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IMPACT OF INFLATION AND GDP ON STOCK MARKET RETURNS IN INDIA

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Abstract: *The market reacts differently to various factors ranging from economic political, and socio-cultural. The stock prices of quoted companies are affected either positively or negatively by a number of factors occurring within or without the economic system. The impact of Real Gross Domestic Product (RGDP), Interest Rate (INT) and Inflation Rate (INF) on stock prices of quoted companies from 1997 – 2009. Stock prices were represented by Stock Market Value Index in the model. A regression analysis showed that the explanatory variables accounted for 95.6% of the variation in stock prices. While a reduction in interest and inflation rate resulted in increased stock prices, increased RDGP has a positive impact. Government should therefore implement policies that will reduce inflation rate and improve the standard of living of its citizens. The interest rate should be made moderate so as to encourage investment and transactions in stock.*

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INTRODUCTION

The stock market is a general term used to refer to an organized exchange where shares of stock are traded. The movement of stock market depends on the rational well as the irrational behavior of the investor.

The returns in the stock market could because of the micro economic factors like profits, business growth (new orders), P/E, dividend announced and the like which are pertaining to a particular company. Macro economic factors like inflation, GDP would also affect the over-all returns in the stock market.

Hence a study will be undertaken to observe the impact of inflation, GDP and interest rates on stock market returns and unearth the nature and strength of relationship between variable under study .

OBJECTIVE OF THE STUDY

The thesis aims to achieve the following objectives.

1. To study the relationship between stock market returns with respect to inflation, GDP and interest rates.
2. To find the strength of the relation between stock market returns with respect to inflation and GDP.

SCOPE

The scope of the project is restricted to find nature and strength of relation between stock market returns with respect to inflation and GDP.

RESEARCH METHODOLOGY

The titled thesis project shall follow the methodology mentioned below.

1. **Nature of the Study:**

a. The research carried out will be descriptive in nature for the better understanding of the undertaken research analysis.

b. The research will also use regression, correlation to find out the nature and strength of the relationship between the variables under study.

c. The data regarding stock market returns, inflation, GDP, interest rates will be taken for the last 10 to15 years for the study.

2. **Tools Used for the collection of data:**

Data:

i. Information regarding inflation, GDP, Stock market returns and interest rates would be collected from the websites of the Ministry of finance, economic survey of India, BSE India and RBI.

ii. Books will be referred to support the formation of certain conceptual definitions and depth knowledge of the subject.

iii. Journals, Magazines and newspapers will be used to accumulate the latest information about the variable under study in the research.

iv. Interviews with experts will be undertaken if necessary to tap the unknown facts and figures of what I think might have been missing in the data.

LIMITATIONS

- The project is limited to **"Impact of inflation, interest rates and GDP on stock market returns in India"**
- The data regarding stock market returns, inflation and GDP will be taken for the last 10 to15 years only for the study.
- Time perspective to conduct the study is yet another constraint.

INDIAN ECONOMY

- Fourth largest economy (US$ 3 trillion GDP) in terms of Purchasing Power Parity after USA, China and Japan.
- The fundamentals of the Indian economy have become strong and stable. The macro-economic indicators are at present the best in the history of independent India with high growth, healthy foreign exchange reserves, and foreign investment and robust increase in exports and low inflation and interest rates.
- A unique feature of the transition of the Indian economy is that it has become the second fastest growing economy of the world in the year 2003 - 10. In the financial year 2008 - 09 the GDP growth has averaged 6.9% (estimated). India has recorded one of the highest growth rates in the 1990s. The target of the 10th Five Year Plan (2002-07) is 8% growth rate. India's services sector grew by 9.4% in 2008-09.

