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CONTENTS

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STATEMENT OF THE PROBLEM

OBJECTIVES

HYPOTHESES

RESEARCH METHODOLOGY

RESULTS & DISCUSSION

FINDINGS

RECOMMENDATIONS/SUGGESTIONS

CONCLUSIONS

SCOPE FOR FURTHER RESEARCH

ACKNOWLEDGMENTS

REFERENCES

APPENDIX/ANNEXURE

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- Garg, Bhavet (2011): Towards a New Natural Gas Policy, Political Weekly, Viewed on January 01, 2012 http://epw.in/user/viewabstract.jsp

FACTORS AFFECTING BEHAVIOR OF INDIAN STOCK MARKET

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ABSTRACT

This paper presents a systematic analysis of monthly return data for studying the influence of macroeconomic fundamentals in explaining variations in Indian stock returns namely BSE Sensex. All possible relevant macro variables were considered in the context of our study of the relation between stock returns and macro variables, and the following variables viz., real economic activity, growth in money supply (broad money, M3), wholesale price index, index of industrial production, exchange rate, world crude oil prices, world gold prices, domestic gold prices, domestic silver prices, LIBOR, foreign capital market like S&P, FTSE-UK, NASDAQ, DJI activity and foreign institutional investment were finally found to have significant effects on monthly returns in the period. Statistical analysis mainly Factor and Regression analysis suggests that linear dependence in the form of model is adequate. In the period taken for study world gold prices and broad money were found to have significant effect in explaining variation in stock return. While if consider the foreign stock market then DJIA and FTSE-UK has the major impact on the returns of the Indian stock market.

KEYWORDS

Indian Stock Market, APT, Regression Analysis, Factor Analysis, Principal Component Analysis.

INTRODUCTION

The movement of stock prices is highly sensitive to fundamentals of economy as well as many other subjective factors which are unpredictable and also non quantifiable. The domestic economic fundamentals play determining role in the performance of stock market. As the economy is globally integrated so domestic variables are also depends upon the global events. The common external factors influencing the stock return would be stock prices in global economy, the interest rate and the exchange rate. Currency appreciation and depreciation is also a key factor which impacts in the movement of stock market.

In financial economics one important empirical regularity is that asset returns can be predicted by a set of macroeconomic variables. This obviously contradicts the efficient market hypothesis, in particular, semi-strong form efficiency which states that stock prices must contain all relevant information including publicly available information. There is a growing literature showing strong influence of macroeconomic variables on stock markets. Earlier the Arbitrage Pricing Theory (APT) developed by Ross and Chen also showed that economic variables have a systematic effect on stock market returns.

As financial theory asserts that movement in stock prices is related to macroeconomic variables, it is important to understand the economic meaning of such relationships. To start with, an increase in current real activity increases demand on existing capital stock, which ultimately induces increased capital investment in the future, and the stock market is very likely to anticipate this. Money supply has a direct effect on stock prices by changing liquidity. Money supply also has an indirect effect on stock prices through corporate dividends by increasing or decreasing interest rates. Stock prices are also influenced by changes in interest rates. Since interest rate is an opportunity cost of holding stock, an increase in interest rate is likely to lead to a substitution effect between stocks and other interest bearing assets. It is therefore expected that as interest rate declines stock price would rise. Inflation also affects the stock market through the output link. There is also strong evidence on the causal influence of exchange rate on stock prices.

The main implication is that changes in exchange rate affects firm's exports and also the cost of imported goods and production inputs and thus ultimately affects stock prices. In recent times the link between stock return and changes in oil price has also been examined.

The linkage between different equity markets can also be due to liberalization of different markets, improvement and development of communications technology, innovations in financial products and services, increase in the international activities of multinational corporations etc. This international integration, in particular of emerging stock markets, with the rest of the world has also led to link-up of the domestic stock markets with the world financial and economic variables. It is also pertinent to note that foreign investment in the developing countries is now playing a crucial role in restructuring of these economies.

Apart from the aforesaid interrelations between economic variables on the one hand and stock return on the other, an important issue in the context of this analysis is the relative role of local factors over global factors as the primary source of variation in stock returns in emerging markets. This issue is important mainly for international investors since the benefits from diversification are enhanced when the allocation of funds is spread across, rather than within regions.

