

## ECONOMIC POLICY REGIMES AND INDIAN ECONOMIC ACTIVITIES

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### ABSTRACT

India has tried some economic policy models since independence to spread the benefits of development to all her people. This paper examines the implications of economic policy shifts on economic activities in India based on select macroeconomic indicators for a period from January 1966 to January 2007. Findings suggest that, to some extent, the policy shifts positively influenced the economic activities save the industrial production. This will surely frustrate the votaries of 'free economy' in India as the policy prescriptions failed to augment the growth in real sector.

### SECTION I

Economic policy planners around the globe primarily aspire to achieve a healthy but faster economic growth, sustain and augment that growth and spread the benefits of development to all people irrespective of their economic and social status. In a similar vein, Indian planners also have toiled hard and tried three distinct economic models since independence. In the 'controlled regime' primary focus was on '*creation of wealth*' through State directed and State controlled financial system. Financial institutions, especially the banking sector was entrusted upon to mobilize and purvey surpluses generated by the economic organisms. In the 'semi-controlled' regime, they have sought to shift from the controlled model of development emphasizing *the efficiency of investment* accompanied by a general move away from administrative and financial control (Kohli 1989, Jha, 1984, 1982). Finally, they settled on the much publicized and optimistic model of 'free economy' from the year 1992. All the suggestions of this new model are focused on '*development by creation and distribution of wealth*'. Financial and trade liberalization with '*borrowing and lending at substantial real rate of interest*' and '*a stable price level*' are the primary commitments of this new policy. Moreover, in the prescription of free economy, role of capital market is favored over the financial institutions, especially, in the noble job of mobilization and allocation of precious resources of the economy. The policy, grossly, entails a move towards a more market oriented system conjured up to usher halcyon days spawning a healthy living to all economic units (Kanagasapathy 2001, Reddy 2002).

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There exists a large volume of research work that debates over the sequence, speed, and possible outcome of the transformation of the economy from 'controlled' to 'free' one. Some argue that the process is 'not at all an easy task' and is 'full of potential pitfalls'. But, in spite of that, it (free-economy model) remains the only game in the town as far as successful economic development is concerned *a la* McKinnon (1989). On the contrary, many people around the world term this policy agenda as an 'empty rhetoric' of poverty reduction (Clarke 2000). Experiences of different countries show no convergent outcome and there is no consensus in the scholarly literature about the possible impact of deregulation on the economic activity (McDonald, 2002, Tabb, 2000). Moreover, reformists often tend to undermine the scope of the unruly behavior of different segments of the economy in post liberalization period. This sometimes lead to over speculation, misallocation of savings and investments that is detrimental to real sector growth and stability.

Against this backdrop, this paper aims at studying the implications and relative influence of regime shift in India on its economic activity. We believe success of an economic policy largely depends on the creation of an environment that is conducive to promote sufficient investment and growth of the economy. If the system fails to discharge the avowed objectives, the entire plan of development would suffer a big jolt.

This paper is organized in the following manner: Section II describes the select macroeconomic variables that are surrogates of economic activity. The data, time-period, and the methodology used in the study are detailed in Section III. Empirical findings are presented in Section IV. Section V summarizes and concludes the study based on the findings of the research work.

## SECTION II

### **Economic Activities and Economic Policy Regimes**

We feel it essential to describe select macroeconomic variables that represent economic activities. Identification of the indicators for depicting the states of development in the developed, developing and under developed economies is a long debated, yet unsettled issue. We basically followed the earlier studies (e.g., Paye, 2006, Rapach et al, 2005, Pethe and Karnik, 2000, Rao, E. N., 1999, Goyal, 1997, As prem, 1989) and economic intuition to balance the problem (Chen, Roll and Ross, 1986). Thus, six individual indicators of economic activity namely, yield on 91- days treasury bills (YTB), yield on long-term government bonds (YLGB), money supply ( $M_3$ ), whole-sale price index (WPI), aggregate market return of the risk-assets (Index), and industrial production (IIP) were chosen to study the impacts of policy regimes on the economic activities in India.

**Yield on 91-days Treasury Bills (YTB):** Yield on treasury bills that is, cost of risk free capital is widely used as a benchmark tool in financial and economic decision-making. Theorists argue that, an arbitrary rise in the cost of risk-free capital will drive up cost of borrowing of all other alternative sources of funds in the economy as restrictive movement or no movement of capital across the countries is a typical feature of

controlled economy (Lopez-Mejia, 1999); and the arbitrarily fixed higher rates of return on risk free capital will simply attract the available surpluses to that sector. This will, at least in the short-run, lead to an increase in interest rates of other available alternative sources of borrowing in the country. In this situation, lenders will find it difficult to lend because of the potential increase in business risk and possible rise in the problems like 'adverse selection' (Mishkin, 1999). Ultimately, the effective investment and economic activity of a country will be affected seriously. On the other hand, if the rate is kept low, a reverse outcome is expected. Naturally, to allow the surpluses to flow in all the desired sectors, an administered but low risk-free rate of return with minimum volatility is expected to be preferred more by the planners in the initial phase of development especially in under-developed and developing economies. Thus, we can hypothesize that a lower yield of the 'risk-free' capital to prevail in the controlled regime.

**Yield on Long-term Government Bonds (YLGB):** Scholars of empirical finance literature suggest that 'State' should share more initial responsibility to invest in infrastructure and core sectors especially in underdeveloped or developing countries (Williamson, 1998). Theorists also suggest that market is not always the best mechanism for providing basic goods and hence the State should step in. They quite plausibly argue that, initial government spending on these sectors will inspire and ignites the private investments and augment the whole process of development (Joseph, 2001, Williamson, 1998, Panitch, 1994). Hence, we can safely assume that the Government, to shoulder the initial responsibility for development, will try to mobilize funds at lower rates as the expected returns from the infrastructural projects and core sectors are relatively low. Administered interest rate policy and 'captive markets' for government securities can help and rescue the government more on this issue. Thus, in the controlled regime cost of government borrowing is expected to be administered and minimum.

