufacturing
11	NTPC Ltd.	Electric & Gas Utilities
12	Oil & Natural Gas Corporation Ltd. (ONGC)	Oil & Gas Extraction
13	Power Grid Corporation of India Ltd.	Electric & Gas Utilities
14	Reliance Industries Ltd.	Chemicals, Plastics & Rubber Products Manufacturing
15	Sterlite Industries (India) Ltd.	Mining (Except Oil & Gas)
16	Tata Consultancy Services Ltd. (TCS)	IT & Network Services
17	Tata Motors Ltd.	Motor Vehicle Manufacturing
18	Tata Power Co. Ltd.	Electric & Gas Utilities
19	Tata Steel Ltd.	Steel Manufacturing
20	Wipro Ltd.	IT & Network Services

b) Variable Description and Data Sources

Five Accounting-based measures, namely, Return on Assets (ROA), Return on Equity (ROE), Return on Capital Employed (ROCE), Profit before Tax (PBT), and a growth variable - Growth in Total Assets (GTA), have been used as proxies for financial performance. Accounting-based measures have been used because the audited accounting data is likely to be authentic and credible and is not influenced by market perceptions or speculations, and is thus considered less noisy in comparison to market based indicators like stock returns, share prices, etc. (Lopez et al., 2007). Overall Sustainability Rating (OSR), Community Performance Rating (COM), Employees Performance Rating (EMP), Environmental Performance Rating (ENV) and Governance Performance Rating (GOV) have been used as proxies for sustainability performance of company.

The financial data has been obtained from company's website, audited financial statements, annual reports and Moneycontrol.com. Corporate Sustainability, governance, community, employee and environment ratings data have been obtained from "CSRHub database", which claims to be world's largest corporate sustainability ratings database and principally adheres to GRI guidelines.

Further, we controlled for size of firm because larger firms are likely to have higher profitability as they have greater resources for investing in profitable ventures. We use natural log of total assets as proxy for firm size.

c) Research Model

This research paper tests two different models using Multiple Regression Analysis as statistical tool in IBM SPSS Statistics software, in order to examine and analyze the relationship between corporate sustainability and financial performance. These models are described in the following section.

i. *First Model*

The first model intends to examine the impact of overall sustainability rating of company (independent variable - OSR) on the financial performance of firm (dependent variables – ROA, ROE, ROCE, PBT, and GTA); while controlling for size of firm (SIZE). Five regression equations shall be tested in this model, which are as follows:

$$ROA = c + b1.OSR + b2.SIZE \quad (1)$$

$$ROE = c + b1.OSR + b2.SIZE \quad (2)$$

$$ROCE = c + b1.OSR + b2.SIZE \quad (3)$$

$$PBT = c + b1.OSR + b2.SIZE \quad (4)$$

$$GTA = c + b1.OSR + b2.SIZE \quad (5)$$

ii. *Second Model*

The second model aims at examining separately the impact of four major components of corporate sustainability (Community, Employees, Environment and Governance) on company's financial performance, while controlling for size of firm. The five regression equations to be tested in this model are as follows:

$$ROA = c + b1.COM + b2.EMP + b3.ENV + b4.GOV + b5.SIZE \quad (6)$$

$$ROE = c + b1.COM + b2.EMP + b3.ENV + b4.GOV + b5.SIZE \quad (7)$$

$$ROCE = c + b1.COM + b2.EMP + b3.ENV + b4.GOV + b5.SIZE \quad (8)$$

$$PBT = c + b1.COM + b2.EMP + b3.ENV + b4.GOV + b5.SIZE \quad (9)$$

$$GTA = c + b1.COM + b2.EMP + b3.ENV + b4.GOV + b5.SIZE \quad (10)$$

VIII. Data analysis and Results

The descriptive statistics for various variables used in this study have been shown in Table 5 below.

Table 5 : Descriptive statistics

Variables	N	Mean	Median	Std. Deviation
ROA (%)	20	15.923	12.219	11.036
ROE (%)	20	19.44011	14.092	16.517
ROCE (%)	20	25.663	16.790	24.029
PBT (in Rs. Cr.)	20	8125.417	5556.093	8168.097
GTA (%)	20	13.66740	14.40400	8.497
OSR (%)	20	52.95	54	7.467
COM (%)	20	53.75	54	8.916
EMP (%)	20	55.825	55.75	6.885
ENV (%)	20	53	54.25	8.382
GOV (%)	20	49.85	50.75	8.604
SIZE (Natural Log of Total Assets)	20	10.80472	10.67852	0.802

From Table 5, we observe that the mean value of Overall Sustainability Rating is only 52.95% and ratings along four components of sustainability are also approximately 50%. This highlights that Indian companies need to take strong steps towards sustainability to improve their sustainability performance ratings.

The results of first model regarding impact of overall sustainability rating on financial performance of company have been summarized in Table 6 below.

Table 6 : Summarized results of first model

Particulars	R	R^2	Adjusted R^2	F	Significance of F	Beta Coefficient for OSR (b_1)	p-value
ROA	.420	.176	.079	1.817	.193	.316	.381
ROE	.568	.323	.243	4.050	.036	-.607	.220
ROCE	.520	.270	.184	3.148	.069	-.441	.548
PBT	.671	.451	.386	6.973	.006	30.584	.887
GTA	.436	.190	.095	1.992	.167	.155	.571

From Table 6, we observe that all p-values are more than .05, while most of beta values (b1) are positive. Thus, Overall Sustainability Rating (OSR) has positive but insignificant impact on financial performance of company. Thus, we accept the first null hypothesis Ho1 and reject the first alternate hypothesis Ha1.

The results of second model regarding impact of four components of sustainability on financial performance of company have been summarized in Table 7 below.

Table 7 : Summarized results of second model

Particulars	ROA	ROE	ROCE	PBT	GTA
R	.730	.769	.760	.826	.690
R^2	.533	.592	.577	.683	.475
Adjusted R^2	.367	.446	.426	.570	.288
F	3.201	4.064	3.825	6.036	2.538
Significance of F	.039	.017	.021	.004	.078
Beta Coefficient for COM (b_1)	1.182	1.106	1.833	260.220	.314
Beta Coefficient for EMP (b_2)	-1.526	-1.684	-2.901	-886.278	.154
Beta Coefficient for ENV (b_3)	-1.228	-2.483	-3.337	-464.416	.871
Beta Coefficient for GOV (b_4)	1.381	1.926	3.026	827.701	-1.073
p-value for COM	.072*	.214	.167	.494	.537
p-value for EMP	.011**	.036**	.017**	.014**	.722
p-value for ENV	.066*	.012**	.020**	.237	.106
p-value for GOV	.024**	.025**	.018**	.027**	.031**

Note:
***. Significant @ 5% level of significance*
**. Significant @ 10% level of significance*

The following conclusions can be inferred from analysis of Table 7:

- Community-related performance has insignificant positive relationship with company's financial performance. Hence, the second alternate hypothesis (Ha2) is rejected.
- Employee-related performance has significant negative relationship with company's financial performance. Hence, the third alternate hypothesis (Ha3) is accepted.
- Environment-related performance has significant negative relationship with company's financial performance. Hence, the fourth alternate hypothesis (Ha4) is accepted.
- Governance-related performance has significant positive relationship with company's financial performance. Hence, the fifth alternate hypothesis (Ha5) is accepted.

The results of Hypothesis Testing are shown below in Table 8.

Table 8 : Results of hypothesis testing

Hypothesis (Alternate)	Accept/Reject
Ha1	Reject
Ha2	Reject
Ha3	Accept
Ha4	Accept
Ha5	Accept

IX. Conclusions and Discussion

The statistical results reveal that corporate sustainability as a whole has no significant influence on financial performance. Further, corporate sustainability influences some of the financial performance measures positively (ROA, PBT & GTA), while others negatively (ROE and ROCE). Our result confirms to the findings of many existing researches which argue that corporate sustainability has no significant association with firm performance (Buys et al., 2011; Manescu, 2011), no significant impact in short-term (Adams et al., 2012) and that the varying effects of different dimensions of sustainability may negate and offset each other leading to no significant influence on financial performance (Galema et al., 2008; Statman & Glushkov, 2009; Brammer et al., 2006).