The purpose of this paper is to examine the influence of macroeconomic variables in explaining variation in stock returns in an emerging economy like the Indian economy with due emphasis on the issues related to market efficiency and proper specification, as stated above.

We have selected a number of economic variables which are likely to be effective in explaining the time-series of aggregate return in several economies. These include real economic activity, inflation WPI, money supply (M3, broad money), foreign exchange rate, international gold price, foreign capital market activity, foreign institutional investment.

Thus, this study not only concludes on the status of market efficiency (semi-strong) of the Indian capital market at the monthly level of returns but also suggests the most appropriate model from consideration of specification of conditional mean and conditional variance, which can be used for the prediction of return.

Objective of this study is to explore whether the movement of stock market are associated with macro economic variables like wholesale price index, consumer price index, index of industrial production, money supply, foreign institutional investment, call money rate and gold prices as well as with other foreign stock market as Nasdaq, Nikkei, S&P, Dow Jones index and FTSE-UK. The objective of study is to explore such causal relation for India with the use of Arbitrage Pricing Model.

LIMITATIONS

Research is being conducted is based on data of around 95 months only may be that much duration is not significant in analyzing the behavior of stock market and it had not covered any other external events like terrorists attack of September 11 while these kind of events have major impact on stock market movement as well as any public announcements from government and from company which too have impact on movement of stock market.

DATA ON VARIABLES

Study is being conducted on data from May 2004 to March 2012 collected from various sources. The data set required for the study consists of BSE Sensex, Index of Industrial Production, Money Supply (M3, Broad Money), Interest Rate (Libor), Foreign Institutional Investment, Wholesale Price Index (general index) as a proxy of inflation, World Crude Oil Prices, World Gold Prices, Domestic Gold Prices, Domestic Silver Prices, Foreign Capital Market activity, and Exchange Rate.

BSE Sensex is being taken for study as it is the most popular market in India and as both Nifty 50 and BSE Sensex are highly correlated so study of one gives insight of other also. IIP shows the development in any economy and if any economy will develop then that will certainly have positive impact on its market also so have chosen IIP as a variable. Broad Money (M3) is being consider as money supply in economy as investment in any market depends upon the money available in economy so that had been considered as one variable. Investment in stock market is directly related to prevailing interest rate as movement of market always depends upon the prevailing interest rate in market for that purpose short term interest rate as LIBOR being taken as FIIs investment depends

upon the prevailing interest rate worldwide which can be taken as London Inter Bank Offering Rate, so LIBOR is being considered as a proxy for short term interest rate. Investments from institutional investment especially from foreign institutions guide the movement of stock market so it had also been considered as a variable. WPI is taken as proxy to inflation as presently inflation is being calculated on basis of WPI.

Gold and Crude are also investment and consumption asset and they share the amount of money which can be invested in stock market so they too impact on the movement of stock market. As India is among top most country in terms of consumption of gold so it is worth to take that into consideration and not only gold even silver is also an investment asset for Indian investor so it also impacts on movement of stock market. Also appreciation and depreciation of rupee impacts the investment amount in stock market and hence movement of stock market so it had also been considered as a variable.

As the entire world markets are integrated and they move in tandem to other so have taken five major markets as DJIA, FTSE-UK, S&P 500, NIKKEI and NASDAQ. As range of data is too wide so for the purpose of statistical analysis logarithmic values are being taken for entire data set.

LITERATURE REVIEW

Shahid Ahmed, 2008," Aggregate Economics Variables and Stock Markets in India," International Research Journal of Finance and Economics, Issue 14 (2008)-- The paper discussed about causal relationship between stock prices and the key macro variables. Time series analysis is being done over quarterly data from March, 1995 to March, 2007. Long run relationship is being found in between stock prices and FDI, stock prices and money supply and stock market and IIP. Paper discussed about lead lag relationship between macro variable and stock prices.

