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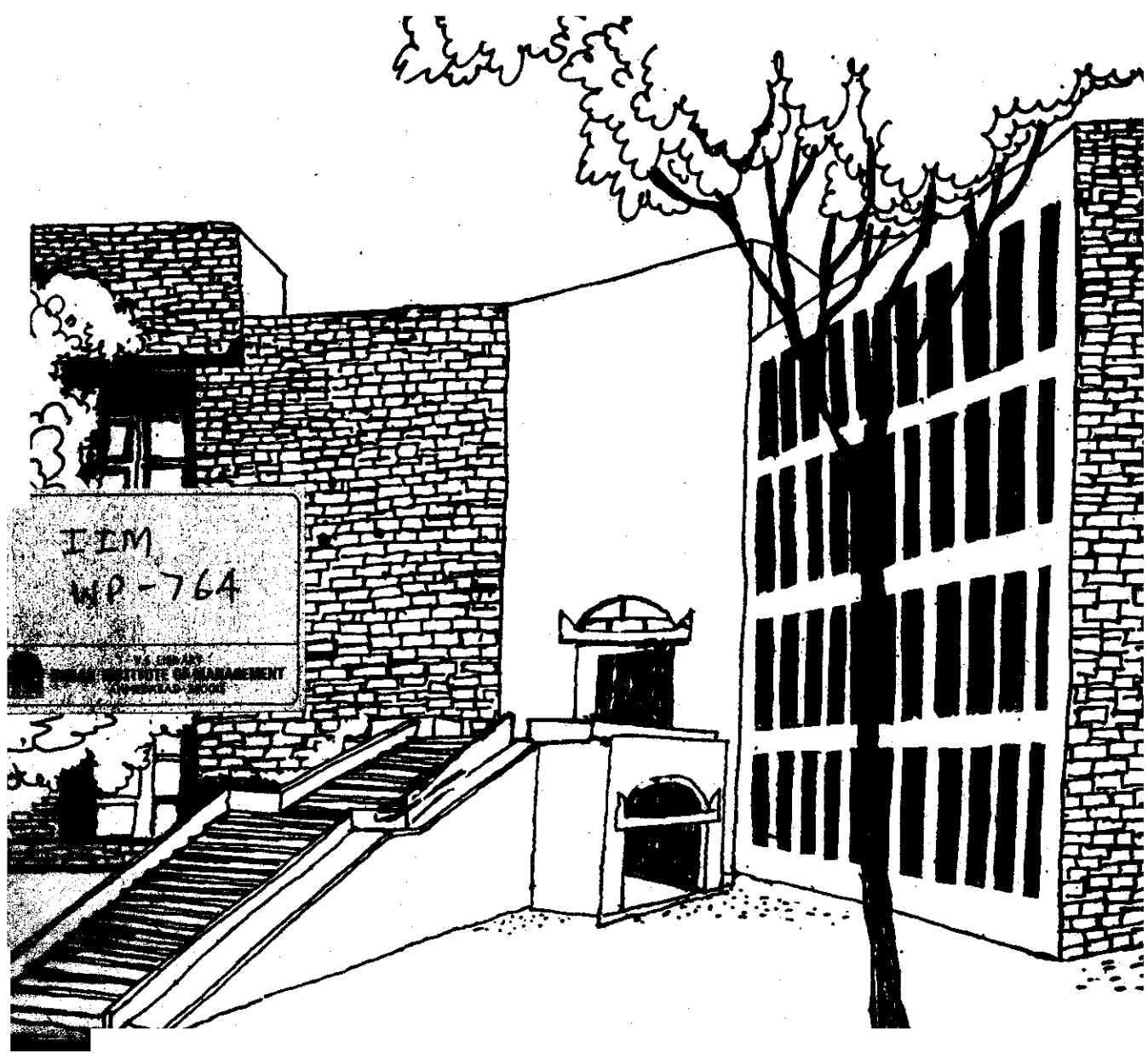
FINANCIAL RATIO PATTERNS IN INDIAN
MANUFACTURING COMPANIES:
A MULTIVARIATE ANALYSIS

By

I.M. Pandey

&

Ramesh Bhat

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ABSTRACT

The objectives of the study were : (a) to present Indian evidence on empirical- based classification of financial ratios, and (b) to examine the intertemporal stability/change of classification of ratios so obtained for the 20 year period of 1965-66 to 1984-85. The study used data of 612 Indian companies belonging to 61 manufacturing and processing industries. The statistical methods employed included factor analysis, differential R factor analysis, correlation and percentage mean absolute deviations.