- The unique feature of Indian economy has been high growth with stability. The Indian economy has proven its strength and resilience when there have been crisis in other parts of the world including in Asia in recent years.
- The foreign exchange reserves have reached a record level of US$ 300 billion in June, 2009. The comfortable situation of Forex reserves has facilitated further relaxation of foreign exchange restrictions and a gradual move towards greater capital account convertibility. According to IMF (2009 report) India's Forex Policies are in line with global best practices.
- Foreign Exchange Reserves (US$ 138.84 bn) now far exceed Foreign Debt (US$ 300 bn as on September, 2009).
- Short-term debt is less than 4 per cent of the reserves.
- In March 1991 Forex Reserves including gold stood at $5.8bn as against external debt of $83 billion.
- The external debt to GDP ratio has improved significantly from 38.7% in 1992 to 17.8% in the end of March 2004. This is one of the lowest among developing economies. External debt in December 2004 was 120.9 billion US dollars. Of this long-term NRI deposit is $ 27 billion, commercial borrowings $ 24 billion, multilateral debt $ 31 billion, and bilateral debt $ 18 billion.
- After a surplus in Current account for two fiscal years, 2002-03 and 2003-04, the current account showed a deficit of US$ 6.4 bn in 2008-09.
- Given the large foreign exchange reserves, the Government has made a premature repayment of US$ 3 billion of 'high-cost' loans to the World Bank and Asian Development Bank and is considering further premature repayment of other loans.
- The Government has decided to (i) discontinue receiving aid from other countries except the following nine: Japan, UK, Germany, USA, EU, France, Italy, Canada and the Russian Federation and (ii) to make pre-payment of all bilateral debt owed to all the countries except the ones mentioned above.
- Since July 2003, India has become a net creditor to the IMF, after having been a borrower in the past.
- The Government has written off debts of US$ 30 million due from seven heavily indebted countries as part of the "India Development Initiative" announced in

February 2003. The interest rate continues to be reduced and is around 6%. This is the lowest in the last thirty years and it is stimulating consumption and investment.

- After reaching an all-time low of Rs.49.06 per US dollar in May, 2002, the rupee has strengthened against the dollar reaching a rate of US$ 1 = Rs.43.51 in June 30, 2009.
- The inflation rate has been contained at 5.5 percent in 2003-04.The inflation rate in 2004-5 has been slightly higher at 6% but has slowed down at the beginning of the current year 2008 - 09 at 9%.

ECONOMY

The seventh largest and second most populous country in the world, India has long been considered a country of unrealised potential. A new spirit of economic freedom is now stirring in the country, bringing sweeping changes in its wake. A series of ambitious economic reforms aimed at deregulating the country and stimulating foreign investment has moved India firmly into the front ranks of the rapidly growing Asia Pacific region and unleashed the latent strengths of a complex and rapidly changing nation.

India's process of economic reform is firmly rooted in a political consensus that spans her diverse political parties. India's democracy is a known and stable factor, which has taken deep roots over nearly half a century. Importantly, India has no fundamental conflict between its political and economic systems. Its political institutions have fostered an open society with strong collective and individual rights and an environment supportive of free economic enterprise.

India's time tested institutions offer foreign investors a transparent environment that guarantees the security of their long term investments. These include a free and vibrant press, a judiciary which can and does overrule the government, a sophisticated legal and accounting system and a user friendly intellectual infrastructure. India's dynamic and highly competitive private sector has long been the backbone of its economic activity. It accounts for over 75% of its Gross Domestic Product and offers considerable scope for joint ventures and collaborations.

Today, India is one of the most exciting emerging markets in the world. Skilled managerial and technical manpower that match the best available in the world and a middle class whose size exceeds the population of the USA or the European Union, provide India with a distinct cutting edge in global competition.

GDP

Economic growth is measured in terms of an increase in the size of a nation's economy. A broad measure of an economy's output. A most widely used measure of economic output is the Gross Domestic Product.

Gross Domestic Product (**GDP**), a calculation method in national accounting is defined as the total value of final goods and services produced within a country's borders in a year, regardless of ownership. GDP measures only final goods and services, that is those goods and services that are consumed by their final user, and not used as an input into other goods. Measuring intermediate goods and services would lead to double counting of economic activity within a country. This distinction also removes transfers between individuals and companies from GDP.