**Money Supply ( $M_3$ ) and Inflation (WPI):** Money supply is the most vulnerable macroeconomic variable that affects the volatility of prices in all the markets – physical and financial. Changes in the volume of money supply also influence the monetary base of an economy to support currency and chequable deposits. A causal relationship is maintained between the money supply and i) non-borrowed monetary base, ii) multiple deposit expansion by the banking sector, iii) volume of discounted loans, iv) wealth, expected deposit outflows and illegal activities in the economy, etc., and vi) inflation (Mishkin, 1992). Its positive relationship with inflation poses the risk to over or underestimate the firms' liabilities in real terms that results in the fluctuations in real net worth of the firms. All these possibilities cast a real challenge to the depositors, lenders, borrowers and others that ultimately influence the investment and economic activities. Again, the intricate relationship of money supply with economic activities largely depends on the 'fiscal discipline' (Mackinnon 1973, Shaw 1973). Hence we assume, to avoid the unfavorable impacts of excessive growth in money supply; an administered growth in money supply and reliance on direct tools of monetary control are expected more in controlled regime.

**Aggregate Return of Stock Market (Index):** Considering the experiences of emerging market economies and the uncertainty about the outcome of the 'free economy' the 'interventionist' approach shows little interest and even bypasses the direct investor-

investment mechanism. They prefer to regulate, monitor and control mobilization and allocation of precious funds generated by the economic organisms through different state owned or controlled public sector banks, insurance organizations and special purpose financial vehicles. At the same time, investors may prefer the system as the government ownership and control of financial institutions shield the investors from the panics of bankruptcy or liquidation of the institutions. It increases investors' confidence on the entire financial system by providing assurance for security and liquidity—the two vital basics of financial investments, and restrains the policy planners, in general, to try a new philosophy. Furthermore, scholars argue that, if the market forces determine the rates and drive them up sufficiently due to either increased demand for credit or by decrease in the money supply, the outcome will be the substantial fall in lending. This will, ultimately, result in net decline in investment and aggregate economic activity and vice versa (Mishkin, 1992). Hence, we can hypothesize that a shallow equity market with flat return is expected in the controlled regime.

**Industrial Production (IIP):** Index of industrial production is a very common and widely used macroeconomic variable to represent the growth of an economy<sup>1</sup>. In a frictionless economy, any change in the economic policy measure is expected to reflect well by the index for industrial production.

### SECTION III

**Data:**

Data on IIP in India are available on a monthly basis. Hence, we have employed monthly data for all the six variables. The data are collected from the secondary sources like, the published reports and information of the Govt. of India, the Reserve Bank of India, the Securities and Exchange Board of India, CMIE, BSE, etc.

In this study, broad money ( $M_3$ ) is considered to represent the money supply and we used the popular formula  $RET = \{(P_1/P_0) - 1\}$  as a measure of the growth rates of the variables except YTB and YLGB which are used at their level values. Here,  $P_1$  = the index for the current month and  $P_0$  = the index for the preceding month of the current month.

**Time Period:**

This study covered a period of about 41 years from January, 1966 to January, 2007, divided into three sub-periods: January 1966 - December 1979, January 1980 – March 1992 and April 1992 - January 2007, representing the 'controlled', 'semi-controlled' and 'free-economy' regimes, respectively.

**Methodology:**

In this study, the selected macro-economic variables are interrelated with each other. They have some joint vis-à-vis individual impacts on the economic activity. We assessed only the individual impacts of the factors on Indian economic activities through the ANOVA models. Assuming the impacts, if present, as deterministic and not stochastic, we estimated the regression equation below in additive form of the indicator variables:

$$Y_i = \beta_1 D_{1i} + \beta_2 D_{2i} + \beta_3 D_{3i} + u_i \dots\dots\dots \text{Eq.1}$$

where,  $Y_i$  = absolute values or RET of the variables,  $D_{1i} = 1$  for ‘controlled regime’ and 0 for otherwise,  $D_{2i} = 1$  for ‘semi-controlled’ regime and 0 for otherwise,  $D_{3i} = 3$  for ‘open economy’ regime and 0 for otherwise;  $\beta_1, \beta_2, \beta_3$  are the differential co-efficients and error term  $u_i \approx N(0, \sigma)$ . Testing whether or not the categorization is relevant can be done by running ‘t- test’ of the dummy variable coefficients against zero or, an ‘F’ test on the appropriate set of dummy variable coefficient estimates (Kennedy.P, 1998).

Undoubtedly, the growth in an economy is better reflected by GDP but the availability of the long monthly data series that is essential for any meaningful analysis, limits our study to use IIP as the surrogate of the same.

