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Permanent and Temporary Components of Indian Stock Market Returns

R.B.Barman and T.P.Madhusoodanan*

The early tests of market efficiency examined autocorrelations and tests for random walk. The test of unit root distinguishes between random walk and stationary components but not the extent of each, when the stock market returns are mixture of both. The variance ratio test gives an estimate of the extent of permanent and temporary components. In this paper, we analyse the permanent and temporary components of Indian stock market returns, using this test, both at the industry level and at company level. In general, the fluctuations in the returns were permanent in nature in the long-run, while for short and medium term they were temporary.

Introduction

The behaviour of stock market returns has been a subject of intense research in the area of finance. The early survey on this topic by Fama(1970) concluded that the stock market was efficient. The recent studies, using US and UK data, indicate that stock returns are predictable. Fama and French (1988) and Poterba and Summers(1988) have shown that for US, the stock returns are predictable upto a certain extent. MacDonald and Power(1991) show that for UK also the stock returns have mean reverting tendency and hence they are predictable. This, in other words, means that the market is not efficient. The authors, however, have reported positive autocorrelations in short-run but negative autocorrelations in long-run.

In this paper, we test the extent of permanent component in Indian stock returns, on the lines suggested by Cochrane(1988). The analysis thus seeks to examine whether the returns on stocks are mean reverting or more akin to a random walk model. The paper is organised into the following sections: Section I is devoted to the definition of random walk model and the tests pursued in the paper. Section II describes the data and the risk and return as revealed from their analysis. In Section III we present the results of the various tests, while the final Section gives the major conclusions of the study.

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SECTION - I

Random Walk model

Let $r_{i,t+1}$ be one-period ahead return on ith stock, I_t it is the information set available at time t, $\bar{r}_{i,t+1}$ is the equilibrium return and $H_{i,t+1}$ is the excess return at time t+1. Then it is possible to represent the excess return by

$$H_{i,t+1} = r_{i,t+1} - E(\bar{r}_{i,t+1}/I_t) \quad ..... \quad (1)$$

If the market is in equilibrium, there should not be any systematic pattern in $H_{i,t+1}$. If this is true then the successive changes in stock prices should be independent and identically distributed. This does not however imply that the expected return on any security is zero. The returns can at times be above normal for securities with high risk. But what the random walk model implies is that past prices should not contain information about subsequent change in price. If the returns follow a random walk, then it is not possible to forecast them reliably. This is a basic characteristic of an efficient market. The random walk model is seen as a sufficient condition for the weak form of efficient market hypothesis which states that all information contained in historical prices get fully reflected in current price and hence future prices cannot be forecasted on the basis of the past. If we assume that an investor can reasonably expect a mean return ß between two time points, then the model can be defined as

$$r_t - r_{t-1} = \beta + \epsilon_t \quad .... (2)$$

where ϵ_t is a stationary series with mean zero and variance σ^2. From this, we find that

$$r_t = r_o + \beta t + \sum_{j=1}^{t} \epsilon_j$$

In this case, the disturbance term is not stationary, because its variance is $t\sigma^2$ which increases over time. Nelson and Plosser (1982) call this as a difference stationary process (DSP). The relation (2) is known as random walk model with constant drift. It can be said that if the stock returns follow a random walk, it belongs to DSP Class.

On the other hand if we assume that the stock returns follow a trend path, then we can represent it by

$$r_t = \alpha + \beta t + u_t \quad ....(3)$$

If we now eliminate the trend by subtracting $\alpha + \beta t$ from both sides

$$r_t - \alpha - \beta t = u_t \qquad ....(4)$$

then u_t satisfies the condition of stationarity. Nelson and Plosser call this as a trend stationary process (TSP). If we want to find out which of the above two models is followed by stock returns, then we may fit one of the following models.

$$r_t = \alpha + \tau\, r_{t-1} + \epsilon_t \qquad ... (5)$$

or

$$r_t = \alpha + \tau\, r_{t-1} + \beta t + \epsilon_t \qquad ... (6)$$

and find out what are the estimate of τ and β. If $\tau = 1$ and $\beta=0$ then the model belongs to DS Class. If, however, $\tau<1$, then the model can be classified as belonging to TS Class.

If a series belongs to TS Class, then the series moves along a trend path. The deviation from the trend at any instant of time is only temporary. Therefore, the return on stocks following TS Class will imply that in the long run there will not be any risk of losing out due to **permanent** fluctuations in the prices. The fluctuation in a random walk model is however permanent in nature and therefore the stock returns following DS Class are likely to be more risky, with no guarantee that the process will return to a trend pattern. It is evident that stock returns following TS Class can be predicted with reasonable degree of accuracy, but the returns following DS Class will be difficult to predict in the long run.

To distinguish between these two types of model the test of unit root (Dickey (1976)) could be applied. This test thus could distinguish between a series with a random walk component from the one that has stationary component. If, however, a series has a mixture of both, then the test of unit root cannot provide a clear answer about the relative importance of each component.

Cochrane (1988) observed that a measure of the size of the random walk component to help guide the proper procedure than a unit root test, is necessary, for, if the random walk component is small, the asymptotic distribution theory based on trend stationarity may prove a better approximation in a given small sample than the theory based on a unit root. Cochrane showed that "If the variance of the shocks to the random walk component is zero, the series is trend stationary, and long-term forecasts do not change in response to shocks. If the variance of the shocks to the random walk component is equal to the variance of first difference, the series is a pure random walk." It therefore gives a measure of relative importance of permanent and temporary components in a series through decomposition of the series into stationary and random walk components.

Variance of log differences

If we assume that the stock returns follow a random walk model, then the variance of its k differences can be written as

$$Var(P_t-P_{t-k}) = k\sigma^2_\epsilon$$

$$(1/k)\ Var(P_t-P_{t-k}) = \sigma^2_\epsilon \qquad ...(7)$$

where P_t is log of prices of stocks at time t.

If, however, the stock returns can be modelled as a trend stationary process, then the variance of its k differences will approach a constant as below :

$$Var(P_t-P_{t-k}) \longrightarrow 2\,\sigma_P^2 \qquad ....(8)$$

In this case (1/k) $Var(P_t-P_{t-k})$ will decline towards zero with the increase in k.

It may, therefore, be seen that the plot of variance of k-differences of stock returns against k indicates whether the series is a random walk or not. But it does not give a measure of the extent of random walk or stationary (temporary) component in stock returns. A measure of size of a random walk component in stock returns can be obtained from the variance of its log difference as will be shown below.

Variance ratio test

Let us assume that return r_t is a stationary process. By Wald's (1938) decomposition theorem, any stationary process can be decomposed into infinite sum moving average process as below :

$$r_t = \mu + \epsilon_t + a_1\epsilon_{t-1} + ... \qquad (9)$$

where μ is the long-run average return on stocks, a_i's are constant and ϵ_i's are uncorrelated random innovations having zero mean and constant variance.

Following Beveridge and Nelson (1981), if the log of stock price at time t is represented as P_t, then the k period ahead expected price $\hat{P}_t$ (k) may be given as

$$\hat{P}_t(k) = (P_{t+1} | \ldots\ldots, P_{t-1}, P_t)$$
$$= P_t + E(r_{t+1} + \ldots\ldots + r_{t+1} | \ldots\ldots r_{t-1}, r_t)$$
$$= P_t + \hat{r}_t(1) + \ldots\ldots + \hat{r}_t(k) \qquad (10)$$

Substituting (9) into (10) and rearranging,

$$\hat{P}_t(k) = k\mu + P_t + (\sum_1^k a_i) \in_t + (\sum_2^{k+1} a_i) \in_{t-1} + \ldots \qquad (11)$$

For k -> ω , (11) can be written as

$$\hat{P}_t(k) = k\mu + P_t + (\sum_1^\infty a_i) \in_t + (\sum_2^\infty a_i) \in_{t-1} + \ldots \qquad (12)$$

It may be seen that the forecast of stock price k period ahead is a linear function of forecast horizon k with slope μ and a level which is a stochastic process.

Cochrane (1988) showed that 1/k time the variance of k-differences gives an estimate of random walk component. This level is interpreted as the permanent component of P_t. Denoting this level by $\bar{P}_t$, we may write

$$\bar{P}_t = P_t + (\sum_1^\infty a_i) \in_t + (\sum_2^\infty a_i) \in_{t-1} + \ldots\ldots \qquad (13)$$

If we now take the first difference, then

$$\bar{P}_t - \bar{P}_{t-1} = (P_t - P_{t-1}) + (\sum_1^\infty a_i) \in_t - (a_1 \in_{t-1} + a_2 \in_{t-2} + \ldots)$$

$$= \mu + (\sum_0^\infty a_i) \in_t, \quad a_\varnothing = 1 \qquad \ldots (14)$$

Therefore, the permanent component is a random walk with rate of drift equal to μ and a non-autocorrelated innovation equal to

$(\sum_0^\infty a_i) \in_t$. It is therefore possible to decompose P_t into a permanent, Z_t, and a covariance stationary process C_t,

i.e., $P_t = Z_t + C_t$.

We want to know how important is the permanent component Z_t in the determination of stock price. For this one may employ spectral density function of return on stocks, r_t, to get a measure of the importance of permanent or random walk component.

The spectral density function $s(\alpha)$ at frequency α can be written as

$$s(\alpha) = \sum_{j=-\omega}^{\infty} \tau_j e^{ij}\alpha \qquad \dots (15)$$

$$= 1 + 2 \sum_{j=1}^{\omega} \tau_j \operatorname{Cos} j\alpha \quad \text{[omitting imaginary part]}$$

τ_j represents the autocorrelation coefficients at lag j, with $\tau_j = \tau_{-j}$.

The spectral density at frequency zero can therefore be written as

$$s(0) = 1 + 2 \sum_{j=1}^{\infty} \tau_j \qquad \dots (16)$$

Cochrane (1988) showed that

$$s(0) = \frac{\sigma_x^2}{\sigma_r^2} = \frac{var(Z_t - Z_{t-1})}{var(P_t - P_{t-1})} \qquad \dots (17)$$

It can be seen from (17) that s(0) is the ratio of the variance of the change in permanent component, Z_t, to the variance of the actual change, $r_t = P_t - P_{t-1}$. It is clear that when the return on stocks is pure random walk, the variance ratio should be one. If, however, the variance ratio is zero then the stock returns are stationary. Therefore, the variance ratio indicates the extent of deviation of a series from random walk or stationarity. If s(0) is less than one, the series will tend to move along a trend and therefore any increase above the trend in the price of stocks in the current period will be followed by a decrease in the future. If, however, s(0) is one or more, the change in stock prices will be permanent; its prediction will be difficult and therefore it will not be easy to earn abnormally high or low returns from holding of stocks.

A standard estimator for the variance ratio statistic is given by Newey and West (1987) as

$$\hat{s}(0) = 1 + 2 \sum w_j^k \tau_j, \qquad \dots (18)$$

where, $w_j^k = 1 - \frac{j}{k+1}$ $j = 1,2,...,k.$

We have used this estimator for estimation of s(0).

SECTION - II

Data

The data on return on stocks relate to two types of series. The first series is based on the indices of ordinary share prices for different industries compiled by the Reserve Bank of India. In all there are 35 industry groups including 'All Industries' (see Appendix for complete list with abbreviations used in the tables). The details about the compilation of these indices are given in the July 1985 issue of the RBI Bulletin. The data used in this paper relate to the period April 1984 through April 1992. The second series relates to data on 35 individual companies. These companies are among the 'blue chips' and are traded the most in stock exchanges. While selecting these companies, a consideration was given to provide representation to various industries. We collected data relating to these companies for the period from December '88 to April '92. We have excluded the period from May, 1992 onwards because of the distinct shift in the behaviour of stock prices following the unearthing of irregularities relating to securities transactions. All the data are weekly series which give us a large number of data points. These are required for the type of techniques we employed for the analysis pursued in the exercise. The original series have been adjusted for general rise in prices using wholesale price index and as such the returns calculated from these data can be considered as on real basis.

Risk and Return

The activities in the stock market are measured in terms of rates of change of returns from the market at different time periods. The total market activity can be represented by some market index. As per Capital Asset Pricing Model (CAPM), the return on any stock can be represented as

$$r_{it} = \alpha_i + \beta_i r_{mt} + e_{it} \qquad ... (19)$$

where r_{mt} is the market return at time t. The residual return e_i has been averaged out to zero when summed up over all the observations. In other words, it is assumed that $E(e_{it}) = 0$ and $V(e_{it}) = \sigma_{ei}^2$ is constant and cov $(e_{it}, r_{mt}) = 0$. Then we will get,

$$\bar{r}_i = \alpha_i + \beta_i \bar{r}_m$$

The term α_i is called the Alpha Coefficient for security i, which is an estimate of the ith asset's rate of return when the market is stationary. The term β_i is called the Beta Coefficient and it is defined as

$$\beta_i = \frac{Cov(\bar{r}_i, \bar{r}_m)}{Var(\bar{r}_m)}$$

The beta coefficient is an index of systematic risk and it may be used for ranking of the systematic risk of different assets. If the beta is larger than one, ($\beta > 1.0$) then the asset is more volatile than the market and is called **aggressive asset**. If the beta is smaller than one ($\beta < 1.0$) the asset is a **defensive asset**; it is less volatile than the market. The beta coefficient has an average value of unity and most of them lie in the range of 0.5 to 1.5. The betas have a tendency to regress back toward unity with the passage of time. For details on risk and return analysis and related topics, one may refer to Elton and Gruber (1987).

Analysis of Risk and Return

The average return and the beta coefficient in respect of the industry level indices are presented in Table 1. The results are presented for the whole period as well as for different subperiods. The returns were calculated in real terms. During the period April 1984 through April 1992, the **average weekly return** was positive for all the industries with the minimum weekly average return being 0.081 per cent in case of 'Jute Textiles' and the maximum return of 0.886 per cent in case of 'Tobacco & Tobacco Products'. This indicates that during the period, the annual average return ranged between 4 per cent and 46 per cent, compared to the market return of about 23 per cent. A look at the beta coefficients indicates that the systematic risk was maximum in the case of shares of 'Shipping' industry, while the minimum systematic risk was in respect of 'Jute Textiles' shares. In general, higher returns were associated with higher risks.

Now let us look at the returns and risk during the subperiods. During the period from April 1984 upto February 1991, the returns were negative in two cases only and again the 'Jute Textiles' recorded the minimum return. The maximum return was in respect of 'Aluminium' shares, which worked out to be about 47 per cent against a market return of 13 per cent in real terms. The maximum beta was again in the case of 'Shipping', while the minimum beta was in the case of 'Financial & Investment'. During the boom period, the returns fluctuated between 32 per cent in respect of Foundries and Engineering Works to 182 per cent in respect of Tobacco and Tobacco products, against a market return of as high as 84 per cent. The minimum beta was again in respect of Jute Textiles, while the maximum beta was in respect of Hotels group. The yearly returns fluctuated widely. During 1986-87 and 1987-88, the market index and most of the share indices showed negative returns. None of the industries had consistently positive return during the years. Investment in shares of Agriculture & Allied Activities, Tea Plantations and Aluminium industries had positive returns except for 1987-88. The betas also fluctuated widely.

The results for the selected companies are presented in Table 2. Here the period is divided into two, before the boom from December 1988 to February 1991, and the subsequent period from March 1991 to April 1992. During the whole period under consideration, a number of companies had negative returns in contrast to the industry level results. Five out of 35 companies showed negative return. The return on equities of different companies (real term) fluctuated between 45 per cent to 74 per cent. Betas were negative in 7 out of 35 cases. During the pre-boom period, 15 out of the 35 companies had negative return, while two of them had negative betas also. During boom period too, one company had a negative real return, while some of the companies even had more than 180 per cent returns. The betas were also comparably higher for the companies which had high returns.

SECTION - III

Estimates of variance of log differences : Industry-wise data

In Table 3, we present the estimate of 1/k times the variance of log differences given in equation (7) for the stock price indices for different industries. The 1/k times variance of log differences of stock prices for 'All Industries' is given in Graph 1. It may be observed from Table 3 that the variances sharply rose till about the tenth lag in the case of most of the industries. This is a reflection of high fluctuations in the share prices in the short-run. The exceptions to this are the indices relating to Tea Plantations and Dyes & Dye Stuff industries. For them 1/k times variances declined sharply indicating that their prices moved along a trend and the fluctuations about this trend were temporary. The decline in 1/k times variance of log difference after the tenth lag or so for a large number of industries indicate the relative decline in volatility in the stock price indices for them. There are a few industries for which variances showed a rise after a fall thereby indicating the complex nature of variation in stock prices. There are some industries where the variances showed no decline with the progression of lag. This group can again be divided into two : the first indicating constancy e.g. Metal & Metal Products, Automobiles, Other Chemicals, etc., and the second showing a rise in variance with progression of lag. The former appears to indicate the likelihood of random walk in their price fluctuations while the latter shows that the price behaviour in these industries are more complicated than random walk model. The fluctuations in the stock price indices appear to remain largely unpredictable for these industries in the long-run.

If the variances are estimated for different sub-periods then one notices a different type of behaviour in them. The 1/k times variance of log differences of stock prices for 'all industries' for different sub-periods are given in Graphs 2 to 4. These graphs indicate that variances decline after an initial rise. Therefore the variations in stock indices during the sub-periods do not appear to be as volatile as the whole period.

Estimates of variance of log differences : Company-wise data

The estimates of 1/k times the variance of log differences of the stock prices of leading companies actively traded in the stock market are given in Table 4. It may be seen from this table that, as in the case of industries, the variances sharply rise till about the tenth lag in quite a number of cases. But after that variances showed a decline which moved very near to zero around sixtieth lag in most of the cases. This shows that the leading shares in the Indian stock market have showed a tendency to revert to their mean path in the long-run. This could possibly be an indication of why shares of leading companies have remained "blue chips" in the market even when there were various ups and downs in the performance of different industries.

Test of unit root in stock returns

Dickey-Fuller t-ratios under the assumption of (1) without trend DF(NT) and (2) with trend DF(TT), tests whether the returns series contain a unit root. Table 5 gives the calculated values of Dickey-Fuller statistic without and with trend component (i.e., equations (5) and (6)), along with autocorrelations of different order, with reference to the industry-wise indices. The corresponding estimates for the company level data are presented in Table 6. The coefficients of the regression without and with trend component along with their standard errors and other relevant statistics are presented in Tables 9 and 10. It is found that the null hypothesis of unit root cannot be rejected in any of the cases for data on industries. This indicates that the returns series based on indices of stock prices belong to DS class for all the industries. Similar tests for the return on companies show that in the case of a few companies the null hypothesis of unit root can be rejected. But the returns on most of the companies appear to belong to DS class as shown by the lack of significance of Dickey-Fuller test. These results point towards a permanent nature of returns on stocks of selected companies. As mentioned earlier, the test of unit root does not indicate the extent of permanent component in the variation of stock returns. We therefore examine the variance ratios to get an idea about the extent of permanent and stationary components in stock returns for the data covered in this study.

Variance Ratios at industry level

The variance ratios for different industries as per equation (18), with data for the whole period, are presented in Table 7. The corresponding standard errors are given in the parenthesis. It may be observed that the variance ratios are much higher than twice the standard error in all the cases. This indicates that variance ratios are significantly different from zero. Similar variance ratios are estimated for a few sub-periods also. A frequency distribution of variance ratios given below provides an idea about the extent of persistence in the stock returns during the different periods.

Summary table of variance ratio tests

	Variance ratios											
Lags	1984-1992			1984-1986			1986-1988			1988-1990		
k	<0.5	0.5-1.0	>1.0	<0.5	0.5-1.0	>1.0	<0.5	0.5-1.0	>1.0	<0.5	0.5-1.0	>1.0
1	-	7	28	-	4	31	-	10	25	-	9	26
2	1	4	30	1	1	33	1	8	26	2	7	26
6	1	2	32	1	4	30	3	13	19	3	4	28
13	2	-	33	2	3	30	7	13	15	4	6	25
26	2	-	33	3	7	25	19	9	7	8	9	18
52	2	-	33	4	13	18	24	8	3	13	5	17

It is observed from the variance ratios for the whole period that they initially show a rise upto lag (k) around 13 and then tend to track a journey towards convergence, though not uniformly. There appears to be a tendency for convergence around k=52 i.e. a period of one year. The variance ratios are more than one for all but two industries. In the case of 'All Industries', the ratio is 3.228. This indicates that the autocorrelations of different lags were mostly positive and therefore it can be said that the changes have been occurring mostly in one direction. In India, the index has been either rising or falling for quite some time during the period of investigation. These changes appear to be persistent in nature. All industries, except two, show this pattern of behaviour; albeit at varying degrees. Tea Plantation and Dye and Dye Stuff industries, however, showed an altogether different pattern of behaviour. In the case of Tea Plantation, the permanent component of return was only about 16 per cent while for Dye and Dye Stuff, it was around 38 per cent. It may also be observed that fluctuations in the returns were high in the case of these two industries as reflected in their standard deviations. But the more important aspect is that the returns for them were mean reverting in the long-run and therefore the long-run return on holding of portfolio of shares of selected companies in these two industries could have been predictable with a reasonable degree of accuracy.

Variance Ratios for Subperiods

The variance ratios estimated from the data for the whole period explained above indicate that the behaviour of stock returns may be represented by random walk model and therefore cannot be predicted in the long-run. This could imply that the market may be efficient, at least in the weak sense. But there are reasons to believe that the market had not moved according to economic fundamentals. The stock market had different phases of ups and downs which cannot be easily explained. As these phases get subsumed in the whole period, we have estimated variance ratios for three sub-periods to understand the behaviour of stock returns during the sub-periods.

In the first period from April 1984 to March 1986, the stock prices showed gradual rise. In this period, the variance ratios were more than one for k upto 26 in the case of 25 industries. However, as k rises, the variance ratios for some of them start declining. When k=52, about half of the industries had variance ratio less than 1 of which 4 had variance ratio less than 0.5.

The variance ratios estimated from the data relating to the second period from April 1986 to March 1988, a period of gradual decline in stock prices, again show a distinctly different behaviour. It is found that the variance ratios were more than 1 in many cases for k < 10. But for k=52, these ratios were less than 1 for all but three industries. There were 16 industries for which the variance ratios were less than 0.3. This indicates that the return on these 16 industries had about 70 per cent or more transitory component and therefore could be greatly explained. It can therefore be said that the stock prices during this period of depression moved along trend path and the returns were mean reverting.

There was a recovery in the stock prices during the third period from April 1988 to June 1990. In this period, the variance ratio for 'all industries' was more than 1 in the short-run for k upto 10. This had happened for most of the other industries. But with the rise in k, the variance ratios showed declines for many of the industries. For k=52, there were 18 industries with variance ratio more than

1. There were 8 industries with variance ratio less than 0.5 and therefore returns on them had a large transitory component.

The analysis of variance ratios for different sub-periods indicate that in many of the cases, the returns were mean reverting. This indicates lack of efficiency in the behaviour of returns for these industries.

Variance ratio at company level

We have selected 35 leading companies for analysis of changes in returns of their equity shares. These companies, being considered "blue chips", are regarded as the market leaders. One is very much interested to know how the return on these companies behave.

The variance ratios for the companies are presented in Table 8. The following table gives a summary of the results of the variance ratio tests with reference to the company level data.

Summary table of variance ratio tests

Lags	Variance ratios					
	1988-1992			1988-1990		
	<0.5	0.5-1.0	>1.0	<0.5	0.5-1.0	>1.0
1	-	8	27	-	7	28
2	-	8	27	-	8	27
6	-	6	29	-	17	18
13	-	7	28	5	16	14
26	1	9	25	11	16	8
52	1	15	19	22	10	3

When data for the period December, 1988 to April, 1992 are taken, it may be seen that in the short-run with k < 13, variance ratios were above 1 for 28 companies. The ones that were below 1 are also very close to unity. When we take k=26, we find that the majority of variance ratios were still above 1. This indicates that in the short-run of upto about six months, the stock prices appear to show a persistent change in their prices. However, with further increase in k there was a tendency for the variance ratios to decline. For k = 52, variance ratios for 19 out of 35 companies were above 1 indicating that the changes in stock prices of these companies were persistent and therefore it would not be possible to forecast these long-run changes. There were 5 companies for which variance ratios were around 0.9. The changes in stock prices for these companies also appear to be quite near permanent. There were 10 companies for which variance ratio fell below 0.60. This indicates that about 40 per cent or more of the variance of actual returns for these 10 companies were transitory in nature. There is only one company which had variance ratio of less than 0.25. This indicates that for this company, the return appears to be greatly deterministic and could be explained.

As there had been a sharp rise in prices of equities from July'90 till April'92, except for a short period during the Gulf conflict, we excluded the period and estimated the variance ratios afresh as given in Table 12. The analysis of changes in the variance ratios for different values of k indicate that in the first few weeks, these ratios were above 1 for majority of the companies, but by about 13 weeks, many of them slided below 1. For k=26, only 8 out of 35 companies had variance ratio above 1 and the number declined to only 3 by the 52nd week. What is more noteworthy is that for k=52, there were 22 companies which had variance ratio less than 0.5 indicating thereby that the return for these companies had large transitory component and therefore could be predicted. This result clearly indicates that the market was not efficient. As these 35 companies account for bulk of the transactions in stock market, this result is a pointer on the entire market.

The comparison of variance ratios at the levels of industry and company shows that the returns were by and large mean reverting after a few weeks in different sub-periods. But when the period is taken as a whole, the returns appear to be permanent.

SECTION - IV

Conclusions

The ups and downs in stock prices in India during the recent years raise serious doubt about efficiency of the market. The return on certain stocks had been much higher than one could expect on the basis of declared profits of these companies and publicly available information. The investors appear to have over-reacted to information on future prospects, which later resulted in serious upturns in the market. This indicates that market lacked efficiency. In an efficient stock market, the expected real return on stock should be equal to the real interest rate on riskless assets and the premium on risk taking. The rise in returns should be commensurate with the new information on the future profits of a company.

We have analysed the data on returns on stocks at the aggregated level of 'industry' and for selected companies to see if the changes were permanent or mean reverting. The test of unit root does not provide an estimate of the extent to which returns are persistent when there is a mixture of random walk and stationary component, but the variance ratio gives such an estimate. We have seen that the variance ratio was more than one in the case of most of the industries, when the entire period is taken. It implies that the return on stocks were not mean reverting and therefore could not have been predicted in the long run. On the contrary, the analysis for the subperiods showed that in many of the cases, the returns were mean reverting. The variance ratios for the leading companies also showed that the changes in prices were generally mean reverting when the boom period is excluded. This indicates that the fluctuations in returns on these companies were by and large transitory. It could therefore be said that the market was not efficient.

An interesting policy implication of this paper is that in the short to medium term period, the predictability of returns on stocks should enable the policy makers to undertake those measures that would enable the stock market to be efficient. In an efficient market, the stock prices should fully reflect all the available information leaving no scope for manipulation of prices to the advantage of a few. This requires greater degree of transparency about the status of the companies quoted in the market. In the recent period, Securities and Exchange Board of India, has made it compulsory to make public the basic strengths and weaknesses of projects for which the companies raise capital through primary issues. In the case of companies quoted in the secondary market, an objective dissemination of information about the companies on an ongoing basis through detailed analysis of various aspects of their operation will help the investing public in taking right decision.