There are three approaches to calculating GDP with al rendering same results.

Expenditure Approach: Calculates the final spending on goods and services.

Product Approach: Calculates the market value of goods and service produced.

Income Approach: Sums the income received by all products in the country.

Expenditure Approach to determine GDP:

GDP = private consumption + government purchases + investment + net exports

- Consumption is calculated by adding durable and non - durable and service expenditures. It is unaffected by the estimated value of imported goods.
- The investment includes investment in fixed assets and increase in inventory.
- Government purchases are equal to the government expenditures less government transfer payments.
- Net Exports are exports minus imports.

NOMINAL GDP AND REAL GDP

Without any adjustment, the GDP calculation is distorted by inflation. This unadjusted GDP is known as the nominal GDP. In practice, GDP is adjusted by dividing the nominal GDP by a price deflator to arrive at the real *GDP*.

In an inflationary environment, the nominal GDP is greater than the real GDP. If the price deflator is not known, an implicit price deflator can be calculated by dividing the nominal GDP by the real GDP:

Implicit Price Deflator = Nominal GDP / Real GDP

The composition of this deflator is different from that of the consumer price index in that the GDP deflator includes government goods, investment goods, and exports rather than the traditional consumer-oriented basket of goods.GDP usually is reported each quarter on a seasonally adjusted annualized basis.

GDP GROWTH

Countries seek to increase their GDP in order to increase their standard of living. Note that growth in GDP does not result in increased purchasing power if the growth is due to inflation or population increase. For purchasing power, it is the real, per capita GDP that is important.

While investment is an important factor in a nation's GDP growth, even more important is greater respect for laws and contracts.

GDP versus GNP

GDP measures the output of goods and services within the borders of the country. Gross National Product (GNP) measures the output of a nation's factors of production, regardless of whether the factors are located within the country's borders. For example, the output of workers located in another country would be included in the workers' home country GNP but not its GDP. The Gross National Product can be either larger or smaller than the country's GDP depending on the number of its citizens working outside its borders and the number of other country's citizens working within its borders.

YEAR	GDP GROWTH RATE (X)	SENSEX (Y)	X-X'	Y-Y'	(X-X')*(Y-Y')	(X-X')^2	(Y-Y')^2	X^2
1990 - 1991	5.00	1908.85	-1.56	-4670.65	7286.21	2.43	21814943.40	25
1991 - 1992	5.10	2615.37	-1.46	-3964.13	5787.63	2.13	15714302.87	26.01
1992 - 1993	5.10	3346.06	-1.46	-3233.44	4720.82	2.13	10455114.83	26.01
1993 - 1994	5.90	3926.90	-0.66	-2652.60	1750.71	0.44	7036270.84	34.81
1994 - 1995	7.30	3110.49	0.74	-3469.01	-2567.07	0.55	12034009.57	53.29
1995 - 1996	7.30	3085.20	0.74	-3494.30	-2585.78	0.55	12210111.52	53.29
1996 - 1997	7.80	3658.98	1.24	-2920.52	-3621.44	1.54	8529419.55	60.84
1997 - 1998	4.80	3055.41	-1.76	-3524.09	6202.39	3.10	12419189.18	23.04
1998 - 1999	6.50	5005.82	-0.06	-1573.68	94.42	0.00	2476459.30	42.25
1999 - 2000	6.10	3972.12	-0.46	-2607.38	1199.39	0.21	6798414.82	37.21
2000 - 2001	4.40	3262.33	-2.16	-3317.17	7165.08	4.67	11003596.91	19.36
2001 - 2002	5.60	3377.28	-0.96	-3202.22	3074.13	0.92	10254193.72	31.36
2002 - 2003	4.40	5838.96	-2.16	-740.54	1599.56	4.67	548395.05	19.36
2003 - 2004	8.10	6602.69	1.54	23.19	35.72	2.37	537.92	65.61
2004 - 2005	7.30	8206.00	0.74	1626.50	1203.61	0.55	2645512.01	53.29
2005 - 2006	8.40	9397.36	1.84	2817.86	5184.87	3.39	7940351.89	70.56
2006 - 2007	9.20	13786.00	2.64	7206.50	19025.17	6.97	51933685.49	84.64
2007 - 2008	9.00	20206.12	2.44	13626.62	33248.96	5.95	185684854.38	81
2008 - 2009	7.40	9328.00	0.84	2748.50	2308.74	0.71	7554268.74	54.76
2009 - 2010	6.50	17900.00	-0.06	11320.50	-679.23	0.00	128153788.17	42.25
SUM	**131.20**	**131589.94**	**0.00**	**0.00**	**90433.89**	**43.27**	**515207420.16**	903.94
MEAN	**6.56**	**6579.50**	0.00	0.00	4521.69	2.16	25760371.01	