Debarata Mukhopadhyay, Nityananda Sarkar, 2003, "Stock Return and Macroeconomic Fundamentals in Model Specification Framework: Evidence from Indian Stock Market,"--- The paper discussed about the influence of macroeconomic variables as real economic activities like wholesale price index, short term rate, consumer price index, IIP, inflation, money supply, interest rate, domestic oil prices, foreign exchange rate, international oil price, foreign capital market activity, FDI, FII, world industrial output and world interest rate. Monthly data is being analyzed and also seasonal effect is being considered in the study.

Basabi Bhattacharya and Jayadeep Mukherjee, "The Nature of the Causal Relationship Between Stock Market and Macroeconomic Aggregates in India: an Empirical Analysis,"--The objective of the paper is to determine the lead lag relation between Indian stock market and the five key macroeconomic variable with a question : Can the Indian stock market act as a barometer for the Indian Economy? The key variables which are being considered as broad money supply, national income, IIP, interest rate, and inflation.

Narasimhan Jagadeesh, Sheridan Titman, 1993,"Returns to Buying Winners and Selling Losers: Implications for Stock Market Efficiency," Journal of Finance, Vol. 48, No. 1, pp 65-91--- Paper discuss about overreaction of stock prices to information. Whether profits are due to systematic risk of trading strategies or there is a role of lead-lag effect from delayed stock prices reactions to information about a common factor exists. The paper do discuss about the transaction by investors who buy past winners and sell low performing stocks move prices away from their long run values temporarily and thereby cause prices to overreact.

Brooks, Ajay Patel, Tie Su, 2003," How the Equity Market Responds to Unanticipated Events," Journal of Business, 2003, Vol 76, No. 1--- The paper talks about publicly available information including macroeconomic information, that can be used to predict stock prices, the impact of unanticipated events over stock prices. According to author the market's response to unanticipated events that take place when the market is closed as there is time to digest the information before trading day opens, the reaction is immediate in price, volume selling pressure, and bid ask spreads. The day time events induce wider bid-ask spreads and longer duration of wider spreads compared with overnight events.

Pham Vu Thang Long, 1991,"Abnormal Returns after Large Stock Price Changes: Evidence from the Vietnamese Stock Market," Journal of Finance, 1991 --- The paper talks about overreaction in Vietnamese stock market to both bad and good news arrivals on the day of large or extreme price changes. The financial market under react to information in some cases i.e., market price does not upward far enough in reaction to good news, or does not move downward far enough in reaction to bad news, while overreact in others. The extreme movements are followed by subsequent price movements in opposite direction. More extreme the initial price movement, the greater is the subsequent adjustment. Generalized Method of Moments (GMM) is used to explain the above over and under reaction in stock market price.

Nupur Hetamsaria, 2008,"A Multi Country Study of the Relationship between Development of Stock Exchanges and Economic Development," ICFAI Journal of Applied Finance, 2008--- The paper talks about the development of stock market as it is dependent on economic fundamentals of the country as there is positive correlation between economic growth and financial development. Other factors which affect stock market are legal system, infrastructure, political environment, FDI, shareholders rights, capital account and stock market liberalization. Author has discussed about the lag-lead relation between stock market and economic development as in less developed countries, financial development leads to economic development while in developed countries economic development causes financial development.

Joao Leitao and Crestova Oliviera, 2008," The Puzzling Effect of September 11 on Interdependences of International Stock Markets," ICFAI Journal of Applied Economics, 2008---The paper talks about the interdependence among some of the important stock markets and occurrence of contagion effect on the European stock market, taking the terrorist attack of 9/11, 2001, in USA, as the reference point. The paper talks about vertical and horizontal contagion effects in market.

Ranjan Kumar Das and Sumanjeet Singh, 2008," Is Indian Stock Market More Volatile in Reform Period? Evidence from E-Garch Model", ICFAI Journal of Applied Economics, 2008--- The paper talks about relation between savings and economy and stock market as stock market helps to increase in savings and investment in an economy which is vital for economic growth. Stock market helps in reducing risk by diversifying risk across a variety of assets. Volatility of affects investment, corporate finance and financial stability in economy, as volatility increases the risk will also increase. Excess volatility cause economic uncertainty which leads increase in market risk hence financial instability increases which will increase the cost of capital hence reduction in investments which ultimately reduce the economic growth.