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Table 1 : Average Returns and Betas - Industry-wise Results

	1984-85		1985-86		1986-87		1987-88		1988-89		1989-90	
IND.NAME	AVERAGE	BETA	AVERAGE	BETA	AVERAGE	BETA	AVERAGE	BETA	AVERAGE	BETA	AVERAGE	BETA
ALL	0.355		0.670		-0.319		-0.504		0.919		0.284	
AGRI	0.994	1.687	0.277	0.843	0.212	0.905	-0.221	1.103	0.606	0.405	0.735	0.943
TEA	1.041	0.652	0.299	0.886	0.226	0.945	-0.219	1.143	0.627	0.418	0.741	3.401
PROC	0.357	0.972	0.708	1.015	-0.371	1.012	-0.519	1.009	0.920	0.482	0.176	1.004
F&T	0.170	0.898	0.550	0.824	-0.330	0.801	-0.386	0.928	0.746	0.383	0.484	1.027
FOOD	0.345	1.074	0.838	0.913	-0.107	0.878	-0.340	0.935	0.699	0.400	0.396	0.966
SUGAR	-0.066	0.281	0.363	0.556	-0.376	0.404	-0.247	0.342	0.456	0.064	1.198	0.851
TOB	0.264	1.134	1.029	1.164	-0.762	1.045	-0.692	0.820	0.994	0.392	0.962	1.056
TEX	0.111	0.796	0.399	0.784	-0.469	0.750	-0.419	0.922	0.780	0.408	0.544	1.072
COTEX	0.270	0.885	0.405	0.602	-0.455	0.627	-0.714	0.901	0.360	0.382	0.441	1.082
JUTEX	0.704	0.266	0.293	0.347	-0.655	-0.433	-0.840	0.232	0.394	-0.088	0.473	0.172
SILK	-0.101	0.788	0.058	0.986	-0.239	0.783	-0.108	1.442	1.303	0.378	0.823	1.439
M&C	0.472	1.016	0.779	1.087	-0.419	1.085	-0.570	1.045	0.969	0.381	0.138	0.993
METAL	0.349	0.982	0.702	1.022	-0.459	0.991	-0.432	1.077	1.112	0.353	0.101	1.120
ALU	0.508	0.644	0.892	0.936	0.004	0.486	-0.384	1.490	2.609	0.282	0.393	1.963
AUTO	0.282	0.878	0.670	1.089	-0.536	1.089	-0.444	0.988	1.092	0.422	0.247	0.968
ELEC	0.062	0.710	0.340	0.745	-0.479	0.573	-0.263	0.734	0.698	0.273	0.101	0.697
MACH	0.226	0.907	0.396	0.735	-0.340	1.133	-0.598	0.923	0.525	0.351	0.112	0.936
FOUND	0.210	0.931	0.346	0.704	-0.222	0.973	-0.107	0.805	1.139	0.159	0.351	0.646
CHEM	0.613	1.043	0.857	1.151	-0.377	1.179	-0.712	1.014	0.800	0.412	0.183	0.828
CFERT	0.941	1.093	0.906	1.349	-0.758	1.390	-0.884	0.827	0.717	0.494	0.218	0.705
DYES	0.232	0.629	-0.062	0.547	-0.461	0.395	-0.132	0.729	0.254	0.275	0.301	0.682
MMFIB	0.242	0.978	0.797	0.889	-0.910	1.081	-0.620	0.986	0.929	0.548	-0.045	1.196
OBIC	0.337	0.653	0.939	1.034	-0.547	0.817	-0.034	0.890	1.309	0.407	0.150	0.690
MED	0.427	1.407	1.011	1.655	-0.112	1.223	-0.671	1.822	0.620	0.391	0.070	0.917
OP&M	-0.090	0.752	0.432	0.800	-0.064	0.787	-0.392	0.904	0.892	0.444	-0.085	1.022
CEM	-0.164	0.995	0.022	0.507	-0.507	0.509	-0.675	0.806	0.519	0.445	-0.038	0.802
RUBB	-0.247	0.652	1.458	1.396	0.365	1.192	0.260	1.232	0.907	0.610	-0.959	1.120
PAPER	-0.067	0.392	0.283	0.640	-0.497	0.609	-0.960	0.490	1.107	0.266	0.791	1.127
OIND	0.209	0.427	0.435	0.627	-0.398	0.579	-0.184	0.433	0.765	0.266	0.218	0.740
EG&S	0.257	0.210	0.806	0.598	-0.462	1.009	-0.323	0.091	0.647	0.291	0.623	0.930
TRADE	0.201	0.129	0.536	0.264	-0.169	0.435	-0.099	-0.066	1.230	0.242	-0.252	0.594
SHIP	-0.041	0.630	-0.170	1.498	-1.099	1.315	-0.183	0.809	1.808	0.967	0.770	1.826
HOTEL	0.638	1.196	0.673	0.947	-0.582	1.007	-0.077	0.800	0.271	0.159	0.097	0.415
F&I	0.420	0.209	0.240	-0.972	-0.101	0.207	-0.165	0.143	-0.080	0.024	0.393	0.026

Table 1 : Average Returns and Betas - Industry-wise Results

IND.NAME	1990-91 AVERAGE	1990-91 BETA	1991-92 AVERAGE	1991-92 BETA	APR'84-FEB'91 AVERAGE	APR'84-FEB'91 BETA	MAR '91-APR'92 AVERAGE	MAR '91-APR'92 BETA	APR'84 - APR'92 AVERAGE	APR'84 - APR'92 BETA
ALL	0.314		1.745		0.251		1.632		0.448	
AGRI	0.380	0.784	1.352	1.022	0.408	0.793	1.334	0.955	0.548	0.833
TEA	0.374	0.806	1.376	1.041	0.423	1.028	1.359	0.970	0.564	1.003
PROC	0.336	1.006	1.541	0.986	0.232	0.917	1.642	0.970	0.443	0.943
F&T	0.564	1.135	1.966	1.072	0.263	0.862	1.942	1.007	0.515	0.917
FOOD	0.463	0.917	2.602	1.347	0.317	0.822	2.572	1.212	0.653	0.955
SUGAR	-0.283	1.088	0.988	0.558	0.171	0.603	1.347	0.736	0.354	0.653
TOB	1.259	1.345	3.664	1.668	0.424	1.034	3.506	1.457	0.886	1.194
TEX	0.625	1.252	1.488	0.822	0.240	0.894	1.464	0.810	0.426	0.878
COTEX	0.996	1.780	1.286	1.033	0.199	0.997	1.288	1.097	0.371	1.023
JUTEX	-0.016	0.154	0.991	0.145	-0.134	0.138	1.348	0.086	0.081	0.160
SILK	0.355	1.237	1.406	1.023	0.304	0.988	1.607	1.053	0.506	1.010
M&C	0.177	0.945	1.312	0.954	0.224	0.906	1.502	0.989	0.414	0.930
METAL	0.216	1.076	1.107	0.929	0.238	0.935	1.428	1.006	0.414	0.952
ALU	0.310	1.230	0.771	1.141	0.584	1.055	1.054	1.125	0.653	1.046
AUTO	0.106	0.931	0.828	0.673	0.203	0.899	1.146	0.760	0.347	0.860
ELEC	0.042	0.691	1.458	0.634	0.077	0.616	1.575	0.875	0.298	0.701
MACH	0.468	1.001	1.004	0.876	0.112	0.824	1.304	0.932	0.292	0.857
FOUND	0.005	0.599	0.158	0.319	0.240	0.615	0.624	0.578	0.295	0.593
CHEM	0.128	0.760	1.549	0.943	0.205	0.857	1.597	0.947	0.414	0.890
CFERT	0.089	0.569	1.467	0.433	0.177	0.855	1.651	0.700	0.397	0.828
DYES	0.287	0.777	1.426	0.775	0.069	0.583	1.359	0.855	0.258	0.665
MMFIB	-0.534	0.997	1.046	1.345	-0.021	0.910	0.990	1.395	0.156	1.043
OBIC	0.133	0.813	1.363	0.811	0.279	0.785	1.620	0.924	0.477	0.829
MED	-0.178	0.754	1.048	0.751	0.143	1.031	1.152	0.776	0.297	0.959
OP&M	0.919	1.126	1.841	0.955	0.224	0.862	1.772	0.955	0.457	0.900
CEM	2.267	1.460	2.354	1.102	0.182	0.853	2.245	1.027	0.491	0.927
RUBB	0.141	0.872	1.942	1.222	0.281	0.994	1.940	1.214	0.531	1.063
PAPER	0.832	1.042	1.406	0.640	0.203	0.746	1.231	0.737	0.359	0.747
OIND	0.211	0.906	1.778	0.653	0.170	0.624	1.884	0.808	0.429	0.699
EG&S	1.461	1.828	1.380	0.673	0.430	0.915	1.472	0.967	0.590	0.927
TRADE	0.197	0.660	1.721	0.728	0.218	0.407	1.901	0.740	0.471	0.526
SHIP	-0.628	0.955	3.009	0.964	0.074	1.165	3.134	1.094	0.553	1.206
HOTEL	-0.477	0.506	2.215	1.891	0.071	0.597	2.154	1.645	0.379	0.898
F&I	-0.216	0.208	0.974	0.405	0.088	0.089	0.855	0.353	0.198	0.172

Table 2 : Average Returns and Betas - Company-wise Results

	DEC'88-APR'92		DEC'88-FEB'91		MAR'91-APR'92		1989		1990		1991	
No.	AVERAGE	BETA	AVERAGE	BETA	AVERAGE	BETA	AVERAGE	BETA	AVEKAGE	BETA	AVERAGE	BETA
1	0.381	-0.037	-0.323	0.647	1.311	1.256	-0.696	0.568	0.173	0.692	1.227	1.201
2	0.747	0.188	0.612	0.575	1.181	1.289	0.320	0.604	0.874	1.211	1.572	1.426
3	1.296	0.190	0.022	0.837	2.905	1.761	-0.082	0.818	1.272	1.288	3.074	1.932
4	0.234	0.091	-0.926	1.422	1.555	0.943	-1.012	1.393	0.102	0.854	1.738	1.089
5	0.703	0.027	0.600	1.563	1.775	0.954	0.479	1.563	-0.035	0.717	1.758	0.939
6	0.208	0.150	-1.840	1.694	1.491	2.131	-1.660	1.735	1.072	2.521	1.917	2.244
7	-0.244	0.575	-2.612	1.041	2.344	1.206	-2.506	0.770	-0.484	1.745	2.509	1.271
8	0.889	0.202	0.410	1.749	1.674	0.989	-0.091	1.543	0.884	1.154	1.312	1.010
9	0.632	0.024	-0.019	0.430	1.246	0.912	0.016	0.513	0.874	0.954	1.072	0.892
10	0.852	-0.145	0.958	0.839	1.017	0.614	0.941	0.861	0.463	0.655	1.052	0.683
11	-0.688	0.399	-4.053	-1.433	1.683	1.426	-4.714	-1.543	0.229	1.504	1.938	1.397
12	0.589	0.303	0.487	1.547	1.463	1.102	-0.116	1.797	-0.383	0.940	1.329	1.183
13	-0.120	0.037	-0.244	1.154	-0.325	0.906	-0.226	1.090	0.330	0.694	-0.907	0.768
14	-0.402	0.343	-3.289	-0.044	1.674	0.780	-3.728	-0.105	0.260	1.286	1.532	0.859
15	0.823	0.130	-0.018	1.178	2.411	0.942	0.557	1.241	-0.127	0.622	2.372	0.953
16	0.170	0.127	-1.304	0.898	1.464	1.787	-0.561	1.306	-0.027	1.671	1.662	1.679
17	0.575	0.265	0.405	1.541	1.074	1.166	0.437	1.279	0.383	1.208	1.225	0.872
18	0.338	-0.138	0.013	0.668	1.238	0.760	0.172	0.334	-0.135	0.595	1.161	0.482
19	0.563	-0.085	-0.585	0.726	2.258	0.470	-0.216	0.763	-0.001	1.022	2.469	0.245
20	0.415	0.565	1.112	1.504	1.354	1.843	1.332	1.385	-1.128	1.547	0.968	2.034
21	0.246	0.159	0.505	0.662	0.859	1.344	0.290	0.683	-0.947	1.083	1.278	1.398
22	0.473	0.157	0.658	1.707	1.491	1.382	0.604	1.650	-0.449	1.331	1.364	1.618
23	0.268	0.276	0.087	0.815	2.427	1.901	-0.074	0.670	-1.291	1.241	2.206	1.445
24	0.486	0.071	0.211	1.357	1.727	0.898	0.007	1.391	-0.113	0.575	1.652	0.904
25	0.064	-0.031	-0.986	0.089	0.751	0.799	-1.097	0.293	0.427	0.950	0.459	0.666
26	0.712	-0.023	0.439	0.755	1.310	1.516	0.557	0.780	0.488	0.564	1.529	1.656
27	1.438	0.332	-0.309	1.002	2.192	1.215	0.285	0.997	2.964	1.522	2.232	1.347
28	0.213	0.366	-0.489	1.916	1.701	1.286	-1.113	1.730	-0.172	1.076	1.831	1.388
29	0.676	0.167	0.835	1.139	0.637	0.603	0.332	1.238	1.076	0.871	0.195	0.541
30	0.996	0.079	0.772	1.410	1.956	1.145	0.298	1.463	0.742	1.276	1.962	1.155
31	0.775	0.071	0.018	1.888	0.730	0.747	0.544	2.024	1.565	1.872	0.859	0.532
32	-0.882	0.282	0.430	0.178	0.375	1.339	-4.673	0.244	0.674	1.125	0.386	1.103
33	0.510	0.064	0.004	1.442	2.413	1.262	0.159	1.240	0.684	0.911	2.643	1.334
34	0.499	-0.067	-0.026	0.409	2.155	1.473	0.230	0.622	-0.690	0.561	2.458	1.474
35	1.175	0.424	0.420	0.694	3.509	2.182	0.483	0.918	-0.064	1.663	3.890	2.260

Table 3: Variance of Log Differences with Standard Errors - Industry-wise Results

Ind.\Lags	1	2	3	4	5	6	13	26	40	52	60
ALL :	0.0007	0.0008	0.0010	0.0011	0.0012	0.0013	0.0015	0.0012	0.0013	0.0013	0.0013
:	(0.0000)	(0.0001)	(0.0001)	(0.0001)	(0.0002)	(0.0002)	(0.0003)	(0.0003)	(0.0005)	(0.0005)	(0.0006)
AGRI :	0.0009	0.0012	0.0014	0.0016	0.0018	0.0019	0.0019	0.0012	0.0009	0.0009	0.0010
:	(0.0000)	(0.0001)	(0.0001)	(0.0002)	(0.0002)	(0.0003)	(0.0004)	(0.0003)	(0.0003)	(0.0004)	(0.0004)
TEA :	0.0104	0.0061	0.0048	0.0042	0.0040	0.0038	0.0029	0.0016	0.0012	0.0011	0.0012
:	(0.0006)	(0.0005)	(0.0005)	(0.0005)	(0.0005)	(0.0005)	(0.0006)	(0.0005)	(0.0004)	(0.0005)	(0.0005)
PROC :	0.0015	0.0012	0.0013	0.0013	0.0014	0.0014	0.0016	0.0013	0.0014	0.0014	0.0014
:	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0002)	(0.0002)	(0.0003)	(0.0004)	(0.0005)	(0.0006)	(0.0006)
F&T :	0.0007	0.0009	0.0011	0.0012	0.0014	0.0015	0.0017	0.0015	0.0016	0.0016	0.0016
:	(0.0000)	(0.0001)	(0.0001)	(0.0001)	(0.0002)	(0.0002)	(0.0003)	(0.0004)	(0.0006)	(0.0006)	(0.0007)
FOOD :	0.0009	0.0011	0.0013	0.0015	0.0017	0.0018	0.0021	0.0018	0.0019	0.0017	0.0016
:	(0.0000)	(0.0001)	(0.0001)	(0.0002)	(0.0002)	(0.0002)	(0.0004)	(0.0005)	(0.0007)	(0.0007)	(0.0007)
SUGAR :	0.0010	0.0012	0.0013	0.0014	0.0014	0.0014	0.0014	0.0012	0.0015	0.0013	0.0013
:	(0.0001)	(0.0001)	(0.0001)	(0.0002)	(0.0002)	(0.0002)	(0.0003)	(0.0003)	(0.0005)	(0.0005)	(0.0006)
TOB :	0.0044	0.0040	0.0039	0.0040	0.0042	0.0044	0.0052	0.0051	0.0054	0.0055	0.0057
:	(0.0002)	(0.0003)	(0.0004)	(0.0005)	(0.0005)	(0.0006)	(0.0010)	(0.0015)	(0.0019)	(0.0022)	(0.0025)
TEX :	0.0010	0.0010	0.0012	0.0013	0.0014	0.0015	0.0017	0.0016	0.0017	0.0018	0.0019
:	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0002)	(0.0002)	(0.0003)	(0.0004)	(0.0006)	(0.0007)	(0.0008)
COTEX :	0.0012	0.0014	0.0016	0.0018	0.0020	0.0022	0.0024	0.0023	0.0023	0.0025	0.0027
:	(0.0001)	(0.0001)	(0.0002)	(0.0002)	(0.0003)	(0.0003)	(0.0005)	(0.0006)	(0.0008)	(0.0010)	(0.0012)
JUTEX :	0.0011	0.0014	0.0015	0.0017	0.0018	0.0018	0.0020	0.0020	0.0021	0.0020	0.0019
:	(0.0001)	(0.0001)	(0.0001)	(0.0002)	(0.0002)	(0.0003)	(0.0004)	(0.0006)	(0.0008)	(0.0008)	(0.0008)
SILK :	0.0018	0.0018	0.0020	0.0021	0.0022	0.0022	0.0024	0.0018	0.0019	0.0018	0.0018
:	(0.0001)	(0.0001)	(0.0002)	(0.0002)	(0.0003)	(0.0003)	(0.0005)	(0.0005)	(0.0007)	(0.0007)	(0.0008)
M&C :	0.0006	0.0008	0.0010	0.0011	0.0012	0.0013	0.0014	0.0013	0.0015	0.0015	0.0015
:	(0.0000)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0002)	(0.0003)	(0.0004)	(0.0005)	(0.0006)	(0.0007)
METAL :	0.0007	0.0009	0.0011	0.0012	0.0013	0.0014	0.0016	0.0013	0.0015	0.0015	0.0015
:	(0.0000)	(0.0001)	(0.0001)	(0.0001)	(0.0002)	(0.0002)	(0.0003)	(0.0004)	(0.0005)	(0.0006)	(0.0006)
ALU :	0.0020	0.0026	0.0029	0.0030	0.0031	0.0032	0.0036	0.0034	0.0038	0.0036	0.0034
:	(0.0001)	(0.0002)	(0.0003)	(0.0003)	(0.0004)	(0.0004)	(0.0007)	(0.0010)	(0.0013)	(0.0015)	(0.0015)
AUTO :	0.0008	0.0009	0.0011	0.0012	0.0013	0.0013	0.0015	0.0013	0.0014	0.0014	0.0015
:	(0.0000)	(0.0001)	(0.0001)	(0.0001)*	(0.0002)	(0.0002)	(0.0003)	(0.0004)	(0.0005)	(0.0006)	(0.0006)
ELEC :	0.0006	0.0008	0.0009	0.0010	0.0011	0.0012	0.0014	0.0012	0.0012	0.0011	0.0010
:	(0.0000)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0002)	(0.0003)	(0.0003)	(0.0004)	(0.0004)	(0.0004)
MACH :	0.0008	0.0010	0.0011	0.0013	0.0013	0.0014	0.0014	0.0011	0.0011	0.0011	0.0011
:	(0.0000)	(0.0001)	(0.0001)	(0.0001)	(0.0002)	(0.0002)	(0.0003)	(0.0003)	(0.0004)	(0.0004)	(0.0005)

Table 3: Variance of Log Differences with Standard Errors -Company-wise Results

Ind.\Lags		1	2	3	4	5	6	13	26	40	52	60
FOUND	:	0.0007	0.0008	0.0010	0.0010	0.0010	0.0010	0.0011	0.0010	0.0011	0.0012	0.0012
	:	(0.0000)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0002)	(0.0003)	(0.0004)	(0.0005)	(0.0005)
CHEM	:	0.0007	0.0009	0.0010	0.0011	0.0012	0.0013	0.0014	0.0014	0.0016	0.0016	0.0017
	:	(0.0000)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0002)	(0.0003)	(0.0004)	(0.0006)	(0.0007)	(0.0007)
CFERT	:	0.0010	0.0012	0.0014	0.0015	0.0016	0.0016	0.0018	0.0020	0.0023	0.0024	0.0024
	:	(0.0001)	(0.0001)	(0.0001)	(0.0002)	(0.0002)	(0.0002)	(0.0004)	(0.0006)	(0.0008)	(0.0010)	(0.0011)
DYES	:	0.0042	0.0028	0.0024	0.0023	0.0022	0.0021	0.0018	0.0015	0.0015	0.0013	0.0012
	:	(0.0002)	(0.0002)	(0.0002)	(0.0003)	(0.0003)	(0.0003)	(0.0004)	(0.0004)	(0.0005)	(0.0005)	(0.0005)
MMFIB	:	0.0013	0.0015	0.0017	0.0018	0.0019	0.0020	0.0023	0.0023	0.0027	0.0028	0.0028
	:	(0.0001)	(0.0001)	(0.0002)	(0.0002)	(0.0002)	(0.0003)	(0.0005)	(0.0007)	(0.0010)	(0.0011)	(0.0012)
OBIC	:	0.0008	0.0009	0.0011	0.0012	0.0013	0.0014	0.0015	0.0013	0.0014	0.0013	0.0014
	:	(0.0000)	(0.0001)	(0.0001)	(0.0001)	(0.0002)	(0.0002)	(0.0003)	(0.0004)	(0.0005)	(0.0005)	(0.0006)
MED	:	0.0016	0.0018	0.0019	0.0020	0.0020	0.0021	0.0022	0.0017	0.0019	0.0019	0.0019
	:	(0.0001)	(0.0001)	(0.0002)	(0.0002)	(0.0003)	(0.0003)	(0.0004)	(0.0005)	(0.0007)	(0.0008)	(0.0008)
OP&M	:	0.0008	0.0011	0.0013	0.0015	0.0017	0.0018	0.0020	0.0015	0.0015	0.0014	0.0014
	:	(0.0000)	(0.0001)	(0.0001)	(0.0002)	(0.0002)	(0.0002)	(0.0004)	(0.0004)	(0.0005)	(0.0006)	(0.0006)
CEM	:	0.0016	0.0021	0.0024	0.0028	0.0031	0.0033	0.0039	0.0040	0.0047	0.0049	0.0053
	:	(0.0001)	(0.0002)	(0.0002)	(0.0003)	(0.0004)	(0.0005)	(0.0008)	(0.0011)	(0.0017)	(0.0020)	(0.0023)
RUBB	:	0.0014	0.0018	0.0021	0.0024	0.0026	0.0027	0.0032	0.0026	0.0025	0.0021	0.0020
	:	(0.0001)	(0.0001)	(0.0002)	(0.0003)	(0.0003)	(0.0004)	(0.0006)	(0.0008)	(0.0009)	(0.0009)	(0.0009)
PAPER	:	0.0008	0.0011	0.0013	0.0015	0.0017	0.0018	0.0023	0.0024	0.0029	0.0034	0.0036
	:	(0.0000)	(0.0001)	(0.0001)	(0.0002)	(0.0002)	(0.0003)	(0.0005)	(0.0007)	(0.0010)	(0.0014)	(0.0016)
OIND	:	0.0009	0.0008	0.0009	0.0010	0.0011	0.0012	0.0014	0.0012	0.0012	0.0011	0.0011
	:	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0002)	(0.0003)	(0.0003)	(0.0004)	(0.0005)	(0.0005)
EG&S	:	0.0021	0.0025	0.0027	0.0028	0.0030	0.0031	0.0037	0.0030	0.0024	0.0022	0.0023
	:	(0.0001)	(0.0002)	(0.0003)	(0.0003)	(0.0004)	(0.0004)	(0.0008)	(0.0009)	(0.0008)	(0.0009)	(0.0010)
TRADE	:	0.0019	0.0015	0.0014	0.0014	0.0015	0.0015	0.0017	0.0014	0.0013	0.0012	0.0011
	:	(0.0001)	(0.0001)	(0.0001)	(0.0002)	(0.0002)	(0.0002)	(0.0004)	(0.0004)	(0.0005)	(0.0005)	(0.0005)
SHIP	:	0.0034	0.0042	0.0048	0.0053	0.0057	0.0059	0.0060	0.0066	0.0071	0.0068	0.0063
	:	(0.0002)	(0.0003)	(0.0005)	(0.0006)	(0.0007)	(0.0008)	(0.0012)	(0.0019)	(0.0025)	(0.0027)	(0.0027)
HOTEL	:	0.0015	0.0017	0.0017	0.0019	0.0021	0.0023	0.0026	0.0022	0.0022	0.0017	0.0015
	:	(0.0001)	(0.0001)	(0.0002)	(0.0002)	(0.0003)	(0.0003)	(0.0005)	(0.0006)	(0.0008)	(0.0007)	(0.0007)
F&I	:	0.0005	0.0006	0.0006	0.0006	0.0007	0.0007	0.0006	0.0005	0.0004	0.0004	0.0004
	:	(0.0000)	(0.0000)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0002)	(0.0002)

Table 4: Variance of Log Differences with Standard Errors - Company-wise Results

C. No.\Lags	1	2	3	4	5	6	13	26	40	52	60
1	0.0041	0.0041	0.0041	0.0042	0.0045	0.0047	0.0054	0.0030	0.0019	0.0015	0.0014
	(0.0004)	(0.0005)	(0.0006)	(0.0007)	(0.0009)	(0.0010)	(0.0017)	(0.0013)	(0.0010)	(0.0010)	(0.0010)
2	0.0025	0.0030	0.0032	0.0035	0.0041	0.0045	0.0051	0.0026	0.0019	0.0014	0.0016
	(0.0002)	(0.0004)	(0.0005)	(0.0006)	(0.0008)	(0.0010)	(0.0016)	(0.0012)	(0.0011)	(0.0009)	(0.0011)
3	0.0072	0.0081	0.0082	0.0084	0.0089	0.0095	0.0108	0.0088	0.0074	0.0050	0.0042
	(0.0006)	(0.0010)	(0.0012)	(0.0015)	(0.0017)	(0.0020)	(0.0034)	(0.0039)	(0.0041)	(0.0031)	(0.0028)
4	0.0027	0.0030	0.0030	0.0032	0.0034	0.0035	0.0033	0.0035	0.0040	0.0031	0.0028
	(0.0002)	(0.0004)	(0.0005)	(0.0006)	(0.0007)	(0.0007)	(0.0010)	(0.0016)	(0.0022)	(0.0019)	(0.0019)
5	0.0053	0.0061	0.0067	0.0071	0.0076	0.0079	0.0075	0.0053	0.0050	0.0040	0.0031
	(0.0005)	(0.0008)	(0.0010)	(0.0012)	(0.0015)	(0.0017)	(0.0024)	(0.0024)	(0.0027)	(0.0025)	(0.0021)
6	0.0079	0.0095	0.0099	0.0106	0.0113	0.0118	0.0119	0.0103	0.0083	0.0067	0.0063
	(0.0007)	(0.0012)	(0.0015)	(0.0019)	(0.0022)	(0.0025)	(0.0037)	(0.0046)	(0.0046)	(0.0042)	(0.0043)
7	0.0353	0.0352	0.0361	0.0370	0.0378	0.0376	0.0331	0.0294	0.0236	0.0195	0.0188
	(0.0031)	(0.0043)	(0.0055)	(0.0065)	(0.0074)	(0.0080)	(0.0104)	(0.0131)	(0.0130)	(0.0123)	(0.0127)
8	0.0023	0.0029	0.0033	0.0035	0.0035	0.0035	0.0033	0.0019	0.0014	0.0011	0.0011
	(0.0002)	(0.0004)	(0.0005)	(0.0006)	(0.0007)	(0.0007)	(0.0010)	(0.0008)	(0.0007)	(0.0007)	(0.0007)
9	0.0019	0.0019	0.0017	0.0016	0.0016	0.0017	0.0016	0.0011	0.0012	0.0010	0.0009
	(0.0002)	(0.0002)	(0.0003)	(0.0003)	(0.0003)	(0.0004)	(0.0005)	(0.0005)	(0.0007)	(0.0006)	(0.0006)
10	0.0021	0.0020	0.0019	0.0018	0.0018	0.0018	0.0014	0.0008	0.0004	0.0004	0.0005
	(0.0002)	(0.0002)	(0.0003)	(0.0003)	(0.0004)	(0.0004)	(0.0005)	(0.0004)	(0.0002)	(0.0003)	(0.0003)
11	0.0333	0.0347	0.0356	0.0360	0.0366	0.0371	0.0385	0.0407	0.0407	0.0333	0.0287
	(0.0029)	(0.0043)	(0.0054)	(0.0063)	(0.0071)	(0.0079)	(0.0121)	(0.0181)	(0.0224)	(0.0210)	(0.0194)
12	0.0039	0.0041	0.0040	0.0041	0.0042	0.0043	0.0041	0.0025	0.0019	0.0014	0.0012
	(0.0003)	(0.0005)	(0.0006)	(0.0007)	(0.0008)	(0.0009)	(0.0013)	(0.0011)	(0.0011)	(0.0009)	(0.0008)
13	0.0036	0.0042	0.0043	0.0044	0.0043	0.0044	0.0047	0.0047	0.0039	0.0039	0.0039
	(0.0003)	(0.0005)	(0.0007)	(0.0008)	(0.0008)	(0.0009)	(0.0015)	(0.0021)	(0.0022)	(0.0025)	(0.0027)
14	0.0329	0.0333	0.0341	0.0347	0.0347	0.0345	0.0346	0.0319	0.0259	0.0219	0.0202
	(0.0029)	(0.0041)	(0.0052)	(0.0061)	(0.0068)	(0.0074)	(0.0109)	(0.0142)	(0.0143)	(0.0138)	(0.0137)
15	0.0020	0.0024	0.0024	0.0024	0.0026	0.0028	0.0030	0.0030	0.0027	0.0019	0.0016
	(0.0002)	(0.0003)	(0.0004)	(0.0004)	(0.0005)	(0.0006)	(0.0010)	(0.0014)	(0.0015)	(0.0012)	(0.0011)
16	0.0055	0.0070	0.0074	0.0077	0.0076	0.0076	0.0066	0.0043	0.0037	0.0024	0.0025
	(0.0005)	(0.0009)	(0.0011)	(0.0013)	(0.0015)	(0.0016)	(0.0021)	(0.0019)	(0.0020)	(0.0015)	(0.0017)
17	0.0040	0.0035	0.0035	0.0037	0.0039	0.0038	0.0037	0.0025	0.0020	0.0012	0.0010
	(0.0003)	(0.0004)	(0.0005)	(0.0007)	(0.0008)	(0.0008)	(0.0012)	(0.0011)	(0.0011)	(0.0007)	(0.0006)
18	1.0000	1.1067	1.0625	1.0618	1.0496	1.0422	0.8186	0.8797	0.7148	0.5724	0.4283
	(0.0873)	(0.1366)	(0.1606)	(0.1854)	(0.2049)	(0.2228)	(0.2576)	(0.3915)	(0.3946)	(0.3603)	(0.2896)

