A Study on Determinants of BSE Sensex: A Factor Analysis Approach

*** Dr M R Senapathy**
**** Mr. Jayesh Agarwal**

* Associate Professor (Finance), Siva Sivani Institute of Management, Secunderabad
** PGDM BIFAAS 2013-15 batch, Siva Sivani institute of Management, Secunderabad

Introduction

India is emerging as a global super power and stock markets are the major indicators for this. India hitherto was inward oriented rather than to look outward and the structural reforms adjustments have created a bullish tendency both in India and abroad. There has been many ups and downs in the stock market The 2008 SENSEX crash due to Global factors has swept away many small investors Foreign Institutional Investors (FII's) withdrawing their money from the system. The crash was triggered by major global events, such as the in the way of downgrading the US debt from AAA to AA+, . Other economies also suffered and there was a concern on in Euro economies, UK etc. Indian markets had a temporary impact and by 2009, the recovery was in and by next year, the consolidation took place. The NAMO effect has taken the SENSEX to 29000 level and is now maintaining a range of 27000- 29000 level over the past one year. The Greece effect has dented the market to certain extent in short term. The Bombay Stock Exchange (BSE) is known to be the oldest exchange in Asia. The Bombay Stock Exchange developed the SENSEX in 1986, an Indicator of the BSE and Indian economy as well. The SENSEX is the benchmark for the Indian Stock exchange, which captures the price movement. It is considered to be the pulse of the Indian stock markets.

Composition of S&P BSE Sensex:

Company Name	Industry	Mkt Cap (Rscr)	Weight
Axis Bank	**Banks - Private Sector**	66,361.91	1.82
Bajaj Auto	**Auto - 2 & 3 Wheelers**	58,148.30	1.60
Bharti Airtel	**Telecommunications – Service**	117,483.59	3.22
BHEL	**Infrastructure – General**	46,235.16	1.27
Cipla	**Pharmaceuticals**	31,635.10	0.87
Coal India	**Mining/Minerals**	171,741.95	4.71
DrReddys Labs	**Pharmaceuticals**	47,030.00	1.29
GAIL	**Oil Drilling And Exploration**	46,622.89	1.28
HDFC	**Finance – Housing**	132,777.73	3.64
HDFC Bank	**Banks - Private Sector**	179,080.36	4.91
Hero Motocorp	**Auto - 2 & 3 Wheelers**	42,064.17	1.15
Hindalco	**Aluminium**	25,280.88	0.69
HUL	**Personal Care**	125,306.62	3.44

ICICI Bank	**Banks - Private Sector**	143,477.43	3.94
Infosys	**Computers – Software**	187,947.50	5.16
ITC	**Cigarettes**	286,435.88	7.86
Larsen	**Infrastructure – General**	113,728.15	3.12
M&M	**Auto - Cars & Jeeps**	60,976.43	1.67
Maruti Suzuki	**Auto - Cars & Jeeps**	56,816.73	1.56
NTPC	**Power - Generation/Distribution**	93,338.66	2.56
ONGC	**Oil Drilling And Exploration**	273,262.35	7.50
Reliance	**Refineries**	292,810.31	8.04
SBI	**Banks - Public Sector**	129,228.07	3.55
SesaSterlite	**Mining/Minerals**	52,504.39	1.44
Sun Pharma	**Pharmaceuticals**	120,500.32	3.31
Tata Motors	**Auto - LCVs/HCVs**	126,413.08	3.47
Tata Power	**Power - Generation/Distribution**	21,723.58	0.60
Tata Steel	**Steel – Large**	35,167.70	0.97
TCS	**Computers – Software**	419,206.96	11.51
Wipro	**Computers – Software**	140,305.08	3.85

Factors Considered:

While doing the research, we have considered the stock exchange sensitivity index as our main database.

Gold Price:

Investors were worried about both the U.S. debt crisis and the euro zone crisis and at the same time Gold was the best option to hedge and it was like neither the dollar nor the euro were safe investments. There are historical evidences and the researchers conducted by world gold council to prove that gold and stocks tend to move in opposite directions. Whether the stocks being compared to gold are large blue chips or small, aggressive growth companies, the correlation to gold is still negative over the long-term.