The time series properties of the variables have been assessed by conducting Augmented Dicky-Fuller (ADF) test. Stationarity, presence of drift and trend are tested simultaneously by estimating the equation:

$$\Delta Y_t = \beta_1 + \beta_2 (t) + \delta Y_{t-1} + \alpha_i \sum_{i=n}^m \Delta Y_{t-i} + \varepsilon_t \dots \dots \dots \text{Eq.2}$$

against the null hypothesis  $\beta_1 = \beta_2 = \delta = 0$ . Here,  $\varepsilon_t$  is a pure white noise,  $Y_t$  is a variable or time series,  $\beta_1$  is the co-efficient for the drift,  $\beta_2$  is the differential

coefficient for the trend,  $\delta = (\rho - 1)$ ,  $\rho$  = co-efficient for autoregression,  $\alpha_i \sum_{i=n}^m \Delta Y_{t-i}$  is the

1st difference of  $Y_t$  at various lags of order  $i=1, 2, 3, \dots, m$  introduced to augment the equation for ADF test. For an asymptotic series, the test statistic follows the ‘F’-distribution (Gujarati, 2003). If the hypothesis  $\beta_1 = \beta_2 = \delta = 0$  is accepted, we can conclude that the series under question i.e.,  $Y_t$  is I(1). If we cannot reject the hypothesis that  $Y_t$  is I(1), we need to further test the Null hypothesis  $H_0: Y_t = I(2)$  versus the Alternative hypothesis  $H_1: Y_t = I(1)$ . The residuals obtained from the Eq. (2) are tested for their influence on the regressors through two sets of tests proposed by Box-Pierce (1970) and Ljung-Box (1978) using the Null  $H_0: \rho_{u,1} = \rho_{u,2} \dots \dots \dots = \rho_{u,h} = 0$  against Alternative  $H_1: \rho_{u,i} \neq 0$  for at least one  $i = 1, 2, \dots, h$  is tested. Here,  $\rho_{u,i} = \text{corr}(u_i, u_{t-1})$  denotes autocorrelation coefficients of the residual series. Both the test-statistics  $Q_h$  and  $LB_h$  grossly follow the  $\chi^2$  distribution.

In addition to the ADF test, we used the tests suggested by Kwiatkowski, Phillips, Schmidt and Shin (1992) and Phillip-Perron (1988). The KPSS test is a unit root test in which the null hypothesis is just opposite to that in ADF test. Under the null, the series in question is I(0) against the alternative I(1). The KPSS statistic has a well-defined asymptotic distribution, which is free of nuisance parameters and tabled by simulation. The P-P test is also non-parametric with respect to nuisance parameters and thereby suitable for a very wide class of weakly dependent and possibly heterogeneously distributed data (Wong et al, 2005).

The optimum lag order used in the study is derived by ‘information criteria’ like:

Akaike Information Criterion, which is defined as (Akaike 1974):

$$AIC = e^{2k/n} (\sum \hat{u}_i^2) / n \dots \dots \dots \text{Eq. (3)}$$

where  $\hat{u}_i$  is the estimated error terms from the regression equation involving the time series. The minimum of the criterion serves as the guide to select the optimum lag range.

Schwarz Information Criterion which is defined as (Schwarz 1978) :

$$SIC = n^{k/n} (\sum \hat{u}_i^2)/n \dots\dots\dots Eq. (4)$$

where  $\hat{u}_i$  is the estimated error terms from the regression equation involving two macrovariables. Like the AIC, here also, the minimum of the criterion serves as the guide to select the optimum lag range.

It is worthy to note here that no one of these criteria is necessarily statistically superior to others. Diebold (2001) however recommends SIC to be applied. This study has tried both the methods and used the highest lag order so obtained.

Granger-Newbold (1974) test is conducted, whenever necessary, to test for spurious regressions. Tests for the collinearity or multi collinearity amongst the regressors were not tested as most of the economic time series data share a common trend and show multicollinearity when regressed [Gujarati, 2003]. It is essentially a micronumerosity and sometimes we have no choice over the data available to us for empirical analysis (Blanchard 1967).

### SECTION IV

**IV.I. General Features:** The stylized facts of the macro-economic variables are presented in the Table-I.

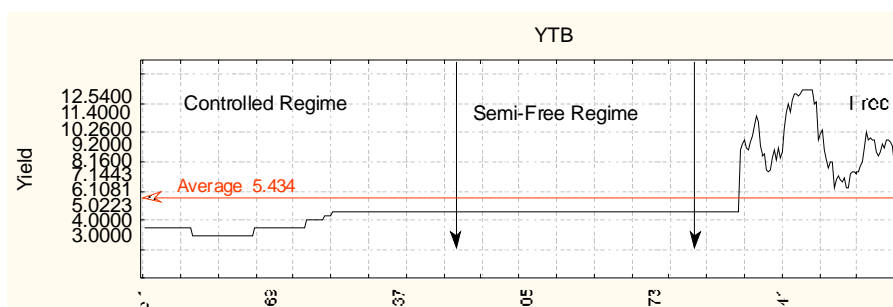
**Table I**  
**Descriptive Statistics of the Macroeconomic Variables**