The study has obtained elevan factors: (1) return on investment, (2) sales efficiency, (3) equity intensiveness, (4) short-tern liquidity, (5) current assest intensiveness, (6) cash position, (7) activity, (8) earnings appropriation, (9) financial structure, (10) interest coverage, and (11) long-term capitalisation. Thus it was indicated that there were multiple dimensions of financial phenomena traditionally grouped under liquidity, profitability, activity, and leverage. It was also shown that financial ratio patterns were reasonably stable over years.

Finance and Accounting Area   I.M.PANDEY
Indian Institute of Management   RAMESH BHAT
Ahmedabad 380 015 INDIA

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INTRODUCTION

Financial ratios are most frequently and widely used in practice to assess a firm's financial performance and condition. Over past several years, researchers have, however, subjected financial ratios to empirical analysis to find their other uses. The research focus in empirical studies has been mostly on ascertaining the predictive power of financial ratios. The predictive power of financial ratios has been investigated in the following areas: (a) corporate bankruptcy/sickness by Altman (1968, 1984), Beaver (1966), Blum (1974), Lincoln (1984), Ohlson (1980) and Wilcox (1973) in the U.S.A., and Gupta (1983), Kaveri (1980) and Yadav (1986) in India; (b) bond ratings by Horrigan (1966), Pinches and Mingo (1973), and Pogue and Soldofsky (1969); (c) acquisition/merger targets by Dietrich and Sorensen (1984), Rege (1984), Simkowitz and Monroe (1971), and Stevens (1973); and (d) relationship of financial ratios to industry targets by Frecka and Lee (1983) and Lev (1969). In these and other related studies a large number of ratios have been reported as important. A decision-maker will find it unwieldy and unmanagable to use all ratios for obtaining information for the decision at hand. In fact, a number of ratios overlap with each other, and therefore, same common information can be obtained by using any one of the overlapping ratios. Therefore, pertinent questions to answer are: (i) how can one narrow down the set of financial ratios

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without much loss of relevant and significant information which the decision-maker requires for his decision? and (ii) how can one determine the groups of overlapping ratios?

A number of ad hoc classifications of financial ratios exist in practice. For example, one most commonly used classification of financial ratios is: (1) liquidity, (2) activity, (3) leverage, and (4) profitability. It is not known if this sort of classification is capable of capturing all financial dimensions, and whether ratios in each category represent actual correlation structures. Therefore, an attempt is required to determine empirically the interrelationships between and among financial ratios in order to discern few groups of financial ratios containing the maximum amount of information. Some studies have been conducted in the U.S.A. in this direction with fair degree of success. In the Indian context, however, there is no systematic and comprehensive study on this subject, although some scanty evidence on classification of ratios is available in the sickness prediction studies involving small sample sizes pertaining to one period. The purpose of this study, therefore, is to present Indian evidence on empirical based classification of financial ratios using a large sample of Indian manufacturing and processing companies. It is also purported to examine the intertemporal stability/change of classification of ratios so obtained over the 20 year period of 1965-66 to 1984-85.

METHODOLOGY AND DATA

In this study we have employed factor analysis to identify independent groups of financial ratios. Factor analysis is a multivariate statistical technique which helps to classify variables into a few factors that retain maximum amount of information contained in the original data set. The correlation of an original variable with a factor is indicated by factor loading. Principal component analysis of factor analysis produces factor patterns of financial ratios by employing financial ratios as variables and firms as cases. The preliminary results of principal component analysis have been rotated using varimax method to obtain more structured financial patterns. The number of factors to be extracted has been determined by requiring that eigenvalues for all factors to be greater than 1.

We have factor analysed data matrices for five years, viz. 1965-66, 1969-70, 1979-80, 1983-84 and 1984-85 to produce patterns of financial ratios for each of the five years. We have used the following four methods to determine the intertemporal stability and change of financial patterns between 1965-66 and 1984-85:

* The correlation coefficients of factor loadings between pairs of years are obtained.