Dollar Price:

U S is the largest consumer thereby creating pressure on dollars due to demand resulting in the depreciation of the dollar's value and a state of inflation resulting in consumables becoming more costlier to US. To control inflation US resorted to increase in interest rates to cool down pressure on demand side of consumption. In addition to this due to recession in all other sectors, especially the real estate sector has caused the mighty US dollar to shake.

In case India and rest of the world, the major imports for India is crude oil and the BOP gap widened during Iraq's attempt to take over Kuwait.

Thereafter, exports contributed to FX reserve along with Foreign Direct Investment into the Indian economy and reduced the BOP gap. Indian rupee appreciation against dollar impacted the Indian economy heavily. The present situation with Greece trying to go out of EURO is impacting the world market in general and India in Particular though experts are of the view that the impact may be marginal due to strong fundamentals of Indian economy.

Foreign Direct Investment:

India has emerged as the most sought of place for many foreign international enterprises due to various positive factors such as high economic growth, fast population growth, English speaking people, a stable government headed by Mr Narendra Modi and lower costs for workers. India's inward investment rule have undergone drastic changes since economic reforms in 1991. Many sectors are opened to FDI. In spite of the global financial crisis, India has continued to be a preferred destination. The liberalization of the FDI in retail, Insurance, infrastructure, Defense, and many areas to follow due to Modinomicscan lead to improved position in days to come.

Foreign Institutional Investment:

Foreign Institutional Investors including institutions such as Pension Funds, Mutual Funds, Investment Trusts, Asset Management are invited to invest in all the securities traded on the Primary and Secondary markets, including the equity and other securities/instruments of companies, which are listed/to be listed on the stock exchanges in India including the OTC Exchange of India. Since the opening up of India's capital markets, the FII activity has been on a constant rise. FII are extremely keen to invest in the emerging economies like India and China. With the meltdown in the eurozone, due to debt crisis in Greece, foreign investors have been selling having an impact on the Indian economy and markets in the recent past. However, India is still the best bet as per investors. Hence, the panic could be for short term.

Inflation:

Recent volatility of domestic staple prices appear higher than that prevailing before the 2008 global food price crisis. Average food price volatility for a sample of 26 low-income countries has been higher over the past year than it was in 2006/07. Price volatility creates additional risks and is a particular burden for low-income producers who are least able to hedge against these fluctuations, as well as for poor consumers. Increased volatility tends to lead to greater government intervention in agricultural markets often with sizeable fiscal costs. In developing country context, inflation tolerance in India is low. And within the overall inflation, food price inflation is least tolerated as bulk of the population spend majority of their income on food items. During the last decade, food price inflation exceeded the headline inflation measured by wholesale price index since around the end of 2005, barring the period September 2007 to September 2008. This gap has become all the more glaring in the more recent time. Currently, this continuing rise in food price inflation has become a major cause for concern for policy makers in India. However, due to various monitory policy measures by RBI, the inflation is well within the manageable limits.

Index of Industrial Production (IIP):

IIP or the index of industrial production is the number denoting the condition of industrial production during a certain period. These figures are calculated in reference to the figures that existed in the past. Currently the base used for calculating IIP is 1993-1994. Every month the stock markets wait with bated breath to hear the IIP numbers.

These numbers decide the market movement. As IIP shows the status of industrial activity, you can find out if the industrial activity has increased, decreased or remained same.

Today it is important because with the news of recession hovering over the horizon, better IIP figures indicate increase in industrial production. It makes investors and stock markets become more optimistic. The optimism amongst the stock markets and investors translates into the markets going up. This is because the markets expect the companies' performance to increase. This ultimately leads to the growth in the country's GDP. It implies improvement in country's economy, thus making it an attractive investment destination to foreign investors.