Variable	Observations(n)	Mean	Median	Std. Dev.	Skewness	Kurtosis
<b>YTB-0</b>	<b>481</b>	<b>5.43354</b>	<b>4.60000</b>	<b>2.21127</b>	<b>1.61797</b>	<b>2.12764</b>
YTB-C	163	3.87301	3.50000	0.640945	-0.00625213	-1.60609
YTB S	145	4.60000	4.60000	0.000000	undefined	undefined
YTB F	173	7.60249	7.25000	2.37350	0.581556	-0.433801
<b>YLGB-0</b>	<b>481</b>	<b>8.38552</b>	<b>7.54000</b>	<b>2.99131</b>	<b>0.406160</b>	<b>-1.25587</b>
YLGB C	163	5.38288	5.00000	0.569779	1.09243	-0.505021
YLGB S	145	9.44841	9.16000	1.74921	-0.0917262	-1.39734
YLGB F	173	10.3237	11.5798	2.97130	-0.340384	-1.39965
<b>WPI-0</b>	<b>481</b>	<b>0.00345339</b>	<b>0.00532765</b>	<b>0.0406133</b>	<b>-11.8880</b>	<b>170.024</b>
WPI C	163	0.00280160	0.00551876	0.0439914	-7.73783	72.0279
WPI S	145	0.00158723	0.00600739	0.0554860	-11.1875	128.693
WPI F	173	0.00530893	0.00429326	0.0141221	1.21504	47.3859
<b>IIP-0</b>	<b>481</b>	<b>0.00356734</b>	<b>0.00516190</b>	<b>0.0731667</b>	<b>-0.735929</b>	<b>23.3285</b>
IIP C	163	0.00161438	0.00295858	0.0612943	-2.89963	18.7143
IIP S	145	0.00567852	0.00447761	0.0904693	1.41254	18.5438
IIP F	173	0.00363793	0.00641711	0.0673899	-3.51584	26.3707
<b>M-0</b>	<b>481</b>	<b>0.0121454</b>	<b>0.0118919</b>	<b>0.0129279</b>	<b>-0.366452</b>	<b>11.9788</b>
M C	163	0.0105203	0.0128762	0.0167065	-0.771047	10.8768
M S	145	0.0133132	0.0126521	0.00903740	0.488336	0.0474107
M F	173	0.0126978	0.0106276	0.0114540	1.13131	3.09565
<b>Index-0</b>	<b>481</b>	<b>0.0132173</b>	<b>0.0106640</b>	<b>0.0800647</b>	<b>1.19393</b>	<b>18.0651</b>
Index C	163	0.00527929	0.00344828	0.0431849	-0.268704	1.62716
Index S	145	0.0113091	0.0140924	0.0923487	-0.332396	11.7449
Index F	173	0.021492	0.0141155	0.0943325	2.14445	15.8781

**Note:** O stands for overall period, C stands for control regime, S stands for semi-controlled regime, F stands for free regime and n stands for number of observations.

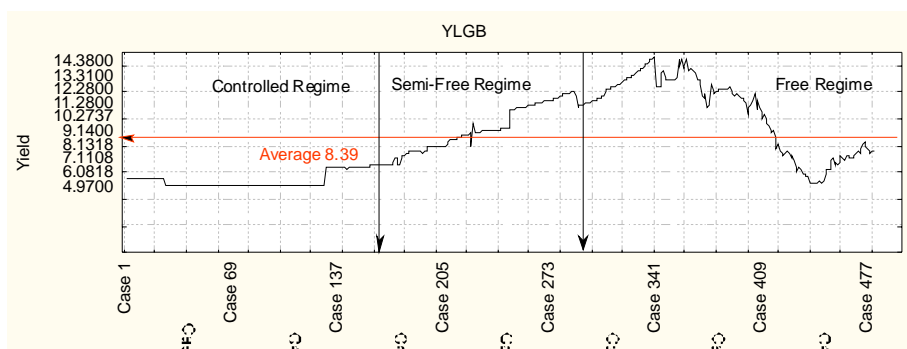
The cost of risk-free capital (YTB 91 days) has increased considerably with a higher degree of volatility in the free regime relative to the other periods including the data for the whole period [see Table I]. A fairly increasing trend is observed in the early periods of free- regime followed by the downward trend from the mid-periods of the regime (Fig. I). The distribution of the variable is non-normal and the negative values of kurtosis indicate that the distribution is more flat than normal in controlled and free regime. The larger changes dominated the controlled regime and smaller changes are frequent in the free regime as positive and negative skewness is found to exist in the regimes, respectively. In essence, impacts of the regimes are found to act more on YTB in the free regime.

Fig. I



Yield on long-term government bonds (Fig. II) also depicts a rising trend with more volatility in free regime and a bit less volatility in semi-controlled than free regimes.

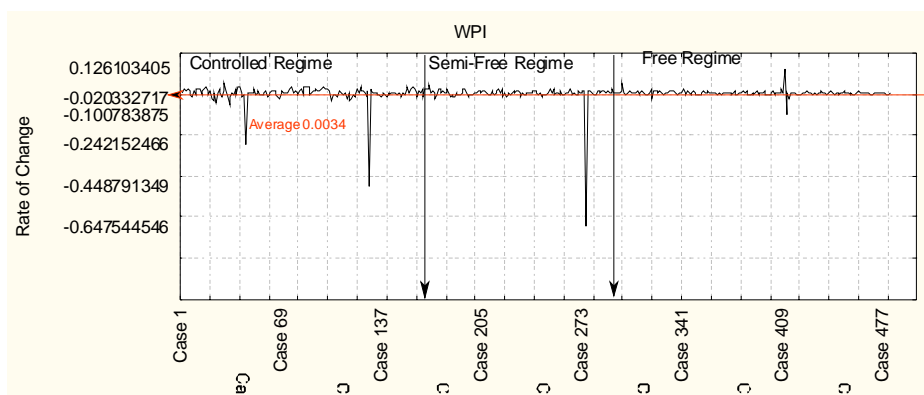
Fig. II



The distribution pattern of this variable is non-normal, platykurtic and very weakly supports the frequent larger changes in semi-controlled and free regimes. The positive value of the skewness, in the controlled regime indicates the dominance of smaller [changes] in the values of the variable. The magnitude of the positive skewness for the entire period confirms the observation stated above (Table I).