RESEARCH METHODOLOGY

Statistical and graphical analysis will be done on the data collected from various sources. Period for the study will be May, 2004 to March, 2012. Relation between variables will be find out on the basis of correlation coefficient which will be get determined by doing regression analysis. Statistical analyses will be done by using SPSS statistical tool.

DATA INTERPRETATION

Stock market of any country is driven by macroeconomic condition of the country so we have taken some important macroeconomic indicators as wholesale price index, consumer price index, index of industrial production, foreign institutional investment, total money supply in economy (broad money) in our study. Other major stock markets also have an impact on the Indian stock market as movements in stock market are contagion as every market is linked to each other so impact of all the market are need to observe over the Indian stock market.

ANALYSIS

FACTOR ANALYSIS

KMO test is used to check whether factor analysis can be done or not as if its value is less than 0.5 than factor analysis is not suitable. But in our analysis its coming out to be 0.708 (Table 1) which is quite good so using factor analysis is advisable.

Same be the case with Bartlett's test of sphericity as Chi-square value is quite high at degree of freedom of 105 that too at 0.000 significance level which represents that factor analysis is quite suitable.

Anti-Image Matrix

The matrix shown in Table 2 shows the correlation between variables but we consider only diagonal elements of anti-image correlation matrix and as the values of every diagonal element are more than 0.5 which represents that variable itself are highly correlated.

Total Variance Explained

Table 3 shows that there are three significant factors as Eigen values for three factors only are greater than 1 and they are explaining 81.053% of total variation. Same can be seen from Scree Plot in Figure 1.

Rotated Component Matrix

Table 4 used to form factors from variables as there are seventeen variables being taken out of them some are correlated to each other so we used factor analysis and based on that we had combined these variables to three factors based on values against each factor.

Factor1	Factor2	Factor3
World Crude Oil Prices	DJIA	FII
World Gold Prices	NASDAQ	
Domestic Gold Prices	S&P	
Domestic Silver Prices	NIKKEI	
LIBOR	FTSE-UK	
WPI	FOREX	

Component Score Matrix

Score of each variable is being calculated from Component Score Coefficient Matrix based on coefficient we calculate the value of each factor.

Factor1 = 0.004*log DJIA + 0.021*log FTSE + 0.066*log NASDAQ - 0.103*log NIKKEI -0.024*log S&P + 0.081*log FOREX + 0.164*log GOLD US$ + 0.167*log IND GOLD + 0.161*log IND SIL + 0.065*log FII + 0.104*log CRUDE - 0.007*log M3 + 0.069*log IIP - 0.152*log LIBOR + 0.167*log WPI

Factor2 = 0.184*log DJIA + 0.195*log FTSE + 0.175*log NASDAQ - 0.136*log NIKKEI -0.188*log S&P - 0.128*log FOREX + 0.026*log GOLD US$ + 0.007*log IND GOLD + 0.045*log IND SIL + 0.037*log FII + 0.118*log CRUDE - 0.006*log M3 - 0.045*log IIP - 0.066*log LIBOR + 0.019*log WPI

Factor3 = 0.067*log DJIA - 0.097*log FTSE - 0.043*log NASDAQ - 0.058*log NIKKEI + 0.017*log S&P - 0.071*log FOREX - 0.004*log GOLD US$ - 0.021*log IND GOLD + 0.006*log IND SIL - 0.800*log FII + 0.008*log CRUDE + 0.473*log M3 + 0.166*log IIP + 0.097*log LIBOR - 0.010*log WPI

log DJIA = logarithm with base 10 of Dow Jones Index
log FTSE = logarithm with base 10 of Index of FTSE-UK market
log NASDAQ= logarithm with base 10 of Index of NASDAQ
log NIKKEI= logarithm with base 10 of Index of NIKKEI
log S&P= logarithm with base 10 of Index of Standard and Poor
log FOREX= logarithm with base 10 of Rupee Dollar exchange rate
log GOLD US$= logarithm with base 10 of World gold prices from Dubai Gold exchange in US $ per 10 gram
log WPI= logarithm with base 10 of Wholesale price index for all commodities
log IIP= logarithm with base 10 of Index of Industrial production for general companies
log FII= logarithm with base 10 of Foreign Institutional Investment
log M3= logarithm with base 10 of Broad money in money supply of Indian economy
log CRUDE= logarithm with base 10 of World Crude Oil Prices in US $ per barrel
log IND GOLD= logarithm with base 10 of Domestic Gold Prices in INR per 10 gram
log IND SIL= logarithm with base 10 of Domestic Silver Prices in INR per kg
log LIBOR= logarithm with base 10 of London Inter Bank Offer Rate