Further investigation of the impact of each component of sustainability separately on company's financial performance provides clearer results. We find that all components except Community, i.e., Employees, Environment and Governance, have significant but varying association with financial performance. Governance and Community dimensions have positive influence, while Employees and Environment dimensions have negative influence on financial performance.

The present study also reveals insignificant positive association between corporate sustainability and growth of firm. This finding is in consonance with Kapoor and Sandhu (2010). This may be due to the reason that growth of a firm is dependent on other factors like product quality, price, marketing strategy, etc. apart from sustainability activities performed by firm. The control variable (firm size) comes out to be significant for financial performance. This result is in consonance with our expectation and with those observed by Guindry and Patten (2010).

Our research result that sustainability performance along employees, environment and governance dimensions does significantly influence company's financial performance may support company's decision to improve its performance in managing sustainability. Companies should understand that improving sustainability performance is as important as improving the financial performance. A company

needs to be concerned towards the needs of future generations in running the business, in order to ensure its survival in the long-run.

X. Limitations of Study

The present study is subject to certain limitations. Firstly, the sample size is small (i.e. 20 companies). Secondly, the time frame of research is short (i.e. 2 years). Thirdly, market-based measures of financial performance are not considered in this paper. Lastly, the study ignores control variables like age of firm, growth of firm, capital intensity, leverage, risk, R&D intensity, industry type, etc. that may have significant influence on this relationship.

The results of study should be interpreted in light of these limitations and the future researchers should attempt to overcome them while doing further research in this area.

References Références Referencias

1. Adams, M., Thornton, B., & Sepehri, M. (2012, April). The impact of the pursuit of sustainability on the financial performance of the firm. Journal of Sustainability and Green Business, 1. Retrieved from http://www.aabri.com/manuscripts/10706.pdf
2. Ameer, R., & Othman, R. (2012, June). Sustainability Practices and Corporate Financial Performance: A Study Based on the Top Global Corporations. Journal of Business Ethics, 108(1), 61-79.
3. Bayoud, N. S., Kavanagh, M., & Slaughter, G. (2012, April). Corporate Social Responsibility Disclosure and Corporate Reputation in Developing Countries: The Case of Libya. Journal of Business and Policy Research, 7(1), 131-60.
4. Brammer, S., Brooks, C., & Pavelin, S. (2006). Corporate Social Performance and Stock Returns: UK Evidence from Disaggregate Measures. Financial Management, 35(3). Retrieved from http://www.jstor.org/discover/10.2307/30137803?uid=3738256&uid=2129&uid=2&uid=70&uid=4&sid=21101616684413
5. Brundtland, G. H. (1987). Our Common Future. United Nations World Commission on Environment and Development (Brundtland Commission). Oxford: Oxford University Press. ISBN: 019282080X
6. Buys, P., Oberholzer, M., & Andrikopoulos, P. (2011). An investigation of the economic performance of sustainability reporting companies versus non-reporting companies: A South African perspective. Journal of Social Sciences, 29(2), 151-158.
7. CSRHub. (n.d.). CSRHub Schema Description. Retrieved November 15, 2013, from http://www.csrhub.com/content/csrhub-data-schema/
8. de Klerk, M., & de Villiers, C. (2012). The value relevance of corporate responsibility reporting: South African evidence. Meditari Accountancy Research, 20(1), 2-2.
9. Detre, J. D., & Gunderson, M. A. (2011). The Triple Bottom Line: What is the Impact on the Returns to Agribusiness?. International Food and Agribusiness Management Review, 14(4), 165-178.
10. Dhaliwal, D. S., Li, O. Z., Tsang, A., & Yang, Y. G. (2011). Voluntary non-financial disclosure and the cost of equity capital: The initiation of corporate social responsibility reporting. The Accounting Review, 86(1), 59-100.
11. Eccles, R. G., Ioannou, I., & Serafeim, G. (2012). The impact of a corporate culture of sustainability on corporate behavior and performance (No. w17950). National Bureau of Economic Research.
12. Elkington, J. (1998). Cannibals with forks. Gabriola Island, BC, Canada: New Society Publishers.
13. Ernst & Young. (2009). Non-financial reporting. Retrieved Nov 30, 2012, from http://www.ey.com/Publication/vwLUAssets/Non-financial_reporting/$FILE/Climate%20change_Non%20financial%20reporting.pdf
14. Freeman, R. E. (1984). Strategic Management: A Stakeholder Approach. London: Financial Times Prentice Hall.
15. Galema, R., Plantinga, A., & Scholtens, B. (2008). The stocks at stake: Return and risk in socially responsible investment. Journal of Banking & Finance, 32(12), 2646-2654.
16. Global Reporting Initiative. (2011). G3.1 Sustainability Reporting Guidelines. Global Reporting Initiative. Retrieved from https://www.globalreporting.org/resourcelibrary/G3.1-Guidelines-Incl-Technical-Protocol.pdf
17. Greenwald, C. (2010). ESG and Earnings Performance. Thomson Reuters. Retrieved from http://thomsonreuters.com/content/financial/pdf/news_content/esg_earnings_performance.pdf
18. Guidry, R. P., & Patten, D. M. (2010). Market reactions to the first-time issuance of corporate sustainability reports: Evidence that quality matters. Sustainability Accounting, Management and Policy Journal, 1(1), 33-50.
19. Humphrey, J. E., Lee, D. D., & Shen, Y. (2012). The independent effects of environmental, social and governance initiatives on the performance of UK firms. Australian Journal of Management, 37(2), 135-151.
20. Jones, S. (2005). Notes of the University of Sydney Pacioli Society. Abacus, 41(2), 211-216.
21. Kapoor, S., & Sandhu, H. S. (2010). Does it pay to be socially responsible? An empirical examination of impact of corporate social responsibility on financial performance. Global Business Review, 11(2), 185-208.
22. Khaveh, A., Nikhasemi, S. R., Haque, A., & Yousefi, A. (2012).Voluntary Sustainability Disclosure,

Revenue, and Shareholders Wealth A Perspective from Singaporean Companies. Business Management Dynamics, 1(9), 06-12.
23. Lindblom, C. K. (1993). The Implication of Organization Legitimacy for Corporate Social Performance and Disclosure. Paper presented at the Critical Perspectives in Accounting Conference, New York.
24. Lopez, M. V., Garcia, A., & Rodriguez, L. (2007). Sustainable development and corporate performance: A study based on the Dow Jones Sustainability Index. Journal of Business Ethics, 75(3), 285-300.
25. Manescu, C. (2011). Stock returns in relation to environmental, social and governance performance: Mispricing or compensation for risk?. Sustainable development, 19(2), 95-118.
26. Mays, S. (2003). Corporate Sustainability-an Investor Perspective: The Mays Report. Assistant Secretary. Environment Protection Branch. Department of the Environment and Heritage. Retrieved from http://www.arema.com.au/media/mays-report.pdf
27. Mohd Taib, E., & Ameer, R. (2012). Relationship between Corporate Sustainability Practices and Financial Performance: Evidence from the GRI Reporting Companies. Available at SSRN: http://ssrn.com/abstract=2152124 or http://dx.doi.org/10.2139/ssrn.2152124
28. Moneva, J. M., & Ortas, E. (2008). Are stock markets influenced by sustainability matter? Evidence from European companies. International Journal of Sustainable Economy, 1(1), 1-16.
29. N.Burhan, A. H., & Rahmanti, W. (2012).The Impact of Sustainability Reporting on Company Performance. Journal of Economics, Business, and Accountancy| Ventura, 15(2), 257-272.
30. Ngwakwe, C. C. (2009). Environmental responsibility and firm performance: evidence from Nigeria. International Journal of Humanities and Social Sciences, 3(2), 97-103.
31. Schadewitz, H., & Niskala, M. (2010). Communication via responsibility reporting and its effect on firm value in Finland. Corporate Social Responsibility and Environmental Management, 17(2), 96-106.
32. Semenova, N., Hassel, L., & Nilsson, H. (2009). The value relevance of environmental and social performance: Evidence from Swedish SIX 300 companies. Retrieved from http://www.pwc. com/sv SE/se/hallbar-utveckling/assets/sammanfattning six300. pdf.
33. Statman, M. D., & Glushkov. (2009). The wages of social responsibility. Financial Analysts Journal, 65, 33-46.
34. Van de Velde, E., Vermeir, W., & Corten, F. (2005). Corporate social responsibility and financial performance. Corporate Governance, 5(3), 129-138.
35. Venanzi, D. (2012). Social Ratings and Financial Performance: An Instrumental Approach. Available at SSRN 2188859.
36. Warren, J., & Thomsen, M. (2012). The Case for Corporate Responsibility Reporting: Valuing and Communicating the Intangibles. White Paper. VT: OneReport, Inc.
37. World Business Council for Sustainable Development. (2002, February). The business case for sustainable development. Switzerland. Retrieved from http://www.wbcsd.ch/DocRoot/rZNj49UF0okxGvdLfDte/business-case.pdf