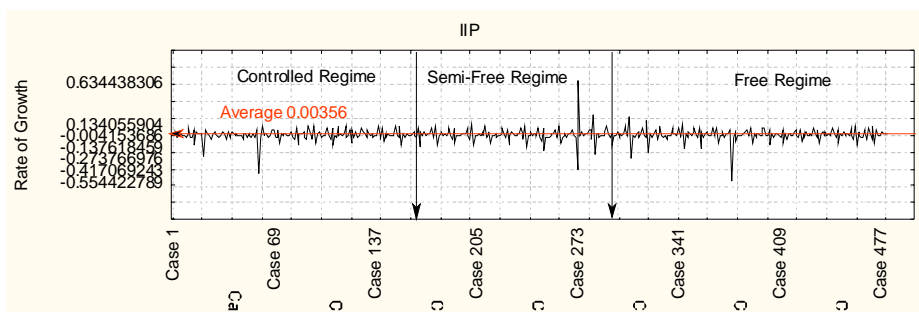
Wholesale price index (Fig. III) is more or less revealing slow negative growth except the free regime: the distribution pattern is highly leptokurtic with a negative skewness for all the periods and sub-periods under the study except the free regime (Table I). In the free regime the distribution is less leptokurtic than the other regimes and is dominated by the greater number of smaller values. This indicates that the impacts of policy changes are more in the free regime than the others.

Fig. III



Industrial production is showing a positive and higher growth rate in the semi-controlled regime than the controlled and free regime (Fig. IV). The volatility of the variable is maximum in semi-controlled regime and shows almost same level of variation in the other regimes including the 'entire period' under the study. The distribution of the variable is non-normal, leptokurtic, and greater number of the smaller growth rates of industrial production is found in the 'entire period' save the semi-controlled regime where the skewness is positive (Table I). In brief, only the policy prescription followed in the semi-controlled regime made the IIP a bit positive and active than the other regimes.

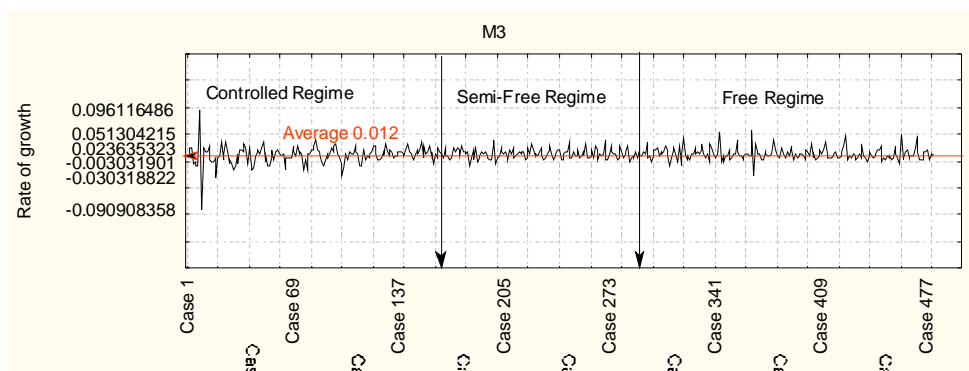
Fig. IV



In the semi-controlled and free regimes growth in the broad money supply is comparatively stable and more than the overall average rate of the same (Fig. V).



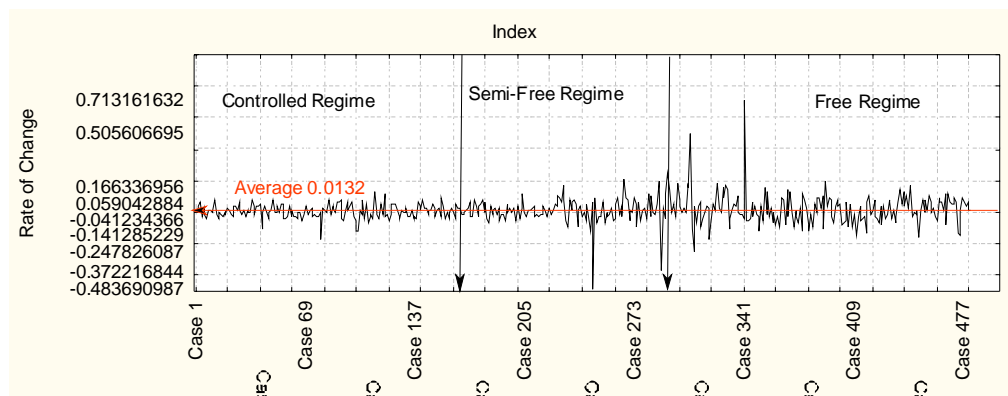
Fig. V



Here also, the distribution of the variable is non-normal, leptokurtic (save the semi-controlled regime) and dominated by smaller changes in semi-controlled and free regimes more than the controlled regime (Table I).

The Indian capital market has started to show its sign of life during the semi-controlled and free regimes with a relatively wide volatility than the other regimes (Fig. VI). The average return of the stock market is higher in the free regime. The distribution pattern of the variable is non-normal, more leptokurtic in the semi-controlled and free regimes and weakly dominated by the larger changes in controlled and semi-controlled regimes. The skewness of the regimes indicates that frequent small changes are greater in the free regime (Table I).

Fig. VI



**IV.II. Time Series Properties:** The time-series properties of all the variables under the study are assessed through the ADF-Test. The results and the optimum lag order used

are shown in Table-II and Table-III, respectively. The error variables are strongly uncorrelated with the regressors and are white noise (see Table-II). From the estimates, it is clear that all the variables WPI, IIP, M3, and Index are I(0); YTB and YLGB are I(1) with no drift and no trend. In addition to the ADF-Test, we employed the KPSS-Test and P-P Test. Results of both the tests confirm the results of ADF-Test (Table IV). Relatively weak responses showed by the variables YTB and YLGB are partly caused by the fact that we have studied only the yield figures instead of holding period returns. Several scholars who used the yield figures only reported similar results (Asprem, 1989).