Table 4: Variance of Log Differences with Standard Errors - Company-wise Results

C. No.\Lags	1	2	3	4	5	6	13	26	40	52	60
19	0.0036	0.0042	0.0043	0.0045	0.0045	0.0045	0.0046	0.0057	0.0050	0.0044	0.0040
	(0.0003)	(0.0005)	(0.0007)	(0.0008)	(0.0009)	(0.0010)	(0.0014)	(0.0025)	(0.0028)	(0.0028)	(0.0027)
20	0.0064	0.0081	0.0093	0.0102	0.0111	0.0120	0.0141	0.0098	0.0091	0.0067	0.0076
	(0.0006)	(0.0010)	(0.0014)	(0.0018)	(0.0022)	(0.0026)	(0.0044)	(0.0044)	(0.0050)	(0.0042)	(0.0052)
21	0.0029	0.0034	0.0037	0.0039	0.0040	0.0041	0.0054	0.0044	0.0038	0.0031	0.0029
	(0.0003)	(0.0004)	(0.0006)	(0.0007)	(0.0008)	(0.0009)	(0.0017)	(0.0020)	(0.0021)	(0.0020)	(0.0020)
22	0.0033	0.0040	0.0043	0.0045	0.0046	0.0049	0.0046	0.0029	0.0025	0.0023	0.0023
	(0.0003)	(0.0005)	(0.0007)	(0.0008)	(0.0009)	(0.0011)	(0.0014)	(0.0013)	(0.0014)	(0.0014)	(0.0016)
23	0.0108	0.0069	0.0064	0.0067	0.0067	0.0064	0.0066	0.0050	0.0052	0.0045	0.0042
	(0.0009)	(0.0008)	(0.0010)	(0.0012)	(0.0013)	(0.0014)	(0.0021)	(0.0022)	(0.0029)	(0.0028)	(0.0028)
24	0.0022	0.0023	0.0024	0.0023	0.0023	0.0023	0.0023	0.0026	0.0032	0.0028	0.0025
	(0.0002)	(0.0003)	(0.0004)	(0.0004)	(0.0004)	(0.0005)	(0.0007)	(0.0012)	(0.0018)	(0.0018)	(0.0017)
25	0.0050	0.0047	0.0046	0.0047	0.0047	0.0048	0.0049	0.0037	0.0035	0.0026	0.0020
	(0.0004)	(0.0006)	(0.0007)	(0.0008)	(0.0009)	(0.0010)	(0.0015)	(0.0017)	(0.0019)	(0.0016)	(0.0014)
26	0.0030	0.0032	0.0030	0.0030	0.0032	0.0035	0.0031	0.0020	0.0011	0.0008	0.0009
	(0.0003)	(0.0004)	(0.0005)	(0.0005)	(0.0006)	(0.0007)	(0.0010)	(0.0009)	(0.0006)	(0.0005)	(0.0006)
27	0.0042	0.0054	0.0063	0.0073	0.0080	0.0087	0.0114	0.0097	0.0088	0.0078	0.0074
	(0.0004)	(0.0007)	(0.0010)	(0.0013)	(0.0016)	(0.0019)	(0.0036)	(0.0043)	(0.0048)	(0.0049)	(0.0050)
28	0.0040	0.0047	0.0051	0.0057	0.0060	0.0063	0.0064	0.0047	0.0042	0.0034	0.0032
	(0.0003)	(0.0006)	(0.0008)	(0.0010)	(0.0012)	(0.0013)	(0.0020)	(0.0021)	(0.0023)	(0.0022)	(0.0022)
29	0.0027	0.0035	0.0040	0.0045	0.0050	0.0055	0.0063	0.0025	0.0024	0.0017	0.0014
	(0.0002)	(0.0004)	(0.0006)	(0.0008)	(0.0010)	(0.0012)	(0.0020)	(0.0011)	(0.0013)	(0.0011)	(0.0010)
30	0.0033	0.0040	0.0040	0.0039	0.0038	0.0037	0.0031	0.0019	0.0015	0.0011	0.0009
	(0.0003)	(0.0005)	(0.0006)	(0.0007)	(0.0007)	(0.0008)	(0.0010)	(0.0008)	(0.0008)	(0.0007)	(0.0006)
31	0.0067	0.0073	0.0075	0.0076	0.0079	0.0079	0.0081	0.0063	0.0040	0.0034	0.0031
	(0.0006)	(0.0009)	(0.0011)	(0.0013)	(0.0015)	(0.0017)	(0.0025)	(0.0028)	(0.0022)	(0.0021)	(0.0021)
32	0.0360	0.0353	0.0347	0.0338	0.0336	0.0336	0.0353	0.0343	0.0298	0.0257	0.0221
	(0.0031)	(0.0044)	(0.0053)	(0.0059)	(0.0066)	(0.0072)	(0.0111)	(0.0153)	(0.0164)	(0.0162)	(0.0150)
33	0.0035	0.0037	0.0039	0.0043	0.0046	0.0049	0.0054	0.0067	0.0078	0.0070	0.0064
	(0.0003)	(0.0005)	(0.0006)	(0.0007)	(0.0009)	(0.0010)	(0.0017)	(0.0030)	(0.0043)	(0.0044)	(0.0043)
34	0.0031	0.0036	0.0036	0.0036	0.0039	0.0044	0.0051	0.0055	0.0058	0.0039	0.0034
	(0.0003)	(0.0004)	(0.0005)	(0.0006)	(0.0008)	(0.0009)	(0.0016)	(0.0025)	(0.0032)	(0.0025)	(0.0023)
35	0.0086	0.0102	0.0111	0.0118	0.0127	0.0139	0.0150	0.0104	0.0066	0.0066	0.0045
	(0.0008)	(0.0013)	(0.0017)	(0.0021)	(0.0025)	(0.0030)	(0.0047)	(0.0046)	(0.0036)	(0.0041)	(0.0030)

Table 5 : Autocorrelations and Results of Dickey-Fuller Tests - Industry-wise Results

Ind. Name \ Lags 1		2	3	4	5	6	13	26	52	60	DF(NT)	DF(TT)	SDY
ALL	0.24	0.23	0.15	0.18	0.07	0.11	-0.05	0.04	-0.01	-0.03	1.106	-0.347	0.026
AGRI	0.37	0.23	0.15	0.16	0.03	-0.00	-0.10	-0.04	0.01	-0.07	0.746	-1.407	0.029
TEA	-0.42	0.02	0.02	0.01	0.01	-0.02	-0.01	0.02	-0.01	-0.00	1.347	-0.493	0.102
PROC	-0.16	0.10	0.04	0.10	0.04	0.05	-0.02	0.01	-0.00	-0.01	3.680	2.504	0.038
F&T	0.29	0.27	0.16	0.20	0.05	0.13	-0.03	0.04	0.00	-0.02	2.324	1.153	0.026
FOOD	0.29	0.18	0.15	0.21	0.11	0.11	-0.01	0.05	0.01	-0.03	3.481	2.912	0.030
SUGAR	0.24	0.05	-0.02	0.05	0.14	0.12	-0.03	0.10	0.01	-0.06	1.799	0.435	0.031
TOB	-0.10	0.04	0.04	0.08	0.01	0.04	0.03	0.00	-0.00	-0.05	7.136	6.462	0.066
TEX	-0.00	0.19	0.08	0.10	0.01	0.11	-0.02	-0.02	0.03	-0.01	2.201	0.828	0.032
COTEX	0.18	0.23	0.16	0.17	0.01	0.14	-0.03	-0.06	0.01	0.00	0.756	-0.683	0.034
JUTEX	0.20	0.19	0.13	0.05	-0.01	0.05	-0.03	0.02	-0.01	-0.06	-0.751	-0.146	0.034
SILK	0.02	0.15	-0.02	0.11	-0.00	0.06	-0.07	-0.00	0.02	-0.04	1.805	0.093	0.042
M&C	0.29	0.21	0.13	0.20	0.08	0.12	-0.02	0.05	-0.01	-0.05	1.270	-0.018	0.025
METAL	0.29	0.21	0.14	0.20	0.08	0.15	-0.04	0.03	-0.02	-0.05	1.371	-0.067	0.027
ALU	0.27	0.09	-0.02	0.01	0.04	0.11	-0.07	0.04	-0.02	-0.02	0.254	-2.127	0.045
AUTO	0.24	0.18	0.11	0.12	0.06	0.12	-0.02	-0.02	0.01	-0.06	1.022	-0.519	0.028
ELEC	0.25	0.21	0.12	0.19	0.12	0.12	-0.03	0.01	-0.01	-0.04	2.091	1.036	0.025
MACH	0.24	0.19	0.14	0.07	0.00	0.11	-0.08	0.01	-0.03	-0.03	1.224	0.279	0.028
FOUND	0.22	0.14	0.07	-0.01	-0.03	0.03	-0.04	0.02	-0.04	-0.03	0.616	-1.309	0.026
CHEM	0.23	0.16	0.11	0.12	0.07	0.03	-0.05	0.08	0.00	-0.06	2.094	1.129	0.026
CFERT	0.28	0.12	0.03	0.10	0.02	0.05	0.07	0.03	0.02	-0.02	1.163	0.540	0.031
DYES	-0.33	0.02	0.04	0.00	-0.01	0.00	-0.01	-0.01	-0.01	0.01	1.860	0.747	0.065
MMFIB	0.14	0.11	0.11	0.08	0.02	0.06	-0.00	-0.00	-0.08	-0.04	-1.497	-1.418	0.036
OBIC	0.22	0.15	0.16	0.15	0.11	0.06	-0.06	0.05	0.01	-0.03	1.821	0.390	0.028
MED	0.07	0.09	-0.02	0.09	-0.02	0.04	-0.01	0.01	-0.04	-0.02	0.318	-0.427	0.040
OP&M	0.35	0.28	0.19	0.14	0.02	0.11	-0.09	0.05	0.02	-0.05	1.604	0.150	0.028
CEM	0.26	0.19	0.22	0.10	0.06	0.13	-0.00	0.06	0.06	-0.03	2.700	1.740	0.040
RUBB	0.25	0.21	0.13	0.10	0.04	0.07	-0.07	0.02	0.00	-0.06	0.448	-1.339	0.038
PAPER	0.33	0.22	0.12	0.06	0.10	0.12	-0.05	0.07	-0.00	-0.04	0.608	-0.696	0.030
OIND	-0.11	0.21	0.13	0.02	0.12	0.11	-0.01	-0.02	-0.01	0.03	7.317	6.381	0.030
EG&S	0.20	0.04	0.03	0.06	0.05	0.09	-0.04	-0.10	0.04	-0.03	2.340	0.750	0.046
TRADE	-0.21	0.01	0.13	0.08	-0.05	0.20	-0.01	0.04	0.01	0.02	4.792	3.918	0.043
SHIP	0.24	0.12	0.14	0.06	-0.00	0.05	-0.03	-0.01	-0.07	0.10	4.047	3.166	0.058
HOTEL	0.15	-0.06	0.15	0.23	0.10	0.06	-0.02	0.02	-0.02	-0.02	-2.020	-2.512	0.039
F&I	0.11	0.07	0.13	0.03	0.08	0.02	0.02	-0.05	-0.04	-0.03	-0.571	-1.202	0.022

Table 6 : Autocorrelations and Results of Dickey-Fuller Tests - Company-wise Results

C. No.\Lags	1	2	3	4	5	6	13	26	52	60	DF(NT)	DF(TT)	SDY
1	-0.01	0.02	0.05	0.11	0.06	0.06	-0.06	0.00	0.02	-0.02	-1.339	-1.808	0.065
2	0.19	0.01	0.20	0.28	0.02	-0.00	-0.15	0.01	-0.01	-0.14	-3.893	-6.342	0.052
3	0.11	-0.04	0.03	0.10	0.12	0.02	0.01	0.04	0.01	0.04	-2.068	-3.422	0.086
4	0.07	-0.03	0.09	0.06	-0.02	-0.06	0.05	0.06	-0.03	0.02	-0.290	-0.512	0.054
5	0.14	0.10	0.01	0.13	-0.01	-0.16	-0.03	0.05	0.00	-0.02	-0.551	-1.724	0.074
6	0.18	-0.02	0.13	0.11	-0.01	0.05	0.06	-0.06	-0.03	0.08	-2.908	-3.217	0.090
7	-0.01	0.04	0.02	0.02	-0.06	0.00	0.03	-0.04	0.05	0.02	-2.210	-2.404	0.187
8	0.27	0.08	0.06	-0.01	-0.05	-0.02	-0.09	-0.06	0.03	0.00	-0.511	-2.430	0.049
9	-0.00	-0.10	-0.03	0.08	0.04	0.08	0.05	0.07	0.04	-0.05	0.445	-1.604	0.044
10	-0.03	-0.11	0.02	0.02	-0.01	-0.05	-0.01	0.06	-0.03	-0.06	-0.845	-3.794	0.046
11	0.03	0.01	-0.01	0.02	0.01	-0.02	0.02	-0.03	0.02	0.05	-1.525	-1.286	0.182
12	0.06	-0.04	0.06	0.06	0.04	0.11	0.06	0.09	-0.06	0.00	-1.197	-1.418	0.063
13	0.14	-0.02	0.03	0.03	0.04	-0.01	0.05	0.00	0.00	-0.02	-1.573	-1.580	0.060
14	0.01	0.03	0.01	-0.02	-0.02	0.01	0.00	0.02	0.01	0.01	-1.790	-2.034	0.180
15	0.18	-0.04	0.04	0.14	0.22	-0.03	0.07	0.03	-0.00	-0.03	5.415	1.839	0.045
16	0.27	-0.03	0.01	-0.02	-0.01	0.04	0.05	0.01	0.07	0.07	-3.641	-4.107	0.077
17	-0.07	0.02	0.08	0.06	-0.05	0.06	0.01	0.06	-0.04	0.07	-1.105	-1.966	0.064
18	0.10	-0.09	0.01	-0.01	-0.01	-0.15	0.02	-0.07	-0.02	0.04	-0.509	-2.117	0.046
19	0.16	-0.02	0.04	-0.01	-0.08	-0.06	0.13	0.08	-0.05	0.07	2.478	0.904	0.061
20	0.26	0.16	0.12	0.16	0.14	0.08	-0.09	0.01	0.04	0.02	-2.452	-2.415	0.083
21	0.16	0.08	0.01	0.03	0.01	0.27	-0.09	0.18	0.09	-0.08	-2.696	-2.689	0.055
22	0.21	0.06	-0.04	0.03	0.19	-0.01	-0.06	-0.06	0.04	0.04	-2.736	-3.200	0.058
23	-0.37	0.12	0.13	0.02	-0.04	0.09	-0.00	-0.05	0.01	-0.02	-1.295	-0.873	0.106
24	0.05	0.01	-0.01	-0.01	0.06	-0.01	-0.04	0.03	-0.12	0.07	-0.158	-1.163	0.049
25	-0.06	-0.01	0.05	0.04	0.02	0.02	0.07	0.03	-0.05	0.03	-1.864	-1.881	0.071
26	0.06	-0.13	0.04	0.18	0.11	-0.13	0.06	0.04	0.02	-0.01	-0.418	-2.599	0.055
27	0.29	0.16	0.25	0.06	0.17	0.20	-0.04	-0.05	-0.02	-0.13	-2.260	-4.778	0.067
28	0.16	0.08	0.17	-0.02	0.09	-0.02	0.06	0.10	-0.04	0.00	-1.739	-1.589	0.064
29	0.31	0.10	0.22	0.19	0.18	0.01	-0.09	0.10	0.00	-0.04	-2.850	-3.990	0.055
30	0.20	-0.12	-0.04	-0.01	-0.01	-0.01	0.03	-0.02	0.08	0.15	-0.125	-1.831	0.059
31	0.08	0.00	0.01	0.04	-0.06	-0.02	0.03	-0.05	-0.10	0.04	-1.296	-3.251	0.082
32	-0.03	-0.01	-0.04	0.02	0.00	0.03	0.09	-0.04	-0.01	-0.00	-1.236	-2.135	0.189
33	0.05	0.06	0.13	0.11	0.06	0.03	0.10	-0.07	-0.06	-0.04	-0.936	-1.823	0.061
34	0.17	-0.11	0.01	0.28	0.22	0.00	0.03	-0.00	0.05	0.02	-0.859	-1.181	0.055
35	0.18	0.05	0.07	0.15	0.18	-0.00	-0.05	-0.03	-0.11	-0.04	-3.766	-4.423	0.094

Table 7 : Estimates of Variance Ratios and their Standard Errors - Industry-wise Results

IND.NAME	SHT(1)	SHT(2)	SHT(3)	SHT(4)	SHT(5)	SHT(6)	SHT(13)	SHT(26)	SHT(52)	SHT(60)
ALL	1.240	1.471	1.661	1.849	1.998	2.136	2.608	2.628	3.133	3.228
	(0.048)	(0.047)	(0.046)	(0.045)	(0.045)	(0.044)	(0.038)	(0.028)	(0.024)	(0.023)
AGRI	1.375	1.654	1.866	2.058	2.195	2.292	2.373	1.772	1.611	1.677
	(0.053)	(0.052)	(0.051)	(0.050)	(0.049)	(0.048)	(0.035)	(0.019)	(0.012)	(0.012)
TEA	0.584	0.459	0.406	0.380	0.366	0.350	0.279	0.192	0.155	0.159
	(0.023)	(0.015)	(0.011)	(0.009)	(0.008)	(0.007)	(0.004)	(0.002)	(0.001)	(0.001)
PROC	0.844	0.858	0.886	0.945	0.997	1.048	1.228	1.225	1.464	1.502
	(0.033)	(0.027)	(0.024)	(0.023)	(0.022)	(0.022)	(0.018)	(0.013)	(0.011)	(0.011)
F&T	1.288	1.560	1.776	1.986	2.143	2.293	2.848	3.007	3.683	3.833
	(0.050)	(0.049)	(0.049)	(0.049)	(0.048)	(0.048)	(0.042)	(0.032)	(0.028)	(0.027)
FOOD	1.294	1.515	1.699	1.893	2.059	2.207	2.803	3.101	3.921	4.095
	(0.050)	(0.048)	(0.047)	(0.046)	(0.046)	(0.046)	(0.041)	(0.033)	(0.030)	(0.029)
SUGAR	1.235	1.346	1.391	1.436	1.512	1.600	1.747	1.685	1.927	1.969
	(0.048)	(0.043)	(0.038)	(0.035)	(0.034)	(0.033)	(0.026)	(0.018)	(0.015)	(0.014)
TOB	0.901	0.898	0.918	0.960	0.991	1.024	1.302	1.438	1.823	1.960
	(0.035)	(0.028)	(0.025)	(0.024)	(0.022)	(0.021)	(0.019)	(0.015)	(0.014)	(0.014)
TEX	0.998	1.126	1.229	1.328	1.397	1.476	1.753	1.786	2.128	2.220
	(0.039)	(0.036)	(0.034)	(0.033)	(0.031)	(0.031)	(0.026)	(0.019)	(0.016)	(0.016)
COTEX	1.179	1.392	1.579	1.757	1.879	2.005	2.357	2.307	2.546	2.649
	(0.046)	(0.044)	(0.043)	(0.043)	(0.042)	(0.042)	(0.035)	(0.024)	(0.019)	(0.019)
JUTEX	1.196	1.388	1.548	1.665	1.740	1.806	2.012	2.103	2.403	2.387
	(0.046)	(0.044)	(0.042)	(0.041)	(0.039)	(0.037)	(0.030)	(0.022)	(0.018)	(0.017)
SILK	1.021	1.131	1.175	1.245	1.291	1.340	1.473	1.289	1.368	1.401
	(0.040)	(0.036)	(0.032)	(0.031)	(0.029)	(0.028)	(0.022)	(0.014)	(0.010)	(0.010)
M&C	1.286	1.520	1.702	1.892	2.044	2.188	2.683	2.827	3.414	3.482
	(0.050)	(0.048)	(0.047)	(0.046)	(0.046)	(0.045)	(0.039)	(0.030)	(0.026)	(0.024)
METAL	1.286	1.521	1.708	1.899	2.054	2.206	2.695	2.756	3.061	3.069
	(0.050)	(0.048)	(0.047)	(0.047)	(0.046)	(0.046)	(0.040)	(0.029)	(0.023)	(0.022)
ALU	1.274	1.426	1.493	1.538	1.581	1.642	1.852	1.844	1.784	1.655
	(0.049)	(0.045)	(0.041)	(0.038)	(0.035)	(0.034)	(0.027)	(0.019)	(0.013)	(0.012)
AUTO	1.238	1.440	1.597	1.740	1.855	1.972	2.329	2.348	2.398	2.407
	(0.048)	(0.046)	(0.044)	(0.043)	(0.042)	(0.041)	(0.034)	(0.025)	(0.018)	(0.017)
ELEC	1.253	1.475	1.647	1.826	1.984	2.131	2.696	2.802	3.188	3.177
	(0.049)	(0.047)	(0.045)	(0.045)	(0.044)	(0.044)	(0.040)	(0.030)	(0.024)	(0.022)
MACH	1.239	1.442	1.615	1.747	1.836	1.931	2.190	1.991	2.140	2.199
	(0.048)	(0.046)	(0.044)	(0.043)	(0.041)	(0.040)	(0.032)	(0.021)	(0.016)	(0.015)

The figures in parentheses indicate standard errors of the estimates

Table 7 : Estimates of Variance Ratios and their Standard Errors - Industry-wise Results

IND.NAME	SHT(1)	SHT(2)	SHT(3)	SHT(4)	SHT(5)	SHT(6)	SHT(13)	SHT(26)	SHT(52)	SHT(60)
FOUND	1.225	1.395	1.515	1.583	1.618	1.651	1.911	1.984	2.111	2.026
	(0.048)	(0.044)	(0.042)	(0.039)	(0.036)	(0.034)	(0.028)	(0.021)	(0.016)	(0.014)
CHEM	1.227	1.413	1.561	1.700	1.816	1.909	2.311	2.537	3.297	3.413
	(0.048)	(0.045)	(0.043)	(0.042)	(0.041)	(0.040)	(0.034)	(0.027)	(0.025)	(0.024)
CFERT	1.278	1.448	1.551	1.651	1.725	1.790	2.026	2.372	3.096	3.203
	(0.050)	(0.046)	(0.043)	(0.041)	(0.039)	(0.037)	(0.030)	(0.025)	(0.023)	(0.022)
DYES	0.670	0.571	0.543	0.526	0.512	0.503	0.458	0.387	0.383	0.382
	(0.026)	(0.018)	(0.015)	(0.013)	(0.011)	(0.010)	(0.007)	(0.004)	(0.003)	(0.003)
MMFIB	1.142	1.264	1.377	1.478	1.553	1.625	1.983	2.106	2.481	2.518
	(0.044)	(0.040)	(0.038)	(0.036)	(0.035)	(0.034)	(0.029)	(0.022)	(0.019)	(0.018)
OBIC	1.217	1.386	1.550	1.708	1.848	1.965	2.342	2.344	2.741	2.807
	(0.047)	(0.044)	(0.043)	(0.042)	(0.041)	(0.041)	(0.034)	(0.025)	(0.021)	(0.020)
MED	1.074	1.159	1.189	1.244	1.273	1.305	1.357	1.112	1.297	1.330
	(0.042)	(0.037)	(0.033)	(0.031)	(0.029)	(0.027)	(0.020)	(0.012)	(0.010)	(0.009)
OP&M	1.350	1.652	1.898	2.104	2.248	2.382	2.764	2.409	2.586	2.701
	(0.052)	(0.052)	(0.052)	(0.052)	(0.050)	(0.049)	(0.041)	(0.025)	(0.019)	(0.019)
CEM	1.261	1.476	1.694	1.867	2.001	2.133	2.626	2.760	3.470	3.764
	(0.049)	(0.047)	(0.046)	(0.046)	(0.045)	(0.044)	(0.039)	(0.029)	(0.026)	(0.026)
RUBB	1.250	1.477	1.656	1.805	1.918	2.020	2.458	2.257	2.211	2.216
	(0.049)	(0.047)	(0.045)	(0.044)	(0.043)	(0.042)	(0.036)	(0.024)	(0.017)	(0.016)
PAPER	1.333	1.592	1.781	1.918	2.043	2.167	2.566	2.641	3.551	3.741
	(0.052)	(0.050)	(0.049)	(0.047)	(0.046)	(0.045)	(0.038)	(0.028)	(0.027)	(0.026)
OIND	0.894	1.000	1.116	1.196	1.290	1.388	1.774	1.914	2.370	2.437
	(0.035)	(0.032)	(0.031)	(0.029)	(0.029)	(0.029)	(0.026)	(0.020)	(0.018)	(0.017)
EG&S	1.200	1.291	1.354	1.417	1.476	1.544	1.783	1.497	1.233	1.281
	(0.047)	(0.041)	(0.037)	(0.035)	(0.033)	(0.032)	(0.026)	(0.016)	(0.009)	(0.009)
TRADE	0.791	0.727	0.757	0.807	0.824	0.893	1.082	1.144	1.249	1.250
	(0.031)	(0.023)	(0.021)	(0.020)	(0.018)	(0.019)	(0.016)	(0.012)	(0.009)	(0.009)
SHIP	1.237	1.399	1.549	1.664	1.741	1.810	1.882	2.125	2.376	2.358
	(0.048)	(0.044)	(0.042)	(0.041)	(0.039)	(0.038)	(0.028)	(0.022)	(0.018)	(0.017)
HOTEL	1.149	1.162	1.243	1.383	1.510	1.618	1.917	2.045	2.511	2.546
	(0.045)	(0.037)	(0.034)	(0.034)	(0.034)	(0.034)	(0.028)	(0.022)	(0.019)	(0.018)
F&I	1.105	1.189	1.295	1.369	1.447	1.509	1.708	1.859	1.884	1.849
	(0.043)	(0.038)	(0.036)	(0.034)	(0.032)	(0.031)	(0.025)	(0.020)	(0.014)	(0.013)

The figures in parentheses indicate standard errors of the estimates

Table 8 : Estimates of Variance Ratios and their Standard Errors - Company-wise Results

C. No.	SHT(2)	SHT(4)	SHT(8)	SHT(12)	SHT(16)	SHT(24)	SHT(32)	SHT(40)	SHT(50)	SHT(60)
1	0.990	0.997	1.026	1.089	1.152	1.215	1.379	1.113	0.973	0.928
	(0.058)	(0.047)	(0.042)	(0.040)	(0.039)	(0.038)	(0.030)	(0.018)	(0.011)	(0.010)
2	1.189	1.260	1.396	1.588	1.723	1.819	2.029	1.370	0.854	0.862
	(0.069)	(0.060)	(0.057)	(0.058)	(0.058)	(0.057)	(0.045)	(0.022)	(0.010)	(0.009)
3	1.108	1.119	1.140	1.194	1.268	1.328	1.538	1.347	1.000	0.977
	(0.064)	(0.053)	(0.047)	(0.044)	(0.043)	(0.041)	(0.034)	(0.021)	(0.011)	(0.010)
4	1.075	1.080	1.127	1.179	1.208	1.211	1.257	1.541	1.777	1.813
	(0.063)	(0.051)	(0.046)	(0.043)	(0.041)	(0.038)	(0.028)	(0.024)	(0.020)	(0.019)
5	1.139	1.250	1.310	1.398	1.454	1.448	1.319	0.961	0.920	0.798
	(0.066)	(0.059)	(0.054)	(0.051)	(0.049)	(0.045)	(0.029)	(0.015)	(0.010)	(0.008)
6	1.184	1.230	1.320	1.418	1.479	1.536	1.748	1.639	1.307	1.315
	(0.069)	(0.058)	(0.054)	(0.052)	(0.050)	(0.048)	(0.038)	(0.026)	(0.015)	(0.014)
7	0.992	1.012	1.031	1.050	1.043	1.039	0.942	0.809	0.640	0.670
	(0.058)	(0.048)	(0.042)	(0.039)	(0.035)	(0.032)	(0.021)	(0.013)	(0.007)	(0.007)
8	1.272	1.418	1.523	1.584	1.609	1.621	1.726	1.298	0.966	0.934
	(0.074)	(0.067)	(0.063)	(0.058)	(0.054)	(0.050)	(0.038)	(0.021)	(0.011)	(0.010)
9	0.998	0.927	0.879	0.881	0.898	0.932	0.914	0.815	0.796	0.775
	(0.058)	(0.044)	(0.036)	(0.032)	(0.030)	(0.029)	(0.020)	(0.013)	(0.009)	(0.008)
10	0.970	0.890	0.861	0.852	0.841	0.819	0.650	0.403	0.222	0.234
	(0.056)	(0.042)	(0.035)	(0.031)	(0.028)	(0.025)	(0.014)	(0.006)	(0.003)	(0.002)
11	1.033	1.052	1.059	1.071	1.083	1.087	1.119	1.156	1.011	0.965
	(0.060)	(0.050)	(0.044)	(0.039)	(0.036)	(0.034)	(0.025)	(0.018)	(0.011)	(0.010)
12	1.055	1.044	1.068	1.107	1.148	1.207	1.385	1.347	1.247	1.232
	(0.061)	(0.050)	(0.044)	(0.041)	(0.039)	(0.038)	(0.030)	(0.021)	(0.014)	(0.013)
13	1.139	1.174	1.205	1.235	1.270	1.293	1.447	1.430	1.019	0.934
	(0.066)	(0.056)	(0.050)	(0.045)	(0.043)	(0.040)	(0.032)	(0.023)	(0.012)	(0.010)
14	1.005	1.025	1.038	1.037	1.027	1.024	1.006	0.902	0.650	0.651
	(0.058)	(0.049)	(0.043)	(0.038)	(0.034)	(0.032)	(0.022)	(0.014)	(0.007)	(0.007)
15	1.179	1.215	1.252	1.330	1.455	1.535	1.939	2.537	3.068	3.068
	(0.069)	(0.058)	(0.052)	(0.049)	(0.049)	(0.048)	(0.043)	(0.040)	(0.035)	(0.032)
16	1.273	1.344	1.383	1.398	1.403	1.417	1.462	1.372	1.227	1.264
	(0.074)	(0.064)	(0.057)	(0.051)	(0.047)	(0.044)	(0.032)	(0.022)	(0.014)	(0.013)
17	0.930	0.920	0.956	1.001	1.013	1.038	1.122	1.060	0.917	0.829
	(0.054)	(0.044)	(0.039)	(0.037)	(0.034)	(0.032)	(0.025)	(0.017)	(0.010)	(0.009)
18	1.102	1.073	1.063	1.054	1.045	0.995	0.812	0.826	0.703	0.644
	(0.064)	(0.051)	(0.044)	(0.039)	(0.035)	(0.031)	(0.018)	(0.013)	(0.008)	(0.007)