Global Journals Inc. (US) Guidelines Handbook 2013

www.GlobalJournals.org

FELLOW OF ASSOCIATION OF RESEARCH SOCIETY IN BUSINESS (FARSB)

Global Journals Incorporate (USA) is accredited by Open Association of Research Society (OARS), U.S.A and in turn, awards "FARSB" title to individuals. The 'FARSB' title is accorded to a selected professional after the approval of the Editor-in-Chief/Editorial Board Members/Dean.

- The "FARSB" is a dignified title which is accorded to a person's name viz. Dr. John E. Hall, Ph.D., FARSB or William Walldroff, M.S., FARSB.

FARSB accrediting is an honor. It authenticates your research activities. After recognition as FARSB, you can add 'FARSB' title with your name as you use this recognition as additional suffix to your status. This will definitely enhance and add more value and repute to your name. You may use it on your professional Counseling Materials such as CV, Resume, and Visiting Card etc.

The following benefits can be availed by you only for next three years from the date of certification:

FARSB designated members are entitled to avail a 40% discount while publishing their research papers (of a single author) with Global Journals Incorporation (USA), if the same is accepted by Editorial Board/Peer Reviewers. If you are a main author or co-author in case of multiple authors, you will be entitled to avail discount of 10%.

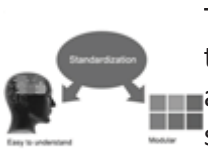
Once FARSB title is accorded, the Fellow is authorized to organize a symposium/seminar/conference on behalf of Global Journal Incorporation (USA).The Fellow can also participate in conference/seminar/symposium organized by another institution as representative of Global Journal. In both the cases, it is mandatory for him to discuss with us and obtain our consent.

You may join as member of the Editorial Board of Global Journals Incorporation (USA) after successful completion of three years as Fellow and as Peer Reviewer. In addition, it is also desirable that you should organize seminar/symposium/conference at least once.

We shall provide you intimation regarding launching of e-version of journal of your stream time to time.This may be utilized in your library for the enrichment of knowledge of your students as well as it can also be helpful for the concerned faculty members.

The FARSB can go through standards of OARS. You can also play vital role if you have any suggestions so that proper amendment can take place to improve the same for the benefit of entire research community.

As FARSB, you will be given a renowned, secure and free professional email address with 100 GB of space e.g. johnhall@globaljournals.org. This will include Webmail, Spam Assassin, Email Forwarders,Auto-Responders, Email Delivery Route tracing, etc.



The FARSB will be eligible for a free application of standardization of their researches. Standardization of research will be subject to acceptability within stipulated norms as the next step after publishing in a journal. We shall depute a team of specialized research professionals who will render their services for elevating your researches to next higher level, which is worldwide open standardization.

The FARSB member can apply for grading and certification of standards of their educational and Institutional Degrees to Open Association of Research, Society U.S.A. Once you are designated as FARSB, you may send us a scanned copy of all of your credentials. OARS will verify, grade and certify them. This will be based on your academic records, quality of research papers published by you, and some more criteria. After certification of all your credentials by OARS, they will be published on your Fellow Profile link on website https://associationofresearch.org which will be helpful to upgrade the dignity.

The FARSB members can avail the benefits of free research podcasting in Global Research Radio with their research documents. After publishing the work, (including published elsewhere worldwide with proper authorization) you can upload your research paper with your recorded voice or you can utilize chargeable services of our professional RJs to record your paper in their voice on request.

The FARSB member also entitled to get the benefits of free research podcasting of their research documents through video clips. We can also streamline your conference videos and display your slides/ online slides and online research video clips at reasonable charges, on request.

The FARSB is eligible to earn from sales proceeds of his/her researches/reference/review Books or literature, while publishing with Global Journals. The FARSB can decide whether he/she would like to publish his/her research in a closed manner. In this case, whenever readers purchase that individual research paper for reading, maximum 60% of its profit earned as royalty by Global Journals, will be credited to his/her bank account. The entire entitled amount will be credited to his/her bank account exceeding limit of minimum fixed balance. There is no minimum time limit for collection. The FARSC member can decide its price and we can help in making the right decision.

The FARSB member is eligible to join as a paid peer reviewer at Global Journals Incorporation (USA) and can get remuneration of 15% of author fees, taken from the author of a respective paper. After reviewing 5 or more papers you can request to transfer the amount to your bank account.

MEMBER OF ASSOCIATION OF RESEARCH SOCIETY IN BUSINESS (MARSB)

The ' MARSB ' title is accorded to a selected professional after the approval of the Editor-in-Chief / Editorial Board Members/Dean.

The "MARSB" is a dignified ornament which is accorded to a person's name viz. Dr. John E. Hall, Ph.D., MARSB or William Walldroff, M.S., MARSB.

MARSB accrediting is an honor. It authenticates your research activities. After becoming MARSB, you can add 'MARSB' title with your name as you use this recognition as additional suffix to your status. This will definitely enhance and add more value and repute to your name. You may use it on your professional Counseling Materials such as CV, Resume, Visiting Card and Name Plate etc.

The following benefitscan be availed by you only for next three years from the date of certification.

MARSB designated members are entitled to avail a 25% discount while publishing their research papers (of a single author) in Global Journals Inc., if the same is accepted by our Editorial Board and Peer Reviewers. If you are a main author or co-author of a group of authors, you will get discount of 10%.

As MARSB, you will be given a renowned, secure and free professional email address with 30 GB of space e.g. johnhall@globaljournals.org. This will include Webmail, Spam Assassin, Email Forwarders,Auto-Responders, Email Delivery Route tracing, etc.

We shall provide you intimation regarding launching of e-version of journal of your stream time to time.This may be utilized in your library for the enrichment of knowledge of your students as well as it can also be helpful for the concerned faculty members.

The MARSB member can apply for approval, grading and certification of standards of their educational and Institutional Degrees to Open Association of Research, Society U.S.A.

Once you are designated as MARSB, you may send us a scanned copy of all of your credentials. OARS will verify, grade and certify them. This will be based on your academic records, quality of research papers published by you, and some more criteria.

It is mandatory to read all terms and conditions carefully.

AUXILIARY MEMBERSHIPS

Institutional Fellow of Open Association of Research Society (USA)-OARS (USA)

Global Journals Incorporation (USA) is accredited by Open Association of Research Society, U.S.A (OARS) and in turn, affiliates research institutions as "Institutional Fellow of Open Association of Research Society" (IFOARS).

The "FARSC" is a dignified title which is accorded to a person's name viz. Dr. John E. Hall, Ph.D., FARSC or William Walldroff, M.S., FARSC.

The IFOARS institution is entitled to form a Board comprised of one Chairperson and three to five board members preferably from different streams. The Board will be recognized as "Institutional Board of Open Association of Research Society"-(IBOARS).

The Institute will be entitled to following benefits:

The IBOARS can initially review research papers of their institute and recommend them to publish with respective journal of Global Journals. It can also review the papers of other institutions after obtaining our consent. The second review will be done by peer reviewer of Global Journals Incorporation (USA) The Board is at liberty to appoint a peer reviewer with the approval of chairperson after consulting us.

The author fees of such paper may be waived off up to 40%.

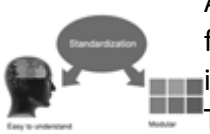
The Global Journals Incorporation (USA) at its discretion can also refer double blind peer reviewed paper at their end to the board for the verification and to get recommendation for final stage of acceptance of publication.