**TABLE II**  
**Unit Root Test of the Macroeconomic Variables (ADF-Test)**

$$\Delta Y_t = \beta_1 + \beta_2(t) + \delta Y_{t-1} + \alpha_i \sum_{i=1}^m \Delta Y_{t-i} + \varepsilon_t$$

Variables	ADF-Test Ho: I(1)			Error Terms of the ADF –Regression Equation B-P Test and L-B Test (Ho: $\rho_{u,i} = 0$ )			
	Coefficient	Test Statistic	p-value	B-P Test		L-B Test	
				Test statistic	$\chi^2$ p-value	Test statistic	$\chi^2$ p-value
YTB	-0.0318703	-2.8769	0.17	102459	1	1.2723	.9999
YLGB	-0.004782	-0.900416	0.9545	0.5725	1	0.587	1
WPI	-0.92443	-5.3626	0.0000	0.005	1	0.0055	1
IIP	-1.50833	-5.7108	0.00000	0.5053	1	0.5112	1
M3	-0.8988	-4.48136	0.001566	5.6236	0.9336	5.7261	0.9293
Index	-0.92158	-5.7184	0.000005	0.2490	1	0.2549	1
1 <sup>st</sup> Diff.YTB	-0.9346	-6.429	0.00000	1.3404	0.9998	1.3623	0.9998
1 <sup>st</sup> Diff.YLGB	-0.8244	-4.86	0.00000	0.4794	1	0.4914	1

**Note:** a)  $\rho_{u,i}$  denotes autocorrelation coefficient of the residuals ( $u_t, u_{t-1}$ ).  
b) I(0) and I(1) denoting the series under question are integrated of order 0 and 1, respectively.

**Table III**  
**The Optimum Lag order of the Unit Root Test**

Variables	AIC	SIC
YTB	15	0
YLGB	1	1
WPI	0	0
IIP	11	1
M3	15	13
Index	0	0
1 <sup>st</sup> Diff.YTB	13	0
1 <sup>st</sup> Diff.YLGB	0	0

**TABLE IV**

**Unit Root Test of the Macroeconomic Variables (P-P and KPSS Test)**

Variables	P-P Test: Ho: I (1)		KPSS Test: Ho: I (0)	
	Test statistics	p-value	Test statistics	p-value
YTB	-2.4781	<0.9	0.6201	<0.01
YLGB	-0.511	<0.9	2.0898	<0.01
WPI	-21.8977	<0.01	0.0301	<1
IIP	-31.4442	<0.01	0.0546	<1
M3	-19.1543	<0.01	0.1542	<0.05
Index	-21.2676	<0.01	0.0586	<1
1 <sup>st</sup> Diff.YTB	-20.6365	<0.01	0.0427	<1
1 <sup>st</sup> Diff.YLGB	-24.5956	<0.01	0.1943	<0.025

**IV.III. Empirical Evidences of Regime Shift:** Results of the ANOVA Test are presented in Table-V. Strong impacts of the policy-shifts are found in growth of money supply for all the regimes. This confirms the preference and reliance of the Indian policy planners on the direct control measures for money supply across the regimes and their recent support for the ‘supply-led growth strategy’. Returns on the risk capital are significantly different in free regime and are weak and slightly insignificant (10.73%) in semi-controlled regime. Growth of IIP is not significant throughout the periods under the study. Broadly speaking, only a very low impact is noticed in the average growth rates of IIP in semi-controlled regime and, that is, statistically insignificant too. No remarkable impacts of regime shifts are found to exist in the changes in the rate of growth in WPI except in the free regime. The rate of growth in the yield of risk free capital has increased in the free regime, and that of the long-term government bonds has increased in the semi-controlled regime but a decreasing trend is found to exist in the free regime. The findings of the study indicate that both the variables are showing statistically insignificant differences amongst the regimes. We cannot draw any inference using the variables YTB and YLGB at levels as both of them show strong evidences of spurious regression (Granger and Newbold, 1974) although they have high ‘F’-values (Table V).

**Table V**  
**Macroeconomic Variables and ANOVA Estimates**

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$$(Y_i = \beta_1 D_{1i} + \beta_2 D_{2i} + \beta_3 D_{3i} + u_i)$$

Macro variables	$\beta_1$	$\beta_2$	$\beta_3$	F	Sig F	R <sup>2</sup>	DW-d	Error variables		
								$\chi^2$	p-value	Remarks
YTB Coef SE t Sig.t	3.8730 0.1220 31.742 0.000*	4.6 0.1366 33.668 0.000*	7.3629 0.1136 64.807 0.000*	2118.1	0.0000	0.5058	0.0655	56.502	0.00000	Uncorrelated with the independent variables
YLGB Coef SE t Sig.t	5.3829 0.1588 33.887 0.000*	9.2294 0.1778 51.889 0.000*	10.405 0.1479 70.351 0.000*	2936.16	0.0000	0.5423	0.0257	21.888	0.00002	Uncorrelated with the independent variables
RET WPI Coef SE t Sig.t	0.0028 0.0032 0.8795 0.3795	0.0016 0.0036 0.4450 0.6565	0.0053 0.0029 1.7899 0.074*	1.3947	0.2497	0.0015	2.0243	26513	0.00000	Uncorrelated with the independent variables
RET IIP Coef SE t Sig.t	0.0016 0.0057 0.2812 0.7787	0.0065 0.0064 1.0184 0.3090	0.0032 0.0053 0.5988 0.5496	0.49257	0.6876	0.0007	2.6667	1237	0.00000	Uncorrelated with the independent variables
RET M3 Coef SE t Sig.t	0.0105 0.0010 10.410 0.000*	0.0130 0.0011 11.525 0.000*	0.0129 0.0009 13.748 0.000*	43.68	0.000	0.0081	2.0558	628.44	0.00000	Uncorrelated with the independent variables
RET Index Coef SE t Sig.t	0.0053 0.0063 0.8433 0.3995	0.0113 0.0070 1.6133 0.1073	0.0214 0.0058 3.6744 0.000*	5.6168	0.0009	0.0076	1.9717	746.67	0.00000	Uncorrelated with the independent variables
1 <sup>st</sup> Diff. YTB Coef SE t Sig.t	0.0068 0.0296 0.2291 0.8189	0 0.0331 0.00 1.00	0.0135 0.0275 0.4919 0.6230	0.0983	0.9609	0.0002	1.9105	1525.5	0.00000	Uncorrelated with the independent variables
1 <sup>st</sup> Diff. YLGB Coef SE t Sig.t	0.0065 0.0209 0.3090 0.7575	0.0342 0.0234 1.4586 0.1453	-0.0179 0.0195 -0.9218 0.3571	1.0263	0.3806	0.0061	202657	1136.7	0.00000	Uncorrelated with the independent variables