* The percentage mean absolute deviations are calculated using the following formula:

$$P_{t,b} = \frac{\sum |AFL(t) - AFL(b)|/n}{\sum AFL(b)/n} \times 100$$

where AFL is absolute value of factor loading, n is number of ratios, b is the base year, t is the current year and p is the mean of absolute percentage change.

* Differential R factor analysis is employed. This technique measures positional change between two time periods.

* Trend analysis based on significance tests of differences in means of financial ratios between 1965-66 and 1984-85 is performed.

Our data source was the Reserve Bank of India (RBI) data tape which provided us data for 793 companies having financial information for all 20 years from 1965-66 to 1984-85. For this study, we have confined our analysis to only those companies which belonged to manufacturing and processing industries and for which sales data were available. Thus we were left with 612 companies in 61 manufacturing and processing industries (see Annexure 1) for which 114 financial ratios were calculated using 57 financial variables generated from 34 financial items. The definitions of financial variables and items as used in this study are given respectively in Annexures 2 and 3. The computed ratios are listed in Annexure 4.

A frequent problem which researchers generally face in such studies is the presence of extreme observations in the data set which may possibly render results less meaningful (Foster 1986). In order to guard against outliers, we have set the value of a ratio equal to -99 or +99 in case it was below -99 or exceeded +99 respectively. Unlike some studies which have mostly log transformed ratios, we have not performed any transformation.

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Yet another problem may be that of the meaningful interpretati of some of ratios where numerator or denominator or both may ha negative values(Foster 1986). For example, interpretation return on equity becomes difficult if net worth is negative. have set such ratios equal to zero.

A survey of sources of financial ratios in India and empiric studies in India and the U.S.A. was made to select ratios used this study. In India the common sources of financial ratios ar (a) ICICI's studies on Financial Performance of Compani published annually since 1972. These studies compute 35 rati covering only those companies which are included in the ICICI portfolio; (b) RBI's study entitled, Selected Financial and Oth Ratios: Private Corporate Sector, 1975-76 to 1978-79 published 1982. In this study 30 ratios have been computed for 17 companies in 53 industries. RBI also conducts company finan studies and publishes them in the RBI Bulletin from time to tim and (c) the Bombay Stock Exchange (BSE) publishes financial da and ratios for individual companies in the Bombay Stock Exchan Directory. Coverage of the BSE studies is quite wide and 25 mai ratios are calculated for a 10-year period for each company.

In recent years, a few empirical studies have been conducted i India to examine the ability of financial ratios in predictin sickness. Gupta (1983) has used 52 ratios in his study. In ye another study, Yadav (1986) has used 36 ratios. Kaveri (1980 focussing his study on the borrower's health in small and medium size enterprises has employed 22 studies. In the U.S.A. context

Chen and Shimreda (1981) have reported that 66 different financial ratios were used in the prediction studies with reference to corporate bankruptcy, bond rating, market return, mergers and beta. They have also reported that 34 financial ratios were found to be useful in seven well known studies about prediction of the firm failure.

It may be noted that definitions of financial variables used to calculate ratios in various studies at times differ from each other. In the Indian context, for example, there is difference between definitions of a number of financial variables used in studies by the ICICI, the RBI and Gupta and in this study. Annexure 5 shows a comparison of definitions of financial variables common in these studies. These differences should be kept in mind while comparing the financial ratios and results of those studies.

Apart from the prediction studies, researchers in the U.S.A. have attempted to determine empirical-based classification of financial ratios using factor analysis. The most prominent study is by Pinches, Mingo and Caruthers (1973) who classified 48 ratios for 221 industrial firms into seven factors using information from factor loadings. Results obtained by Pinches, Mingo and Caruthers (1973), Pinches, Eubank, Mingo, and Caruthers (1975), Gombola and Ketz (1983) and Johnson (1979) suggested that meaningful empirically based classification of financial ratios could be identified. These studies have also provided evidence in support of the cross-section and intertemporal stability of the composition of financial ratio groups. Chen and Shimerda

(1981), after providing a reconciliation of various studies in
the U.S.A.(excluding those by Johnson and Gombola and Ketz), have
obtained conclusions similar to those obtained by Pinches, Mingo
and Caruthers(1973).