Foreign Exchange Reserves:

Foreign exchange reserves include foreign exchange and gold, Special Drawing Rights and International Monetary Fund reserve positions held by central banks and monetary authorities**.** India's accumulation of foreign exchange reserves has been increasing in recent years. The country's primary sources of foreign exchange reserves have been capital flows and portfolio inflows. High foreign exchange reserves are often seen as a strength indicating the backing a currency has. On the other side of the coin, however, holding of huge foreign exchange reserves also indicates the lack of confidence on the global financial architecture. The advent of floating exchange rate in 1973, reforms of financial markets in the early 1990s and the Asian currency crisis of 1997-98 have jointly made a strong pitch for the dynamic linkage between stock and foreign exchange market. Both the markets are considered as the most sensitive segment of the financial markets because the impact of any such deviation is associated with policy variables as well as macroeconomic variables. However, in the case of foreign exchange market, the impact is direct whereas in the case of stock market there is an indirect impact.

Call Money Rate:

Call money market is the most sensitive part of money market, in which a good number of players from banking sector as well as the non-bank financial sector actively participate on a regular basis. The head offices, after meeting their usual liquidity requirement, invest the surplus funds in the call money market. The NCBs are the main source of fund in the call money market. The cost of funds for FCBs is very low as compared to the local banks but they prefer to preserve the excess reserve rather than lend in the interbank money market mainly because of lack of confidence. The NBFIs are now participating in the inter-bank money market in both borrowing and lending but they borrow more than lending. Therefore, they play an important role in the interbank money market.

Review of Literature

Yucel and Kurt (2002) examined the foreign exchange exposure of Turkish companies in the study for a sample of 152 companies listed in İstanbul Stock Exchange. The findings revealed that 11.8 % of sample firms had a positive and significant economic exposure for the examined period. The proportion and mean exposure coefficient were high for exporter companies compare to non-exporter and overall sample. The results from the inclusion of market return to the model do not reveal significant difference in the economic exposure of the companies.

Akhtaruzzaman, Akhter and Masuduzzaman (2005) investigated the call money market in Bangladesh and the results revealed that in most cases, whenever excess reserve fell, the rate of interest in call money market rose and vice versa.

Liao and Chen (2005) examined the relationship among oil prices, gold prices, and individual Industrial Sub-Indices instead of the popular Taiwan Stock Exchange Capitalization Weighted Stock Index (TAIEX). The authors believed that commodity prices should have different degrees of influences to individual industries instead of the whole market. According to previous researches, stock returns have leptokurtic, volatility clustering, and volatility asymmetric characteristics; this research further applied the TGARCH models to describe the relationship among oil prices, gold prices, and individual Industrial Sub-Indices. It was concluded that the fluctuations in oil prices influenced both the Electronic Industrial Sub-Indices and the Rubber Industrial Sub-Indices. The correlations among oil prices and the Electronic Industrial Sub-Indices and the Rubber Industrial Sub-Indices were positive. Further, the Chemical Industrial Sub-Indices, Cement Industrial Sub-Indices, Automobile Industrial Sub-Indices, Food Industrial Sub-Indices, and Textiles Industrial Sub-Indices were influenced by fluctuations in gold prices.

Günsel and Çukur (2007) investigated the performance of the Arbitrage Pricing Theory (APT) in London Stock Exchange for the period of 1980-1993 as monthly. The researcher developed seven prespecified macroeconomic variables. The term structure of interest rate, the risk premium, the exchange rate, the money supply and unanticipated inflation were similar to those derived in Chen, Roll and Ross (1986).Using OLS technique, the study has demonstrated that there were some big differences among industries. Before interpreting the OLS results, the serial correlation problem was discussed by using Durbin Waltson Statistics. D-W statistics showed that there was no evidence for positive or negative serial correlation.

Subair and Salihu (2007) also investigated the effects of exchange rate volatility on the Nigeria stock markets. It was found that the exchange rate volatility generated via GARCH process exerted a stronger negative impact on the Nigeria stock markets. However the rate of inflation and interest rate did not have long run relationship with stock market capitalization since the major participant in the market is government. Based on this it was recommended that a coordinated monetary and fiscal policy should be put in place to check mate the fluctuation of exchange rate in order to deepen the depth of the Stock Market.