Note: \* signifies that  $Y_i$  differs significantly from the other periods.

The discussion on development without acknowledging the role and efficiency of capital market is partial. It is more relevant for this study as our policy planners are now attaching greater emphasis on the markets. Theoretically, the efficient market is expected to reveal normal distribution of their returns, and the proponents of 'free-economy' posited reduction of the volatility of the capital market that would enable the market to allocate resources effectively and efficiently (Cho, 1986). Findings of the study show that volatility of the Indian market, measured by the standard deviation, has increased remarkably in the periods of semi-controlled and free-economy regimes. The JB-Statistic

are 9.6941, 0.09056, 3.2048 and 7.6764 for the overall period, controlled, semi-controlled, and free regimes, respectively. The estimates of Skewness, Kurtosis and JB-Statistics speak for the overall and gradual inefficiency of the Indian Capital Market. There may be some disagreements but applying more sophisticated econometric tools many authors also share the view that the Indian capital market is not mature enough to depend with the vital task of allocation of precious national resources (Dev, 2003, Naka et al 2001, Pethe and Karnik 2000, Bilson et al 2000).

## SECTION V

### Summary and Conclusion

The findings of the study suggest that the policy measures so far experimented have, to some extent, influenced the Indian economic activities. The average rate of growth in money supply is statistically significantly different from one regime to the other. The growth is almost steady but relatively more in the semi-controlled and free regimes than the overall and control regime. Whether a steady growth in money supply would lead to increase in investment resulting development to the developing and less-developed countries is still a big issue to research and resolve. The growth in the wholesale price index remained unmoved and almost flat throughout the entire period under the study; but the evidence of its positive growth pattern in free regime would certainly add much to the frustration of the policy planners. The very recent steps taken by the Government of India confirm the findings of the study. Findings of the study also point to the fact that our policy planners have to walk a few miles more to contribute something real to the masses. All the primary determinant macroeconomic variables for growth of industrial activities are found favorable but the real sector represented by the growth in industrial production remained dumb. Even, contradicting the 'neo-liberalists', it exhibits a relatively more frustrating state in the 'free-regime'. The steady and increasing trend of growth in money supply failed to influence the growth of real output—the basic indicator of development but only pushed the inflation significantly in the free regime. Probably the delay or lack of use of the advanced technology, unplanned and negative growth in employment, poor growth in exports, larger spread in saving and investment, positive growth in debt-servicing by both the central and state governments, physical-financial-legal infrastructure, opacity of the economy and others may have distorted the transmission process. It may also be due to the shift in activities from real sector to the other sectors leading to a 'job-less growth' in the economy. It is a matter of great concern and warrants serious attention for rectification.

In the total period covered under study, the yield on treasury bills and long-term government bonds are intensely influenced by the policy changes with steady and higher degrees of volatility with time. The cost of government borrowings is comparatively high in the semi-controlled regime but continues to fall in free regime and almost converges with that of the risk-free return on capital. This is definitely a positive signal to all the potential investors—government and private—to undertake projects including the long-term ones that may ultimately augment the growth in economic activities. We hope the potential investors would seriously discount the message in the

signal. But inferences on these variables at level should be drawn with caution, as the same are non-stationary and showing spurious regression estimates. Moreover, the I(1) data of both the variables exhibit no significant statistical differences amongst the regimes.

The financial sector, especially the stock market where the recent policy measures are focused more, sufficiently discounted the policy prescriptions and conveyed signals of deference during the semi-controlled and in particular, the free regime. But, delighted with this information, over-jubilant ones should not keep their eyes away from the lessons of the great Asian debacle of 1997 as our market is more open now. The findings of this study also indicate that the Indian equity market is not efficient enough to depend, which belies the hopes of the votaries of 'free-economy'. Moreover, without adequate safeguards over-emphasis on inefficient equity market might be avoided in the job of allocation of precious social resources, otherwise, that may invite catastrophe in the economy at any moment. Now it is high time for both the policy planners and researchers to think further over the issue and to decide, to what direction and to what magnitude we should control or allow the factors to roll.