REGRESSION ANALYSIS

R Square value is the measure of regression models ability to predict the dependent variable by the independent variables. If value of R Square value is greater than 0.5 then model is acceptable, here the value of R Square is 0.819 (table 6) means Indian stock is 81.9% predictable by the factors which is quite large hence we can say that model is quite accurate.

From the table 7 we had derived an equation between dependent variable BSE Sensex and independent variables means factors which had been identified as-

For Standardized Coefficients--

Index of Indian stock market BSE Sensex = 0.758* Factor1 + 0.493* Factor2 - 0.034* Factor3

The above equation shows a relation between index of Indian stock market and other factors which are discussed in study. From equation we can easily find out as which factor has major impact on the movement of stock market as factor 1 has the highest coefficient of multiplier so impact of change in factor1 is maximum on the index.

Next important factor is factor2 as increase in factor2 has positive impact on index means an increase in factor2 shows a significant positive impact on index of stock market i.e. BSE Sensex.

While when we observe the impact of FII over the Indian stock market we find that it is the least significant means changes in FII holdings have very less impact on BSE index.

CONCLUSION

In this paper we have basically identified, using monthly data, the major macroeconomic fundamentals responsible for significant movements in Indian stock returns. Amongst the variables considered towards this end, real economic activity, interest rate, growth in money supply or broad money, consumer price index, wholesale price index, nominal exchange rate, international gold price, international crude oil prices, domestic gold and silver prices, US stock return denoted by NASDAQ composite index and of various other major stock market returns like that of Dow Jones, S&P, FTSE-UK and Nikkei, variable representing foreign capital inflow viz., FII, real economic activity, inflation, growth in money supply were found to be significant in explaining variations in stock return during the period.

However, the significant presence of the variables like NASDAQ has important implications from the point of view of integration of the Indian economy with the rest of the world and policies relating to foreign institutional investment. Finally, results based on regression analysis which has been applied in order to examine the relation and linear dependence on various variables.

SCOPE FOR FURTHER RESEARCH

Non quantifiable events like changes in governmental policies, terrorist attacks, company announcements, etc. also affect the movement of stock prices. A researcher may consider all these factors and a better estimate of SenSex can be made.

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15. http://finance.yahoo.com/q/hp?a=02&b=1&c=2002&d=02&e=1&f=2012&g=m&s=%5EGSPC%2C+&ql=1 visited on April 24, 2012
16. http://finance.yahoo.com/q/hp?s=%5EDJI&a=02&b=1&c=2002&d=02&e=1&f=2012&g=m visited on April 24, 2012
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19. http://www.eia.gov/dnav/pet/pet_pri_spt_s1_m.htm visited on April 25, 2012
20. http://www.gold.org/investment/statistics/gold_price_chart visited on April 25, 2012
21. http://www.oanda.com/currency/historical-rates/ visited on April 24, 2012
22. http://www.sebi.gov.in/sebiweb/investment/FIITrends.jsp visited on April 25, 2012
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APPENDIX

TABLE 1: KMO AND BARTLETT'S TEST

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.708
Bartlett's Test of Sphericity	Approx. Chi-Square	2834.072
	df	105
	Sig.	.000