Slope(regression) = covar/ var (x)

Covariance	4521.69
Variance X	2.16
Variance Y	25760371.01
Slope	2090.09
SD(X)	1.22
SD(Y)	1614.25

Corelation : covar / SD(X) * SD (Y)

r 2.30

Standard Error : Sqrt{Sum(Y-Y')^2 / n-2}

Se 5350.01

Regression Line : Y = a + bx

Where a = Y(mean) - bX(mean)

b = {SUMXY - n (meanX)*(meanY)} / {SUM(X*X) - n(meanX)*(meanX)}

Value	
a	3054.22
b	537.39

Regression Line

Y = 3054.22 + 537.39 X

Standard Error of Slope (b) : Se / Sqrt(SUM X^2 - n X' ^2)

Sb	813.34

Real Gross Domestic Product (RGDP) and Stock Prices

The measure of aggregate output in the national income accounts is Gross Domestic Product (GDP) according to Blanchard (1997). He stated that there are three ways of thinking about an economy's GDP. These are that:

• GDP is the value of the final goods and services produced in the economy during a given period

• GDP is the sum of value added in the economy during a given period ,

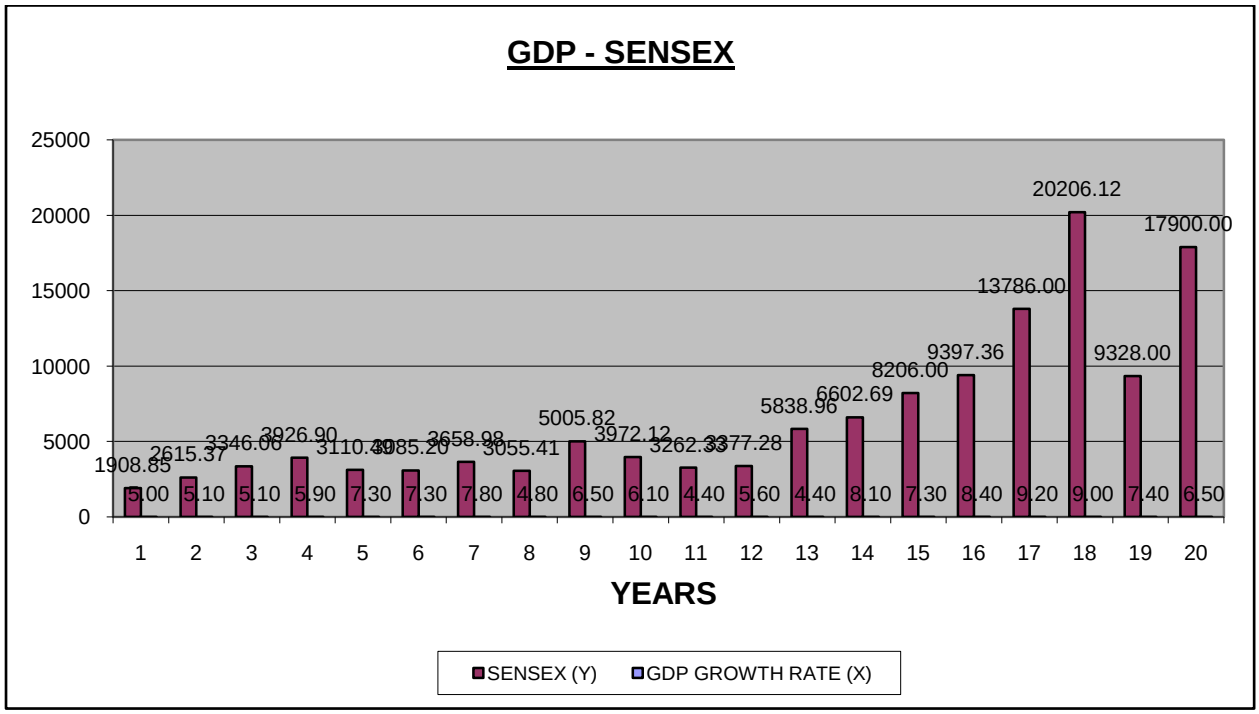
• GDP is the sum of incomes in the economy during a given period.