The IBOARS can organize symposium/seminar/conference in their country on behalf of Global Journals Incorporation (USA)-OARS (USA). The terms and conditions can be discussed separately.

The Board can also play vital role by exploring and giving valuable suggestions regarding the Standards of "Open Association of Research Society, U.S.A (OARS)" so that proper amendment can take place for the benefit of entire research community. We shall provide details of particular standard only on receipt of request from the Board.

The board members can also join us as Individual Fellow with 40% discount on total fees applicable to Individual Fellow. They will be entitled to avail all the benefits as declared. Please visit Individual Fellow-sub menu of GlobalJournals.org to have more relevant details.

We shall provide you intimation regarding launching of e-version of journal of your stream time to time. This may be utilized in your library for the enrichment of knowledge of your students as well as it can also be helpful for the concerned faculty members.



After nomination of your institution as "Institutional Fellow" and constantly functioning successfully for one year, we can consider giving recognition to your institute to function as Regional/Zonal office on our behalf.
The board can also take up the additional allied activities for betterment after our consultation.

The following entitlements are applicable to individual Fellows:

Open Association of Research Society, U.S.A (OARS) By-laws states that an individual Fellow may use the designations as applicable, or the corresponding initials. The Credentials of individual Fellow and Associate designations signify that the individual has gained knowledge of the fundamental concepts. One is magnanimous and proficient in an expertise course covering the professional code of conduct, and follows recognized standards of practice.

Open Association of Research Society (US)/ Global Journals Incorporation (USA), as described in Corporate Statements, are educational, research publishing and professional membership organizations. Achieving our individual Fellow or Associate status is based mainly on meeting stated educational research requirements.

Disbursement of 40% Royalty earned through Global Journals : Researcher = 50%, Peer Reviewer = 37.50%, Institution = 12.50% E.g. Out of 40%, the 20% benefit should be passed on to researcher, 15 % benefit towards remuneration should be given to a reviewer and remaining 5% is to be retained by the institution.

We shall provide print version of 12 issues of any three journals [as per your requirement] out of our 38 journals worth $ 2376 USD.

Other:

The individual Fellow and Associate designations accredited by Open Association of Research Society (US) credentials signify guarantees following achievements:

- The professional accredited with Fellow honor, is entitled to various benefits viz. name, fame, honor, regular flow of income, secured bright future, social status etc.

- In addition to above, if one is single author, then entitled to 40% discount on publishing research paper and can get 10%discount if one is co-author or main author among group of authors.
- The Fellow can organize symposium/seminar/conference on behalf of Global Journals Incorporation (USA) and he/she can also attend the same organized by other institutes on behalf of Global Journals.
- The Fellow can become member of Editorial Board Member after completing 3yrs.
- The Fellow can earn 60% of sales proceeds from the sale of reference/review books/literature/publishing of research paper.
- Fellow can also join as paid peer reviewer and earn 15% remuneration of author charges and can also get an opportunity to join as member of the Editorial Board of Global Journals Incorporation (USA)
- • This individual has learned the basic methods of applying those concepts and techniques to common challenging situations. This individual has further demonstrated an in–depth understanding of the application of suitable techniques to a particular area of research practice.

Note :

"

- In future, if the board feels the necessity to change any board member, the same can be done with the consent of the chairperson along with anyone board member without our approval.
- In case, the chairperson needs to be replaced then consent of 2/3rd board members are required and they are also required to jointly pass the resolution copy of which should be sent to us. In such case, it will be compulsory to obtain our approval before replacement.
- In case of "Difference of Opinion [if any]" among the Board members, our decision will be final and binding to everyone.

"

Process of submission of Research Paper

The Area or field of specialization may or may not be of any category as mentioned in 'Scope of Journal' menu of the GlobalJournals.org website. There are 37 Research Journal categorized with Six parental Journals GJCST, GJMR, GJRE, GJMBR, GJSFR, GJHSS. For Authors should prefer the mentioned categories. There are three widely used systems UDC, DDC and LCC. The details are available as 'Knowledge Abstract' at Home page. The major advantage of this coding is that, the research work will be exposed to and shared with all over the world as we are being abstracted and indexed worldwide.

The paper should be in proper format. The format can be downloaded from first page of 'Author Guideline' Menu. The Author is expected to follow the general rules as mentioned in this menu. The paper should be written in MS-Word Format (*.DOC,*.DOCX).

The Author can submit the paper either online or offline. The authors should prefer online submission.Online Submission: There are three ways to submit your paper:

(A) (I) First, register yourself using top right corner of Home page then Login. If you are already registered, then login using your username and password.

(II) Choose corresponding Journal.

(III) Click 'Submit Manuscript'. Fill required information and Upload the paper.

(B) If you are using Internet Explorer, then Direct Submission through Homepage is also available.

(C) If these two are not convenient, and then email the paper directly to dean@globaljournals.org.

Offline Submission: Author can send the typed form of paper by Post. However, online submission should be preferred.

Preferred Author Guidelines

MANUSCRIPT STYLE INSTRUCTION (Must be strictly followed)

Page Size: 8.27" X 11'"

- Left Margin: 0.65
- Right Margin: 0.65
- Top Margin: 0.75
- Bottom Margin: 0.75
- Font type of all text should be Swis 721 Lt BT.
- Paper Title should be of Font Size 24 with one Column section.
- Author Name in Font Size of 11 with one column as of Title.
- Abstract Font size of 9 Bold, "Abstract" word in Italic Bold.
- Main Text: Font size 10 with justified two columns section
- Two Column with Equal Column with of 3.38 and Gaping of .2
- First Character must be three lines Drop capped.
- Paragraph before Spacing of 1 pt and After of 0 pt.
- Line Spacing of 1 pt
- Large Images must be in One Column
- Numbering of First Main Headings (Heading 1) must be in Roman Letters, Capital Letter, and Font Size of 10.
- Numbering of Second Main Headings (Heading 2) must be in Alphabets, Italic, and Font Size of 10.

You can use your own standard format also.
Author Guidelines:

1. General,

2. Ethical Guidelines,

3. Submission of Manuscripts,

4. Manuscript's Category,

5. Structure and Format of Manuscript,

6. After Acceptance.

1. GENERAL

Before submitting your research paper, one is advised to go through the details as mentioned in following heads. It will be beneficial, while peer reviewer justify your paper for publication.

Scope

The Global Journals Inc. (US) welcome the submission of original paper, review paper, survey article relevant to the all the streams of Philosophy and knowledge. The Global Journals Inc. (US) is parental platform for Global Journal of Computer Science and Technology, Researches in Engineering, Medical Research, Science Frontier Research, Human Social Science, Management, and Business organization. The choice of specific field can be done otherwise as following in Abstracting and Indexing Page on this Website. As the all Global

Journals Inc. (US) are being abstracted and indexed (in process) by most of the reputed organizations. Topics of only narrow interest will not be accepted unless they have wider potential or consequences.

2. ETHICAL GUIDELINES

Authors should follow the ethical guidelines as mentioned below for publication of research paper and research activities.

Papers are accepted on strict understanding that the material in whole or in part has not been, nor is being, considered for publication elsewhere. If the paper once accepted by Global Journals Inc. (US) and Editorial Board, will become the copyright of the Global Journals Inc. (US).

Authorship: The authors and coauthors should have active contribution to conception design, analysis and interpretation of findings. They should critically review the contents and drafting of the paper. All should approve the final version of the paper before submission

The Global Journals Inc. (US) follows the definition of authorship set up by the Global Academy of Research and Development. According to the Global Academy of R&D authorship, criteria must be based on:

1) Substantial contributions to conception and acquisition of data, analysis and interpretation of the findings.

2) Drafting the paper and revising it critically regarding important academic content.

3) Final approval of the version of the paper to be published.

All authors should have been credited according to their appropriate contribution in research activity and preparing paper. Contributors who do not match the criteria as authors may be mentioned under Acknowledgement.

Acknowledgements: Contributors to the research other than authors credited should be mentioned under acknowledgement. The specifications of the source of funding for the research if appropriate can be included. Suppliers of resources may be mentioned along with address.

Appeal of Decision: The Editorial Board's decision on publication of the paper is final and cannot be appealed elsewhere.