In this study we have attempted to identify meaningful
independent financial ratio groups using Indian data. Based on
the results of earlier U.S. and Indian studies and on economic
reasoning, we have calculated 114 ratios for 612 industrial
firms. Those ratios which were either used in a very few studies
or were not found important and those ratios used in earlier
studies but for which we could not find an economic justification
were excluded in this study. Annexure 4 gives the list of ratios
calculated in this study and indicates those which were also used
in other studies. Annexure 6 provides list of ratios which were
used in other studies but were excluded in this study.

EMPIRICAL RESULTS

Financial Patterns

Table 1 presents factors, financial ratios and rotated factor
loadings for financial ratios that loaded at 0.70 or greater in
any of five years, viz. 1965-66, 1969-70, 1979-80, 1983-84 or
1984-85. A loading of 0.70 was selected as it explained at least
50 per cent common variation. It may be noted that the numbering
of factors in Table 1 does not represent any relative importance
of factors since factor analysis does not provide any ranking.
Total number of factors obtained in each of five years was

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respectiely 19 (1965-66), 20 (1969-70), 20 (1979-80), 22(1983-84)
and 20 (1984-85). After a screening, we have reported final
eleven factors in Table 1. Factors were screened as follows: (i)
factors containing less than three variables were not considered
(Thurstone 1947); (ii) factors present only in one year and not
in others were dropped for analysis; and (iii) factors which
could not be interpreted in any meaningful manner were not
reported. The eleven factors obtained in this study are named as
follows: (1) return on investment, (2) sales efficiency, (3)
equity intensiveness, (4) short-term liquidity, (5) current asset
intensiveness, (6) cash position, (7) activity, (8) earnings
appropriation, (9) financial structure, (10) interest coverage,
and (11) long-term capitalization. These eleven factors explain
more than two-thirds of information contained in the original
financial ratio matrix in most of years as given below:

PERCENTAGE VARIATION EXPLAINED BY FACTORS

Year	% Variation Explained
1965-66	71.4
1969-70	69.0
1979-80	70.7
1983-84	64.8
1984-85	75.6

Analysis of Table 1 indicates that factors one, two, three, ten
and eleven – return on investment, sales efficiency, equity
intensiveness, interest coverage, and long-term capitalization –
are quite consistent as factor loadings for two-thirds or more
ratios are greater than 0.70 in at least three years and factors

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seven and nine – activity and financial structure – are least consistent. Financial ratios with highest loadings with respective factors in all years are as follows:

. FINANCIAL RATIOS WITH HIGHEST LOADINGS IN RESPECTIVE FACTORS

	Factor	Financial Ratio
1	Return on investment	1. PBDIT/TTA
2	Sales efficiency	2. PAT/NS
3	Equity intensiveness	3. RCF/TNW *
4	Short-term liquidity	4. QA/FEXP
5	Current asset intensiveness	5. INV/CA
6	Cash position	6. CASH/CL
7	Activity	7. INV/COP
8	Earnings appropriation	8. DIV/PBT
9	Financial structure	9. TL/TTA
10	Interest coverage	10. PBIT/INT
11	Long-term capitalization	11. LD/TK

* Two other ratios with almost same loadings are NCF/TNW and PAT/TNW

Further analysis of Table 1 reveals that the eleven factors exhibit a little similarity with the traditional classification of ratios, viz. liquidity, activity, profitability and leverage. An empirically-based classification of ratios, such as obtained in this study, is more comprehensive and reliable than any ad hoc classification. For example, in place of one classification of liquidity ratios, we have obtained three factors discribing different dimensions of a firm's liquidity position. These factors are: short-term liquidity, current asset intensiveness and cash position. Similarly, in this study, four factors capture the financial dimensions commonly classified under leverage ratios. They are financial structure (comprising both long-term and short-term relationships), interest coverage, long-term capitalization and equity intensiveness. Furthermore, three

factors — return on investment, sales efficiency and equity intensiveness — are obtained in place of single traditional classification of profitability ratios. We have also obtained a factor which we have described as activity. However, it may be noted that some of the ratios traditionally categorised under activity ratios are included under the sales efficiency factor. In this study a separate factor — earnings appropriation — has also been isolated. Thus an important insight from this study is that ratios grouped traditionally have different correlation structures in reality. Given below is the list of most commonly used financial ratios under the traditional classification with factor names to which they are assigned in this study and the number of years in which factor loadings were greater than 0.70.