Nominal GDP is simply the sum of the quantities of final goods produced times their current price. Economists use nominal for variables expressed in units of the currency of the relevant country.

Nominal GDP increases over time for two reasons. The first is that the production of most goods increases over time. The second is that the price of most goods increases over time. In order to measure production and its change over time, the effect of increasing prices

need to be eliminated. Hence, focus is on real GDP rather than nominal. Carstrom (2002) expressed that stock prices and future RGDP growth are related. He gave two prominent explanations for this; the first explanation was that changes in information about the future course of RGDP cause prices to change in the stock market today.

He also said that changes in stock prices, no matter what the source is, will reduce firms' asset positions and affect the cost of their borrowing. When it costs more for firms to borrow money, they borrow and invest less, RGDP growth slows. Changes in information about the future course of RGDP may cause prices to change in the stock market. This explanation suggests that while stock prices are used to predict future economic activity, the actual causality is from future GDP growth in current stock prices.



INFLATION

Simply put, inflation is a situation in the economy where, there is more money chasing less of goods and services. In other words, it means there is more supply/availability of money in the economy and there are less of goods and services to buy with that increased money. Thus goods and services commands a higher price than actual as more people are willing to pay a higher value to buy the same goods. In this inflationary situation, there is no real growth in the output of the economy per se. It's simply more money chasing few goods and services. For a brief moment let us suspend belief and imagine that all the money in the

country is just Rs100. And all the goods produced in the country are just five apples. Naturally, each apple will fetch Rs20. Next year, the money doubles to Rs200 but the total goods produced are again five apples. Each apple will now fetch Rs40. That is what inflation is all about — too much money chasing too few goods. Inflation is a hydra-headed monster, which has a desirable as well as an undesirable effect. The desirable part is that when prices are high, businessmen get more value for their goods, which entices them to produce more. The undesirable part is that when prices shoot up, people are forced to restrict their purchases, which can lead to recession. Rising oil prices have been one of the main causes of inflation though that is not all. A weak monsoon till recently brought about a shortage in food items and some commodities. There had also been a surge in foreign exchange inflows and to keep the price of the rupee stable, the RBI has been purchasing dollars — and that means pumping in rupees into the system.

To suck out the excess rupees from the system, the RBI follows a policy of sterile intervention — which translates into the RBI issuing government securities. There is a limit to the quantum of government securities the RBI can issue and its stock of securities at the moment is insignificant. The RBI can tighten the monetary policy by raising interest rates, however, higher interest rates will hit the balance sheet of banks that have large interest rate exposures. Moreover, the RBI is also the banker to the government by virtue of which, it tends to keep the interest rate low so that the government's interest cost remains in control.

Types of inflation:

Inflation is caused by a combination of four factors.

- The supply of money goes up.
- The supply of goods goes down.
- Demand for money goes down.
- Demand for goods goes up.