Permissions: It is the author's responsibility to have prior permission if all or parts of earlier published illustrations are used in this paper.

Please mention proper reference and appropriate acknowledgements wherever expected.

If all or parts of previously published illustrations are used, permission must be taken from the copyright holder concerned. It is the author's responsibility to take these in writing.

Approval for reproduction/modification of any information (including figures and tables) published elsewhere must be obtained by the authors/copyright holders before submission of the manuscript. Contributors (Authors) are responsible for any copyright fee involved.

3. SUBMISSION OF MANUSCRIPTS

Manuscripts should be uploaded via this online submission page. The online submission is most efficient method for submission of papers, as it enables rapid distribution of manuscripts and consequently speeds up the review procedure. It also enables authors to know the status of their own manuscripts by emailing us. Complete instructions for submitting a paper is available below.

Manuscript submission is a systematic procedure and little preparation is required beyond having all parts of your manuscript in a given format and a computer with an Internet connection and a Web browser. Full help and instructions are provided on-screen. As an author, you will be prompted for login and manuscript details as Field of Paper and then to upload your manuscript file(s) according to the instructions.

To avoid postal delays, all transaction is preferred by e-mail. A finished manuscript submission is confirmed by e-mail immediately and your paper enters the editorial process with no postal delays. When a conclusion is made about the publication of your paper by our Editorial Board, revisions can be submitted online with the same procedure, with an occasion to view and respond to all comments.

Complete support for both authors and co-author is provided.

4. MANUSCRIPT'S CATEGORY

Based on potential and nature, the manuscript can be categorized under the following heads:

Original research paper: Such papers are reports of high-level significant original research work.

Review papers: These are concise, significant but helpful and decisive topics for young researchers.

Research articles: These are handled with small investigation and applications

Research letters: The letters are small and concise comments on previously published matters.

5.STRUCTURE AND FORMAT OF MANUSCRIPT

The recommended size of original research paper is less than seven thousand words, review papers fewer than seven thousands words also.Preparation of research paper or how to write research paper, are major hurdle, while writing manuscript. The research articles and research letters should be fewer than three thousand words, the structure original research paper; sometime review paper should be as follows:

Papers: These are reports of significant research (typically less than 7000 words equivalent, including tables, figures, references), and comprise:

(a)Title should be relevant and commensurate with the theme of the paper.

(b) A brief Summary, "Abstract" (less than 150 words) containing the major results and conclusions.

(c) Up to ten keywords, that precisely identifies the paper's subject, purpose, and focus.

(d) An Introduction, giving necessary background excluding subheadings; objectives must be clearly declared.

(e) Resources and techniques with sufficient complete experimental details (wherever possible by reference) to permit repetition; sources of information must be given and numerical methods must be specified by reference, unless non-standard.

(f) Results should be presented concisely, by well-designed tables and/or figures; the same data may not be used in both; suitable statistical data should be given. All data must be obtained with attention to numerical detail in the planning stage. As reproduced design has been recognized to be important to experiments for a considerable time, the Editor has decided that any paper that appears not to have adequate numerical treatments of the data will be returned un-refereed;

(g) Discussion should cover the implications and consequences, not just recapitulating the results; conclusions should be summarizing.

(h) Brief Acknowledgements.

(i) References in the proper form.

Authors should very cautiously consider the preparation of papers to ensure that they communicate efficiently. Papers are much more likely to be accepted, if they are cautiously designed and laid out, contain few or no errors, are summarizing, and be conventional to the approach and instructions. They will in addition, be published with much less delays than those that require much technical and editorial correction.

The Editorial Board reserves the right to make literary corrections and to make suggestions to improve briefness.

It is vital, that authors take care in submitting a manuscript that is written in simple language and adheres to published guidelines.

Format

Language: The language of publication is UK English. Authors, for whom English is a second language, must have their manuscript efficiently edited by an English-speaking person before submission to make sure that, the English is of high excellence. It is preferable, that manuscripts should be professionally edited.

Standard Usage, Abbreviations, and Units: Spelling and hyphenation should be conventional to The Concise Oxford English Dictionary. Statistics and measurements should at all times be given in figures, e.g. 16 min, except for when the number begins a sentence. When the number does not refer to a unit of measurement it should be spelt in full unless, it is 160 or greater.

Abbreviations supposed to be used carefully. The abbreviated name or expression is supposed to be cited in full at first usage, followed by the conventional abbreviation in parentheses.

Metric SI units are supposed to generally be used excluding where they conflict with current practice or are confusing. For illustration, 1.4 l rather than 1.4 × 10-3 m3, or 4 mm somewhat than 4 × 10-3 m. Chemical formula and solutions must identify the form used, e.g. anhydrous or hydrated, and the concentration must be in clearly defined units. Common species names should be followed by underlines at the first mention. For following use the generic name should be constricted to a single letter, if it is clear.

Structure

All manuscripts submitted to Global Journals Inc. (US), ought to include:

Title: The title page must carry an instructive title that reflects the content, a running title (less than 45 characters together with spaces), names of the authors and co-authors, and the place(s) wherever the work was carried out. The full postal address in addition with the e-mail address of related author must be given. Up to eleven keywords or very brief phrases have to be given to help data retrieval, mining and indexing.

Abstract, used in Original Papers and Reviews:

Optimizing Abstract for Search Engines

Many researchers searching for information online will use search engines such as Google, Yahoo or similar. By optimizing your paper for search engines, you will amplify the chance of someone finding it. This in turn will make it more likely to be viewed and/or cited in a further work. Global Journals Inc. (US) have compiled these guidelines to facilitate you to maximize the web-friendliness of the most public part of your paper.

Key Words

A major linchpin in research work for the writing research paper is the keyword search, which one will employ to find both library and Internet resources.

One must be persistent and creative in using keywords. An effective keyword search requires a strategy and planning a list of possible keywords and phrases to try.

Search engines for most searches, use Boolean searching, which is somewhat different from Internet searches. The Boolean search uses "operators," words (and, or, not, and near) that enable you to expand or narrow your affords. Tips for research paper while preparing research paper are very helpful guideline of research paper.

Choice of key words is first tool of tips to write research paper. Research paper writing is an art.A few tips for deciding as strategically as possible about keyword search:

- One should start brainstorming lists of possible keywords before even begin searching. Think about the most important concepts related to research work. Ask, "What words would a source have to include to be truly valuable in research paper?" Then consider synonyms for the important words.
- It may take the discovery of only one relevant paper to let steer in the right keyword direction because in most databases, the keywords under which a research paper is abstracted are listed with the paper.
- One should avoid outdated words.

Keywords are the key that opens a door to research work sources. Keyword searching is an art in which researcher's skills are bound to improve with experience and time.

Numerical Methods: Numerical methods used should be clear and, where appropriate, supported by references.

Acknowledgements: Please make these as concise as possible.

References

References follow the Harvard scheme of referencing. References in the text should cite the authors' names followed by the time of their publication, unless there are three or more authors when simply the first author's name is quoted followed by et al. unpublished work has to only be cited where necessary, and only in the text. Copies of references in press in other journals have to be supplied with submitted typescripts. It is necessary that all citations and references be carefully checked before submission, as mistakes or omissions will cause delays.

References to information on the World Wide Web can be given, but only if the information is available without charge to readers on an official site. Wikipedia and Similar websites are not allowed where anyone can change the information. Authors will be asked to make available electronic copies of the cited information for inclusion on the Global Journals Inc. (US) homepage at the judgment of the Editorial Board.

The Editorial Board and Global Journals Inc. (US) recommend that, citation of online-published papers and other material should be done via a DOI (digital object identifier). If an author cites anything, which does not have a DOI, they run the risk of the cited material not being noticeable.

The Editorial Board and Global Journals Inc. (US) recommend the use of a tool such as Reference Manager for reference management and formatting.

Tables, Figures and Figure Legends

Tables: Tables should be few in number, cautiously designed, uncrowned, and include only essential data. Each must have an Arabic number, e.g. Table 4, a self-explanatory caption and be on a separate sheet. Vertical lines should not be used.