The figures in parentheses indicate standard errors of the estimates

Table 8 : Estimates of Variance Ratios and their Standard Errors - Company-wise Results

C. No.	SHT(2)	SHT(4)	SHT(8)	SHT(12)	SHT(6)	SHT(24)	SHT(32)	SHT(40)	SHT(50)	SHT(60)
19	1.161	1.199	1.241	1.260	1.248	1.222	1.286	1.824	2.289	2.334
	(0.068)	(0.057)	(0.051)	(0.046)	(0.042)	(0.038)	(0.028)	(0.029)	(0.026)	(0.025)
20	1.256	1.448	1.601	1.758	1.908	2.037	2.358	1.740	1.326	1.428
	(0.073)	(0.069)	(0.066)	(0.065)	(0.064)	(0.063)	(0.052)	(0.028)	(0.015)	(0.015)
21	1.161	1.265	1.321	1.368	1.402	1.503	1.872	1.611	1.232	1.191
	(0.068)	(0.060)	(0.054)	(0.050)	(0.047)	(0.047)	(0.041)	(0.026)	(0.014)	(0.013)
22	1.209	1.317	1.352	1.384	1.468	1.524	1.528	1.207	1.106	1.141
	(0.070)	(0.063)	(0.056)	(0.051)	(0.049)	(0.047)	(0.034)	(0.019)	(0.012)	(0.012)
23	0.632	0.590	0.632	0.663	0.672	0.703	0.908	1.031	1.204	1.236
	(0.037)	(0.028)	(0.026)	(0.024)	(0.023)	(0.022)	(0.020)	(0.016)	(0.014)	(0.013)
24	1.051	1.076	1.084	1.087	1.110	1.123	1.206	1.344	1.851	1.863
	(0.061)	(0.051)	(0.045)	(0.040)	(0.037)	(0.035)	(0.027)	(0.021)	(0.021)	(0.020)
25	0.937	0.907	0.917	0.938	0.960	0.981	0.991	0.850	0.672	0.618
	(0.055)	(0.043)	(0.038)	(0.035)	(0.032)	(0.031)	(0.022)	(0.013)	(0.008)	(0.007)
26	1.055	0.990	0.979	1.046	1.126	1.144	1.181	1.254	1.025	0.971
	(0.061)	(0.047)	(0.040)	(0.038)	(0.038)	(0.036)	(0.026)	(0.020)	(0.012)	(0.010)
27	1.289	1.495	1.724	1.884	2.046	2.217	2.766	2.475	2.308	2.248
	(0.075)	(0.071)	(0.071)	(0.069)	(0.069)	(0.069)	(0.061)	(0.039)	(0.026)	(0.024)
28	1.159	1.269	1.409	1.485	1.567	1.618	1.816	1.648	1.756	1.802
	(0.067)	(0.060)	(0.058)	(0.055)	(0.053)	(0.050)	(0.040)	(0.026)	(0.020)	(0.019)
29	1.308	1.478	1.674	1.868	2.058	2.197	2.359	1.472	1.000	0.848
	(0.076)	(0.070)	(0.069)	(0.069)	(0.069)	(0.068)	(0.052)	(0.023)	(0.011)	(0.009)
30	1.203	1.189	1.161	1.139	1.120	1.102	1.015	0.808	0.792	0.771
	(0.070)	(0.056)	(0.048)	(0.042)	(0.038)	(0.034)	(0.022)	(0.013)	(0.009)	(0.008)
31	1.076	1.103	1.122	1.150	1.148	1.143	1.182	0.879	0.563	0.512
	(0.063)	(0.052)	(0.046)	(0.042)	(0.039)	(0.036)	(0.026)	(0.014)	(0.006)	(0.005)
32	0.973	0.955	0.924	0.915	0.909	0.916	0.946	0.860	0.679	0.617
	(0.057)	(0.045)	(0.038)	(0.034)	(0.031)	(0.028)	(0.021)	(0.014)	(0.008)	(0.007)
33	1.053	1.113	1.210	1.310	1.397	1.466	1.592	1.890	2.100	2.092
	(0.061)	(0.053)	(0.050)	(0.048)	(0.047)	(0.046)	(0.035)	(0.030)	(0.024)	(0.022)
34	1.174	1.158	1.155	1.264	1.410	1.516	1.721	2.122	2.638	2.638
	(0.068)	(0.055)	(0.048)	(0.047)	(0.047)	(0.047)	(0.038)	(0.034)	(0.030)	(0.028)
35	1.179	1.274	1.354	1.460	1.590	1.683	2.051	2.134	2.104	1.970
	(0.069)	(0.061)	(0.056)	(0.054)	(0.053)	(0.052)	(0.045)	(0.034)	(0.024)	(0.021)

The figures in parentheses indicate standard errors of the estimates

Table 9 : Augmented Dickey-Fuller Test - Industry-wise Results

IND.	Model I			Model II				
NAME	α	τ	Phi 1	α	ß	τ	Phi 2	Phi 3
ALL	-0.0574	1.0057	1.5395	-0.0318	0.0007	0.9971	1.6139	1.4912
	0.1074	0.0052		0.1090	0.0005	0.0083		
	-0.5343	1.1058		-0.2920	1.3256	-0.3470		
AGRI	0.0130	1.0030	1.5237	0.0181	0.0029	0.9875	2.2914	2.1829
	0.1680	0.0040		0.1675	0.0015	0.0088		
	0.0773	0.7459		0.1080	1.9508	-1.4073		
TEA	-0.1072	1.0096	2.4486	-0.2035	0.0041	0.9929	2.2363	1.8102
	0.3628	0.0072		0.3695	0.0030	0.0144		
	-0.2955	1.3472		-0.5507	1.3424	-0.4931		
PROC	-0.2878	1.0195	9.2307	-0.2880	-0.0001	1.0201	25.0157	6.7587
	0.1149	0.0053		0.1150	0.0006	0.0080		
	-2.5055	3.6796		-2.5040	-0.1026	2.5037		
F&T	-0.1143	1.0116	3.8340	-0.1267	0.0003	1.0084	2.6729	2.8767
	0.0858	0.0050		0.0883	0.0005	0.0073		
	-1.3322	2.3236		-1.4349	0.6023	1.1532		
FOOD	-0.5503	1.0263	7.1164	-0.5224	-0.0013	1.0351	5.0349	6.4961
	0.2261	0.0076		0.2281	0.0014	0.0120		
	-2.4343	3.4813		-2.2905	-0.9361	2.9121		
SUGAR	-0.1007	1.0108	2.6638	-0.0902	0.0004	1.0041	2.0445	2.0215
	0.0891	0.0060		0.0899	0.0004	0.0095		
	-1.1306	1.7989		-1.0043	0.8992	0.4348		
TOB	-1.0853	1.0579	27.4050	-0.6258	-0.0032	1.0638	18.6459	26.0253
	0.3659	0.0081		0.5689	0.0030	0.0099		
	-2.9659	7.1361		-1.1001	-1.0547	6.4617		
TEX	-0.0688	1.0097	3.8534	-0.0836	0.0003	1.0052	2.9101	2.9340
	0.0600	0.0044		0.0618	0.0003	0.0063		
	-1.1458	2.2011		-1.3527	1.0115	0.8276		
COTEX	-0.0088	1.0049	1.2010	-0.0194	0.0005	0.9948	1.6181	1.6328
	0.0721	0.0064		0.0736	0.0003	0.0077		
	-0.1225	0.7565		-0.2637	1.7636	-0.6825		
JUTEX	0.0235	0.9955	0.3885	-0.0277	0.0002	0.9991	2.1552	3.1247
	0.0276	0.0060		0.0348	0.0001	0.0062		
	0.8540	-0.7506		-0.7944	2.3832	-0.1460		
SILK	-0.0370	1.0078	2.9098	-0.0834	0.0007	1.0007	2.3915	2.3049
	0.0692	0.0043		0.0798	0.0006	0.0075		
	-0.5347	1.8047		-1.0443	1.1619	0.0931		

Table 9 : Augmented Dickey-Fuller Test - Industry-wise Results

IND. NAME	Model I α	Model I τ	Phi 1	Model II α	Model II ß	Model II τ	Phi 2	Phi 3
M&C	-0.0943	1.0070	1.8049	-0.0525	0.0005	0.9998	1.5968	1.3963
	0.1231	0.0055		0.1290	0.0005	0.0086		
	-0.7662	1.2700		-0.4069	1.0859	-0.0175		
METAL	-0.0998	1.0075	1.9267	-0.0560	0.0006	0.9994	1.6702	1.5182
	0.1211	0.0054		0.1277	0.0006	0.0093		
	-0.8244	1.3711		-0.4386	1.0751	-0.0674		
ALU	0.1355	1.0011	0.9125	-0.2922	0.0060	0.9810	2.7806	3.2790
	0.2170	0.0042		0.2732	0.0024	0.0089		
	0.6243	0.2544		-1.0697	2.5480	-2.1273		
AUTO	-0.0633	1.0052	1.6711	0.0057	0.0008	0.9956	1.7788	1.5163
	0.1272	0.0051		0.1361	0.0006	0.0086		
	-0.4979	1.0217		0.0421	1.4093	-0.5190		
ELEC	-0.1443	1.0146	3.2905	-0.1254	0.0002	1.0092	2.5240	2.6808
	0.0869	0.0070		0.0890	0.0002	0.0089		
	-1.6599	2.0905		-1.4089	0.9956	1.0359		
MACH	-0.1056	1.0088	1.6652	-0.0797	0.0004	1.0024	1.6908	1.6189
	0.1220	0.0072		0.1235	0.0003	0.0087		
	-0.8653	1.2243		-0.6460	1.3177	0.2787		
FOUND	-0.0015	1.0026	1.5910	0.0610	0.0007	0.9891	2.2608	1.9815
	0.0717	0.0043		0.0788	0.0004	0.0083		
	-0.0216	0.6164		0.7744	1.8922	-1.3087		
CHEM	-0.2186	1.0137	3.7357	-0.1993	0.0003	1.0101	2.6030	2.3632
	0.1465	0.0066		0.1502	0.0005	0.0090		
	-1.4922	2.0938		-1.3274	0.5912	1.1287		
CFERT	-0.1041	1.0073	1.9252	-0.1269	0.0005	1.0038	1.7484	1.3730
	0.1657	0.0063		0.1667	0.0005	0.0070		
	-0.6283	1.1635		-0.7612	1.1794	0.5403		
DYES	-0.1196	1.0211	3.0765	-0.1263	0.0005	1.0101	2.7787	2.8170
	0.0972	0.0114		0.0972	0.0003	0.0136		
	-1.2305	1.8597		-1.2996	1.4716	0.7473		
MMFIB	0.1937	0.9884	1.4307	0.1584	0.0001	0.9889	1.0544	1.2726
	0.1179	0.0077		0.1340	0.0002	0.0078		
	1.6430	-1.4974		1.1824	0.5537	-1.4185		
OBIC	-0.0884	1.0089	2.7950	-0.0781	0.0003	1.0038	1.9849	1.8419
	0.0842	0.0049		0.0859	0.0006	0.0097		
	-1.0497	1.8209		-0.9092	0.6109	0.3904		

Table 9 : Augmented Dickey-Fuller Test - Industry-wise Results

IND.	Model I			Model II				
NAME	α	τ	Phi 1	α	ß	τ	Phi 2	Phi 3
MED	0.0137	1.0026	1.3806	0.0325	0.0004	0.9958	1.4713	0.8748
	0.1373	0.0083		0.1379	0.0003	0.0099		
	0.1000	0.3179		0.2356	1.2839	-0.4270		
OP&M	-0.0734	1.0086	2.3982	-0.0906	0.0007	1.0012	2.0587	1.9746
	0.0978	0.0054		0.0988	0.0006	0.0083		
	-0.7504	1.6036		-0.9165	1.1727	0.1505		
CEM	-0.1415	1.0134	4.8199	-0.2894	0.0011	1.0099	3.7053	4.3806
	0.1386	0.0050		0.1847	0.0009	0.0057		
	-1.0211	2.6996		-1.5669	1.2105	1.7400		
RUBB	0.0359	1.0026	1.2388	0.0573	0.0019	0.9858	2.0052	1.8625
	0.1532	0.0058		0.1532	0.0010	0.0106		
	0.2346	0.4483		0.3743	1.8769	-1.3388		
PAPER	0.0120	1.0036	1.0521	-0.0585	0.0009	0.9946	1.9636	2.0296
	0.0854	0.0059		0.0909	0.0005	0.0077		
	0.1408	0.6083		-0.6438	1.8821	-0.6962		
OIND	-0.6690	1.0536	1.0214	-0.6576	-0.0010	1.0661	1.7455	8.3435
	0.1208	0.0073		0.1207	0.0006	0.0104		
	-5.5367	7.3166		-5.4464	-1.7043	6.3809		
EG&S	-0.0929	1.0128	4.5850	-0.2457	0.0015	1.0062	7.9946	3.2922
	0.1745	0.0055		0.2269	0.0014	0.0083		
	-0.5325	2.3398		-1.0826	1.0527	0.7499		
TRADE	-0.5548	1.0258	4.2336	-0.5616	-0.0012	1.0347	8.8965	2.2936
	0.1626	0.0054		0.1626	0.0009	0.0088		
	-3.4114	4.7924		-3.4539	-1.2599	3.9180		
SHIP	-0.1605	1.0305	9.5048	-0.1650	0.0000	1.0301	6.3232	8.1738
	0.0754	0.0075		0.0954	0.0005	0.0095		
	-2.1275	4.0474		-1.7307	0.0786	3.1659		
HOTEL	0.4909	0.9713	2.5310	0.4579	0.0008	0.9626	2.8889	3.8395
	0.2243	0.0142		0.2243	0.0004	0.0149		
	2.1885	-2.0200		2.0416	1.8902	-2.5120		
F&I	0.0774	0.9938	0.9164	0.1245	0.0002	0.9856	1.4436	1.4093
	0.1102	0.0108		0.1140	0.0001	0.0120		
	0.7019	-0.5709		1.0923	1.5784	-1.2017		

Table 10 : Augmented Dickey-Fuller Test - Company-wise Results

Comp.	Model I			Model II				
No.	α	τ	Phi 1	α	ß	τ	Phi 2	Phi 3
1	0.6196	0.9972	0.5594	0.3289	0.0145	0.9843	4.4662	1.4398
	1.7047	0.0228		1.7040	0.0086	0.0240		
	0.3635	-0.1216		0.1930	1.6925	-0.6556		
2	5.2013	0.9689	2.5030	8.2822	0.1138	0.8845	7.6686	11.1755
	2.3247	0.0148		2.3351	0.0272	0.0246		
	2.2374	-2.1003		3.5468	4.1829	-4.6908		
3	-2.0836	1.0519	6.9603	-2.4889	0.0133	1.0431	4.6980	4.9706
	1.5173	0.0166		1.7326	0.0272	0.0246		
	-1.3732	3.1222		-1.4365	0.4883	1.7525		
4	-0.8958	1.0149	1.0744	-2.5087	0.0209	1.0125	3.1191	4.0461
	1.4461	0.0155		1.5440	0.0078	0.0152		
	-0.6195	0.9630		-1.6248	2.6705	0.8175		
5	0.0186	1.0111	1.4369	-0.3383	0.0420	0.9852	1.8586	1.5709
	2.2858	0.0163		2.2852	0.0257	0.0227		
	0.0082	0.6807		-0.1480	1.6352	-0.6531		
6	2.2206	0.9759	0.8231	1.0772	0.0224	0.9654	1.5861	2.0247
	1.8686	0.0248		1.9675	0.0128	0.0253		
	1.1884	-0.9726		0.5475	1.7583	-1.3658		
7	5.1786	0.9489	2.3110	9.9848	-0.0393	0.9357	1.7519	2.6254
	3.2000	0.0238		6.7946	0.0490	0.0289		
	1.6183	-2.1487		1.4695	-0.8021	-2.2232		
8	-1.7668	1.0278	4.7918	-1.6766	0.0032	1.0242	3.1841	2.6070
	1.2942	0.0122		1.4210	0.0203	0.0260		
	-1.3652	2.2847		-1.1799	0.1560	0.9306		
9	-1.4319	1.0330	7.0062	-1.1526	0.0070	1.0196	5.4376	3.8489
	0.8368	0.0122		0.9570	0.0116	0.0254		
	-1.7112	2.7128	-1.2045	0.6051	0.7691			
10	23.3243	0.9998	2.3172	100.0233	2.3514	0.8659	4.9632	5.6633
	28.6514	0.0124		35.2723	0.7006	0.0409		
	0.8141	-0.0141		2.8357	3.3564	-3.2825		
11	2.9983	0.9800	1.3839	4.2097	-0.0102	0.9788	0.9203	1.1837
	5.2755	0.0130		13.8210	0.1075	0.0180		
	0.5683	-1.5402		0.3046	-0.0949	-1.1804		
12	-0.8646	1.0139	1.4436	-1.5861	0.0210	1.0068	1.4829	0.9263
	4.0984	0.0254		4.1326	0.0169	0.0259		
	-0.2109	0.5472		-0.3838	1.2459	0.2629		

Table 10 : Augmented Dickey-Fuller Test - Company-wise Results

Comp.	Model I			Model II				
No.	α	τ	Phi 1	α	ß	τ	Phi 2	Phi 3
13	7.6227	0.9695	1.3357	7.6892	-0.0007	0.9695	0.8856	1.3244
	4.8807	0.0187		5.3778	0.0236	0.0187		
	1.5618	-1.6320		1.4298	-0.0298	-1.6273		
14	7.4602	0.9669	1.6145	20.1124	-0.0979	0.9511	1.3503	1.9870
	6.2354	0.0187		15.2624	0.1078	0.0255		
	1.1964	-1.7754		1.3178	-0.9083	-1.9172		
15	-4.1554	1.0741	23.5714	-4.0857	-0.0104	1.0850	15.9978	20.7382
	0.8732	0.0116		0.8767	0.0111	0.0164		
	-4.7585	6.3735		-4.6604	-0.9403	5.1812		
16	-1.6051	1.0337	1.4106	-2.3844	0.0215	1.0164	2.8004	3.6272
	1.6370	0.0258		1.6493	0.0092	0.0265		
	-0.9805	1.3055		-1.4458	2.3461	0.6172		
17	2.4213	0.9799	0.7855	3.7879	0.0285	0.9352	1.6237	1.7929
	3.1470	0.0365		3.2156	0.0158	0.0439		
	0.7694	-0.5504		1.1780	1.8107	-1.4767		
18	-0.0685	1.0067	1.1369	1.4734	0.0211	0.9769	3.7153	1.4074
	2.2405	0.0194		2.4191	0.0129	0.0265		
	-0.0306	0.3443		0.6091	1.6417	-0.8705		
19	-2.2041	1.0635	17.2536	-2.8805	0.0185	1.0455	14.2469	17.4362
	0.6498	0.0122		0.6878	0.0070	0.0138		
	-3.3918	5.1880		-4.1882	2.6412	3.3015		
20	19.6105	0.9529	4.4254	17.8762	0.0218	0.9526	2.9989	4.3083
	6.6852	0.0162		7.7977	0.0501	0.0162		
	2.9334	-2.9102		2.2925	0.4350	-2.9202		
21	81.4134	0.9569	2.9907	77.7825	0.0388	0.9571	2.0027	2.9693
	33.5323	0.0177		36.7094	0.1572	0.0178		
	2.4279	-2.4314		2.1189	0.2467	-2.4109		
22	23.9714	0.9711	1.3542	24.6094	0.1413	0.9533	1.8961	2.3588
	15.8482	0.0219		15.7599	0.0823	0.0241		
	1.5126	-1.3225		1.5615	1.7170	-1.9389		
23	-0.7598	1.0239	0.8519	-6.2402	0.0379	1.0600	7.6840	4.0025
	2.0440	0.0319		2.8411	0.0139	0.0340		
	-0.3717	0.7488		-2.1964	2.7246	1.7664		
24	-1.8199	1.0376	6.4902	-1.7631	0.0092	1.0242	4.9582	5.0330
	0.8873	0.0131		0.8861	0.0068	0.0164		
	-2.0512	2.8627		-1.9897	1.3533	1.4739		

Table 10 : Augmented Dickey-Fuller Test - Company-wise Results

Comp.	Model I			Model II				
No.	α	τ	Phi 1	α	ß	τ	Phi 2	Phi 3
25	5.3655	0.9686	0.9801	3.1510	0.0237	0.9695	1.3532	1.9497
	3.8423	0.0234		4.1256	0.0164	0.0233		
	1.3964	-1.3420		0.7638	1.4447	-1.3092		
26	-0.7352	1.0211	1.8481	-0.3051	0.0180	0.9944	1.8456	1.4068
	1.6017	0.0213		1.6292	0.0133	0.0291		
	-0.4590	0.9931		-0.1873	1.3500	-0.1933		
27	6.9447	1.0007	0.7439	-16.3060	0.6351	0.9620	2.7679	3.3854
	8.8510	0.0090		12.4757	0.2442	0.0173		
	0.7846	0.0773		-1.3070	2.6009	-2.1934		
28	1.1156	0.9863	0.5490	-0.3789	0.0095	0.9968	3.7515	1.0731
	1.1745	0.0176		1.6815	0.0077	0.0195		
	0.9498	-0.7789		-0.2253	1.2400	-0.1642		
29	2.7445	0.9808	1.9197	6.5891	0.0554	0.9054	5.6019	7.6557
	1.5393	0.0130		1.8262	0.0160	0.0242		
	1.7829	-1.4746		3.6080	3.4551	-3.8998		
30	-1.5727	1.0385	7.6355	-1.5722	0.0001	1.0383	5.0601	4.4669
	0.9652	0.0128		0.9695	0.0153	0.0235		
	-1.6294	2.9979		-1.6217	0.0092	1.6278		
31	14.6574	0.9819	1.0360	6.3061	0.7036	0.8864	3.9187	5.4716
	10.2587	0.0158		10.3692	0.2273	0.0345		
	1.4288	-1.1391		0.6082	3.0953	-3.2903		
32	2.4764	0.9817	0.8734	21.9679	-0.1522	0.9516	1.5291	2.1945
	4.1810	0.0147		12.3259	0.0906	0.0231		
	0.5923	-1.2452		1.7823	-1.6799	-2.0929		
33	-0.7426	1.0376	6.1619	-0.9153	0.0083	1.0201	6.5194	5.5273
	0.4497	0.0136		0.4567	0.0045	0.0166		
	-1.6513	2.7664		-2.0041	1.8160	1.2111		
34	0.5537	0.9906	0.5158	-1.0173	0.0107	1.0118	2.2434	2.6268
	0.7969	0.0217		0.7969	0.0052	0.0200		
	0.6948	-0.4346		-1.2765	2.0674	0.5918		
35	6.6442	0.9743	0.8178	1.1831	0.1262	0.9438	2.0026	2.4873
	5.7169	0.0326		6.2373	0.0606	0.0354		
	1.1622	-0.7892		0.1897	2.0830	-1.5845		

Table 11: Autocorrelations and Results of Dickey-Fuller Test - Industry-wise Results

a. April 1984 - March 1986

Ind. Name\Lags	1	2	3	4	5	6	13	26	52	60	DF(NT)	DF(TT)	SDY
ALL	0.24	0.25	-0.00	0.13	0.10	0.15	-0.05	0.08	-0.02	-0.07	-0.612	-2.592	0.020
AGRI	0.42	0.24	0.10	0.10	0.05	-0.05	-0.07	-0.05	0.02	-0.06	-1.381	-2.421	0.031
TEA	-0.38	0.07	0.05	0.03	-0.01	-0.04	0.03	-0.10	0.01	0.03	-1.345	-2.417	0.077
PROC	0.23	0.22	-0.00	0.11	0.10	0.17	-0.03	0.07	-0.02	-0.07	-0.334	-2.515	0.021
F&T	0.30	0.29	0.04	0.11	0.09	0.15	-0.02	0.07	-0.02	-0.07	-0.828	-2.445	0.020
FOOD	0.29	0.17	0.00	0.03	0.14	0.20	-0.10	-0.05	0.06	-0.03	-0.179	-2.867	0.025
SUGAR	0.21	0.15	0.09	0.01	-0.07	-0.20	0.08	0.03	0.05	-0.06	-0.850	-2.511	0.021
TOB	0.29	0.09	-0.19	-0.10	0.07	0.07	-0.15	-0.03	0.13	-0.07	0.245	-2.334	0.038
TEX	0.24	0.29	0.04	0.12	0.02	0.12	0.05	0.10	-0.07	-0.08	-0.990	-2.136	0.020
COTEX	0.42	0.28	0.12	0.13	0.14	0.18	0.07	0.06	-0.08	-0.11	-0.701	-1.885	0.018
JUTEX	0.55	0.36	0.23	0.06	0.02	-0.07	-0.09	0.06	0.01	-0.05	-2.479	-2.658	0.034
SILK	0.09	0.10	-0.02	0.04	0.05	0.07	0.04	0.02	0.00	-0.05	-1.374	-1.427	0.028
M&C	0.22	0.20	-0.02	0.11	0.08	0.15	-0.02	0.04	-0.02	-0.07	-0.138	-2.299	0.023
METAL	0.23	0.28	0.10	0.15	0.09	0.20	-0.10	0.11	-0.02	-0.08	-0.716	-2.287	0.022
ALU	0.01	0.11	-0.09	-0.11	-0.08	-0.06	-0.10	0.10	-0.02	-0.01	-0.165	-2.320	0.027
AUTO	0.20	0.21	0.06	0.19	0.00	0.18	0.04	-0.00	0.02	-0.04	-0.545	-1.840	0.02
ELEC	0.34	0.35	0.10	0.29	0.14	0.17	-0.12	0.13	-0.00	-0.05	-1.761	-2.857	0.019
MACH	0.43	0.30	0.15	0.02	0.08	0.13	-0.04	0.11	-0.00	-0.10	-1.145	-2.477	0.020
FOUND	0.37	0.27	0.08	0.02	0.08	0.05	-0.23	0.24	0.05	-0.06	-0.896	-2.934	0.021
CHEM	0.21	0.07	-0.13	0.04	0.08	0.11	0.07	-0.03	-0.01	-0.04	-0.010	-2.745	0.025
CFERT	0.20	0.07	-0.20	0.03	0.04	0.06	0.03	-0.01	-0.01	-0.03	-0.254	-2.749	0.031
DYES	-0.46	-0.01	0.01	-0.02	0.00	0.01	-0.01	-0.01	-0.00	0.01	-2.818	-9.054	0.117
MMFIB	0.22	0.11	-0.09	-0.00	0.18	0.26	0.06	-0.03	-0.08	-0.06	-0.514	-1.722	0.023
OBIC	0.23	0.04	0.08	0.16	0.08	-0.04	-0.06	0.06	0.06	0.03	0.002	-2.561	0.028
MED	0.27	0.05	-0.08	0.10	0.06	0.13	0.00	0.07	0.02	-0.06	-0.809	-2.608	0.045
OP&M	0.25	0.20	0.01	0.08	0.11	0.05	-0.08	0.18	-0.01	-0.09	-0.821	-2.393	0.019
CEM	0.19	0.18	-0.02	0.01	-0.02	-0.11	0.10	0.21	0.16	-0.12	-2.098	-1.805	0.024
RUBB	0.17	0.20	0.02	0.05	0.19	0.08	-0.13	0.09	0.01	-0.02	-0.821	-2.639	0.038
PAPER	0.14	-0.01	-0.22	-0.03	-0.04	0.08	-0.13	0.01	-0.10	-0.09	-0.519	-3.351	0.019
OIND	-0.03	0.36	0.09	0.19	0.05	0.06	-0.11	0.15	-0.02	-0.05	-0.785	-3.159	0.016
EG&S	0.32	0.04	-0.03	-0.06	-0.06	0.06	-0.26	0.01	0.06	-0.05	-0.923	-2.186	0.037
TRADE	0.37	0.28	0.28	0.16	0.03	-0.03	-0.25	0.03	-0.13	-0.11	-0.621	-2.964	0.013
SHIP	0.20	0.13	0.09	0.16	0.01	-0.06	-0.06	0.03	-0.01	0.00	-1.848	-2.177	0.049
HOTEL	-0.02	0.15	-0.05	0.19	0.04	-0.06	0.02	-0.03	-0.00	-0.05	-0.368	-2.272	0.030
F&I	0.04	0.02	0.01	-0.05	-0.13	-0.05	-0.04	-0.11	0.05	0.03	-0.882	-1.249	0.014