"Inflation can result from a decrease in aggregate supply. The two main sources of decrease in aggregate supply are

- An increase in wage rates
- An increase in the prices of raw materials

These sources of a decrease in aggregate supply operate by increasing costs, and the resulting inflation is called cost-push inflation.

YEAR	LATION CPI	SENSEX (Y)	X-X'	Y-Y'	(X-X')*(Y-Y')	(X-X')^2	(Y-Y')^2	X^2
1990 - 1991	13.70	1908.85	5.78	-6863.81	-39672.84	33.41	47111924.32	187.7
1991 - 1992	13.5	2615.37	5.58	-6157.29	-34357.69	31.14	37912252.98	182.3
1992 - 1993	9.6	3346.06	1.68	-5426.60	-9116.69	2.82	29448016.50	92.16
1993 - 1994	7.5	3926.90	-0.42	-4845.76	2035.22	0.18	23481415.82	56.25
1994 - 1995	10.10	3110.49	2.18	-5662.17	-12343.54	4.75	32060199.31	102
1995 - 1996	9.20	3085.20	1.28	-5687.46	-7279.95	1.64	32347231.58	84.64
1996 - 1997	7.20	3658.98	-0.72	-5113.68	3681.85	0.52	26149750.42	51.84
1997 - 1998	13.10	3055.41	5.18	-5717.25	-29615.37	26.83	32686978.05	171.6
1998 - 1999	4.70	5005.82	-3.22	-3766.84	12129.23	10.37	14189103.68	22.09
1999 - 2000	4.00	3972.12	-3.92	-4800.54	18818.13	15.37	23045209.89	16
2000 - 2001	3.80	3262.33	-4.12	-5510.33	22702.57	16.97	30363766.10	14.44
2001 - 2002	4.30	3377.28	-3.62	-5395.38	19531.29	13.10	29110154.12	18.49
2002 - 2003	4.10	5838.96	-3.82	-2933.70	11206.74	14.59	8606611.34	16.81
2003 - 2004	5.50	6602.69	-2.42	-2169.97	5251.33	5.86	4708781.37	30.25
2004 - 2005	4.30	8206.00	-3.62	-566.66	2051.32	13.10	321106.58	18.49
2005 - 2006	4.20	9397.36	4.20	624.70	2623.73	17.64	390246.76	17.64
2006 - 2007	4.80	13786.00	4.80	5013.34	24064.02	23.04	25133551.22	23.04
2007 - 2008	9.00	20206.12	9.00	11433.46	102901.12	81.00	130723946.59	81
2008 - 2009	11.49	9328.00	3.57	555.34	1982.55	12.74	308399.55	132
2009 - 2010	12.00	17900.00	4.08	9127.34	37239.54	16.65	83308286.80	144
SUM	**118.80**	**131589.94**	**0.00**	**0.00**	**-34978.40**	**190.65**	**371542502.07**	**1083**
MEAN	**7.92**	**8772.66**	0.00	0.00	-2331.89	12.71	24769500.14	

Slope(regression) = covar/ var (x)

Covariance	-1748.92
Variance X	9.5326
Variance Y	18577125.10
Slope	-183.47
SD(X)	3.55
SD(Y)	1614.25

Corelation : covar / SD(X) * SD (Y)

r	-0.30

Standard Error : Sqrt {Sum(Y-Y')^2 / n-2}

Se	4543.26

Regression Line : Y = a + bx

Where a = Y(mean) - bX(mean)

b = {SUMXY - n (meanX)*(meanY)} / {SUM(X*X) - n(meanX)*(meanX)}

Value	
a	11061.23
b	-288.96

Regression Line

Y = 11061.23 - 288.96 X

Standard Error of Slope (b) : Se / Sqrt(SUM X^2 - n X' ^2)

Sb	1124.93

INFLATION AND ITS EFFECT ON STOCK PRICES

Asogu(1991) was of the view that inflation is generally used to distribute a situation of rapid, persistent and unacceptable high rises in general price level in an economy, resulting in general loss of purchasing power of the currency. According to him, inflation causes serious discomfort for consumers, investors, producers and the government.