Figures: Figures are supposed to be submitted as separate files. Always take in a citation in the text for each figure using Arabic numbers, e.g. Fig. 4. Artwork must be submitted online in electronic form by e-mailing them.

Preparation of Electronic Figures for Publication

Even though low quality images are sufficient for review purposes, print publication requires high quality images to prevent the final product being blurred or fuzzy. Submit (or e-mail) EPS (line art) or TIFF (halftone/photographs) files only. MS PowerPoint and Word Graphics are unsuitable for printed pictures. Do not use pixel-oriented software. Scans (TIFF only) should have a resolution of at least 350 dpi (halftone) or 700 to 1100 dpi (line drawings) in relation to the imitation size. Please give the data for figures in black and white or submit a Color Work Agreement Form. EPS files must be saved with fonts embedded (and with a TIFF preview, if possible).

For scanned images, the scanning resolution (at final image size) ought to be as follows to ensure good reproduction: line art: >650 dpi; halftones (including gel photographs) : >350 dpi; figures containing both halftone and line images: >650 dpi.

Color Charges: It is the rule of the Global Journals Inc. (US) for authors to pay the full cost for the reproduction of their color artwork. Hence, please note that, if there is color artwork in your manuscript when it is accepted for publication, we would require you to complete and return a color work agreement form before your paper can be published.

Figure Legends: Self-explanatory legends of all figures should be incorporated separately under the heading 'Legends to Figures'. In the full-text online edition of the journal, figure legends may possibly be truncated in abbreviated links to the full screen version. Therefore, the first 100 characters of any legend should notify the reader, about the key aspects of the figure.

6. AFTER ACCEPTANCE

Upon approval of a paper for publication, the manuscript will be forwarded to the dean, who is responsible for the publication of the Global Journals Inc. (US).

6.1 Proof Corrections

The corresponding author will receive an e-mail alert containing a link to a website or will be attached. A working e-mail address must therefore be provided for the related author.

Acrobat Reader will be required in order to read this file. This software can be downloaded

(Free of charge) from the following website:

www.adobe.com/products/acrobat/readstep2.html. This will facilitate the file to be opened, read on screen, and printed out in order for any corrections to be added. Further instructions will be sent with the proof.

Proofs must be returned to the dean at dean@globaljournals.org within three days of receipt.

As changes to proofs are costly, we inquire that you only correct typesetting errors. All illustrations are retained by the publisher. Please note that the authors are responsible for all statements made in their work, including changes made by the copy editor.

6.2 Early View of Global Journals Inc. (US) (Publication Prior to Print)

The Global Journals Inc. (US) are enclosed by our publishing's Early View service. Early View articles are complete full-text articles sent in advance of their publication. Early View articles are absolute and final. They have been completely reviewed, revised and edited for publication, and the authors' final corrections have been incorporated. Because they are in final form, no changes can be made after sending them. The nature of Early View articles means that they do not yet have volume, issue or page numbers, so Early View articles cannot be cited in the conventional way.

6.3 Author Services

Online production tracking is available for your article through Author Services. Author Services enables authors to track their article - once it has been accepted - through the production process to publication online and in print. Authors can check the status of their articles online and choose to receive automated e-mails at key stages of production. The authors will receive an e-mail with a unique link that enables them to register and have their article automatically added to the system. Please ensure that a complete e-mail address is provided when submitting the manuscript.

6.4 Author Material Archive Policy

Please note that if not specifically requested, publisher will dispose off hardcopy & electronic information submitted, after the two months of publication. If you require the return of any information submitted, please inform the Editorial Board or dean as soon as possible.

6.5 Offprint and Extra Copies

A PDF offprint of the online-published article will be provided free of charge to the related author, and may be distributed according to the Publisher's terms and conditions. Additional paper offprint may be ordered by emailing us at: editor@globaljournals.org .

You must strictly follow above Author Guidelines before submitting your paper or else we will not at all be responsible for any corrections in future in any of the way.

Before start writing a good quality Computer Science Research Paper, let us first understand what is Computer Science Research Paper? So, Computer Science Research Paper is the paper which is written by professionals or scientists who are associated to Computer Science and Information Technology, or doing research study in these areas. If you are novel to this field then you can consult about this field from your supervisor or guide.

TECHNIQUES FOR WRITING A GOOD QUALITY RESEARCH PAPER:

1. Choosing the topic: In most cases, the topic is searched by the interest of author but it can be also suggested by the guides. You can have several topics and then you can judge that in which topic or subject you are finding yourself most comfortable. This can be done by asking several questions to yourself, like Will I be able to carry our search in this area? Will I find all necessary recourses to accomplish the search? Will I be able to find all information in this field area? If the answer of these types of questions will be "Yes" then you can choose that topic. In most of the cases, you may have to conduct the surveys and have to visit several places because this field is related to Computer Science and Information Technology. Also, you may have to do a lot of work to find all rise and falls regarding the various data of that subject. Sometimes, detailed information plays a vital role, instead of short information.

2. Evaluators are human: First thing to remember that evaluators are also human being. They are not only meant for rejecting a paper. They are here to evaluate your paper. So, present your Best.

3. Think Like Evaluators: If you are in a confusion or getting demotivated that your paper will be accepted by evaluators or not, then think and try to evaluate your paper like an Evaluator. Try to understand that what an evaluator wants in your research paper and automatically you will have your answer.

4. Make blueprints of paper: The outline is the plan or framework that will help you to arrange your thoughts. It will make your paper logical. But remember that all points of your outline must be related to the topic you have chosen.

5. Ask your Guides: If you are having any difficulty in your research, then do not hesitate to share your difficulty to your guide (if you have any). They will surely help you out and resolve your doubts. If you can't clarify what exactly you require for your work then ask the supervisor to help you with the alternative. He might also provide you the list of essential readings.

6. Use of computer is recommended: As you are doing research in the field of Computer Science, then this point is quite obvious.

7. Use right software: Always use good quality software packages. If you are not capable to judge good software then you can lose quality of your paper unknowingly. There are various software programs available to help you, which you can get through Internet.

8. Use the Internet for help: An excellent start for your paper can be by using the Google. It is an excellent search engine, where you can have your doubts resolved. You may also read some answers for the frequent question how to write my research paper or find model research paper. From the internet library you can download books. If you have all required books make important reading selecting and analyzing the specified information. Then put together research paper sketch out.

9. Use and get big pictures: Always use encyclopedias, Wikipedia to get pictures so that you can go into the depth.

10. Bookmarks are useful: When you read any book or magazine, you generally use bookmarks, right! It is a good habit, which helps to not to lose your continuity. You should always use bookmarks while searching on Internet also, which will make your search easier.

11. Revise what you wrote: When you write anything, always read it, summarize it and then finalize it.

12. Make all efforts: Make all efforts to mention what you are going to write in your paper. That means always have a good start. Try to mention everything in introduction, that what is the need of a particular research paper. Polish your work by good skill of writing and always give an evaluator, what he wants.

13. Have backups: When you are going to do any important thing like making research paper, you should always have backup copies of it either in your computer or in paper. This will help you to not to lose any of your important.

14. Produce good diagrams of your own: Always try to include good charts or diagrams in your paper to improve quality. Using several and unnecessary diagrams will degrade the quality of your paper by creating "hotchpotch." So always, try to make and include those diagrams, which are made by your own to improve readability and understandability of your paper.

15. Use of direct quotes: When you do research relevant to literature, history or current affairs then use of quotes become essential but if study is relevant to science then use of quotes is not preferable.

16. Use proper verb tense: Use proper verb tenses in your paper. Use past tense, to present those events that happened. Use present tense to indicate events that are going on. Use future tense to indicate future happening events. Use of improper and wrong tenses will confuse the evaluator. Avoid the sentences that are incomplete.

17. Never use online paper: If you are getting any paper on Internet, then never use it as your research paper because it might be possible that evaluator has already seen it or maybe it is outdated version.

18. Pick a good study spot: To do your research studies always try to pick a spot, which is quiet. Every spot is not for studies. Spot that suits you choose it and proceed further.

19. Know what you know: Always try to know, what you know by making objectives. Else, you will be confused and cannot achieve your target.