Table 11: Autocorrelations and Results of Dickey-Fuller Test - Industry-wise Results

b. April 1986 - March 1988

Ind. Name\Lags	1	2	3	4	5	6	13	26	52	60	DF(NT)	DF(TT)	SDY
ALL	0.10	0.17	-0.13	-0.07	-0.33	0.03	-0.01	-0.05	-0.05	-0.07	-0.056	-4.533	0.017
AGRI	0.28	0.31	0.01	-0.05	-0.17	0.04	-0.04	-0.08	0.03	-0.03	-2.179	-2.479	0.026
TEA	0.28	0.31	0.01	-0.05	-0.17	0.04	-0.04	-0.08	0.03	-0.03	-2.162	-2.504	0.027
PROC	0.09	0.16	-0.14	-0.06	-0.35	0.02	-0.00	-0.04	-0.05	-0.08	0.017	-4.846	0.018
F&T	-0.02	0.22	-0.09	0.02	-0.27	0.11	-0.05	-0.12	-0.08	-0.01	-0.360	-3.480	0.018
FOOD	0.12	0.20	0.04	-0.03	-0.17	0.08	-0.06	-0.16	-0.07	-0.03	-1.164	-2.328	0.021
SUGAR	0.08	-0.00	0.04	0.04	-0.02	0.05	0.08	0.02	-0.10	0.02	-1.247	-1.327	0.018
TOB	0.19	0.01	0.07	-0.02	-0.20	0.06	0.05	-0.11	0.01	0.03	-0.398	-2.473	0.035
TEX	-0.13	0.22	-0.15	0.07	-0.25	0.07	0.06	-0.07	-0.04	0.02	-1.018	-3.707	0.019
COTEX	-0.07	0.03	-0.04	0.08	-0.13	-0.05	0.03	-0.07	0.06	0.06	-0.614	-3.315	0.019
JUTEX	-0.07	0.09	-0.05	0.06	-0.00	0.04	0.04	-0.05	-0.06	-0.00	-1.552	-2.223	0.023
SILK	-0.29	0.15	-0.13	0.01	-0.10	0.11	-0.02	-0.09	-0.05	0.05	-2.383	-2.411	0.044
M&C	0.11	0.13	-0.12	-0.07	-0.34	-0.01	0.01	-0.00	-0.04	-0.09	-0.102	-4.995	0.019
METAL	0.14	0.19	-0.08	-0.03	-0.40	-0.05	0.02	-0.02	-0.01	-0.09	-0.734	-2.607	0.020
ALU	0.34	0.17	-0.03	-0.10	-0.18	-0.11	-0.19	-0.06	0.01	-0.02	-3.018	-3.087	0.042
AUTO	0.10	0.04	-0.05	-0.06	-0.22	-0.01	0.02	-0.08	0.10	0.00	-0.799	-3.369	0.023
ELEC	0.36	0.14	0.00	-0.11	-0.07	0.11	-0.01	-0.06	0.01	-0.11	-1.286	-2.574	0.017
MACH	-0.13	0.09	-0.07	-0.08	-0.21	0.09	-0.03	-0.08	-0.09	-0.11	-0.024	-6.027	0.026
FOUND	0.12	-0.03	-0.21	-0.08	-0.21	-0.01	-0.01	-0.12	0.00	-0.06	-3.773	-3.760	0.028
CHEM	0.04	0.06	-0.14	-0.11	-0.22	0.01	0.03	-0.02	-0.06	-0.08	0.153	-3.732	0.021
CFERT	0.11	0.01	-0.01	0.03	-0.14	0.00	0.01	-0.07	0.03	-0.02	-1.161	-3.459	0.030
DYES	0.22	0.16	0.19	0.05	-0.09	0.07	-0.01	-0.08	0.03	-0.06	-2.050	-2.091	0.024
MMFIB	-0.20	0.02	-0.03	-0.11	-0.05	-0.12	-0.00	-0.05	-0.20	-0.02	-1.981	-1.627	0.031
OBIC	0.16	0.00	-0.17	-0.13	-0.22	0.04	0.11	-0.05	-0.09	0.02	-1.500	-2.091	0.022
MED	0.11	0.18	-0.07	0.05	-0.14	-0.02	-0.04	-0.02	-0.01	-0.02	-1.013	-3.023	0.038
OP&M	0.06	0.08	-0.18	-0.06	-0.29	0.08	-0.03	-0.12	-0.01	0.01	0.861	-0.631	0.017
CEM	0.08	0.01	0.00	0.04	-0.17	-0.01	-0.04	-0.05	-0.00	0.11	-0.332	-2.080	0.021
RUBB	-0.04	0.03	-0.26	-0.12	-0.33	0.15	0.02	-0.14	0.01	0.02	-1.740	-2.947	0.026
PAPER	0.31	0.08	-0.00	-0.05	-0.07	-0.07	-0.05	-0.14	-0.06	-0.06	-0.273	-2.432	0.017
OIND	0.06	0.14	0.06	-0.05	-0.16	0.16	-0.10	-0.13	0.05	0.05	-1.733	-2.539	0.014
EG&S	0.03	-0.03	-0.10	-0.15	-0.04	0.00	0.15	-0.12	-0.06	0.06	-1.917	-2.615	0.029
TRADE	-0.42	-0.04	0.07	0.02	-0.11	0.25	-0.02	0.04	0.01	-0.01	-2.650	-2.643	0.072
SHIP	0.20	-0.02	0.06	0.00	-0.20	-0.03	-0.05	-0.02	0.10	0.07	-2.380	-2.295	0.045
HOTEL	0.08	-0.02	-0.07	0.05	-0.03	0.14	-0.09	-0.02	-0.06	0.05	-1.928	-2.441	0.026
F&I	-0.21	0.02	-0.07	-0.02	0.00	0.02	-0.11	-0.02	0.08	0.06	-1.465	-2.980	0.014

Table 11: Autocorrelations and Results of Dickey-Fuller Test - Industry-wise Results c. April 1988 - June 1990

Ind. Name \ Lags	1	2	3	4	5	6	13	26	52	60	DF(NT)	DF(TT)	SDY
ALL	0.03	0.11	0.02	-0.07	-0.03	-0.05	-0.11	0.08	-0.06	0.02	-1.653	-2.888	0.027
AGRI	0.23	0.16	-0.12	-0.02	-0.06	-0.03	-0.09	-0.02	0.01	0.01	-1.117	-3.367	0.025
TEA	-0.47	-0.00	-0.00	-0.00	0.01	-0.02	-0.01	0.01	-0.01	-0.00	-1.193	-3.224	0.152
PROC	-0.40	0.01	-0.03	0.03	0.04	-0.01	0.00	-0.01	-0.01	0.01	-1.716	-2.567	0.054
F&T	0.31	0.16	-0.03	-0.01	-0.10	-0.14	-0.10	0.09	-0.07	0.07	-1.272	-2.745	0.028
FOOD	0.25	0.06	0.00	-0.01	-0.12	-0.12	-0.03	0.13	0.00	-0.05	-1.261	-3.045	0.026
SUGAR	0.23	-0.07	0.00	-0.08	-0.03	0.04	0.00	0.01	0.01	-0.08	-1.237	-1.919	0.035
TOB	-0.38	0.03	-0.00	-0.01	-0.04	0.01	0.02	-0.00	-0.03	-0.03	-0.309	-2.346	0.092
TEX	-0.28	0.05	-0.03	-0.02	-0.03	0.02	-0.03	-0.03	-0.03	0.00	-1.131	-2.299	0.043
COTEX	0.44	0.11	0.07	-0.04	-0.07	-0.02	-0.20	0.01	-0.08	0.03	-1.346	-2.358	0.041
JUTEX	-0.09	0.11	-0.01	0.05	-0.09	0.15	-0.11	-0.03	-0.01	0.05	-1.029	-2.194	0.033
SILK	-0.10	0.06	-0.18	0.11	-0.10	-0.04	-0.11	0.01	-0.05	0.06	-1.472	-2.833	0.047
M&C	0.42	0.18	0.08	-0.02	-0.05	-0.02	-0.08	0.16	-0.10	-0.02	-2.030	-2.814	0.024
METAL	0.39	0.14	0.03	-0.08	-0.06	0.03	-0.02	0.13	-0.08	-0.05	-1.920	-2.331	0.028
ALU	0.26	-0.02	-0.15	-0.13	0.00	0.15	0.06	0.11	0.01	-0.10	-1.480	-2.658	0.053
AUTO	0.20	0.13	0.11	-0.07	-0.10	-0.06	-0.09	0.08	-0.08	-0.01	-2.018	-1.488	0.028
ELEC	0.38	0.09	-0.03	-0.04	0.01	0.02	-0.15	0.04	-0.07	-0.06	-2.340	-3.926	0.025
MACH	0.38	0.15	0.03	-0.01	-0.11	-0.04	-0.14	0.04	-0.11	0.09	-1.667	-2.956	0.028
FOUND	0.20	0.12	0.14	-0.14	-0.01	-0.04	0.00	-0.01	-0.01	-0.13	-1.734	-1.774	0.025
CHEM	0.40	0.21	0.11	0.01	-0.05	-0.08	-0.14	0.14	-0.09	0.00	-2.186	-3.717	0.022
CFERT	0.32	0.16	0.12	-0.05	-0.07	-0.10	0.01	0.09	0.01	-0.08	-2.611	-3.238	0.026
DYES	0.15	0.17	0.09	0.04	-0.20	-0.10	-0.02	-0.00	-0.03	0.08	-1.040	-2.173	0.033
MMFIB	0.29	0.09	0.07	-0.03	-0.06	-0.08	-0.01	0.06	-0.06	-0.04	-2.676	-2.008	0.035
OBIC	0.40	0.32	0.13	0.10	0.07	-0.01	-0.09	0.10	-0.10	0.00	-2.079	-3.521	0.024
MED	-0.13	0.04	0.02	0.07	-0.20	0.01	-0.09	0.03	-0.01	0.06	-2.423	-2.442	0.038
OP&M	0.28	0.20	0.21	0.09	0.01	0.02	-0.20	0.13	0.02	-0.03	-1.387	-2.764	0.031
CEM	-0.06	-0.01	0.20	0.05	-0.02	0.05	0.00	0.03	0.04	-0.08	-0.322	-1.583	0.049
RUBB	0.33	0.27	0.21	0.19	0.11	0.11	-0.17	0.11	-0.04	-0.10	-1.943	-1.953	0.036
PAPER	0.49	0.27	0.20	0.16	0.23	0.10	-0.09	0.17	0.00	-0.00	-0.690	-2.776	0.032
OIND	0.36	0.06	0.17	0.08	-0.03	-0.04	-0.09	0.02	-0.04	0.13	-1.624	-4.059	0.024
EG&S	0.23	-0.15	-0.08	0.03	0.10	-0.07	-0.09	-0.01	0.03	-0.02	-1.318	-3.960	0.054
TRADE	0.20	0.08	0.21	0.26	0.06	0.02	0.07	0.04	0.02	0.09	-2.050	-1.785	0.026
SHIP	0.21	0.11	0.13	0.02	-0.07	0.03	-0.10	-0.05	-0.04	0.08	-2.264	-2.430	0.065
HOTEL	0.08	-0.05	-0.09	0.08	0.08	-0.00	-0.11	0.05	-0.06	0.01	-1.814	-1.947	0.023
F&I	-0.11	-0.15	0.08	-0.07	0.18	0.03	-0.04	-0.04	-0.02	0.04	-1.494	-2.034	0.021

Table 12: Estimates of Variance Ratios and their Standard Errors - Industry-wise Results

a. April 1984 - March 1986.

Ind. Name	SHT(1)	SHT(2)	SHT(3)	SHT(4)	SHT(5)	SHT(6)	SHT(13)	SHT(26)	SHT(52)	SHT(60)
ALL	1.243	1.489	1.612	1.738	1.856	1.983	2.104	1.768	1.521	1.314
	(0.048)	(0.047)	(0.044)	(0.043)	(0.042)	(0.041)	(0.031)	(0.019)	(0.011)	(0.009)
AGRI	1.420	1.721	1.918	2.077	2.199	2.271	1.946	1.017	0.625	0.603
	(0.055)	(0.055)	(0.053)	(0.051)	(0.049)	(0.047)	(0.029)	(0.011)	(0.005)	(0.004)
TEA	0.621	0.541	0.526	0.529	0.527	0.514	0.409	0.222	0.125	0.117
	(0.024)	(0.017)	(0.014)	(0.013)	(0.012)	(0.011)	(0.006)	(0.002)	(0.001)	(0.001)
PROC	1.231	1.458	1.571	1.684	1.792	1.917	2.093	1.867	1.627	1.404
	(0.048)	(0.046)	(0.043)	(0.041)	(0.040)	(0.040)	(0.031)	(0.020)	(0.012)	(0.010)
F&T	1.305	1.601	1.768	1.913	2.040	2.174	2.510	2.471	2.120	1.809
	(0.051)	(0.051)	(0.049)	(0.047)	(0.046)	(0.045)	(0.037)	(0.026)	(0.016)	(0.013)
FOOD	1.293	1.504	1.610	1.685	1.782	1.910	2.113	1.472	1.121	1.010
	(0.050)	(0.048)	(0.044)	(0.041)	(0.040)	(0.040)	(0.031)	(0.016)	(0.008)	(0.007)
SUGAR	1.206	1.372	1.498	1.578	1.607	1.569	1.095	0.904	0.668	0.624
	(0.047)	(0.043)	(0.041)	(0.039)	(0.036)	(0.033)	(0.016)	(0.010)	(0.005)	(0.004)
TOB	1.286	1.439	1.420	1.368	1.355	1.366	1.479	0.881	0.669	0.640
	(0.050)	(0.046)	(0.039)	(0.034)	(0.030)	(0.028)	(0.022)	(0.009)	(0.005)	(0.004)
TEX	1.242	1.515	1.673	1.818	1.921	2.027	2.358	2.676	2.343	1.972
	(0.048)	(0.048)	(0.046)	(0.045)	(0.043)	(0.042)	(0.035)	(0.028)	(0.018)	(0.014)
COTEX	1.421	1.747	1.970	2.157	2.328	2.501	3.129	3.443	2.581	2.129
	(0.055)	(0.055)	(0.054)	(0.053)	(0.052)	(0.052)	(0.046)	(0.036)	(0.019)	(0.015)
JUTEX	1.552	1.974	2.302	2.523	2.675	2.764	2.516	1.865	1.517	1.261
	(0.060)	(0.063)	(0.063)	(0.062)	(0.060)	(0.057)	(0.037)	(0.020)	(0.011)	(0.009)
SILK	1.088	1.184	1.220	1.258	1.301	1.350	1.579	1.540	1.246	1.073
	(0.042)	(0.037)	(0.033)	(0.031)	(0.029)	(0.028)	(0.023)	(0.016)	(0.009)	(0.008)
M&C	1.219	1.427	1.521	1.620	1.714	1.825	1.928	1.680	1.455	1.254
	(0.047)	(0.045)	(0.042)	(0.040)	(0.038)	(0.038)	(0.028)	(0.018)	(0.011)	(0.009)
METAL	1.227	1.492	1.677	1.849	1.993	2.152	2.363	2.206	1.856	1.577
	(0.048)	(0.047)	(0.046)	(0.045)	(0.045)	(0.045)	(0.035)	(0.023)	(0.014)	(0.011)
ALU	1.012	1.090	1.083	1.032	0.972	0.911	0.718	0.440	0.368	0.333
	(0.039)	(0.035)	(0.030)	(0.025)	(0.022)	(0.019)	(0.011)	(0.005)	(0.003)	(0.002)
AUTO	1.196	1.401	1.533	1.689	1.795	1.920	2.052	2.177	1.740	1.455
	(0.046)	(0.044)	(0.042)	(0.041)	(0.040)	(0.040)	(0.030)	(0.023)	(0.013)	(0.010)
ELEC	1.335	1.679	1.899	2.149	2.362	2.562	2.829	2.411	2.026	1.690
	(0.052)	(0.053)	(0.052)	(0.053)	(0.053)	(0.053)	(0.041)	(0.025)	(0.015)	(0.012)
MACH	1.435	1.780	2.029	2.188	2.319	2.450	2.480	2.116	1.746	1.490
	(0.056)	(0.056)	(0.056)	(0.054)	(0.052)	(0.051)	(0.036)	(0.022)	(0.013)	(0.010)

The figures in the parentheses indicate standard errors of the estimates.

Table 12: Estimates of Variance Ratios and their Standard Errors - Industry-wise Results
a. April 1984 - March 1986.

Ind. Name	SHT(1)	SHT(2)	SHT(3)	SHT(4)	SHT(5)	SHT(6)	SHT(13)	SHT(26)	SHT(52)	SHT(60)
FOUND	1.374	1.677	1.869	1.993	2.101	2.193	2.195	1.584	1.283	1.138
	(0.053)	(0.053)	(0.051)	(0.049)	(0.047)	(0.045)	(0.032)	(0.017)	(0.010)	(0.008)
CHEM	1.210	1.324	1.314	1.324	1.357	1.412	1.418	1.121	0.952	0.833
	(0.047)	(0.042)	(0.036)	(0.032)	(0.030)	(0.029)	(0.021)	(0.012)	(0.007)	(0.006)
CFERT	1.199	1.311	1.269	1.255	1.260	1.282	1.223	0.891	0.655	0.571
	(0.047)	(0.042)	(0.035)	(0.031)	(0.028)	(0.027)	(0.018)	(0.009)	(0.005)	(0.004)
DYES	0.537	0.377	0.301	0.249	0.214	0.194	0.114	0.078	0.052	0.046
	(0.021)	(0.012)	(0.008)	(0.006)	(0.005)	(0.004)	(0.002)	(0.001)	(0.000)	(0.000)
MMFIB	1.218	1.364	1.392	1.407	1.478	1.602	2.269	2.912	2.360	1.983
	(0.047)	(0.043)	(0.038)	(0.035)	(0.033)	(0.033)	(0.033)	(0.031)	(0.018)	(0.014)
OBIC	1.235	1.337	1.428	1.544	1.647	1.709	1.544	0.921	0.582	0.520
	(0.048)	(0.042)	(0.039)	(0.038)	(0.037)	(0.035)	(0.023)	(0.010)	(0.004)	(0.004)
MED	1.274	1.400	1.420	1.473	1.527	1.601	1.690	1.034	0.834	0.772
	(0.049)	(0.044)	(0.039)	(0.036)	(0.034)	(0.033)	(0.025)	(0.011)	(0.006)	(0.005)
OP&M	1.255	1.475	1.590	1.691	1.795	1.885	1.872	1.481	1.322	1.193
	(0.049)	(0.047)	(0.044)	(0.041)	(0.040)	(0.039)	(0.027)	(0.016)	(0.010)	(0.008)
CEM	1.190	1.374	1.455	1.509	1.539	1.529	1.173	0.975	0.756	0.713
	(0.046)	(0.044)	(0.040)	(0.037)	(0.034)	(0.032)	(0.017)	(0.010)	(0.006)	(0.005)
RUBB	1.169	1.356	1.461	1.545	1.666	1.776	2.094	1.772	1.521	1.405
	(0.045)	(0.043)	(0.040)	(0.038)	(0.037)	(0.037)	(0.031)	(0.019)	(0.011)	(0.010)
PAPER	1.136	1.175	1.085	1.019	0.963	0.945	0.966	0.895	0.844	0.775
	(0.044)	(0.037)	(0.030)	(0.025)	(0.022)	(0.020)	(0.014)	(0.009)	(0.006)	(0.005)
OIND	0.971	1.199	1.359	1.531	1.662	1.773	1.651	1.160	1.053	0.898
	(0.038)	(0.038)	(0.037)	(0.038)	(0.037)	(0.037)	(0.024)	(0.012)	(0.008)	(0.006)
EG&S	1.321	1.454	1.506	1.513	1.499	1.508	1.725	1.109	0.644	0.667
	(0.051)	(0.046)	(0.041)	(0.037)	(0.034)	(0.031)	(0.025)	(0.012)	(0.005)	(0.005)
TRADE	1.371	1.680	1.975	2.218	2.390	2.505	2.387	1.351	0.823	0.735
	(0.053)	(0.053)	(0.054)	(0.054)	(0.054)	(0.052)	(0.035)	(0.014)	(0.006)	(0.005)
SHIP	1.201	1.358	1.482	1.621	1.717	1.769	1.466	1.247	0.905	0.774
	(0.047)	(0.043)	(0.041)	(0.040)	(0.038)	(0.037)	(0.021)	(0.013)	(0.007)	(0.005)
HOTEL	0.976	1.066	1.085	1.174	1.246	1.278	1.200	0.847	0.433	0.375
	(0.038)	(0.034)	(0.030)	(0.029)	(0.028)	(0.027)	(0.018)	(0.009)	(0.003)	(0.003)
F&I	1.036	1.064	1.083	1.076	1.029	0.980	0.966	1.183	0.897	0.756
	(0.040)	(0.034)	(0.030)	(0.026)	(0.023)	(0.020)	(0.014)	(0.012)	(0.007)	(0.005)

The figures in the parentheses indicate standard errors of the estimates.

Table 12: Estimates of Variance Ratios and their Standard Errors - Industry-wise Results
b. April 1986 - March 1988.

Ind. Name	SHT(1)	SHT(2)	SHT(3)	SHT(4)	SHT(5)	SHT(6)	SHT(13)	SHT(26)	SHT(52)	SHT(60)
ALL	1.101	1.249	1.259	1.238	1.113	1.033	0.636	0.236	0.177	0.169
	(0.043)	(0.040)	(0.035)	(0.030)	(0.025)	(0.021)	(0.009)	(0.002)	(0.001)	(0.001)
AGRI	1.277	1.573	1.724	1.795	1.787	1.791	1.845	1.472	0.886	0.795
	(0.050)	(0.050)	(0.047)	(0.044)	(0.040)	(0.037)	(0.027)	(0.016)	(0.007)	(0.006)
TEA	1.280	1.577	1.729	1.800	1.792	1.797	1.848	1.473	0.886	0.795
	(0.050)	(0.050)	(0.047)	(0.044)	(0.040)	(0.037)	(0.027)	(0.016)	(0.007)	(0.006)
PROC	1.091	1.225	1.223	1.197	1.064	0.976	0.558	0.189	0.149	0.145
	(0.042)	(0.039)	(0.034)	(0.029)	(0.024)	(0.020)	(0.008)	(0.002)	(0.001)	(0.001)
F&T	0.978	1.115	1.140	1.163	1.087	1.065	0.756	0.306	0.188	0.155
	(0.038)	(0.035)	(0.031)	(0.029)	(0.024)	(0.022)	(0.011)	(0.003)	(0.001)	(0.001)
FOOD	1.125	1.301	1.409	1.462	1.442	1.450	1.302	0.885	0.538	0.542
	(0.044)	(0.041)	(0.039)	(0.036)	(0.032)	(0.030)	(0.019)	(0.009)	(0.004)	(0.004)
SUGAR	1.079	1.104	1.138	1.174	1.192	1.219	1.338	1.716	1.378	1.148
	(0.042)	(0.035)	(0.031)	(0.029)	(0.027)	(0.025)	(0.020)	(0.018)	(0.010)	(0.008)
TOB	1.192	1.261	1.330	1.361	1.314	1.297	1.436	0.936	0.426	0.417
	(0.046)	(0.040)	(0.036)	(0.033)	(0.029)	(0.027)	(0.021)	(0.010)	(0.003)	(0.003)
TEX	0.870	0.971	0.947	0.963	0.890	0.859	0.549	0.229	0.162	0.125
	(0.034)	(0.031)	(0.026)	(0.024)	(0.020)	(0.018)	(0.008)	(0.002)	(0.001)	(0.001)
COTEX	0.925	0.921	0.897	0.915	0.883	0.846	0.505	0.201	0.158	0.135
	(0.036)	(0.029)	(0.025)	(0.022)	(0.020)	(0.018)	(0.007)	(0.002)	(0.001)	(0.001)
JUTEX	0.935	0.975	0.972	0.996	1.011	1.034	1.158	1.090	0.631	0.443
	(0.036)	(0.031)	(0.027)	(0.024)	(0.023)	(0.021)	(0.017)	(0.012)	(0.005)	(0.003)
SILK	0.713	0.716	0.653	0.618	0.562	0.554	0.446	0.305	0.172	0.141
	(0.028)	(0.023)	(0.018)	(0.015)	(0.013)	(0.011)	(0.007)	(0.003)	(0.001)	(0.001)
M&C	1.108	1.232	1.232	1.204	1.072	0.977	0.530	0.161	0.127	0.130
	(0.043)	(0.039)	(0.034)	(0.030)	(0.024)	(0.020)	(0.008)	(0.002)	(0.001)	(0.001)
METAL	1.136	1.309	1.357	1.374	1.252	1.151	0.610	0.239	0.190	0.189
	(0.044)	(0.041)	(0.037)	(0.034)	(0.028)	(0.024)	(0.009)	(0.003)	(0.001)	(0.001)
ALU	1.335	1.560	1.656	1.672	1.623	1.558	1.171	0.815	0.532	0.453
	(0.052)	(0.049)	(0.045)	(0.041)	(0.036)	(0.032)	(0.017)	(0.009)	(0.004)	(0.003)
AUTO	1.100	1.158	1.160	1.139	1.052	0.985	0.690	0.494	0.314	0.303
	(0.043)	(0.037)	(0.032)	(0.028)	(0.024)	(0.020)	(0.010)	(0.005)	(0.002)	(0.002)
ELEC	1.356	1.567	1.675	1.697	1.689	1.715	1.749	1.165	0.844	0.843
	(0.053)	(0.050)	(0.046)	(0.042)	(0.038)	(0.036)	(0.026)	(0.012)	(0.006)	(0.006)
MACH	0.868	0.881	0.853	0.806	0.705	0.657	0.335	0.209	0.185	0.173
	(0.034)	(0.028)	(0.023)	(0.020)	(0.016)	(0.014)	(0.005)	(0.002)	(0.001)	(0.001)

The figures in the parentheses indicate standard errors of the estimates.

Table 12: Estimates of Variance Ratios and their Standard Errors - Industry-wise Results
b. April 1986 - March 1988.

Ind. Name	SHT(1)	SHT(2)	SHT(3)	SHT(4)	SHT(5)	SHT(6)	SHT(13)	SHT(26)	SHT(52)	SHT(60)
FOUND	1.123	1.147	1.055	0.966	0.838	0.744	0.565	0.369	0.273	0.238
	(0.044)	(0.036)	(0.029)	(0.024)	(0.019)	(0.015)	(0.008)	(0.004)	(0.002)	(0.002)
CHEM	1.040	1.092	1.049	0.979	0.857	0.773	0.480	0.237	0.205	0.199
	(0.040)	(0.035)	(0.029)	(0.024)	(0.019)	(0.016)	(0.007)	(0.003)	(0.002)	(0.001)
CFERT	1.113	1.155	1.171	1.192	1.158	1.135	0.671	0.353	0.213	0.168
	(0.043)	(0.037)	(0.032)	(0.029)	(0.026)	(0.024)	(0.010)	(0.004)	(0.002)	(0.001)
DYES	1.217	1.395	1.581	1.715	1.773	1.836	2.119	2.161	1.511	1.288
	(0.047)	(0.044)	(0.043)	(0.042)	(0.040)	(0.038)	(0.031)	(0.023)	(0.011)	(0.009)
MMFIB	0.797	0.741	0.699	0.629	0.567	0.489	0.394	0.339	0.319	0.289
	(0.031)	(0.023)	(0.019)	(0.015)	(0.013)	(0.010)	(0.006)	(0.004)	(0.002)	(0.002)
OBIC	1.157	1.212	1.153	1.066	0.935	0.851	0.670	0.641	0.457	0.367
	(0.045)	(0.038)	(0.032)	(0.026)	(0.021)	(0.018)	(0.010)	(0.007)	(0.003)	(0.003)
MED	1.107	1.265	1.309	1.355	1.341	1.324	1.228	0.487	0.295	0.245
	(0.043)	(0.040)	(0.036)	(0.033)	(0.030)	(0.027)	(0.018)	(0.005)	(0.002)	(0.002)
OP&M	1.056	1.127	1.070	1.010	0.873	0.798	0.679	0.608	0.569	0.537
	(0.041)	(0.036)	(0.029)	(0.025)	(0.020)	(0.017)	(0.010)	(0.006)	(0.004)	(0.004)
CEM	1.084	1.122	1.143	1.171	1.133	1.103	1.003	0.700	0.315	0.273
	(0.042)	(0.036)	(0.031)	(0.029)	(0.025)	(0.023)	(0.015)	(0.007)	(0.002)	(0.002)
RUBB	0.956	0.962	0.834	0.709	0.515	0.417	0.329	0.268	0.192	0.188
	(0.037)	(0.030)	(0.023)	(0.017)	(0.012)	(0.009)	(0.005)	(0.003)	(0.001)	(0.001)
PAPER	1.312	1.471	1.549	1.578	1.573	1.548	1.532	1.190	1.082	0.968
	(0.051)	(0.047)	(0.042)	(0.039)	(0.035)	(0.032)	(0.022)	(0.013)	(0.008)	(0.007)
OIND	1.065	1.181	1.269	1.300	1.267	1.288	1.329	0.666	0.419	0.398
	(0.041)	(0.037)	(0.035)	(0.032)	(0.028)	(0.027)	(0.019)	(0.007)	(0.003)	(0.003)
EG&S	1.032	1.024	0.969	0.874	0.799	0.746	0.576	0.385	0.207	0.177
	(0.040)	(0.032)	(0.027)	(0.021)	(0.018)	(0.015)	(0.008)	(0.004)	(0.002)	(0.001)
TRADE	0.579	0.414	0.366	0.345	0.295	0.329	0.283	0.145	0.057	0.066
	(0.022)	(0.013)	(0.010)	(0.008)	(0.007)	(0.007)	(0.004)	(0.002)	(0.000)	(0.000)
SHIP	1.201	1.253	1.309	1.342	1.297	1.257	1.166	0.707	0.625	0.585
	(0.047)	(0.040)	(0.036)	(0.033)	(0.029)	(0.026)	(0.017)	(0.007)	(0.005)	(0.004)
HOTEL	1.081	1.093	1.065	1.066	1.057	1.091	1.133	0.589	0.318	0.301
	(0.042)	(0.035)	(0.029)	(0.026)	(0.024)	(0.023)	(0.017)	(0.006)	(0.002)	(0.002)
F&I	0.788	0.731	0.665	0.618	0.587	0.571	0.443	0.340	0.157	0.174
	(0.031)	(0.023)	(0.018)	(0.015)	(0.013)	(0.012)	(0.006)	(0.004)	(0.001)	(0.001)

The figures in the parentheses indicate standard errors of the estimates.