TABLE 2: ANTI-IMAGE MATRICES

		log DJIA	log FTSE	logNASDAQ	log NIKKIE	log S&P	log FOREX	log GOLD US$	log IND GOLD	log IND SIL	log FII	log CRUDE	log M3	log IIP	log LIBOR	log WPI
Anti-image Covariance	log DJIA	.005	.002	.005	.005	-.003	.009	.001	-.001	.005	.015	.014	-.002	-.019	.002	-.003
	log FTSE	.002	.028	.002	-.022	-.002	.010	-.001	.000	.005	-.029	.018	.019	.035	.005	-.003
	logNASDAQ	.005	.002	.015	.004	-.004	.010	.001	-.002	.007	.014	.012	-.008	-.010	.017	-.004
	log NIKKIE	.005	-.022	.004	.061	-.002	.005	.001	-.002	.003	.011	.005	-.006	-.036	-.015	.007
	log S&P	-.003	-.002	-.004	-.002	.002	-.005	.000	.001	-.004	-.007	-.009	.001	.006	-.003	.002
	log FOREX	.009	.010	.010	.005	-.005	.107	.016	-.012	.011	.037	.061	.012	-.007	-.001	-.008
	log GOLD US$	.001	-.001	.001	.001	.000	.016	.004	-.003	.001	.012	.004	-.004	-.001	.001	-.001
	log IND GOLD	-.001	.000	-.002	-.002	.001	-.012	-.003	.003	-.003	-.009	-.006	.002	.000	-.001	.000
	log IND SIL	.005	.005	.007	.003	-.004	.011	.001	-.003	.018	.028	.019	-.005	-.009	.008	-.004
	log FII	.015	-.029	.014	.011	-.007	.037	.012	-.009	.028	.728	.021	-.040	-.064	.040	-.011
	log CRUDE	.014	.018	.012	.005	-.009	.061	.004	-.006	.019	.021	.144	.031	-.022	-.011	-.018
	log M3	-.002	.019	-.008	-.006	.001	.012	-.004	.002	-.005	-.040	.031	.897	.013	-.032	-.008
	log IIP	-.019	.035	-.010	-.036	.006	-.007	-.001	.000	-.009	-.064	-.022	.013	.318	.032	.016
	log LIBOR	.002	.005	.017	-.015	-.003	-.001	.001	-.001	.008	.040	-.011	-.032	.032	.048	-.001
	log WPI	-.003	-.003	-.004	.007	.002	-.008	-.001	.000	-.004	-.011	-.018	-.008	.016	-.001	.013
Anti-image Correlation	log DJIA	.599[a]	.160	.583	.283	-.915	.394	.136	-.369	.496	.239	.516	-.026	-.458	.096	-.411
	log FTSE	.160	.818[a]	.117	-.532	-.338	.176	-.109	-.117	.205	-.202	.282	.118	.376	.129	-.170
	logNASDAQ	.583	.117	.645[a]	.119	-.804	.250	.181	-.357	.447	.138	.266	-.072	-.141	.647	-.299
	log NIKKIE	.283	-.532	.119	.856[a]	-.190	.059	.040	-.144	.079	.052	.058	-.024	-.255	-.275	.263
	log S&P	-.915	-.338	-.804	-.190	.569[a]	-.374	-.137	.441	-.607	-.179	-.516	.026	.257	-.356	.377
	log FOREX	.394	.176	.250	.059	-.374	.592[a]	.737	-.761	.246	.134	.491	.039	-.038	-.014	-.215
	log GOLD US$	.136	-.109	.181	.040	-.137	.737	.767[a]	-.827	.157	.204	.147	-.056	-.038	.067	-.153
	log IND GOLD	-.369	-.117	-.357	-.144	.441	-.761	-.827	.685[a]	-.525	-.201	-.331	.049	.017	-.134	-.041
	log IND SIL	.496	.205	.447	.079	-.607	.246	.157	-.525	.747[a]	.244	.370	-.040	-.124	.286	-.270
	log FII	.239	-.202	.138	.052	-.179	.134	.204	-.201	.244	.097[a]	.065	-.050	-.133	.214	-.117
	log CRUDE	.516	.282	.266	.058	-.516	.491	.147	-.331	.370	.065	.694[a]	.086	-.102	-.128	-.430
	log M3	-.026	.118	-.072	-.024	.026	.039	-.056	.049	-.040	-.050	.086	.761[a]	.024	-.155	-.075
	log IIP	-.458	.376	-.141	-.255	.257	-.038	-.038	.017	-.124	-.133	-.102	.024	.653[a]	.256	.254
	log LIBOR	.096	.129	.647	-.275	-.356	-.014	.067	-.134	.286	.214	-.128	-.155	.256	.821[a]	-.044
	log WPI	-.411	-.170	-.299	.263	.377	-.215	-.153	-.041	-.270	-.117	-.430	-.075	.254	-.044	.840[a]

a. Measures of Sampling Adequacy(MSA)