The Perusal of literature revealed that many studies have been conducted in the past focusing on one or two of the factors determining stock market all over the world. The present study investigates into the fluctuation in the Indian stock market in the past four years and analyses the factors, which directly or indirectly affect the Indian Stock Market. The study of factors affecting their investment enables investor in taking decision regarding their investment.

Objectives of the Study

The current study has been carried out to achieve the following objectives:

- Identify the various factors affecting the Indian Stock Market (SENSEX)
- Investigate into the relationship between the various factors and SENSEX
- Identify variables having significant impact on SENSEX

Scope of the Study

It is a well-known fact that Dollar price or money exchange rate has a great influence on BSE Sensex. Our research identifies the level of influence of dollar price on BSE Sensex. The strength and stability of the host country‘s currency is measured by the level and volatility of call money rates. Gold price is included in the model as an additional variable, to examine whether gold price contain any additional significant relation with share price movements.

Since gold has an asset value it works as an important savings material. The technology transfer in terms of innovation and inventions to the developing country like India in phase of Globalization in terms of Foreign Portfolio Investment has an impact on the volatility in the BSE Sensex. The macroeconomic stability of any developing economy is highly dependent on food price inflation. Every month the stock markets wait with bated breath to hear the IIP numbers. These numbers decide the market movement can be analyzed with its effect on stocks. Its impact on BSE Sensex can be analyzed. The potentials of the economy is strengthened by the foreign exchange reserve which has some impact on Stock market.

Limitations of the Study:

1. The study is based on Sensex sample

2. The data is taken on monthly basis and is secondary

Data Analysis

The current study is a descriptive research, as it involves a description of the state of affairs as it exists at present. The data for the variables used in the research has been collected from secondary sources for a period starting from January 2011 to December 2013. Month end prices have been collected for all the variables from www.bseindia.com and www.rbi.com

Table 1- Description of dependent and independent variables

Variable Name	Study period and Frequency	Data Source
Independent Variables		
Gold Prices	Jan 2011 – Dec 2013 Month end prices	World Gold Council
Dollar Prices	Jan 2011 – Dec 2013 Month end prices	Reserve Bank of India
FII (Debt and Equity)	Jan 2011 – Dec 2013 Month end prices	Reserve Bank of India
Inflation	Jan 2011 – Dec 2013Month end prices	Reserve Bank of India
Call Money Rate	Jan 2011 – Dec 2013 Month end prices	Reserve Bank of India
IIP	Jan 2011 – Dec 2013 Month end prices	Reserve Bank of India
Forex Reserves (Forex)	Jan 2011 – Dec 2013 Month end prices	Reserve Bank of India
Dependent Variable		
Sensex	Jan 2011 – Dec 2013 Month end prices	BSE India

The data analysis is divided into two parts,

Factor analysis and multiple regression analysis

- Factor Analysis

Factor analysis is a collection of methods used to examine how underlying factors or determinants influence the responses on a number of measured variables. There are basically two types of factor analysis: exploratory and confirmatory. Exploratory factor analysis (EFA) attempts to discover the nature of the constructs influencing a set of responses. Confirmatory factor analysis (CFA) tests whether a specified set of constructs is influencing responses in a predicted way. Factor analyses are performed by examining the pattern of correlations (or co variances) between the observed measures. Measures that are highly correlated (either positively or negatively) are likely influenced by the same factors, while those that are relatively uncorrelated are likely influenced by different factors.

- Multiple Regression Analysis

We have done multiple regression analysis also to check multiple variables effect on share price changes. Multiple regression is used to account for (predict) the variance in an interval dependent, based on linear combinations of interval, dichotomous, or dummy independent variables. Multiple regression can establish that a set of independent variables explains a proportion of the variance in a dependent variable at a significant level (through a significance test of R2), and can establish the relative predictive importance of the independent variables (by comparing beta weights). Power terms can be added as independent variables to explore curvilinear effects. Cross-product terms can be added as independent variables to explore interaction effects. One can test the significance of difference of two R2's to determine if adding an independent variable to the model helps significantly. (G. David Garson (2003)).

In general, multiple regression procedures will estimate a linear equation of the form:

Y = a + b1*X1+b2*X2+.....+bn*Xn

In the above the regression coefficients (or B coefficients) represent the independent contributions of each independent variable to the prediction of the dependent variable.