Table 12: Estimates of Variance Ratios and their Standard Errors - Industry-wise Results c. April 1988 - March 1990.

Ind. Name	SHT(1)	SHT(2)	SHT(3)	SHT(4)	SHT(5)	SHT(6)	SHT(13)	SHT(26)	SHT(52)	SHT(60)
ALL	1.032	1.114	1.167	1.171	1.166	1.147	0.966	0.714	0.812	0.808
	(0.040)	(0.035)	(0.032)	(0.029)	(0.026)	(0.024)	(0.014)	(0.008)	(0.006)	(0.006)
AGRI	1.227	1.412	1.446	1.457	1.444	1.427	1.126	0.725	0.446	0.454
	(0.048)	(0.045)	(0.040)	(0.036)	(0.032)	(0.030)	(0.017)	(0.008)	(0.003)	(0.003)
TEA	0.526	0.367	0.287	0.237	0.209	0.183	0.091	0.044	0.024	0.022
	(0.020)	(0.012)	(0.008)	(0.006)	(0.005)	(0.004)	(0.001)	(0.000)	(0.000)	(0.000)
PROC	0.596	0.468	0.388	0.351	0.339	0.328	0.243	0.154	0.168	0.165
	(0.023)	(0.015)	(0.011)	(0.009)	(0.008)	(0.007)	(0.004)	(0.002)	(0.001)	(0.001)
F&T	1.311	1.519	1.607	1.658	1.658	1.618	1.097	0.443	0.300	0.255
	(0.051)	(0.048)	(0.044)	(0.041)	(0.037)	(0.034)	(0.016)	(0.005)	(0.002)	(0.002)
FOOD	1.246	1.366	1.428	1.461	1.443	1.395	1.006	0.554	0.496	0.476
	(0.048)	(0.043)	(0.039)	(0.036)	(0.032)	(0.029)	(0.015)	(0.006)	(0.004)	(0.003)
SUGAR	1.230	1.258	1.273	1.250	1.226	1.222	1.025	0.960	0.619	0.604
	(0.048)	(0.040)	(0.035)	(0.031)	(0.027)	(0.025)	(0.015)	(0.010)	(0.005)	(0.004)
TOB	0.616	0.507	0.452	0.414	0.377	0.354	0.295	0.223	0.111	0.090
	(0.024)	(0.016)	(0.012)	(0.010)	(0.008)	(0.007)	(0.004)	(0.002)	(0.001)	(0.001)
TEX	0.723	0.664	0.618	0.582	0.548	0.528	0.333	0.136	0.080	0.066
	(0.028)	(0.021)	(0.017)	(0.014)	(0.012)	(0.011)	(0.005)	(0.001)	(0.001)	(0.000)
COTEX	1.441	1.663	1.811	1.885	1.913	1.926	1.608	1.114	1.156	1.075
	(0.056)	(0.053)	(0.050)	(0.046)	(0.043)	(0.040)	(0.024)	(0.012)	(0.009)	(0.008)
JUTEX	0.914	0.958	0.974	1.005	0.997	1.033	1.183	0.893	0.295	0.240
	(0.035)	(0.030)	(0.027)	(0.025)	(0.022)	(0.021)	(0.017)	(0.009)	(0.002)	(0.002)
SILK	0.895	0.898	0.810	0.802	0.764	0.726	0.531	0.332	0.314	0.303
	(0.035)	(0.028)	(0.022)	(0.020)	(0.017)	(0.015)	(0.008)	(0.004)	(0.002)	(0.002)
M&C	1.425	1.688	1.861	1.958	2.007	2.036	1.840	1.629	2.016	2.006
	(0.055)	(0.053)	(0.051)	(0.048)	(0.045)	(0.042)	(0.027)	(0.017)	(0.015)	(0.014)
METAL	1.387	1.609	1.734	1.776	1.785	1.800	1.693	1.814	2.288	2.278
	(0.054)	(0.051)	(0.048)	(0.044)	(0.040)	(0.037)	(0.025)	(0.019)	(0.017)	(0.016)
ALU	1.263	1.336	1.298	1.224	1.176	1.185	1.385	1.787	1.877	1.759
	(0.049)	(0.042)	(0.036)	(0.030)	(0.026)	(0.025)	(0.020)	(0.019)	(0.014)	(0.012)
AUTO	1.196	1.345	1.473	1.523	1.522	1.504	1.347	1.205	1.252	1.200
	(0.046)	(0.043)	(0.040)	(0.037)	(0.034)	(0.031)	(0.020)	(0.013)	(0.009)	(0.008)
ELEC	1.383	1.573	1.653	1.686	1.712	1.736	1.417	1.118	1.384	1.383
	(0.054)	(0.050)	(0.045)	(0.041)	(0.038)	(0.036)	(0.021)	(0.012)	(0.010)	(0.010)
MACH	1.376	1.598	1.723	1.794	1.804	1.799	1.493	0.866	0.600	0.566
	(0.053)	(0.051)	(0.047)	(0.044)	(0.040)	(0.037)	(0.022)	(0.009)	(0.005)	(0.004)

The figures in the parentheses indicate standard errors of the estimates.

Table 12: Estimates of Variance Ratios and their Standard Errors - Industry-wise Results c. April 1988 - March 1990.

Ind. Name	SHT(1)	SHT(2)	SHT(3)	SHT(4)	SHT(5)	SHT(6)	SHT(13)	SHT(26)	SHT(52)	SHT(60)
FOUND	1.205	1.354	1.501	1.533	1.553	1.556	1.912	2.076	2.098	2.144
	(0.047)	(0.043)	(0.041)	(0.038)	(0.035)	(0.032)	(0.028)	(0.022)	(0.016)	(0.015)
CHEM	1.398	1.669	1.859	1.977	2.040	2.064	1.792	1.217	1.320	1.294
	(0.054)	(0.053)	(0.051)	(0.049)	(0.046)	(0.043)	(0.026)	(0.013)	(0.010)	(0.009)
CFERT	1.315	1.525	1.688	1.765	1.793	1.782	1.475	1.168	1.124	1.063
	(0.051)	(0.048)	(0.046)	(0.043)	(0.040)	(0.037)	(0.022)	(0.012)	(0.008)	(0.007)
DYES	1.155	1.317	1.444	1.536	1.532	1.501	1.177	0.753	0.484	0.358
	(0.045)	(0.042)	(0.040)	(0.038)	(0.034)	(0.031)	(0.017)	(0.008)	(0.004)	(0.003)
MMFIB	1.291	1.446	1.558	1.613	1.630	1.620	1.346	1.297	1.615	1.631
	(0.050)	(0.046)	(0.043)	(0.040)	(0.037)	(0.034)	(0.020)	(0.014)	(0.012)	(0.011)
OBIC	1.396	1.744	1.982	2.163	2.306	2.403	2.841	3.134	3.435	3.471
	(0.054)	(0.055)	(0.054)	(0.053)	(0.052)	(0.050)	(0.042)	(0.033)	(0.026)	(0.024)
MED	0.872	0.859	0.865	0.897	0.852	0.824	0.660	0.354	0.199	0.202
	(0.034)	(0.027)	(0.024)	(0.022)	(0.019)	(0.017)	(0.010)	(0.004)	(0.001)	(0.001)
OP&M	1.281	1.510	1.732	1.899	2.013	2.101	2.173	1.719	1.831	1.732
	(0.050)	(0.048)	(0.048)	(0.047)	(0.045)	(0.044)	(0.032)	(0.018)	(0.014)	(0.012)
CEM	0.943	0.915	1.000	1.070	1.108	1.152	1.178	1.169	1.046	0.932
	(0.037)	(0.029)	(0.027)	(0.026)	(0.025)	(0.024)	(0.017)	(0.012)	(0.008)	(0.007)
RUBB	1.332	1.624	1.873	2.098	2.284	2.449	3.089	3.082	3.111	2.964
	(0.052)	(0.051)	(0.051)	(0.051)	(0.051)	(0.051)	(0.045)	(0.033)	(0.023)	(0.021)
PAPER	1.492	1.836	2.110	2.339	2.569	2.762	3.301	2.968	2.675	2.340
	(0.058)	(0.058)	(0.058)	(0.057)	(0.058)	(0.057)	(0.048)	(0.031)	(0.020)	(0.016)
OIND	1.363	1.522	1.685	1.814	1.889	1.931	1.708	1.198	1.199	1.127
	(0.053)	(0.048)	(0.046)	(0.045)	(0.042)	(0.040)	(0.025)	(0.013)	(0.009)	(0.008)
EG&S	1.226	1.203	1.150	1.130	1.150	1.146	0.853	0.418	0.179	0.181
	(0.048)	(0.038)	(0.032)	(0.028)	(0.026)	(0.024)	(0.013)	(0.004)	(0.001)	(0.001)
TRADE	1.199	1.316	1.479	1.682	1.839	1.956	2.481	3.094	3.629	3.417
	(0.047)	(0.042)	(0.041)	(0.041)	(0.041)	(0.041)	(0.036)	(0.033)	(0.027)	(0.024)
SHIP	1.209	1.351	1.489	1.582	1.619	1.654	1.338	1.052	0.504	0.457
	(0.047)	(0.043)	(0.041)	(0.039)	(0.036)	(0.034)	(0.020)	(0.011)	(0.004)	(0.003)
HOTEL	1.079	1.071	1.021	1.023	1.050	1.068	0.985	0.654	0.578	0.556
	(0.042)	(0.034)	(0.028)	(0.025)	(0.024)	(0.022)	(0.014)	(0.007)	(0.004)	(0.004)
F&I	0.885	0.746	0.717	0.671	0.702	0.733	0.887	0.912	0.894	0.787
	(0.034)	(0.024)	(0.020)	(0.016)	(0.016)	(0.015)	(0.013)	(0.010)	(0.007)	(0.006)

The figures in the parentheses indicate standard errors of the estimates.

Table 13: Autocorrelations and Results of Dickey-Fuller Test - Company-wise Results
a. December 1988 - June 1990

Co.\Lags No.	1	2	3	4	5	6	13	26	52	60	DF(NT)	DF(TT)	SDY
1	-0.02	0.11	0.01	0.06	0.04	0.07	-0.12	0.01	0.01	0.04	-1.584	-1.795	0.070
2	-0.08	0.07	-0.24	-0.01	-0.11	-0.00	-0.13	0.04	-0.04	-0.02	-1.964	-3.075	0.031
3	0.06	-0.09	-0.00	-0.01	0.14	0.09	0.01	0.01	0.03	0.02	-1.675	-1.810	0.090
4	0.07	-0.07	0.06	-0.00	-0.13	-0.03	0.11	0.06	-0.01	0.00	-0.804	-2.170	0.057
5	0.19	0.16	0.00	0.12	0.11	0.07	-0.08	0.03	-0.09	0.03	0.070	-1.363	0.042
6	0.19	-0.11	-0.09	0.02	-0.07	-0.12	0.14	0.03	0.05	0.01	-0.975	-2.043	0.061
7	-0.04	-0.00	0.02	-0.02	-0.06	0.00	0.03	0.03	0.00	0.00	-1.630	-1.968	0.255
8	0.22	0.12	-0.02	-0.02	-0.07	-0.08	-0.05	-0.09	-0.04	0.06	-3.007	-2.851	0.040
9	0.05	0.03	0.03	-0.05	0.05	0.09	-0.02	-0.09	-0.06	-0.08	-1.530	-1.503	0.027
10	0.17	0.14	-0.05	0.07	-0.03	-0.06	-0.01	-0.01	0.00	-0.00	-0.206	-2.553	0.027
11	0.00	0.01	-0.01	-0.01	-0.02	-0.04	0.02	-0.04	0.01	0.01	-0.700	-2.130	0.259
12	0.07	-0.00	0.07	-0.14	0.02	0.04	0.07	0.15	-0.00	0.01	-2.706	-2.530	0.060
13	0.07	0.25	-0.07	0.01	-0.05	0.01	-0.10	0.01	-0.01	0.06	-1.420	-1.295	0.032
14	-0.01	0.02	-0.00	-0.04	-0.04	-0.00	-0.01	0.01	-0.02	0.00	-1.151	-2.038	0.262
15	0.14	-0.03	-0.08	0.14	0.27	-0.01	0.01	-0.03	-0.06	0.01	-1.111	-1.965	0.039
16	0.32	-0.11	-0.24	-0.14	-0.08	0.03	0.09	-0.00	0.11	-0.02	-2.490	-3.432	0.061
17	0.03	0.14	-0.08	0.14	-0.21	-0.16	0.06	0.13	0.02	0.07	-1.641	-1.406	0.038
18	0.13	0.02	0.04	-0.25	-0.15	-0.16	-0.02	0.02	-0.00	0.02	-0.777	-4.489	0.032
19	0.19	-0.11	-0.10	-0.17	-0.17	-0.15	0.10	-0.11	0.01	-0.01	-2.162	-3.317	0.043
20	0.12	0.03	-0.11	-0.21	-0.04	-0.12	-0.05	-0.06	-0.02	-0.02	-0.519	-2.378	0.053
21	0.24	0.06	-0.02	-0.28	-0.09	0.07	0.01	0.02	-0.10	-0.03	-0.381	-1.894	0.028
22	0.02	0.06	-0.10	-0.16	0.09	-0.00	-0.13	0.03	-0.07	0.05	-1.393	-1.560	0.045
23	-0.10	0.06	-0.06	-0.28	-0.05	0.02	0.03	0.06	-0.09	0.04	-2.748	-4.003	0.025
24	0.02	-0.05	0.04	-0.08	-0.22	-0.08	-0.10	0.08	-0.12	0.01	-2.683	-2.599	0.038
25	-0.13	-0.00	0.02	0.01	-0.04	-0.03	0.10	0.03	0.01	0.02	-1.145	-1.742	0.081
26	0.06	0.03	-0.15	-0.11	-0.13	-0.19	0.03	0.14	0.04	0.01	-0.893	-3.578	0.023
27	0.18	0.04	0.07	-0.07	0.11	0.01	-0.06	0.01	0.03	-0.02	1.207	-0.271	0.040
28	0.06	0.05	0.18	-0.22	0.11	-0.11	0.09	0.14	-0.00	-0.00	-1.015	-1.279	0.066
29	0.32	0.02	0.22	0.24	0.18	0.04	-0.05	0.14	0.04	-0.00	-2.969	-2.884	0.062
30	0.30	-0.06	-0.12	-0.00	0.04	0.09	-0.09	-0.09	-0.00	-0.02	-2.309	-2.370	0.042
31	0.14	-0.04	-0.07	-0.07	-0.02	-0.07	-0.00	0.07	-0.01	-0.06	0.292	-1.225	0.061
32	-0.03	-0.02	-0.05	0.01	-0.00	0.02	0.09	-0.03	-0.02	-0.01	-0.823	-1.740	0.272
33	0.06	0.03	0.02	0.07	-0.10	-0.03	-0.00	0.03	0.03	-0.00	-1.943	-1.914	0.038
34	0.07	-0.06	-0.25	-0.11	0.20	0.06	-0.18	0.12	0.05	-0.04	-2.150	-2.186	0.025
35	0.02	-0.15	-0.29	-0.06	0.24	0.02	-0.11	0.20	0.08	-0.00	-2.369	-3.471	0.062

Table 14: Estimates of Variance Ratios and their Standard Errors - Company-wise Results c. December 1988 - June 1990.

Co. No.	SHT(2)	SHT(4)	SHT(8)	SHT(12)	SHT(16)	SHT(24)	SHT(32)	SHT(40)	SHT(50)	SHT(60)
1	0.975	1.041	1.077	1.123	1.166	1.218	1.282	0.624	0.291	0.244
	(0.057)	(0.049)	(0.044)	(0.041)	(0.039)	(0.038)	(0.028)	(0.010)	(0.003)	(0.003)
2	0.921	0.943	0.835	0.764	0.681	0.620	0.532	0.363	0.323	0.284
	(0.054)	(0.045)	(0.034)	(0.028)	(0.023)	(0.019)	(0.012)	(0.006)	(0.004)	(0.003)
3	1.065	1.026	1.006	0.989	1.025	1.076	1.317	1.216	0.591	0.493
	(0.062)	(0.049)	(0.041)	(0.036)	(0.034)	(0.033)	(0.029)	(0.019)	(0.007)	(0.005)
4	1.067	1.045	1.062	1.071	1.034	1.000	0.758	0.783	0.367	0.294
	(0.062)	(0.050)	(0.044)	(0.039)	(0.035)	(0.031)	(0.017)	(0.012)	(0.004)	(0.003)
5	1.188	1.357	1.444	1.542	1.645	1.740	1.601	0.873	0.598	0.513
	(0.069)	(0.064)	(0.059)	(0.057)	(0.055)	(0.054)	(0.035)	(0.014)	(0.007)	(0.005)
6	1.188	1.181	1.131	1.108	1.068	1.005	0.694	0.655	0.407	0.370
	(0.069)	(0.056)	(0.047)	(0.041)	(0.036)	(0.031)	(0.015)	(0.010)	(0.005)	(0.004)
7	0.964	0.952	0.955	0.950	0.926	0.909	0.796	0.576	0.315	0.273
	(0.056)	(0.045)	(0.039)	(0.035)	(0.031)	(0.028)	(0.018)	(0.009)	(0.004)	(0.003)
8	1.215	1.369	1.438	1.471	1.470	1.447	1.347	1.126	0.686	0.612
	(0.071)	(0.065)	(0.059)	(0.054)	(0.049)	(0.045)	(0.030)	(0.018)	(0.008)	(0.006)
9	1.046	1.079	1.108	1.106	1.121	1.159	1.013	0.998	0.479	0.380
	(0.061)	(0.051)	(0.046)	(0.041)	(0.038)	(0.036)	(0.022)	(0.016)	(0.005)	(0.004)
10	1.169	1.321	1.373	1.435	1.465	1.469	1.030	0.439	0.277	0.229
	(0.068)	(0.063)	(0.056)	(0.053)	(0.049)	(0.046)	(0.023)	(0.007)	(0.003)	(0.002)
11	1.003	1.010	1.009	1.006	0.996	0.977	0.899	0.760	0.351	0.289
	(0.058)	(0.048)	(0.041)	(0.037)	(0.033)	(0.030)	(0.020)	(0.012)	(0.004)	(0.003)
12	1.065	1.087	1.131	1.103	1.090	1.091	1.167	1.039	0.775	0.688
	(0.062)	(0.052)	(0.047)	(0.041)	(0.037)	(0.034)	(0.026)	(0.016)	(0.009)	(0.007)
13	1.069	1.257	1.315	1.354	1.363	1.373	1.455	1.460	1.190	1.064
	(0.062)	(0.060)	(0.054)	(0.050)	(0.046)	(0.043)	(0.032)	(0.023)	(0.013)	(0.011)
14	0.985	0.991	0.992	0.975	0.950	0.932	0.833	0.631	0.358	0.301
	(0.057)	(0.047)	(0.041)	(0.036)	(0.032)	(0.029)	(0.018)	(0.010)	(0.004)	(0.003)
15	1.137	1.166	1.139	1.179	1.296	1.378	1.442	1.865	1.438	1.238
	(0.066)	(0.055)	(0.047)	(0.043)	(0.044)	(0.043)	(0.032)	(0.030)	(0.016)	(0.013)
16	1.323	1.360	1.261	1.146	1.043	0.977	0.583	0.403	0.204	0.212
	(0.077)	(0.065)	(0.052)	(0.042)	(0.035)	(0.030)	(0.013)	(0.006)	(0.002)	(0.002)
17	1.028	1.130	1.139	1.199	1.170	1.104	0.825	0.672	0.521	0.448
	(0.060)	(0.054)	(0.047)	(0.044)	(0.039)	(0.034)	(0.018)	(0.011)	(0.006)	(0.005)
18	1.132	1.190	1.239	1.168	1.068	0.952	0.410	0.238	0.125	0.108
	(0.066)	(0.057)	(0.051)	(0.043)	(0.036)	(0.030)	(0.009)	(0.004)	(0.001)	(0.001)

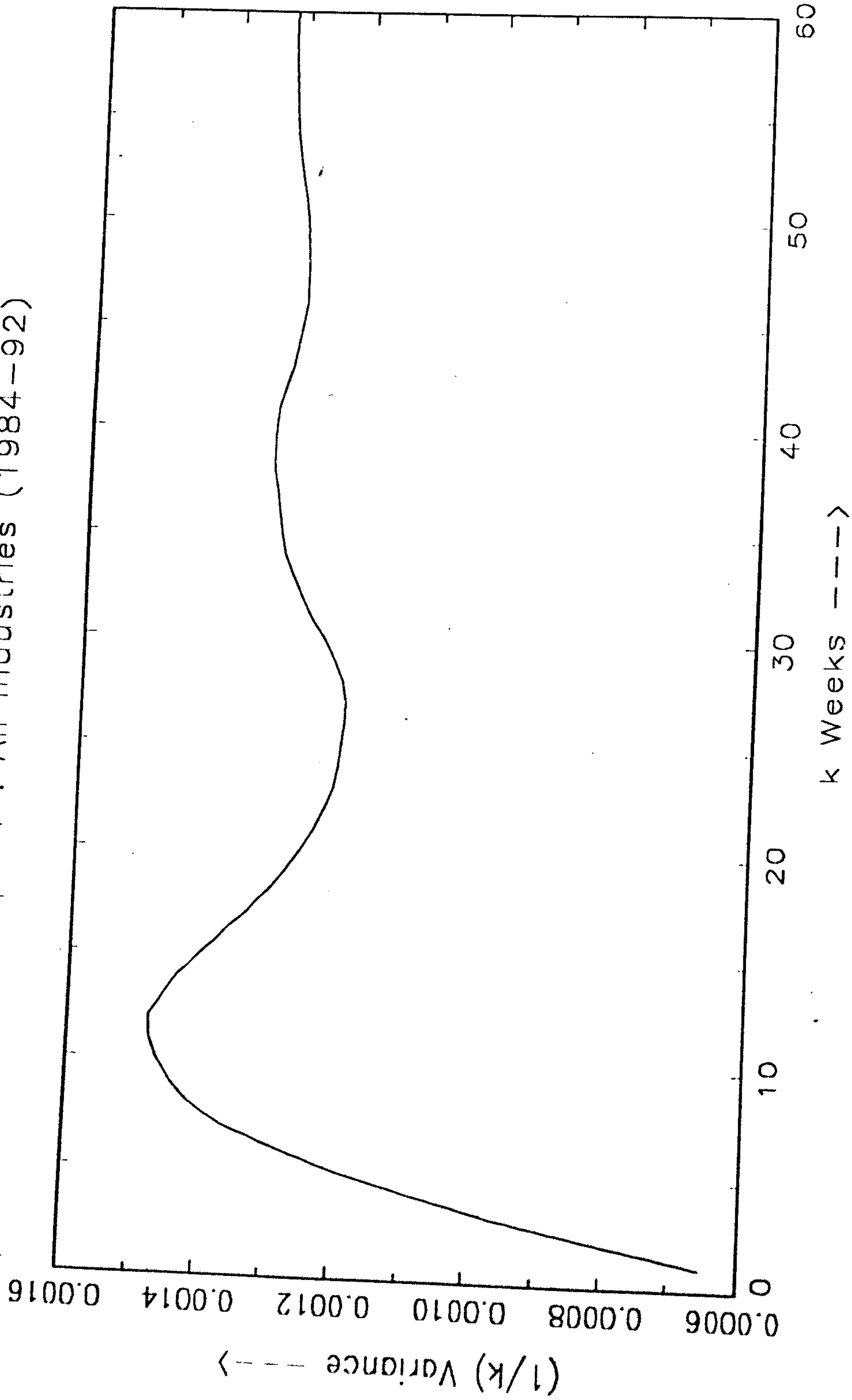
The figures in the parentheses indicate standard errors of the estimates.

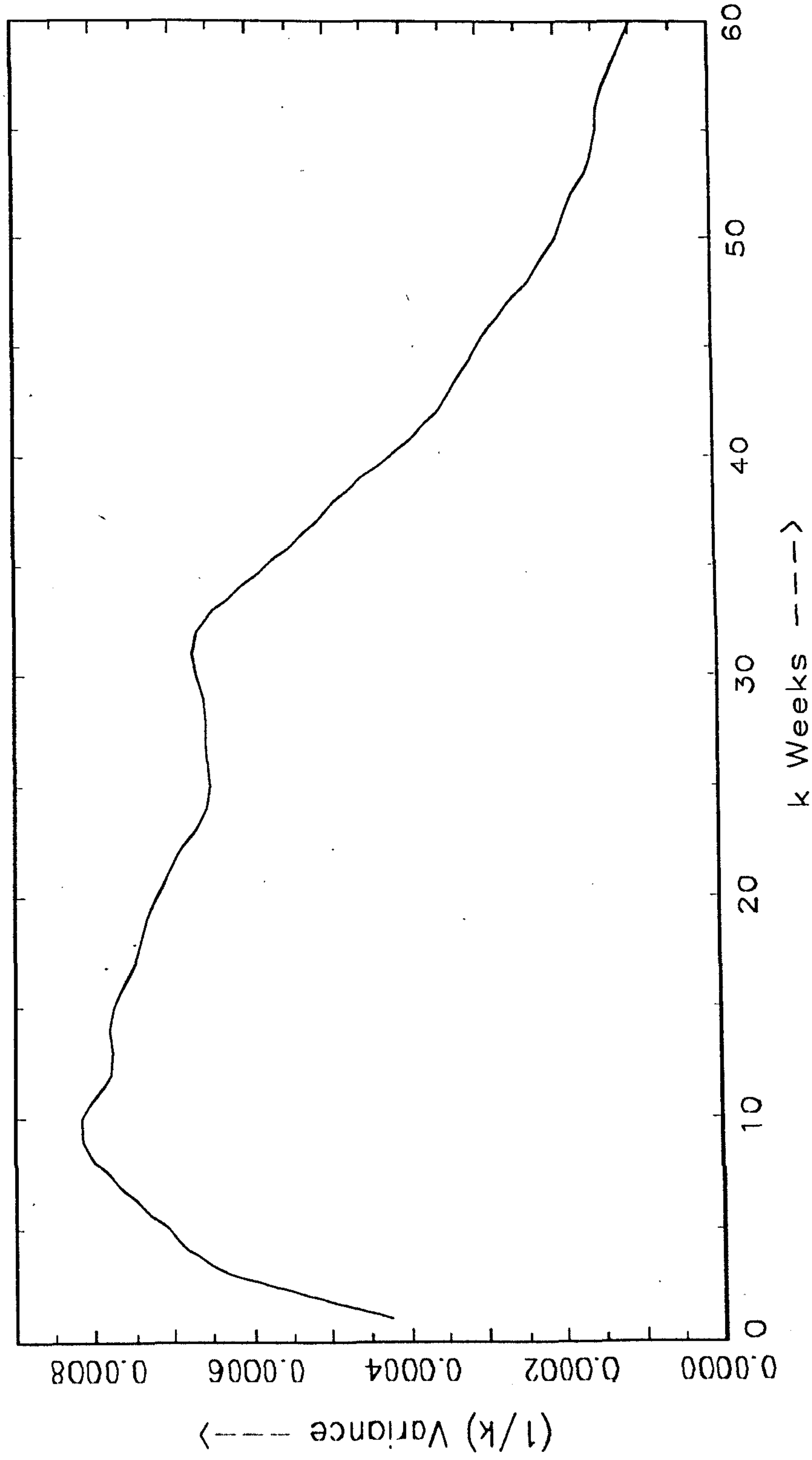
Table 14: Estimates of Variance Ratios and their Standard Errors - Company-wise Results
c. December 1988 - June 1990.