20. Use good quality grammar: Always use a good quality grammar and use words that will throw positive impact on evaluator. Use of good quality grammar does not mean to use tough words, that for each word the evaluator has to go through dictionary. Do not start sentence with a conjunction. Do not fragment sentences. Eliminate one-word sentences. Ignore passive voice. Do not ever use a big word when a diminutive one would suffice. Verbs have to be in agreement with their subjects. Prepositions are not expressions to finish sentences with. It is incorrect to ever divide an infinitive. Avoid clichés like the disease. Also, always shun irritating alliteration. Use language that is simple and straight forward. put together a neat summary.

21. Arrangement of information: Each section of the main body should start with an opening sentence and there should be a changeover at the end of the section. Give only valid and powerful arguments to your topic. You may also maintain your arguments with records.

22. Never start in last minute: Always start at right time and give enough time to research work. Leaving everything to the last minute will degrade your paper and spoil your work.

23. Multitasking in research is not good: Doing several things at the same time proves bad habit in case of research activity. Research is an area, where everything has a particular time slot. Divide your research work in parts and do particular part in particular time slot.

24. Never copy others' work: Never copy others' work and give it your name because if evaluator has seen it anywhere you will be in trouble.

25. Take proper rest and food: No matter how many hours you spend for your research activity, if you are not taking care of your health then all your efforts will be in vain. For a quality research, study is must, and this can be done by taking proper rest and food.

26. Go for seminars: Attend seminars if the topic is relevant to your research area. Utilize all your resources.

27. Refresh your mind after intervals: Try to give rest to your mind by listening to soft music or by sleeping in intervals. This will also improve your memory.

28. Make colleagues: Always try to make colleagues. No matter how sharper or intelligent you are, if you make colleagues you can have several ideas, which will be helpful for your research.

29. Think technically: Always think technically. If anything happens, then search its reasons, its benefits, and demerits.

30. Think and then print: When you will go to print your paper, notice that tables are not be split, headings are not detached from their descriptions, and page sequence is maintained.

31. Adding unnecessary information: Do not add unnecessary information, like, I have used MS Excel to draw graph. Do not add irrelevant and inappropriate material. These all will create superfluous. Foreign terminology and phrases are not apropos. One should NEVER take a broad view. Analogy in script is like feathers on a snake. Not at all use a large word when a very small one would be sufficient. Use words properly, regardless of how others use them. Remove quotations. Puns are for kids, not grunt readers. Amplification is a billion times of inferior quality than sarcasm.

32. Never oversimplify everything: To add material in your research paper, never go for oversimplification. This will definitely irritate the evaluator. Be more or less specific. Also too, by no means, ever use rhythmic redundancies. Contractions aren't essential and shouldn't be there used. Comparisons are as terrible as clichés. Give up ampersands and abbreviations, and so on. Remove commas, that are, not necessary. Parenthetical words however should be together with this in commas. Understatement is all the time the complete best way to put onward earth-shaking thoughts. Give a detailed literary review.

33. Report concluded results: Use concluded results. From raw data, filter the results and then conclude your studies based on measurements and observations taken. Significant figures and appropriate number of decimal places should be used. Parenthetical remarks are prohibitive. Proofread carefully at final stage. In the end give outline to your arguments. Spot out perspectives of further study of this subject. Justify your conclusion by at the bottom of them with sufficient justifications and examples.

34. After conclusion: Once you have concluded your research, the next most important step is to present your findings. Presentation is extremely important as it is the definite medium though which your research is going to be in print to the rest of the crowd. Care should be taken to categorize your thoughts well and present them in a logical and neat manner. A good quality research paper format is essential because it serves to highlight your research paper and bring to light all necessary aspects in your research.

Informal Guidelines of Research Paper Writing

Key points to remember:

- Submit all work in its final form.
- Write your paper in the form, which is presented in the guidelines using the template.
- Please note the criterion for grading the final paper by peer-reviewers.

Final Points:

A purpose of organizing a research paper is to let people to interpret your effort selectively. The journal requires the following sections, submitted in the order listed, each section to start on a new page.

The introduction will be compiled from reference matter and will reflect the design processes or outline of basis that direct you to make study. As you will carry out the process of study, the method and process section will be constructed as like that. The result segment will show related statistics in nearly sequential order and will direct the reviewers next to the similar intellectual paths throughout the data that you took to carry out your study. The discussion section will provide understanding of the data and projections as to the implication of the results. The use of good quality references all through the paper will give the effort trustworthiness by representing an alertness of prior workings.

Writing a research paper is not an easy job no matter how trouble-free the actual research or concept. Practice, excellent preparation, and controlled record keeping are the only means to make straightforward the progression.

General style:

Specific editorial column necessities for compliance of a manuscript will always take over from directions in these general guidelines.

To make a paper clear

· Adhere to recommended page limits

Mistakes to evade

- Insertion a title at the foot of a page with the subsequent text on the next page
- Separating a table/chart or figure - impound each figure/table to a single page
- Submitting a manuscript with pages out of sequence

In every sections of your document

· Use standard writing style including articles ("a", "the," etc.)

· Keep on paying attention on the research topic of the paper

· Use paragraphs to split each significant point (excluding for the abstract)

· Align the primary line of each section

· Present your points in sound order

· Use present tense to report well accepted

· Use past tense to describe specific results

· Shun familiar wording, don't address the reviewer directly, and don't use slang, slang language, or superlatives

· Shun use of extra pictures - include only those figures essential to presenting results

Title Page:

Choose a revealing title. It should be short. It should not have non-standard acronyms or abbreviations. It should not exceed two printed lines. It should include the name(s) and address (es) of all authors.

Abstract:

The summary should be two hundred words or less. It should briefly and clearly explain the key findings reported in the manuscript--must have precise statistics. It should not have abnormal acronyms or abbreviations. It should be logical in itself. Shun citing references at this point.

An abstract is a brief distinct paragraph summary of finished work or work in development. In a minute or less a reviewer can be taught the foundation behind the study, common approach to the problem, relevant results, and significant conclusions or new questions.

Write your summary when your paper is completed because how can you write the summary of anything which is not yet written? Wealth of terminology is very essential in abstract. Yet, use comprehensive sentences and do not let go readability for briefness. You can maintain it succinct by phrasing sentences so that they provide more than lone rationale. The author can at this moment go straight to shortening the outcome. Sum up the study, with the subsequent elements in any summary. Try to maintain the initial two items to no more than one ruling each.

- Reason of the study - theory, overall issue, purpose
- Fundamental goal
- To the point depiction of the research
- Consequences, including definite statistics - if the consequences are quantitative in nature, account quantitative data; results of any numerical analysis should be reported
- Significant conclusions or questions that track from the research(es)

Approach:

- Single section, and succinct
- As a outline of job done, it is always written in past tense
- A conceptual should situate on its own, and not submit to any other part of the paper such as a form or table
- Center on shortening results - bound background information to a verdict or two, if completely necessary
- What you account in an conceptual must be regular with what you reported in the manuscript
- Exact spelling, clearness of sentences and phrases, and appropriate reporting of quantities (proper units, important statistics) are just as significant in an abstract as they are anywhere else

Introduction:

The **Introduction** should "introduce" the manuscript. The reviewer should be presented with sufficient background information to be capable to comprehend and calculate the purpose of your study without having to submit to other works. The basis for the study should be offered. Give most important references but shun difficult to make a comprehensive appraisal of the topic. In the introduction, describe the problem visibly. If the problem is not acknowledged in a logical, reasonable way, the reviewer will have no attention in your result. Speak in common terms about techniques used to explain the problem, if needed, but do not present any particulars about the protocols here. Following approach can create a valuable beginning:

- Explain the value (significance) of the study
- Shield the model - why did you employ this particular system or method? What is its compensation? You strength remark on its appropriateness from a abstract point of vision as well as point out sensible reasons for using it.
- Present a justification. Status your particular theory (es) or aim(s), and describe the logic that led you to choose them.
- Very for a short time explain the tentative propose and how it skilled the declared objectives.

Approach:

- Use past tense except for when referring to recognized facts. After all, the manuscript will be submitted after the entire job is done.
- Sort out your thoughts; manufacture one key point with every section. If you make the four points listed above, you will need a least of four paragraphs.