Factor Analysis:

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy		.612
Bartlett's Test of Sphericity	Approx. Chi-Square	185.460
	Df	28
	Sig.	.000

Communalities

	Initial	Extraction
gold	1.000	.782
dollar	1.000	.945
FII(Equity)	1.000	.674
FII(Debt)	1.000	.757
Inflation	1.000	.844
IIP	1.000	.641
forex res	1.000	.896
call money	1.000	.767

Extraction Method: Principal Component Analysis

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	3.449	43.107	43.107	3.449	43.107	43.107	2.482	31.029	31.029
2	1.757	21.965	65.072	1.757	21.965	65.072	2.148	26.852	57.881
3	1.099	13.742	78.814	1.099	13.742	78.814	1.675	20.933	78.814
4	.701	8.763	87.577						
5	.441	5.515	93.092						
6	.345	4.307	97.400						
7	.187	2.339	99.739						
8	.021	.261	100.000						

Extraction Method: Principal Component Analysis

Component Matrix[a]

	Component		
	1	2	3
gold	.686	.284	.480
dollar	.957	-.126	-.110
FII(Equity)	.274	.751	-.188
FII(Debt)	-.347	.737	.305
Inflation	-.715	-.116	.566
IIP	-.105	.692	-.388
forex res	.929	-.170	-.057
call money	.693	.179	.505

Extraction Method: Principal Component Analysis

a. 3 components extracted

Rotated Component Matrix[a]

	Component		
	1	2	3
Gold	.157	.863	.113
Dollar	.822	.516	-.052
FII(Equity)	.130	.236	.776
FII(Debt)	-.633	.177	.570
Inflation	-.852	-.094	-.330
IIP	-.020	-.170	.782
forex res	.779	.525	-.113
call money	.173	.859	.006

Extraction Method: Principal Component Analysis

Rotation Method: Varimax with Kaiser Normalization

a. Rotation converged in 5 iterations.

Component Transformation Matrix

Component	1	2	3
1	.755	.655	.028
2	-.254	.253	.934
3	-.604	.712	-.357

Extraction Method: Principal Component Analysis

Rotation Method: Varimax with Kaiser Normalization

gold	0.686		0.48
dollar	0.957		-0.11
FII(Equity)	0.274	0.751	
FII(Debt)		0.737	0.305
Inflation		-0.116	0.566
IIP	-0.105	0.692	
forex res	0.929		-0.057
call money	0.693		0.505

gold	0.157	0.863	
dollar	0.822	0.516	
FII(Equity)		0.236	0.776
FII(Debt)		0.177	0.57
Inflation		-0.094	-0.33
IIP	-0.02		0.782
forex res	0.779	0.525	
call money	0.173	0.859	

Analysis:
Grouping

Group1(Economy)	Group2(Investments)	Group3 (Growth Indicators)
Dollar	Gold	Inflation
Forex Reserve	FII equity	IIP
	FII debt	
	Call money	

Factor Analysis has reduced 8 elements into 3 groups. According to the elements in the first group, Group has been named as economy and second group has gold, FII equity, FII debt and call money which are investments into the country and the third grouping can be named as Growth indicators which has inflation and IIP as its elements.

Partial Correlations

Correlations

Control Variables			Close	gold
dollar & FII(Equity) & FII(Debt) & Inflation & IIP & forex res & call money	Close	Correlation	1.000	-.625
		Significance (2-tailed)	.	.000
		df	0	27
	Gold	Correlation	-.625	1.000
		Significance (2-tailed)	.000	.
		df	27	0

We can conclude that Gold and Sensex is highly correlated in a negative way, by keeping all other variables constant.

Correlations

Control Variables			Close	Dollar
FII(Equity) & FII(Debt) & Inflation & IIP & forex res & call money & gold	Close	Correlation	1.000	.034
		Significance (2-tailed)	.	.862
		Df	0	27
	Dollar	Correlation	.034	1.000
		Significance (2-tailed)	.862	.
		Df	27	0

We can conclude that Dollar and Sensex are less positivelycorrelated , by keeping all other variables constant.