Co. No.	SHT(2)	SHT(4)	SHT(8)	SHT(12)	SHT(16)	SHT(24)	SHT(32)	SHT(40)	SHT(50)	SHT(60)
19	1.188	1.179	1.126	1.025	0.902	0.773	0.465	0.318	0.108	0.102
	(0.069)	(0.056)	(0.046)	(0.038)	(0.030)	(0.024)	(0.010)	(0.005)	(0.001)	(0.001)
20	1.115	1.174	1.151	1.053	0.975	0.884	0.662	0.449	0.177	0.165
	(0.065)	(0.056)	(0.047)	(0.039)	(0.033)	(0.027)	(0.015)	(0.007)	(0.002)	(0.002)
21	1.238	1.360	1.411	1.329	1.242	1.201	1.073	0.554	0.376	0.307
	(0.072)	(0.065)	(0.058)	(0.049)	(0.042)	(0.037)	(0.024)	(0.009)	(0.004)	(0.003)
22	1.021	1.066	1.039	0.958	0.935	0.919	0.831	0.704	0.430	0.355
	(0.059)	(0.051)	(0.043)	(0.035)	(0.031)	(0.029)	(0.018)	(0.011)	(0.005)	(0.004)
23	0.904	0.913	0.885	0.758	0.657	0.591	0.427	0.289	0.229	0.231
	(0.053)	(0.043)	(0.036)	(0.028)	(0.022)	(0.018)	(0.009)	(0.005)	(0.003)	(0.002)
24	1.022	0.996	1.003	0.975	0.883	0.795	0.643	0.307	0.226	0.204
	(0.059)	(0.047)	(0.041)	(0.036)	(0.030)	(0.025)	(0.014)	(0.005)	(0.003)	(0.002)
25	0.874	0.830	0.817	0.813	0.799	0.781	0.725	0.668	0.305	0.247
	(0.051)	(0.039)	(0.034)	(0.030)	(0.027)	(0.024)	(0.016)	(0.011)	(0.003)	(0.003)
26	1.063	1.104	1.048	0.971	0.876	0.756	0.333	0.216	0.126	0.115
	(0.062)	(0.052)	(0.043)	(0.036)	(0.029)	(0.023)	(0.007)	(0.003)	(0.001)	(0.001)
27	1.183	1.273	1.353	1.373	1.423	1.461	1.708	1.894	2.157	2.030
	(0.069)	(0.060)	(0.056)	(0.051)	(0.048)	(0.045)	(0.038)	(0.030)	(0.024)	(0.021)
28	1.059	1.114	1.230	1.211	1.236	1.223	1.110	1.053	0.739	0.613
	(0.062)	(0.053)	(0.051)	(0.045)	(0.042)	(0.038)	(0.024)	(0.017)	(0.008)	(0.006)
29	1.318	1.439	1.612	1.812	2.006	2.155	2.344	1.299	0.978	0.871
	(0.077)	(0.068)	(0.066)	(0.067)	(0.067)	(0.067)	(0.052)	(0.021)	(0.011)	(0.009)
30	1.300	1.357	1.323	1.302	1.299	1.322	1.139	0.952	0.853	0.755
	(0.076)	(0.064)	(0.054)	(0.048)	(0.044)	(0.041)	(0.025)	(0.015)	(0.010)	(0.008)
31	1.143	1.167	1.145	1.104	1.069	1.023	0.899	0.675	0.774	0.754
	(0.066)	(0.055)	(0.047)	(0.041)	(0.036)	(0.032)	(0.020)	(0.011)	(0.009)	(0.008)
32	0.965	0.941	0.901	0.880	0.866	0.863	0.848	0.827	0.681	0.611
	(0.056)	(0.045)	(0.037)	(0.032)	(0.029)	(0.027)	(0.019)	(0.013)	(0.008)	(0.006)
33	1.059	1.097	1.128	1.173	1.168	1.156	0.841	0.623	0.381	0.341
	(0.062)	(0.052)	(0.046)	(0.043)	(0.039)	(0.036)	(0.018)	(0.010)	(0.004)	(0.004)
34	1.069	1.054	0.920	0.796	0.781	0.787	0.534	0.420	0.218	0.186
	(0.062)	(0.050)	(0.038)	(0.029)	(0.026)	(0.024)	(0.012)	(0.007)	(0.002)	(0.002)
35	1.017	0.920	0.729	0.590	0.579	0.576	0.338	0.112	0.078	0.066
	(0.059)	(0.044)	(0.030)	(0.022)	(0.019)	(0.018)	(0.007)	(0.002)	(0.001)	(0.001)

The figures in the parentheses indicate standard errors of the estimates.

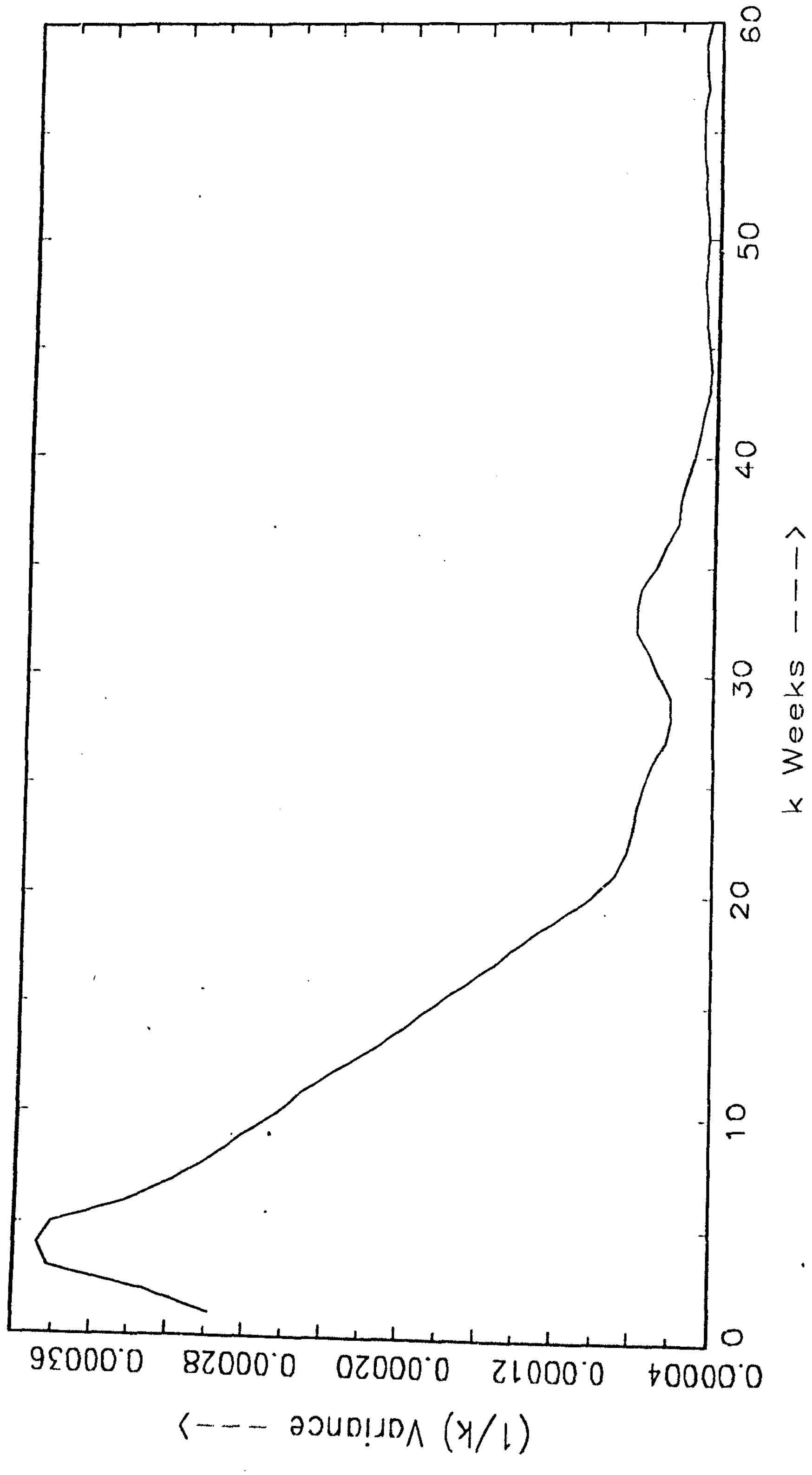
Graph 1 : All Industries (1984–92)

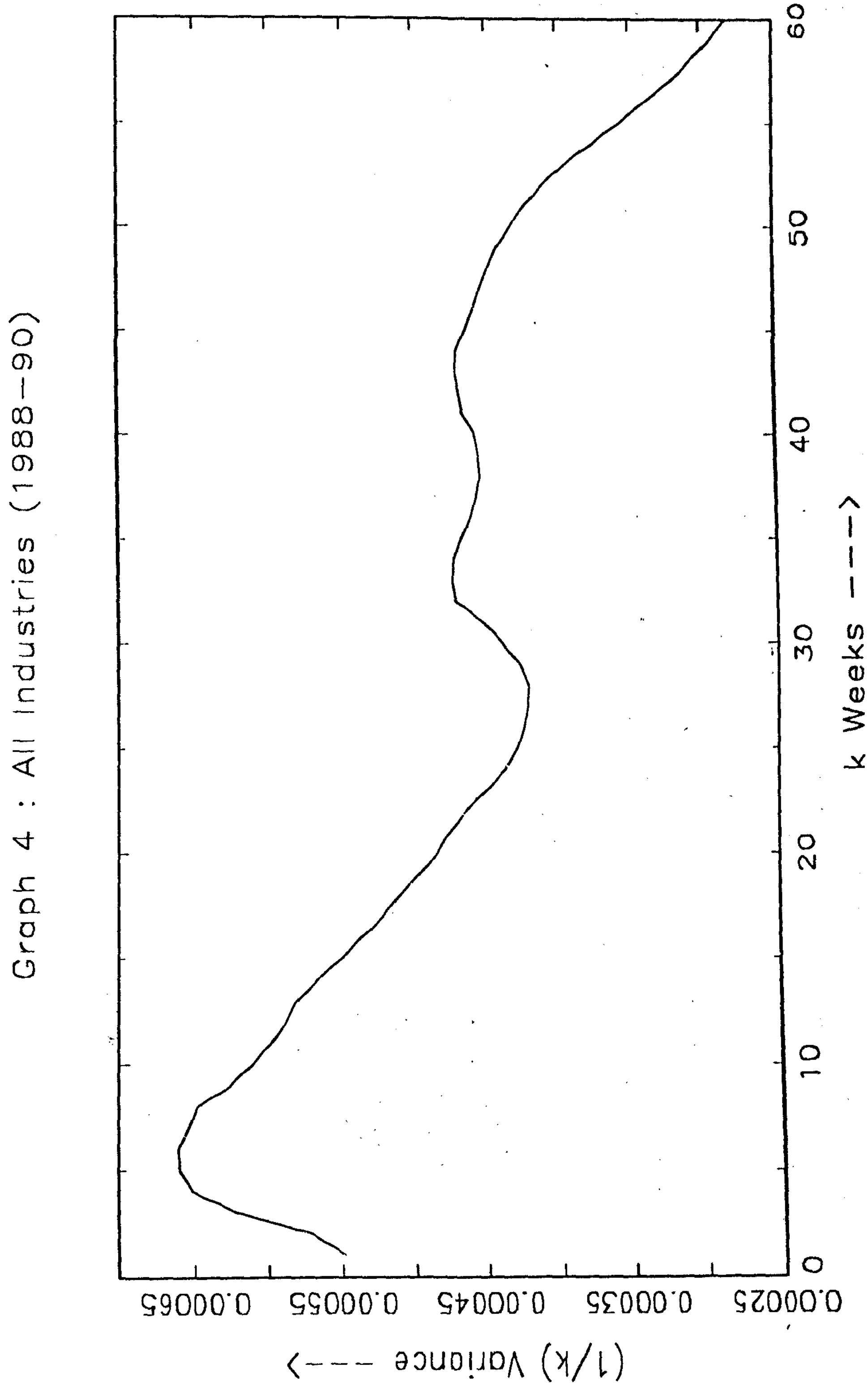




Graph 2 : All Industries (1984—86)

Graph 3 : All Industries (1986—88)




Graph 4 : All Industries (1988—90)
k Weeks --->
0
10
20
30
40
50
60
(1/k) Variance --->
0.00025
0.00035
0.00045
0.00055
0.00065

Appendix - Name of Industries

ALL	All Industries
AGRI	Agriculture and Allied Activities
TEA	Tea Plantations
PROC	Processing and Manufacturing
F & T	Food stuffs and Textiles
FOOD	Foodstuffs
SUGAR	Sugar
TOB	Tobacco
TEX	Textiles
COTEX	Cotton Textiles
JUTEX	Jute Textiles
SILK	Silk, Woollen and Rayon Textiles
M&C	Metals, Chemicals and Products thereof
METAL	Metals and Products thereof
ALU	Alumimium
AUTO	Automobiles & Auto Ancillaries
ELEC	Electrical/Electronic Machinery
MACH	Other Machinery
FOUND	Foundaries and Engineering Workshops
CHEM	Chemicals and Products thereof
CFERT	Chemicals Fertilizers
DYES	Dyes & Dye-stuffs
MMFIB	Man-mad Fibres
OBIC	Other Basic Industrial Chemicals
MED	Medicines & Pharmaceuticals
OP&M	Other Processing and Manufacturing
CEM	Cement
RUBB	Rubber and Rupper Products
PAPER	Paper and Paper Products
OIND	Other Industries
EG&S	Electricity Generation and Supply
TRADE	Trading
SHIP	Shipping
HOTEL	Hotels
F&I	Financial & Investment

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Patterns of Credit Outstanding in Priority Sector - A Regional Analysis

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In this paper the regional pattern of credit outstanding of the Scheduled Commercial Banks in the Priority Sectors at two selected points of time, i.e., June 1985 and March 1990 has been analysed with a view to study the pattern of changes in share and hierarchical positions of the regions during the period. It has been observed that there are certain imbalances in the distribution of credit over different regions and the position remained more or less same during the period.

Introduction

One of the important features of Indian banking is the specification that a proportion of total net bank credit of each bank has to be for priority sectors. Priority sectors consist of agriculture, small scale industries and other activities undertaken by self-employed and professionals and small borrowers. This proportion at present stands at 40 per cent, with a sub-target of 18.0 per cent for agriculture. This allocative device is applicable only for banks. As the bank offices have spread far and wide and as most scheduled commercial banks have all-India presence, it is possible to view the allocative device from the viewpoint of its effect on different regions of the country. This study is an attempt to provide a clue to an understanding of the regional economic development.

This study attempts to analyse the regional pattern of credit outstanding in the priority sectors at only two selected points of time, i.e., June 1985 and March 1990, coinciding approximately with the beginning and end of Seventh Five Year Plan. One could consider larger span of time but the choice is dictated

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by the considerations that it represents a shift of policy stance from an administered one to a somewhat flexible, liberalized one, and of data availability. The exercise here is confined to six defined banking regions in India (see, Annexure-I) and three sub-sectors of the Priority Sector. The major aims of the study are to determine (1) the region-wise share of priority sector outstanding in total credit outstanding, (2) the changes, if any, in the distributional pattern of 'number of accounts' and the 'amount of credit outstanding' over the regions as well as over the sub-sectors during the study period, and (3) the overall hierarchical positions of the various regions in terms of per capita credit outstanding at two time points. Special emphasis is accorded to the points (2) and (3) employing statistical techniques.

The Analysis

The data considered for the purpose of this study are based on the information furnished by the commercial banks in the returns on 'Advance to Priority Sector' and 'Form-A' in terms of Section 42(2) of the RBI Act. These data are processed and regularly published in various RBI publications. This study focusses mainly on the 'number of accounts' and the 'amount of credit outstanding' in the priority sectors. Some adjustments were made for region-wise total outstanding figures on the basis of data available from the Basic Statistical Returns (BSR-1).

(a) Priority Sector Credit Outstanding

The data on Priority Sector are grouped into three main sub-sectors viz, Agriculture, Small Scale Industries (SSI) and Other Priority Sectors. The analysis was carried out for six banking regions as mentioned earlier. The basic data ,i.e., the 'number of accounts' and the 'amount of credit outstanding' in the priority sectors are presented in Statement-1 and Statement-2, respectively. The share of each region in a sub-sector for the study time-points June 1985 and March 1990 was expressed as a percentage of the All-India figure. It may be seen that in every sub-sector of the priority sector lending, the Southern Region was consistently in the forefront approximately accounting for 32 per cent of total 'credit outstanding' and 40 per cent of the total 'number of accounts', whereas the North-Eastern region trailed behind all the regions in every case with barely 2 per cent contribution on both the counts. However, between these extreme points, the performance rankings of the various regions showed diversity.

In the agriculture sub-sector, the top position was occupied by the Southern region in both respects (36 to 38 per cent of credit outstanding and 43 to 44 per cent of total number of accounts). The Northern region came second in terms of balance outstanding (20.7 per cent in 1985 and 18.5 per cent in 1990), while the Eastern region was in the second position in terms of 'number of accounts' (16.3 per cent in 1985 and 17.3 per cent in 1990).

In the case of SSI sub-sector too, the Southern region held the first position with a share of about 27 to 29 per cent in respect of balance outstanding and a share of about 29 to 32 per cent in respect of 'number of accounts'. In the case of balance outstanding, the second and third positions were held by the Western region (25.9 per cent in 1985 and 26.0 per cent in 1990) and the Northern region (20.7 per cent in 1985 and 21.2 per cent in 1990), respectively. In terms of 'number of accounts' these two positions were occupied by Central and Eastern regions. In June 1985, the second and third positions were held by Central region (19.1 per cent) and Eastern region (17.1 per cent), respectively, whereas in March 1990 their positions were in reverse order (Eastern: 25.5 per cent and Central: 19.0 per cent).

Statement-3 reveals that the share of agriculture sub-sector dominated in so far as credit outstanding is concerned. The overall share of agriculture was about 40.8 per cent in both the years. The share of SSI had gone up from 36.4 per cent in 1985 to 38.5 per cent in 1990. Consequently, the share of 'Other Priority' sector had gone down from 22.9 per cent to 20.7 per cent over the same period. The highest share of agriculture was in Southern region (46.6 per cent in 1985 and 48.4 per cent in 1990). The Western region had the highest stake in SSI sector with a share of 47.6 per cent in 1985 and 51.4 per cent in 1990. A slight variation was noticed in the Eastern region where SSI outpaced agriculture in 1990.

From Statement-4, it may be seen that the agriculture sub-sector reported a relatively high share of about 58 to 69 per cent of the total 'number of accounts' in priority sectors. The SSI had a meagre 5 to 12 per cent share. However, the share of agriculture at All-India level declined from 65.6 per cent in 1985 to 60.5 per cent in 1990 and the share of SSI increased from 6.7 per cent in 1985 to 7.6 per cent in 1990.

Statement-5 presents the sector-wise distribution of priority sector outstanding as a percentage of total credit outstanding. Taking the region-wise distributional pattern of BSR data as published in 'Banking Statistics', the regional total credit outstanding was estimated for Section 42(2) data. Then the priority sector outstanding was expressed as a percentage of total credit outstanding. It is observed that the banks were able to meet the target of 40.0 per cent by 1985 as set by RBI and improved slightly on this position in 1990. Agriculture constituted 16.6 per cent of total credit outstanding in 1985 and 17.3 per cent in

1990, while SSI constituted 14.8 per cent in 1985 and 16.3 per cent in 1990. The region-wise achievement of the target was, however, different. In 1985, only three regions out of the six regions exceeded the target. The Eastern region and Northern region failed to achieve the target marginally. The highest performance was in the Central region (69.0 per cent) followed by the North-Eastern region (66.7 per cent) and the Southern region (51.4 per cent), respectively. In 1990, all the regions except Western region achieved the target. The best performance was in the North-Eastern region where as much as 71.6 per cent credit outstanding was in priority sector. But it may be noted that this region accounted barely 2 per cent of the total outstanding. This region was followed by the Central (59.5 per cent) and the Southern (48.3 per cent) regions, respectively. The Western region achieved only 25.3 per cent in 1985 and 28.4 per cent in 1990 and was placed at the bottom.

From Statement-6, it may be seen that in 1990 the amount of credit outstanding per account was the highest in Northern region (Rs. 20,600) and the lowest was in the Eastern region (Rs. 7,390). In agriculture sub-sector, it was the highest in the Northern region at both time points (Rs.10,610 and Rs.13,740). Similarly, in SSI sub-sector, Western region had the maximum amount of credit outstanding per account. It was Rs.87,260 in 1985 and rose to Rs.1.43 lakh in 1990 (an increase of 64.4 per cent). There was a decrease in the amount per account in SSI and 'Other Priority' sectors in the Eastern region (11.4 per cent) and also a decrease in 'Other Priority' sector in the North-Eastern region (21.9 per cent). At the All-India level the increase in 'amount per account' in priority sectors was 32.4 per cent, of which the maximum increase was in agriculture sub-sector (43.6 per cent).

The per capita outstanding in different sub-sectors of the priority sector was calculated and presented in Statement-7. At the All-India level the per capita credit outstanding in agriculture was Rs.108.3 compared with Rs. 96.6 in SSI and Rs. 60.8 in 'Other Priority' sub-sectors in the year 1985. The highest per capita outstanding was in the Northern region (Rs. 443.9) which was mainly due to agricultural credit (Rs.186.4). The lowest per capita outstanding was in the North-Eastern region in SSI sector (Rs.22.8). The levels of per capita outstanding had gone up between 1985 and 1990 for all regions as well as all sub-sectors. The overall per capita outstanding in priority sector increased from Rs.265.7 in 1985 to Rs.504.7 in 1990. It can be seen that the distributional pattern remained, more or less the same, with the Northern region having the maximum per capita outstanding and the North-Eastern region having the minimum.

b) Credit Outstanding Patterns

One of the main aims of the study was to test whether the outstanding patterns in priority sectors remained the same across the regions during the seventh plan period. For this purpose we considered the 'proportion of number of accounts' and 'proportion of amount outstanding' for each region as a basic data for the test-statistic. As the number of observations was very small (six observations corresponding to six regions studied), a non-parametric test was used. The proportions in 1985 were taken as one set of observations considering as a variable 'x' and the proportions in 1990 as another set of observations considering as a variable 'y' for both 'the amount of outstanding' (Statement-1) and 'number of accounts' (Statement-2). As there may be some misgivings regarding the use of parametric test for a small number of observations, we had used non-parametric 'sign-test' to support the hypothesis. The methodologies are given in Annexure II (Part-A). The test was carried out for each sub-sector and also for the overall priority sector. The null hypothesis was that there was no difference between two sets of proportions or in other words that the distribution pattern in 1990 was the same as in 1985. The following table gives the calculated values of the test-statics.

Table 1 : Calculated values of test-statistics

Test statistic	Credit Outstanding				No. of Accounts			
	Agr.	SSI	Others	Total	Agr.	SSI	Others	Total
Sign-test								
P(t <= r) Probability	0.586	0.586	0.242	0.414	0.414	0.414	0.586	0.586

From Table-1, it may be observed that all the calculated probabilities are much higher than 0.025 (Annexure II, Part-A). Hence, we can not reject the null hypothesis that there is no significant differences in distribution pattern of credit deployment. In other words, the differences in the regional distribution pattern in credit outstanding remained statistically similar in nature both in 1985 and 1990 for all sub-sectors.

c) Relative hierarchical position of regions

To determine the relative positions of different regions, we used multi-dimensional scaling technique. Generally, this technique is used to reduce a larger number of dimensions (say, n) into a smaller number of dimensions (say, m); normally m is taken as 2, so as to be able to plot the units graphically. As our data on per capita outstanding involves only 3-dimensions (i.e. agriculture, SSI and other priority sector), we thought it prudent to reduce it to one dimension. The statistical techniques usually employed for reducing the number of dimensions such as principal component analysis, factor analysis, etc. are applicable generally when the number of observations is large. Therefore, we preferred to use a simple ordinal scaling technique which is a mathematical procedure mainly based on matrix solution. The methodology is described in Annexure II (Part-B). The initial matrix of per capita outstanding was

$$X = \begin{bmatrix} 186.36 & 165.76 & 91.77 \\ 26.73 & 22.78 & 59.52 \\ 53.24 & 48.52 & 40.02 \\ 75.00 & 49.82 & 45.16 \\ 113.73 & 174.84 & 79.16 \\ 163.03 & 117.88 & 69.24 \end{bmatrix} \text{ for 1985}$$

and that for 1990 was

$$X = \begin{bmatrix} 165.55 & 147.26 & 81.52 \\ 23.77 & 20.26 & 52.92 \\ 48.29 & 44.01 & 36.30 \\ 67.64 & 44.93 & 40.73 \\ 104.53 & 160.70 & 72.75 \\ 149.92 & 108.40 & 63.67 \end{bmatrix}$$

By using the 'Gauss' software package, the characteristic roots (λ i) of the matrix (XX') were calculated. The values of the characteristic roots and the corresponding characteristic vectors are arranged in Table-2 given below:-

Table - 2 : Characteristic roots and characteristic vectors

	1985			1990		
λ_i	λ_1	λ_2	λ_3	λ_1	λ_2	λ_3
Value	181880.01	3373.76	2125.69	149149.46	2837.03	1690.65
Vector (Vi)	0.6225	0.1652	0.1483	0.6107	0.1665	0.1434
	0.1280	0.0380	-0.9185	0.1256	0.0340	-0.9156
	0.1916	0.0333	-0.2294	0.1919	0.0338	-0.2345
	0.2322	0.2767	-0.1992	0.2312	0.2735	-0.2047
	0.5112	-0.8136	0.0299	0.5190	-0.8104	0.0345
	0.4941	0.4811	0.2027	0.5017	0.4883	0.2030

It is observed that λ_1, the largest root is 53.91 times larger than second root and 85.56 times larger than third root for the year 1985. If it is expressed in percentage of total values of λ_i (i.e. $\lambda_1 + \lambda_2 + \lambda_3$), the percentage value becomes as high as 97.1% . It only indicates that λ_1 takes into account about 97% of the information of the data set. Therefore, taking the values of λ_1 and the corresponding vector (v_1), the value of $f_1 = \sqrt{\lambda_1}\, v_1$ was calculated to obtain the first ordinate which seems quite reasonable to represent the data matrix. Similarly for the year 1990, the value of first root i.e. λ_1 was 52.57 times and 88.22 times larger than second and third roots, respectively and its capacity to explain the data set is about 97% . The values of f_1 (i.e. final ratings) for six regions are given below.

Table - 3 : Region-wise final ratings (scores)

Region	1985	1990
Northern	265.50	235.85
N-Eastern	54.57	48.50
Eastern	81.70	74.10
Central	99.01	89.27
Western	218.02	200.45
Southern	210.71	193.74

From Table-3 it could be said that the hierarchical positions of the different regions remained the same at both the points of time (i.e. 1985 and 1990). The Northern region occupied the first position in terms of per capita credit outstanding, followed by Western and Southern regions. Then the fourth, fifth and sixth positions were occupied by Central, Eastern and North-Eastern regions, respectively.

Conclusion

The analysis of priority sector credit expressed as a percentage of total net bank credit indicated that the banks were able to comply with the target of 40 per cent by 1985 as stipulated by RBI and improved upon this slightly in 1990 (42 per cent). Agriculture constituted 16.6 per cent of the total credit outstanding in 1985 and 17.3 per cent in 1990, while SSI constituted 14.8 per cent in 1985 and 16.3 per cent in 1990. The region-wise achievement of the target was, however, different. In 1985, only three out of the six regions surpassed the target. The achievement was around the level of 69 per cent in the Central region and 67 per cent in the North-Eastern region followed by the Southern region (51 per cent). In 1990, all the regions except Western region achieved the target. The best performance was in the North-Eastern region where as much as 72 per cent of credit outstanding was in priority sectors. But it should be noted that this region accounted for barely 2 per cent of the total outstanding. This region was followed by the Central region (59 per cent). The Southern region ranked third (48 per cent). The achievement of Western region was only 25 per cent in 1985 and 28 per cent in 1990 and was placed at the bottom.

The implicit implications of the study are that specified credit targets can be achieved, if laid down clearly for each bank, and that regional balancing of credit can also be stated in quantitative terms for banks as a whole. The latter would be possible since Indian banks have branches all over the country in fairly good measure. It is necessary to see that the All India character of branch banking is maintained to achieve regional balancing of bank credit.

ANNEXURE - I

Region	Name of States / Union Territories
1. NORTHERN	CHANDIGARH, DELHI, HARYANA, HIMACHAL PRADESH, JAMMU & KASHMIR and PUNJAB
2. NORTH-EASTERN	ARUNACHAL PRADESH, ASSAM, MANIPUR, MEGHALAYA, MIZORAM, NAGALAND, SIKKIM and TRIPURA
3. EASTERN	BIHAR, ORISSA and WEST BENGAL
4. CENTRAL	MADHYA PRADESH and UTTAR PRADESH
5. WESTERN	DADRA & NAGAR HAVELI, DAMAN & DIU, GOA, GUJARAT and MAHARASHTRA
6. SOUTHERN	ANDHRA PRADESH, KARNATAKA, KERALA, LAKSHADWEEP, PONDICHERY and TAMIL NADU

ANNEXURE - II

PART-A: Non-parametric test for paired observations (Sign - test)

Let us assume that we have a random sample of n pairs, such as, (x_1, y_1), (x_2, y_2), ..., (x_n, y_n) and the corresponding n differences are $d_i = x_i - y_i$, i = 1, 2, ..., n.

Now the null hypothesis is H_o: $\theta_d = \theta_o$ (some specified value). More specifically, the median value $\theta_o = 0$ in this case i.e. there is no differences between the two elements of paired observations.