### References

- Akaike, H. (1974), "A New Look at the Statistical Model Identification", *IEEE Transactions on Automatic Control*, AC-19, pp. 716–23.
- Asprem, M. (1989), "Stock Price, Asset Portfolio and Macroeconomic Variables in Ten European Countries", *Journal of Banking and Finance*, No.13.
- Blanchard, O.J. (1967), "Comment", *Journal of Business and Economic Statistics*, Vol.5.
- Bilson, C. M., T.J.Brailsford and V.J.Hooper (2000), "Selecting Macroeconomic Variables as Explanatory Factors of Emerging Stock Markets", *Working Paper No. 04*, The Australian National University.
- Box, G. and D. A. Pierce (1970), "Distribution of Residual Autocorrelation in Autoregressive Integrated Moving Average Time Series Models", *Journal of American Statistical Association*, Vol. 65, pp.1509-1526.
- Chen, N. F., R. Roll, and S. A. Ross (1986), "Economic Forces and the Stock Market", *Journal of Business*, 59: pp. 383-403.
- Cho, Y.Je. (1986), "Inefficiencies from Financial Liberalization in the Absence of Well Functioning Equity Markets", *Journal of Money, Credit and Banking*, Vol. 18, No. 2.
- Clarke, T. (2000), "Taking on the WTO: Lessons from the Battle of Seattle", *Studies in Political Economy*, 62, Summer.
- Deb, S. S. (2003), "In Search of Weak Form of Efficiency in Indian Capital Market"; *The ICAFI Journal of Applied Finance*, Vol. 9, No. 9, Dec.
- Diebold, F. (2001), *Elements of Forecasting*, 2nd Ed: South Western Publishing, pp. 83-89.

- Goyal, A. (1997), "Financial Reforms: Why Interest Rates must be Kept Low", *International Journal of Development Banking*, Vol. 15, No. 2, July.
- Granger, C. W. J. and P. Newbold (1974), "Spurious Regression in Econometrics", *Journal of Econometrics*, Vol. 2.
- Gujarati, D.N. (2003), "Basic Econometrics", 4th ed. McGraw Hill International, N.Y.
- Jha, P. S. (1982), "The End of the Tunnel: Return to Sanity in economic Policy"; *Times of India*, April 9.
- ..... (1984), "Seventh Plan Perspective: A New Direction for the Industry", *Times of India*, Aug. 13.
- Joseph, S. (2001), "Democratic Good Governance — New Agenda for Change", *Economic and Political Weekly*, March 24-30.
- Kanagasabapathy, K. (2001), "Monetary Policy Underpinnings : A Perspective"; *Economic and Political Weekly*, Jan. 27.
- Kennedy, P. (1998), *A Guide to Econometrics*, The MIT Press, Cambridge, Mass., 4th ed.
- Kohli, A. (1989), "Politics of Economic Liberalisation in India", *World Development*, Vol. 17.
- Kwiatkowski, D., Phillips, P. C. B., Schmidt, P. and Shin, Y. (1992), "Testing the null of stationarity against the alternative of a unit root: How sure are we that the economic time series have a unit root?", *Journal of Econometrics*, 54: pp. 159-178.
- Ljung, G. M. and Box, G. E. P. (1978), "On a measure of lack of fit in time-series models", *Biometrika*, 65: pp. 297-303.
- Lopez-Mejia, A. (1999), "Large Capital Flows, Causes, Consequences and Policy Responses", *Finance and Development*, Sept.
- MacKinnon, R. I. (1973), *Money and Capital in Economic Development*, Washington, DC, Brookings Institute.
- McDonald, D. (2002), "Cosatu Out of Touch", *Mail and Guardian*, 11th October.
- MacKinnon, R.I. (1989), "Financial Liberalization and Economic Development: A Reassessment of Interest Rate Policies in Asia and Latin America", *Oxford Review of Economic Policy*, Vol. 5.
- Mishkin, F. S. (1999), "Global Financial Instability: Framework, Events, Issues", *Journal of Economic Perspective*, Vol. 13, No. 4, Fall.
- ....., (1992), *The Economics of Money, Finance and Financial Markets*, 3rd ed., Harper Collins Publishers.
- Naka, Mukherjee and Tufte, (2001), *Microeconomic Variables and the Performance of the Indian Stock Market*, University of New Orleans, USA.
- Panitch, L. (1994), "Globalisation and the State", published in "Social Register" ed. by Milband, R. and Leo Panitch, 30th issue.
- Paye, B.S. and A. Timmermann (2006), "Instability of Return Prediction Models", *Journal of Empirical Finance*, Forthcoming.

- Pethe, A. and A. Karnik (2000), "Do Indian Stock Market Matter?" *Economic and Political Weekly*, Jan. 29.
- Phillips, P. C. B. and P. Perron (1988), "Testing for a unit root in time series regression", *Biometrika*, 75, 335-346.
- Rao, E. N. (1999), "Stock Market Response to Macroeconomic Events", *Finance India*, Vol.12, No. 4, Dec.
- Rapach, D. E, M.E. Wohar, and J. Rangvid (2005), "Macro Variables and International Stock Return Predictability", *International Journal of Forecasting*, 21: pp. 137 -166.
- Reddy, Y. V. (2002), "Monetary and Financial Sector Reform in India": *R.B.I. Bulletin*, Vol. LVI, No. 5.
- Schwarz, G. (1978) "Estimating the dimension of a model", *Annals of Statistics*, 6, pp. 461-64.
- Shaw, E. S., (1973),. *Financial Deepening in Economic Development*, Oxford University Press, New York.
- Tabb, W. K.(2000), "After Seattle: Understanding the Politics of Globalization", *Monthly Review*, Vol. 51, No.10, March.
- Williamson, J. (1998), "Globalisation, Labour Markets and Policy Backlash in the Past", *Journal of Economic Perspective*, Fall .
- Wong, W. K., A. Agarwal and Jun Du (2005), "Financial Integration for Indian Stock Market, a Fractional Co-integration Approach", Working Paper No. 0501, Dept. of Economics, National University of Singapore.