Correlations

Control Variables			Close	FII(Equity)
FII(Debt) & Inflation & IIP & forex res & call money & gold & dollar	Close	Correlation	1.000	.736
		Significance (2-tailed)	.	.000
		df	0	27
	FII(Equity)	Correlation	.736	1.000
		Significance (2-tailed)	.000	.
		df	27	0

We can conclude that FII equity and Sensex are highly positively correlated, by keeping all other variables constant.

Correlations

Control Variables			Close	FII(Debt)
Inflation & IIP & forex res & call money & gold & dollar & FII(Equity)	Close	Correlation	1.000	-.424
		Significance (2-tailed)	.	.022
		df	0	27
	FII(Debt)	Correlation	-.424	1.000
		Significance (2-tailed)	.022	.
		df	27	0

We can conclude that FII Debt and Sensex are moderately negatively correlated, by keeping all other variables constant.

Correlations

Control Variables			Close	Inflation
IIP & forex res & call money & gold & dollar & FII(Equity) & FII(Debt)	Close	Correlation	1.000	-.047
		Significance (2-tailed)	.	.809
		df	0	27
	Inflation	Correlation	-.047	1.000
		Significance (2-tailed)	.809	.
		df	27	0

We can conclude that Inflation and Sensex are less negatively correlated , by keeping all other variables constant.

Correlations

Control Variables			Close	IIP
forex res & call money & gold & dollar & FII(Equity) & FII(Debt) & Inflation	Close	Correlation	1.000	.067
		Significance (2-tailed)	.	.732
		df	0	27
	IIP	Correlation	.067	1.000
		Significance (2-tailed)	.732	.
		df	27	0

We can conclude that IIP and Sensex are less positively correlated , by keeping all other variables constant.

Correlations

Control Variables			Close	forex res
call money & gold & dollar & FII(Equity) & FII(Debt) & Inflation & IIP	Close	Correlation	1.000	.257
		Significance (2-tailed)	.	.179
		df	0	27
	forex res	Correlation	.257	1.000
		Significance (2-tailed)	.179	.
		df	27	0

We can conclude that IIP and Sensex are less positively correlated, by keeping all other variables constant.

Correlations

Control Variables			Close	Call money
gold & dollar & FII(Equity) & FII(Debt) & Inflation & IIP & forex res	Close	Correlation	1.000	-.348
		Significance (2-tailed)	.	.065
		df	0	27
	Call money	Correlation	-.348	1.000
		Significance (2-tailed)	.065	.
		df	27	0

We can conclude that Call money and Sensex are moderately negatively correlated, by keeping all other variables constant.

Multiple Regression Analysis:

Regression Statistics	
Multiple R	0.886981833
R Square	0.786736772
Adjusted R Square	0.723547668
Standard Error	727.6997976
Observations	36

Model is fit as it is more 0.7

ANOVA:-

Null hypothesis:- There is no significant difference among the variables with respect to Sensex.

Alternate hypothesis: There is significant difference among the variables with respect to Sensex.

ANOVA					
	Df	*SS*	*MS*	*F*	*Significance F*
Regression	8	52745054.31	6593131.789	12.45051307	2.7759E-07
Residual	27	14297768.88	529546.9954		
Total	35	67042823.19			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	17126.10442	4642.783281	3.688758098	0.001002173	7599.900007	26652.30884	7599.900007	26652.30884
gold	-2.469569392	0.598767761	-4.124419435	0.000318202	-3.698139357	-1.240999427	-3.698139357	-1.240999427
dollar	-11.0492411	114.3708134	-0.096608923	0.923750515	-245.7187663	223.6202841	-245.7187663	223.6202841
FII(Equity)	0.084983547	0.014939667	5.688450016	4.82643E-06	0.054329883	0.115637211	0.054329883	0.115637211
FII(Debt)	-0.04352314	0.017599953	-2.472912264	0.019988552	-0.07963526	-0.007411019	-0.07963526	-0.007411019
Inflation	-41.30169818	154.8559454	-0.266710445	0.79171858	-359.0398526	276.4364563	-359.0398526	276.4364563
IIP	7.237102095	17.54722661	0.412435666	0.68327669	-28.76683295	43.24103714	-28.76683295	43.24103714
forex res	0.693147321	0.430552926	1.609900384	0.119050777	-0.190274312	1.576568955	-0.190274312	1.576568955
call money	-489.7664756	253.4567814	-1.932347097	0.063871312	-1009.816834	30.28388296	-1009.816834	30.28388296