Here it is assumed that the distribution of differences is continuous in the vicinity of its median 0 ; i.e.

$$P[d < \theta] = P[d > \theta] = \frac{1}{2}$$

$$\text{and } P[d > \theta_o] = p,$$

where p = ½ considering Binomial distribution.

Let r be the no. of plus signs and s be the no. of negative signs, then (r + s) <= n. The distribution of r, given (r + s), is Binomial with $p = P[d > \theta_o]$.

The n number of plus sign (r) may be used to test H_o, which is equivalent to test for the Binomial parameter, i.e. p = ½ .

The critical region for the level α two-sided (equal tailed) test is given by $r > r_{\alpha/2}$ and $r < r'_{\alpha/2}$,

where $r_{\alpha/2}$ is the smallest and $r'_{\alpha/2}$ is the largest integer of the no. of plus signs (r), such as :

$$\sum_{r^1}^{n} \binom{n}{t} (1/2)^{n-1} (1/2)^t \leq \alpha/2$$

and

$$\sum_{0}^{r} \binom{n}{t} (1/2)^{n-1} (1/2)^t \leq \alpha/2$$

(Ref. Goon, Gupta and Dasgupta, 1979).

For practical purpose we consider r as the no. of times the less frequent sign occurs in the data. Similarly, as it is difficult to compute cumulative probabilities from Binomial distribution directly, we may use its relationship with Beta distribution and use 'Biometrika Tables for Statisticians' to calculate the probabilities. Thus, if r be the less frequent sign occurring for each set of paired observations.

$$P[t \le r] = \sum_{t=o}^{r} \binom{n}{t} (½)^{n-t} (½)^{t}$$

$$= 1 - I_{p=½}(r+1,\ n-r) \text{ .... (ii)}$$

where I(r + 1, n - r) follows a Beta distribution with parameter $\upsilon = r + 1$, and $\upsilon_2 = n - r$.

If $P(t \le r) \le 0.05$, we reject H_o for one sided test at $\alpha = 5\%$ level of significance and if $P(t \le r) \le 0.025$, we reject H_o for two-sided test for $\alpha = 5\%$ level of significance.

PART-B: Multidimensional Scaling

Similar to the 2-dimensional plotting of principal component scores there are several types of multidimensional scaling. Multidimensional scaling is the term used to describe any procedure which starts with the 'distance' between a set of points (or individuals), or information about these 'distances' and finds a configuration of points, preferably in a smaller number of dimensions. There are two types of scaling:- (i) Classical scaling or metric scaling - is basically an algebraic method of constructing the point co-ordinates assuming the dissimilarities are euclidean distances. Torgerson (1952, 1958) originally proposed it and Gower (1966) popularised it under the name 'principal co-ordinates analysis'. (ii) Ordinal scaling - is an alternative to classical scaling was developed by R.N.Shepard and J.B. Kruskal using the ordinal properties of the dissimilarities and subsequently a rigorous treatment was provided by Sibson (1981). The original name suggested by Kruskal (1964b) was 'nonmetric multidimensional scaling' but Chatfield and Collins (1980) gave a more descriptive title of 'ordinal scaling'.

Methodology

If X_{nxp} be the data matrix, then $B = XX'$, which is the matrix of between - individual sum of squares and products. To get the co-ordinate matrix X from

B, simply carrying out of an eigenvector analysis of B is enough. If B is of rank k, where k <= n, then B will have k non-zero eigenvalues which can be arranged in order of magnitude so that $\lambda_1 \geq \lambda_2 \geq ...... \geq \lambda_k \geq 0$.

The corresponding eigenvectors of unit length can be denoted by $\{ c_i \}$. Scale these eigenvectors so that their sum of squares is equal to λ_i. This can be done by setting $f_i = \sqrt{\lambda_i} . c_i$ ....(iii).

Then the possible co-ordinate matrix X will be given by X = $(f_1, f_2, ...f_k)$ ....(iv).

Thus, we have got a configuration in k-dimensions. In other words, the co-ordinates of rth point or individual are given by the rth component of the $\{ f_i \}$.

(Ref. Chatfield & Collins (1980), pp.189-203)

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STATEMENT-1

REGION-WISE DISTRIBUTION OF PRIORITY SECTOR ADVANCES (BALANCE OUTSTANDING)

(In Rs.Crore)

	AGR.		SSI		OTHERS		TOTAL	
REGION/ SECTOR	JUNE 1985	MARCH 1990	JUNE 1985	MARCH 1990	JUNE 1985	MARCH 1990	JUNE 1985	MARCH 1990
NORTHERN	1676	3126	1490	3386	825	1416	3991	7928
	(20.73)	(18.47)	(20.68)	(21.20)	(18.17)	(16.46)	(20.13)	(19.11)
N-EASTERN	79	210	68	205	177	287	324	702
	(0.98)	(1.24)	(0.94)	(1.29)	(3.89)	(3.34)	(1.63)	(1.69)
EASTERN	873	1819	795	1840	656	1447	2324	5106
	(10.8)	(10.75)	(11.03)	(11.52)	(14.45)	(16.82)	(11.72)	(12.31)
CENTRAL	1331	2762	884	2062	802	1588	3017	6412
	(16.47)	(16.32)	(12.27)	(12.91)	(17.66)	(18.47)	(15.21)	(15.45)
WESTERN	1215	2586	1867	4153	845	1340	3927	8079
	(15.03)	(15.28)	(25.91)	(26.01)	(18.62)	(15.58)	(19.81)	(19.47)
SOUTHERN	2909	6425	2103	4322	1235	2523	6247	13270
	(35.99)	(37.95)	(29.18)	(27.06)	(27.21)	(29.33)	(31.5)	(31.98)
ALL-INDIA	8082	16928	7208	15969	4540	8600	19830	41497
	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)

Note : i) Figures in brackets represent percentage to total All-India figure.

ii) All India total may not tally because of rounding off.

iii) A crore is 10 million.

STATEMENT-2

REGION-WISE DISTRIBUTION OF PRIORITY SECTOR ADVANCES (No. of Accounts)

(in Thousand)

	AGR.		SSI		OTHERS		TOTAL	
REGION/ SECTOR	JUNE 1985	MARCH 1990	JUNE 1985	MARCH 1990	JUNE 1985	MARCH 1990	JUNE 1985	MARCH 1990
NORTHERN	1579	2276	231	363	735	1210	2545	3849
	(10.35)	(10.23)	(14.84)	(12.99)	(11.41)	(10.33)	(10.94)	(10.47)
N-EASTERN	304	418	39	101	139	289	482	808
	(1.99)	(1.88)	(2.50)	(3.63)	(2.16)	(2.47)	(2.07)	(2.20)
EASTERN	2490	3852	267	711	945	2351	3702	6914
	(16.32)	(17.31)	(17.13)	(25.48)	(14.67)	(20.06)	(15.92)	(18.80)
CENTRAL	2396	3453	298	529	1127	2122	3821	6104
	(15.71)	(15.52)	(19.12)	(18.96)	(17.49)	(18.10)	(16.43)	(16.60)
WESTERN	1720	2683	214	290	1026	1580	2960	4553
	(11.28)	(12.06)	(13.73)	(10.37)	(15.92)	(13.48)	(12.73)	(12.38)
SOUTHERN	6766	9572	510	798	2473	4169	9749	14539
	(44.36)	(43.01)	(32.69)	(28.58)	(38.37)	(35.57)	(41.91)	(39.54)
ALL-INDIA	15254	22253	1559	2791	6445	11720	23258	36764
	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)

Note: i) Figures in brackets represent percentage to total All-India figure.
ii) All-India total may not tally because of rounding off.

STATEMENT-3

SECTOR-WISE DISTRIBUTION OF PRIORITY SECTOR ADVANCES (BALANCE OUTSTANDING)

(in Rs. Crore)

	NORTHERN		N-EASTERN		EASTERN		CENTRAL	
SECTOR/ REGION	JUNE 1985	MARCH 1990	JUNE 1985	MARCH 1990	JUNE 1985	MARCH 1990	JUNE 1985	MARCH 1990
AGR.	1676	3126	79	210	873	1819	1331	2762
	(41.98)	(39.43)	(24.51)	(29.89)	(37.55)	(35.63)	(44.12)	(43.08)
SSI	1490	3386	68	205	795	1840	884	2062
	(37.34)	(42.71)	(20.9)	(29.25)	(34.22)	(36.04)	(29.31)	(32.16)
OTHERS	825	1416	177	287	656	1447	802	1588
	(20.67)	(17.86)	(54.59)	(40.86)	(28.23)	(28.33)	(26.57)	(24.77)
TOTAL	3991	7928	324	702	2324	5106	3017	6412
	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)

STATEMENT-3 (CONTD.)

	WESTERN		SOUTHERN		ALL INDIA	
SECTOR REGION	JUNE 1985	MARCH 1990	JUNE 1985	MARCH 1990	JUNE 1985	MARCH 1990
AGR.	1215	2586	2909	6425	8082	16928
	(30.93)	(32.01)	(46.56)	(48.42)	(40.76)	(40.79)
SSI	1867	4153	2103	4322	7208	15969
	(47.55)	(51.41)	(33.67)	(32.57)	(36.35)	(38.48)
OTHERS	845	1340	1235	2522	4540	8600
	(21.53)	(16.59)	(19.77)	(19.01)	(22.89)	(20.72)
TOTAL	3927	8079	6247	13269	19830	41497
	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)

Note :
i) Figures in brackets represent percentage share of Regions based on total figure.
ii) All India total may not tally because of rounding off.
iii) A crore is 10 million.

STATEMENT-4

SECTOR-WISE DISTRIBUTION OF PRIORITY SECTOR ADVANCES (No.of Accounts)

(in Thousand)

	NORTHERN		N-EASTERN		EASTERN		CENTRAL	
SECTOR/ REGION	JUNE 1985	MARCH 1990	JUNE 1985	MARCH 1990	JUNE 1985	MARCH 1990	JUNE 1985	MARCH 1990
AGR.	1579	2276	304	418	2490	3852	2396	3453
	(62.03)	(59.13)	(63.04)	(51.69)	(67.25)	(55.71)	(62.71)	(56.57)
SSI	231	363	39	101	267	711	298	529
	(9.09)	(9.42)	(8.1)	(12.54)	(7.21)	(10.29)	(7.8)	(8.67)
OTHERS	735	1210	139	289	945	2350	1127	2122
	(28.88)	(31.45)	(28.87)	(35.77)	(25.53)	(34)	(29.49)	(34.76)
TOTAL	2545	3849	482	808	3702	6913	3821	6104
	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)

STATEMENT-4 (CONTD.)

	WESTERN		SOUTHERN		ALL-INDIA	
SECTOR/ REGION	JUNE 1985	MARCH 1990	JUNE 1985	MARCH 1990	JUNE 1985	MARCH 1990
AGR.	1720	2683	6766	9572	15254	22253
	(58.11)	(58.94)	(69.41)	(65.84)	(65.59)	(60.53)
SSI	214	290	510	798	1559	2791
	(7.23)	(6.36)	(5.23)	(5.49)	(6.70)	(7.59)
OTHERS	1026	1580	2473	4169	6445	11720
	(34.66)	(34.70)	(25.37)	(28.67)	(27.71)	(31.88)
TOTAL	2960	4553	9749	14539	23258	36764
	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)

Note: i) Figures in brackets represent percentage to total All-India figure.
ii) All-India total may not tally because of rounding off.

STATEMENT - 5

SECTOR-WISE DISTRIBUTION OF PRIORITY SECTOR ADVANCES AS A PERCENTAGE OF TOTAL BANK CREDIT

	AGR.		S.S.I.		OTHERS		TOTAL	
REGION	1985	1990	1985	1990	1985	1990	1985	1990
NORTHERN	16.42	17.71	14.61	19.19	8.09	8.02	39.12	44.92
N-EASTERN	16.34	21.40	13.93	20.94	36.39	29.26	66.66	71.60
EASTERN	14.97	14.27	13.64	14.44	11.25	11.35	39.86	40.06
CENTRAL	30.45	25.61	20.23	19.12	18.33	14.72	69.01	59.45
WESTERN	7.81	9.09	12.01	14.61	5.45	4.71	25.27	28.41
SOUTHERN	23.95	23.40	17.32	15.74	10.17	9.19	51.44	48.33
ALL-INDIA	16.64	17.27	14.84	16.29	9.34	8.76	40.82	42.32

Note : i) RRBs are excluded from total bank credit outstandings.
ii) Region-wise total credit has been estimated on the basis of BSR and Sec.42(2) data.

STATEMENT - 6

SECTOR-WISE DISTRIBUTION OF AMOUNT PER A/C

(Rs.Thousand)

	AGRICULTURE		S.S.I.		OTHERS		TOTAL	
	JUNE 1985	MARCH 1990	JUNE 1985	MARCH 1990	JUNE 1985	MARCH 1990	JUNE 1985	MARCH 1990
NORTHERN	10.61	13.74 (29.50)	64.44	93.42 (44.97)	11.22	11.70 (4.28)	15.68	20.60 (31.38)
N-EASTERN	2.61	5.02 (92.34)	17.36	20.27 (16.76)	12.71	9.93 (-21.87)	6.72	8.69 (29.32)
EASTERN	3.50	4.72 (34.86)	29.79	25.88 (-13.13)	6.94	6.15 (-11.38)	6.28	7.39 (17.68)
CENTRAL	5.56	8.00 (43.88)	29.67	38.96 (31.31)	7.11	7.49 (5.34)	7.90	10.51 (33.04)
WESTERN	7.06	9.64 (36.54)	87.26	143.46 (64.41)	8.24	8.48 (2.91)	13.27	17.75 (33.76)
SOUTHERN	4.30	6.71 (56.05)	41.27	54.19 (31.31)	5.00	6.05 (21.00)	6.41	9.13 (42.43)
ALL-INDIA	5.30	7.61 (43.58)	46.24	57.21 (23.72)	7.04	7.34 (4.26)	8.53	11.29 (32.36)

Note : Figures in brackets indicate growth rate in 1990 over 1985.

STATEMENT-7

PER CAPITA OUTSTANDING IN PRIORITY SECTOR (in Rs.)

	AS ON JUNE 1985				AS ON MARCH 1990			
REGION	AGR.	SSI	OTHERS	TOTAL	AGR.	SSI	OTHERS	TOTAL
NORTHERN	186.36	165.76	91.77	443.90	308.90	334.61	139.90	783.41
N-EASTERN	26.73	22.78	59.52	109.03	62.82	61.47	85.89	210.18
EASTERN	53.24	48.52	40.02	141.78	100.68	101.85	80.06	282.59
CENTRAL	75.00	49.82	45.16	169.97	140.35	104.78	80.69	325.83
WESTERN	113.73	174.84	79.16	367.73	222.54	357.42	115.31	695.27
SOUTHERN	163.03	117.88	69.24	350.15	331.18	222.79	130.02	683.99
ALL-INDIA	108.31	96.59	60.84	265.74	205.86	194.20	104.58	504.65

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BOOK REVIEWS

Background papers: Report on the Measurement of International Capital Flows, International Monetary Fund, December 1992, pp.97, Price US $ 19.50

The International Monetary Fund constituted a senior-level Working Party under the Chairmanship of Baron Jean Godeaux in December 1989 to evaluate statistical practices relating to the measurement of international capital flows in general and to identify the principal sources of discrepancies in the major components of capital account in global balance of payments statistics with a view to minimising these discrepancies over time. The volume under review contains a number of background papers prepared as research input to the Report on Capital Flows released recently by the Fund. As John F. Wilson has already given a brilliant overview of the background papers in his preface, the reviewer has adopted an eclectic approach in the sense that the review is basically issue-specific.

The additional data on capital flow reported on the questionnaire received from 48 out of 69 recipient countries with other data furnished to the Statistics Department of the Fund represent the most comprehensive set of data on this topic ever furnished by the countries themselves. The additional capital flow details such as additional information on reinvested earnings may help the Fund in detecting misclassification, in closing gaps in the data and correcting arithmetic errors. The Working Party, however, ought to have perhaps laid more emphasis on getting detailed data on short-term capital flows which are often considered to be particularly inaccurate. This has assumed special significance in the context of build-up of huge flows of hot money which are basically short-term capital. This also reflects the problems of getting separate data on trade credits when exchange records are the basic data source or of obtaining satisfactory response from questionnaire in terms of coverage and reliability. The paramount need for accurate short-term capital flow data to assess the 'basic balance' is too obvious to need any reiteration for its analytic implication.

The paper on "U.S. Direct Investment Flows with Selected Caribbean OFCs" describes rather succinctly the conventions relating to capital flow measurement with offshore financial centers. The Report on Capital Flows has itself delineated that the main reason for excess outflow is the reinvestment of earnings of multinational enterprises which are not treated as direct foreign investment. Needless to point out that these earnings need to be reported by both the host country and the investing country. The persistent discrepancy in this regard may also perhaps be attributed to valuation problem. As balance of payments transactions are put through in terms of a number of currencies, the contributors could have perhaps explored the feasibility for a universal unit of account to facilitate inter-country comparisons and permit aggregation on a regional or global basis. Transactions, in principle, ought to be converted at the exchange rate applicable at the time the contract was made rather than legal change of ownership of financial assets as prescribed by Balance of Payments Manual (Fourth Edition). In countries, with the multiple exchange rates in vogue, transactions relating to balance of payments ought to be theoretically converted at the notional unitary rate that would apply if all the transactions were channeled through an uncontrolled market. This would result in the exclusion from the balance of payments, the tax and subsidy transactions between residents that are implicit in the multiple exchange rate scheme. The benefit of hindsight suggests that the actual basis for currency conversion is more often than not different from those theoretical principles. Information at times may not be available and some average of the exchange rates in the accounting period often has to be used. This explains at least partially the discrepancy between inflows and outflows of capital.

The contribution by Russ Krueger is really a masterpiece in the sense that it unravels the formidable problems the emergence of financial innovations have posed for measurement of capital flows. The statistical system currently in vogue is not good enough to capture the impact of these financial innovations on the measurement of capital flows.

The concept of basic balance is as analytically useful as current account balance to rectify external imbalances. The basic balance reflects the long-run balance of payments position by placing below the line the transactions that are expected to be reversed in the short-run. As the short-term capital flows are generally expected to be unstable, long-term capital flows are placed above the line apart from the items clubbed under the current account.

The paper on "Data Sources used by National Compilers" by Niel Patterson and the subsequent paper focus on data sources and compilation systems currently in vogue in selected developed economies such as Australia, Belgium, Canada, France, Germany, Italy, Japan, the Netherlands, Switzerland, the United Kingdom and the United States. As is inevitable, sources and compilation system vary considerably across countries for important components of balance of payments such as direct investment, portfolio investment and non-bank capital flows.

The second section of the volume under review has dealt with direct investment capital flows. Direct investment is defined as "investment that is made to acquire a lasting interest in an enterprise operating in the economy other than that of investor, the investor's purpose being to have a effective voice in the management of the enterprise (the Balance of Payments Manual, p.136)". The Report on Capital Flows submitted by the Working Party has brought out the sharpness of the problem emanating from the unrecorded international capital flows that constitute the international underground economy. Direct investment is only a component of the capital account which recorded outflows that have consistently outstripped inflows during 1986-89 period. The excess outflow averaged U.S. $ 17 billion a year during the period. Neil Patterson in his paper on "Bilateral Comparison of Direct Investment Data" has attributed bilateral discrepancies in data to differences between countries in definitions, classification as specific transaction may involve activity in several countries, instruments and currencies. This appeared to have weighed with the author to suggest the need for further study to fill up the data gaps on the effect of derivative on the balance of payments statistics.

The Paper on "Foreign Investment of Pension Funds in Six Countries" by Lorna M. Dailey and John Motala gives a synoptic view of operation of major class of institutional investors in Australia, the Netherlands, Canada, Japan, the United Kingdom and the United States. The Working Party has underscored the need for close monitoring of reporting by these organisations to overcome statistical discrepancies in the compilation of inflows and outflows of capital. The contribution by Stephen P. Taylor delves into interconnection between the banking data and the balance of payments figures. It was perhaps apposite for the author to look into the problems associated with the reconciliation of the balance of payments data for international reserves resulting from different exchange rate conversions in the two sources. John F. Wilson in his paper on "Physical Currency Movements and Capital Flows" has dealt with the relation of currency movements to the balance of payments accounts. Interestingly, the startling finding is that foreign demand for several physical currencies has been rising reflecting, albeit implicitly, that unmeasured capital flows into the countries of currencies issued" (p.35).

None of the contributors have looked into the causes and magnitude of unrecorded international capital flows constituting the international underground economy. It would have perhaps enabled the Working Party a better insight into the problems associated with the discrepancy in global inflows and outflows of capital. It goes without saying that capital flight increases the flow demand for unauthorised foreign exchange. Indian economy, for instance, witnessed sizeable outflow of capital during the eighties. Rishi and Boyce (1990) have estimated that during 1971-86, the capital flight amounted to $ 21.1 billion. The authors have also estimated that the exodus of capital averaged $ 2 billion per annum during the eighties. In other words, the cumulative sum of capital flight during the seventies and eighties amounted to about $ 30 billion and more than $ 42 billion with interest adjustments. Notwithstanding this, the background papers prepared for the Working Party are illuminating, stimulating and thought-provoking. They must be read by every serious student of balance of payments analytics in particular and international finance in general.

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The economics of development has by now been recognized as a subject which encompasses almost every aspect of human life. It is not restricted to economic growth; it is rather concerned with the processes of human development. Keeping an eye on such a vast canvas of development, the World Bank has devoted the World Development Report 1993, the sixteenth in the annual series, to "Investing in Health", a subject which is pertinent for developing countries and has indeed rightly followed the Bank's Development Reports on environment, and on poverty.

As is common in other streams of development studies, there are various popular misconceptions about the studies related to health. People, more often than not, over-estimate the effect of the medical system in improving the health situations. However, it is by now well established that at least before the second half of this century, medical facilities had a rather limited role in the improvement of the longevity of human population. Improvements in food supply due to changes in agricultural technology, introduction of new crop varieties in various countries, access to safer drinking water, improvements in sanitation habits, favourable changes in the eco-system (for example, the micro-organism which used to cause plague almost got eliminated from the world due to an ecological change) etc. played a very crucial role in improving the health profile of the world population till the first half of this century. These issues still remain relevant for shaping the longevity of the human population. But during the last four decades, medical science has advanced a great deal and more importantly, medical facilities have reached a much larger proportion of the population. Notwithstanding Facoult's description of a clinic, which, in fact, is not totally irrelevant even in these days, particularly in developing countries, there has been an enormous movement away from the traditional to modern medical outfit during the second half of the twentieth century. As mentioned above, the state of public health is a function of various factors and medical facilities is only one, although very crucial, of these factors. The World Development Report 1993, has rightly emphasized the need for an overall improvement of the condition and facilities of human living as the ultimate goal of any sensible health policy.

The World Development Report 1993, has carried out three intensive tasks. First, it has categorised the world into eight regions and has traced the improvement in health standards of these regions since 1950. Secondly, the report highlights the achievements as well as failures of the health policies, particularly in the developing countries, during this period. It has also projected the challenges which health policy has to face in developing countries in the days to come. Thirdly, the report analyzes the reasons behind various failures of the health policies of the developing countries. In the background of this, the report recommends various ways in which these countries can improve their health policy and thus achieve better health standards.

The report unequivocally shows that there has been a marked change in the demographic profile of the developing countries during the last four decades. In this period, life expectancy in these countries has increased from 40 years in 1950 to 63 years in 1990. Infant mortality has decreased from 28 to 10 per cent. Small pox which was a major killer disease till 1950s has become almost extinct by 1990. The incidence of many other diseases has also decreased considerably during this period. These changes have been effected by improvements in various sectors, the most crucial being increases in the level of income and education in the developing countries. Along with these, there is also due recognition of the role of technological improvements in the health sector and expansion of health related services in making these achievements possible.

However, the developing countries have no reason to be complacent about their achievements because there still exists a very large gulf between the health standards of the developing and the developed world. Infant mortality and death of the mother during child delivery are very high in the developing countries. The report estimates that if the developing countries could achieve the levels of child mortality of the developed countries, then 11 million fewer children would have died in the developing countries. The toll of various preventable diseases still continues to be large in the developing countries. For example, India's situation in this respect is quite alarming. In the report India is ranked seventh out of the 8 regions of the world, ahead only of Sub-Saharan Africa.

The report has also drawn attention towards major drawbacks of the health policy, and essentially public policy, in the developing countries. The report reckons that the single largest factor behind the poor health standards in the developing countries is the misallocation of medical expenditure. A disproportionately large chunk of this expenditure goes for the treatment of specific diseases like cancer, heart ailment, etc. At the same time, the basic health facilities like immunization, removal of mal-nutrition, prevention of contagious diseases, supply of safe drinking water etc. get the backseat. The poorer sections of the developing countries are most susceptible to illness and premature death. Thus, in order to raise the overall health standards in the developing countries, it is essential to improve the living conditions of the large chunk of population. But, as mentioned before, the neglect of basic health facilities in the public health policy perpetuates the vulnerability of the economically poorer group and acts as a stumbling block against equalization of health standards of developing and the developed world. The report also points out some other weaknesses of the present public expenditure policy in the developing countries for the health sector. Lack of competition in the provision of various basic health services imparts inefficiency in health care system and results in low standards of the service provided. Lack of incentives for the workers discharging public health services also results in poor standards of health services.

From the standpoint of medical insurance the poorest sections of the population in the developing countries constitute a very high risk group. But they lack the resources to pay high premium for medical insurance. This results in insurance market failure in the developing countries. On the other hand, fee-for-service, third party medical insurance, results in overtreatment of the richer sections in the developing countries. Similar situations have resulted in rapid escalation of medical expenditure in the middle-income countries.

In the background of notable success and crucial failures of the health policies in the developing countries, the report has proposed an "agenda for action". The Bank urges developing country governments to adopt growth - oriented policies which improve the economic situation of the households. This would also provide cure to the problem of malnutrition and would enable the households to maintain better standard of health and hygiene. Secondly, a redirection of the existing health spending in the developing countries is to be brought about on a priority basis. Public health expenditure in the developing countries which makes up 50 per cent of the total yearly health expenditure of US $ 168 billion should provide cost-effective facilities. Instead of providing specialized treatment for diseases like cancer, heart ailment (which mainly cater to the need of the relatively rich), public health expenditure should provide basic clinical, medical, and other health facilities (e.g. access to safe drinking water, education, especially to the women as mothers shape the health policy of the households, etc.). The subsidised clinical treatments should be aimed at diseases that cause widespread early death or disability. The governments should ensure the provision of two basic packages of public health improvements and basic clinical services. The former include vaccination of children in the developing countries against the main diseases and providing vitamin and iron supplements to protect them against malnutrition, campaigns for reducing levels of smoking and school-based health services. The basic clinical services should concentrate on facilities for better care during pregnancy, control of tuberculosis and sexually transmitted diseases and care for common diseases like diarrohea and measles. Thirdly, the report encourages developing country governments to promote diversity and competition in the funding and delivery of health services. Within strict government regulation, private sector should also be allowed to play its beneficial role. Further, disseminating health-related information is also a very crucial duty of the government.

Despite its genuine concern towards health standards of developing countries and, especially of the poorer section of their population, the report has missed out certain very crucial aspects of the problem. The report asks for reorientation of the public health policy to benefit the poor and the rural people. It argues that presently the public expenditure on account of health are biased towards the rich and the urban people through subsidised care in hospitals and subsidised health insurance policies (Pg.69-70). It has, therefore, proposed a reorientation of policy. However, such a reorientation is not an easy task and the report in fact admits this point (Pg.170-71). As a result, the recommendations of the report within the present socio-economic conditions of the developing countries, though appealing, would turn out to be non-feasible. The report does not suggest any mechanisms to overcome this problem.

Secondly, the report has estimated that a package consisting of minimum elements of essential clinical and public health intervention measures will cost $ 12 per capita per year in low-income countries. Whereas the present level of such spending is $ 6 per capita per year (Pg.10-11 & 65). Thus, the report calls for doubling of public expenditure on health in the low income countries. The mobilization of additional resources to such a vast extent will prove to be a major hindrance towards the adoption of such a package. The present trends of resource mobilization by the governments in the low income countries do not make one hopeful about such a doubling of expenditure on public health. The possibility of increased aid from developed countries to cover the shortfall also appears bleak, because rather than increasing, the proportion of health aid to total aid has decreased over the eighties. In 1990, it accounted for only 2.5 per cent of health spending of the developing countries (Pg.165-67).

Thirdly, the estimates of future health expenditures of the developing countries in the report are based on the present trends of prices. However, if the successful completion of Uruguay Round of GATT talks results in more stringent patent laws for developing countries, then the expenditure on drugs will increase very sharply in the near future. This in turn will upset the calculations of the report and would necessitate a much larger expenditure to be incurred on health in the developing countries.

Last but not the least, the report, though talks of cost-effective health measures, has failed to notice the effectiveness of various indigenous health measures widely practiced in the developing countries. Many of these measures like naturalopathy, biochemic treatment, ayurvedic treatment, acupuncture, yoga, etc. can prove to be very cost-efficient for the purpose of medical care in the developing countries. Further research and practical application of these policies can simultaneously reduce the health expenditures and improve the health conditions in the developing countries.

Despite these shortcomings, the World Development Report 1993 is informative, well researched and a very useful document on health economics. That the World Bank is the best resource-endowed development agency for carrying out research in this area is evident from the coverage of health related information in the report. The developing country governments could derive considerable benefit from this report while formulating their public health policies.

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