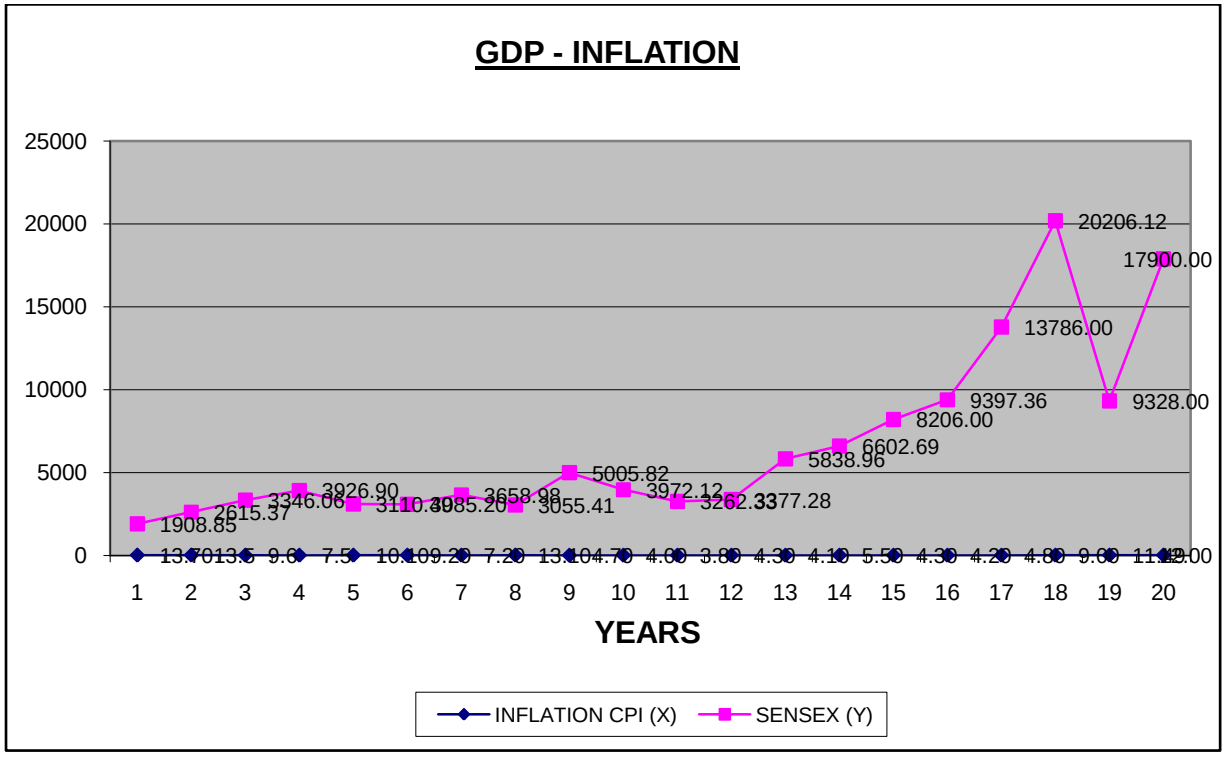
In a study of some countries, Maynard and Van Ryckeghem (1975) as cited in Masha (2003), found that the long-run trend of rising price levels can be attributed to differences in the rates of growth and productivity in the industrial and service sectors. Other causes of rising prices are differences in the prices and elasticity between the two sectors, uniform growth nominal wages in both sectors, and price and wage rigidities Some attempts have been made to study the character of inflation. Asogu (1991) undertook an empirical investigation based on ten different specifications that covered monetary, structural and open economy aspects of inflation. The variables used include money supply and its lagged values, Real

Gross Domestic Product (RGDP) and its lagged values, aggregate domestic credit to the economy and its lagged values, government expenditure and its lagged values. Others are industrial production index, the import price index and an official exchange rate in all, the models were estimated and the character of inflation seems to be well captured.