TABLE 3: TOTAL VARIANCE EXPLAINED

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	5.962	39.745	39.745	5.962	39.745	39.745	5.923	39.484	39.484
2	5.126	34.174	73.920	5.126	34.174	73.920	5.114	34.091	73.575
3	1.070	7.134	81.053	1.070	7.134	81.053	1.122	7.479	81.053
4	.934	6.228	87.281						
5	.884	5.891	93.172						
6	.444	2.959	96.131						
7	.236	1.574	97.705						
8	.178	1.189	98.895						
9	.087	.581	99.475						
10	.028	.186	99.661						
11	.020	.133	99.795						
12	.017	.111	99.906						
13	.011	.072	99.977						
14	.002	.015	99.993						
15	.001	.007	100.000						

Extraction Method: Principal Component Analysis.

FIGURE 1

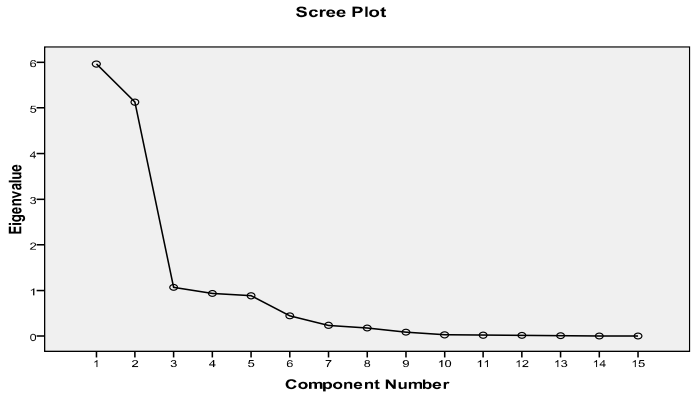

TABLE 4: ROTATED COMPONENT MATRIX[a]

	Component		
	1	2	3
log DJIA	.044	.959	.119
log FTSE	.072	.972	-.055
logNASDAQ	.360	.880	.021
log NIKKIE	-.640	.686	-.078
log S&P	-.144	.966	.052
log FOREX	.456	-.674	-.074
log GOLD US$	.968	.122	.071
log IND GOLD	.983	.024	.050
log IND SIL	.951	.222	.086
log FII	.038	.001	-.861
log CRUDE	.613	.602	.081
log M3	.160	.079	.526
log IIP	.481	-.196	.206
log LIBOR	-.863	.370	.059
log WPI	.982	.084	.064

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 4 iterations.

TABLE 5: COMPONENT SCORE COEFFICIENT MATRIX

	Component		
	1	2	3
log DJIA	.004	.184	.067
log FTSE	.021	.195	-.097
logNASDAQ	.066	.175	-.043
log NIKKIE	-.103	.136	-.058
log S&P	-.024	.188	.017
log FOREX	.081	-.128	-.071
log GOLD US$	.164	.026	-.004
log IND GOLD	.167	.007	-.021
log IND SIL	.161	.045	.006
log FII	.065	.037	-.800
log CRUDE	.104	.118	.008
log M3	-.007	-.006	.473
log IIP	.069	-.045	.166
log LIBOR	-.152	.066	.097
log WPI	.167	.019	-.010

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
Component Scores.

TABLE 6: MODEL SUMMARY[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.905[a]	.819	.813	1.9983214E3	.819	136.987	3	91	.000	.329

a. Predictors: (Constant), BART factor score 3 for analysis 1, BART factor score 2 for analysis 1, BART factor score 1 for analysis 1

b. Dependent Variable: BSE- 30

TABLE 7: COEFFICIENTS[a]

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
1 (Constant)	13391.564	205.023		65.317	.000	12984.311	13798.818
BART factor score 1 for analysis 1	3501.220	206.111	.758	16.987	.000	3091.805	3910.634
BART factor score 2 for analysis 1	2274.745	206.111	.493	11.036	.000	1865.331	2684.159
BART factor score 3 for analysis 1	-159.291	206.111	-.034	-.773	.442	-568.705	250.124

a. Dependent Variable: BSE- 30

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