- Present surroundings information only as desirable in order hold up a situation. The reviewer does not desire to read the whole thing you know about a topic.
- Shape the theory/purpose specifically - do not take a broad view.
- As always, give awareness to spelling, simplicity and correctness of sentences and phrases.

Procedures (Methods and Materials):

This part is supposed to be the easiest to carve if you have good skills. A sound written Procedures segment allows a capable scientist to replacement your results. Present precise information about your supplies. The suppliers and clarity of reagents can be helpful bits of information. Present methods in sequential order but linked methodologies can be grouped as a segment. Be concise when relating the protocols. Attempt for the least amount of information that would permit another capable scientist to spare your outcome but be cautious that vital information is integrated. The use of subheadings is suggested and ought to be synchronized with the results section. When a technique is used that has been well described in another object, mention the specific item describing a way but draw the basic principle while stating the situation. The purpose is to text all particular resources and broad procedures, so that another person may use some or all of the methods in one more study or referee the scientific value of your work. It is not to be a step by step report of the whole thing you did, nor is a methods section a set of orders.

Materials:

- Explain materials individually only if the study is so complex that it saves liberty this way.
- Embrace particular materials, and any tools or provisions that are not frequently found in laboratories.
- Do not take in frequently found.
- If use of a definite type of tools.
- Materials may be reported in a part section or else they may be recognized along with your measures.

Methods:

- Report the method (not particulars of each process that engaged the same methodology)
- Describe the method entirely
- To be succinct, present methods under headings dedicated to specific dealings or groups of measures
- Simplify - details how procedures were completed not how they were exclusively performed on a particular day.
- If well known procedures were used, account the procedure by name, possibly with reference, and that's all.

Approach:

- It is embarrassed or not possible to use vigorous voice when documenting methods with no using first person, which would focus the reviewer's interest on the researcher rather than the job. As a result when script up the methods most authors use third person passive voice.
- Use standard style in this and in every other part of the paper - avoid familiar lists, and use full sentences.

What to keep away from

- Resources and methods are not a set of information.
- Skip all descriptive information and surroundings - save it for the argument.
- Leave out information that is immaterial to a third party.

Results:

The principle of a results segment is to present and demonstrate your conclusion. Create this part a entirely objective details of the outcome, and save all understanding for the discussion.

The page length of this segment is set by the sum and types of data to be reported. Carry on to be to the point, by means of statistics and tables, if suitable, to present consequences most efficiently.You must obviously differentiate material that would usually be incorporated in a study editorial from any unprocessed data or additional appendix matter that would not be available. In fact, such matter should not be submitted at all except requested by the instructor.

Content

- Sum up your conclusion in text and demonstrate them, if suitable, with figures and tables.
- In manuscript, explain each of your consequences, point the reader to remarks that are most appropriate.
- Present a background, such as by describing the question that was addressed by creation an exacting study.
- Explain results of control experiments and comprise remarks that are not accessible in a prescribed figure or table, if appropriate.
- Examine your data, then prepare the analyzed (transformed) data in the form of a figure (graph), table, or in manuscript form.

What to stay away from

- Do not discuss or infer your outcome, report surroundings information, or try to explain anything.
- Not at all, take in raw data or intermediate calculations in a research manuscript.
- Do not present the similar data more than once.
- Manuscript should complement any figures or tables, not duplicate the identical information.
- Never confuse figures with tables - there is a difference.

Approach

- As forever, use past tense when you submit to your results, and put the whole thing in a reasonable order.
- Put figures and tables, appropriately numbered, in order at the end of the report
- If you desire, you may place your figures and tables properly within the text of your results part.

Figures and tables

- If you put figures and tables at the end of the details, make certain that they are visibly distinguished from any attach appendix materials, such as raw facts
- Despite of position, each figure must be numbered one after the other and complete with subtitle
- In spite of position, each table must be titled, numbered one after the other and complete with heading
- All figure and table must be adequately complete that it could situate on its own, divide from text

Discussion:

The Discussion is expected the trickiest segment to write and describe. A lot of papers submitted for journal are discarded based on problems with the Discussion. There is no head of state for how long a argument should be. Position your understanding of the outcome visibly to lead the reviewer through your conclusions, and then finish the paper with a summing up of the implication of the study. The purpose here is to offer an understanding of your results and hold up for all of your conclusions, using facts from your research and generally accepted information, if suitable. The implication of result should be visibly described. Infer your data in the conversation in suitable depth. This means that when you clarify an observable fact you must explain mechanisms that may account for the observation. If your results vary from your prospect, make clear why that may have happened. If your results agree, then explain the theory that the proof supported. It is never suitable to just state that the data approved with prospect, and let it drop at that.

- Make a decision if each premise is supported, discarded, or if you cannot make a conclusion with assurance. Do not just dismiss a study or part of a study as "uncertain."
- Research papers are not acknowledged if the work is imperfect. Draw what conclusions you can based upon the results that you have, and take care of the study as a finished work
- You may propose future guidelines, such as how the experiment might be personalized to accomplish a new idea.
- Give details all of your remarks as much as possible, focus on mechanisms.
- Make a decision if the tentative design sufficiently addressed the theory, and whether or not it was correctly restricted.
- Try to present substitute explanations if sensible alternatives be present.
- One research will not counter an overall question, so maintain the large picture in mind, where do you go next? The best studies unlock new avenues of study. What questions remain?
- Recommendations for detailed papers will offer supplementary suggestions.

Approach:

- When you refer to information, differentiate data generated by your own studies from available information
- Submit to work done by specific persons (including you) in past tense.
- Submit to generally acknowledged facts and main beliefs in present tense.

Administration Rules Listed Before Submitting Your Research Paper to Global Journals Inc. (US)

Please carefully note down following rules and regulation before submitting your Research Paper to Global Journals Inc. (US):

Segment Draft and Final Research Paper: You have to strictly follow the template of research paper. If it is not done your paper may get rejected.

- The **major constraint** is that you must independently make all content, tables, graphs, and facts that are offered in the paper. You must write each part of the paper wholly on your own. The Peer-reviewers need to identify your own perceptive of the concepts in your own terms. NEVER extract straight from any foundation, and never rephrase someone else's analysis.

- Do not give permission to anyone else to "PROOFREAD" your manuscript.

- Methods to avoid Plagiarism is applied by us on every paper, if found guilty, you will be blacklisted by all of our collaborated research groups, your institution will be informed for this and strict legal actions will be taken immediately.)
- To guard yourself and others from possible illegal use please do not permit anyone right to use to your paper and files.

Criterion for Grading a Research Paper (Compilation) by Global Journals Inc. (US)

Please note that following table is only a Grading of "Paper Compilation" and not on "Performed/Stated Research" whose grading solely depends on Individual Assigned Peer Reviewer and Editorial Board Member. These can be available only on request and after decision of Paper. This report will be the property of Global Journals Inc. (US).

Topics	Grades		
	A-B	**C-D**	**E-F**
Abstract	Clear and concise with appropriate content, Correct format. 200 words or below	Unclear summary and no specific data, Incorrect form Above 200 words	No specific data with ambiguous information Above 250 words
Introduction	Containing all background details with clear goal and appropriate details, flow specification, no grammar and spelling mistake, well organized sentence and paragraph, reference cited	Unclear and confusing data, appropriate format, grammar and spelling errors with unorganized matter	Out of place depth and content, hazy format
Methods and Procedures	Clear and to the point with well arranged paragraph, precision and accuracy of facts and figures, well organized subheads	Difficult to comprehend with embarrassed text, too much explanation but completed	Incorrect and unorganized structure with hazy meaning
Result	Well organized, Clear and specific, Correct units with precision, correct data, well structuring of paragraph, no grammar and spelling mistake	Complete and embarrassed text, difficult to comprehend	Irregular format with wrong facts and figures
Discussion	Well organized, meaningful specification, sound conclusion, logical and concise explanation, highly structured paragraph reference cited	Wordy, unclear conclusion, spurious	Conclusion is not cited, unorganized, difficult to comprehend
References	Complete and correct format, well organized	Beside the point, Incomplete	Wrong format and structuring

INDEX

Global Journal of Management and Business Research

Visit us on the Web at www.GlobalJournals.org | www.JournalofBusiness.Org
or email us at helpdesk@globaljournals.org

ISSN 9755853