	P-value	*Result*
Intercept	0.001002173	Reject Null Hypothesis
Gold	0.000318202	Reject Null Hypothesis
Dollar	0.923750515	Accept Null Hypothesis
FII(Equity)	4.82643E-06	Reject Null Hypothesis
FII(Debt)	0.019988552	Reject Null Hypothesis
Inflation	0.79171858	Accept Null Hypothesis
IIP	0.68327669	Accept Null Hypothesis
forex res	0.119050777	Accept Null Hypothesis
call money	0.063871312	Accept Null Hypothesis

Analysis

From the F- value, we have p< 0.05 hence we have reject Null hypothesis and accept that there is association between the elements and sensex. The above elements p- value individually also suggests we reject null hypothesis a for most elements but not for every element which suggest, some elements have no significance in association between them. Not clear conclusion on model correctness can be made. More factors need to be considered for a clear conclusion.

Equation

The Regression equation of the above variables will be

Y = 17126.10442 -2.469569392(Gold Price) -11.0492411(Dollar Price) + 0.08498354 (FII (Equity))

-0.04352314 (FII (Debt)) -41.30169818 (Inflation Rate) + 7.237102095 (IIP) + 0.693147321(Forex Reserves)

-489.7664756 (Call Money Rate)

Analysis

The equation suggests negative correlation between Sensex and Gold Price, Dollar price, FII debt, Inflation rate,Call money rate which indicates if these reduce Sensex value increases and Positive association is with FII- equity,IIP and Forex reserves.

Results and Conclusion

Conclusions:

In our research, we tried to find out the relationship between BSE Sensex and some other important economic factors and got some interesting results related to this. We have used statistical methods to do the analysis based on monthly basis database of different economic factors. Finally we got some relationships of those factors with BSE Sensex, From the factor analysis we could group the given elements under 3 groups- first group named as economy and second group has gold, FII equity , FII debt and call money which are investments into the country and the third grouping can be named as Growth indicators which has inflation and IIP as its elements.

Partial Correlation Summary

SENSEX	Gold	-0.625
	Dollar	0.034
	FII(Equity)	0.736
	FII(Debt)	-0.424
	Inflation	-0.047
	IIP	0.067
	Forex res	0.257
	Call money	-0.348

The Partial correlations indicate negative correlation between sensex and gold, FII –debt, inflation and call money and positive correlation between dollar price, FII equity, IIP and forex reserves. We can conclude that Sensex increases in value when there is a inflow into the country in the form of equity and has the highest negative influence with gold imports.

The equation suggests negative correlation between Sensex and Gold Price, Dollar price, FII debt, Inflation rate; Call money rate, which indicates if these reduce Sensex value increases and Positive association is with FII- equity, IIP and Forex reserves. The highest influencer in a positive way for the sensex is IIP and negative influence is call money rate followed by inflation rate.

From the above two contradictory relations we can conclude that the elements have inter association with each other as well and are influencing each other hence the difference in conclusions. The model has been inconclusive from anova analysis hence more elements are to be considered.

From the factor analysis we could group the given elements under 3 groups- first group named as economy and second group has gold, FII equity, FII debt and call money which are investments into the country and the third grouping can be named as Growth indicators which has inflation and IIP as its elements.

Several other factors like Government Policies, political turbulence and social variables affects fluctuations in BSE Sensex, which can be, analyzed statistically in future studies. Due to the constraint on database, we have not considered the impact of political factors and turbulence on BSE Sensex. Here we have analyzed nine independent variables but more quantitative factors and non-linear dimensions can be included in further research. .

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- ***Mr. Ashish Arora*** *Assistant Professor Guru Nanak Dev University College Jalandhar*

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