In summary, the results of the estimations suggested that real output, especially industrial output, net exports, current money supply, domestic food prices and exchange rate changes were the major determinants of inflation. The study, therefore, confirms the importance of structural character of the economy; open economy and monetary aspects of an inflationary trend. Who argued that inflation is dependent on growth in broad money, the rate of exchange the growth of real income, the level of anticipated inflation, which is based on the previous year's level of inflation. Causes of inflation can however be broadly categorized into the 'fiscal' and 'balance of payment' views. Proponents of the fiscal view have argued that continuous expansion of base money essentially arises from a fiscal disequilibrium. Attempts have been made to show that the economy will be characterized by two inflation equilibria if there is an exogenous real fiscal deficit; a change in Cagan semi-logarithmic money demand function and rational expectations. The high inflation equilibrium will be stable and the low inflation equilibrium unstable.

It is a common belief that inflation is advantageous to common stock. This is majorly because it is argued that inflation increases the returns to shareholders since price of products rise faster than wage rates. The expected relationship between inflation and returns to owners of equity would be valid if business firms were debtors and if the current interest rates on debt finance failed to reflect the future changes in the price level.

According to Jhingan (1997), when there is inflation, most prices are rising, though some price rise faster than others. Have shown from their studies that there is a relationship between inflation and rising prices. A positively in relation to changes in prices Therefore, in assessing the impact of inflation on the performance of stock prices of quoted companies; if there is a relationship, one should expect a positive association between inflation and the variation in stock prices.



YEAR	GDP GROWTH RATE (X)	INFLATION CPI (X)	SENSEX (Y)
1991	5.00	13.70	1908.85
1992	5.10	13.5	2615.37
1993	5.10	9.6	3346.06
1994	5.90	7.5	3926.90
1995	7.30	10.10	3110.49
1996	7.30	9.20	3085.20
1997	7.80	7.20	3658.98
1998	4.80	13.10	3055.41
1999	6.50	4.70	5005.82
2000	6.10	4.00	3972.12
2001	4.40	3.80	3262.33
2002	5.60	4.30	3377.28
2003	4.40	4.10	5838.96
2004	8.10	5.50	6602.69
2005	7.30	4.30	8206.00
2006	8.40	4.20	9397.36
2007	9.20	4.80	13786.00
2008	9.00	9.00	20206.12
2009	7.40	11.49	9328.00
2010	6.50	12.00	17900.00
SUM	**131.20**	**156.09**	**131589.94**
MEAN	**6.56**	**7.80**	**6579.50**

RECOMMENDATIONS

- An investor who actively invests in the stock market should take macro economic factors like GDP and inflation into consideration.
- These are the vital factors that will show the long term trend of the stocks and the economy of any country.
- Currently India's GDP is growing at a healthy pace and inflation is under control as a result of this, there is an increased stock market return but the threat of rising oil prices could turn down the market sentiment.
- India is one of the promising and rising economy according to BRIC reports as a result of this many FII's invested in India to take advantage of the rising return on investment and the difference in the currency rate.
- One should take a close watch of these FII's as they quite capable of creating a financial crisis in any economy.

CONCLUSIONS

The impact of RGDP, interest and inflation rates on stock prices of quoted companies. The findings were in line with a priori expectation expressed by Blanchard and Tamtom. An important finding is that the explanatory variables in the model result in 95.6% influence on the stock prices of quoted companies for the period 1997 – 2006. It also provides preliminary evidence regarding the relative importance of the explanatory variables on stock prices of quoted companies. Specifically, the findings suggest that RDGP was the most important variable influencing stock prices. Conclusively, government should implement policies that will reduce inflation rate and poverty level through infrastructural development and improved standard of living. Also, interest rates should be made moderate in order to encourage investment and transactions in the stock market.

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