LIST OF TRADITIONAL RATIOS ASSIGNED TO FACTORS IN THIS STUDY

Traditional groups of ratios	Factor(s) to which ratio assigned in this study	Years where loading >.70
Liquidity Ratios		
1. CA/CL	Financial structure	1
2. QA/CL	Current Asset Intensiveness	0
Activity Ratios		
3. TTA/NS	Sales Efficiency/Activity	4/1
4. CA/NS	Sales Efficiency/Activity	2/2
5. REC/NS	Short-term Liquidity	2
6. INV/NS	Short-term Liquidity/Activity	1/2
Profitability Ratios		
7. PAT/NS	Sales Efficiency	4
8. PBIT/NS	Sales Efficiency	4
9. PAT/TTA	Return on Investment	5
10. PBIT/TTA	Return on Investment	5
11. PAT/TNW	Equity Intensiveness	5
12. RE/TNW	Equity Intensiveness	1
Capital Structure Ratios		
13. TD/TNW	Equity Intensiveness	5
14. PBIT/INT	Interest Coverage	3

As contrasted to the Indian evidence as revealed in this study, studies by Pinches, Mingo and Caruthers (PMC) (1973) and Pinches, Eubank, Mingo and Caruthers (PEMC) (1975) in the U.S.A. have found seven factors, viz. (1) return on investment, (2) capital intensiveness, (3) inventory intensiveness, (4) financial leverage, (5) receivable intensiveness, (6) short-term liquidity, and (7) cash position. In an early study, Pinches and Mingo (1973) have obtained a slightly different group of factors. Financial ratios with highest loading with the seven factors were: (i) net income/net worth, (ii) sales/total assets, (iii) inventory/sales, (iv) debt/total capital, (v) receivables/inventory, (vi) current asset/current liabilities, and (vii) cash/fund expenditure. A study by Johnson (1979) confirmed results of the PMC and PEMC studies except that he obtained one more factor based on decomposition measure. Further, in their studies Stevens (1973) and Libby (1975) arrived at different sets of factors than PMC and PEMC. Chen and Shimerda (CS) (1981) have provided a reconciliation of factors reported in the above referred studies and have concluded that financial ratios can be grouped and represented by the seven common factors as defined in the PMC and PEMC studies. They have also shown that financial ratios (34 in number) found useful in predictive studies on bankruptcy in the U.S.A. can be assigned by one of these seven factors. Financial patterns in our study do not entirely confirm to those of the PMC and PEMC studies and the CS reconciliation. As shown below, we have obtained two factors - interest coverage and earnings appropriation - not found in the PMC/PEMC/CS studies. Also, financial ratios grouped under the

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return on investment factor in the PMC/PEMC studies have been assigned by three factors - return on investment, sales efficiency and equity intensiveness in our study. Similarly, capital intensiveness and financial leverage factors have been assigned by two factors each in our study. On the other hand, the current assets intensiveness factor in this study has been assigned by two factors - inventory intensiveness and receivables intensiveness in the PMC/PEMC studies.

COMPARISON OF THIS STUDY WITH PMC/PEMC/CS STUDIES

PMC/PEMC/CS Studies	This Study
* Return on investment	* Return on investment * Sales efficiency * Equity intensiveness
* Capital intensiveness	* Sales efficiency * Activity
* Inventory intensiveness * Receivables intensiveness	* Current asset intensiveness
* Short-term liquidity	* Short-term liquidity
* Cash position	* Cash position
* Financial leverage	* Financial structure * Long-term Capitalization * Interest coverage * Earnings appropriation

Inter-temporal Stability of Financial Patterns

As discussed earlier, we have used three statistical methods to examine the intertemporal stability of financial ratio patterns. Table 2 provides correlation coefficients of factor loadings in each factor for the pairs of years, viz., 1965-66 with 1969-70:

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1965-66 with 1979-80; 1965-66 with 1983-84; 1965-66 with 1984-85; 1969-70 with 1979-80; 1969-70 with 1983-84; 1969-70 with 1984-85; 1979-80 with 1983-84; 1979-80 with 1984-85; and 1983-84 with 1984-85. A study of correlation coefficients in Table 2 indicates that factors one, three and nine – return on investment, equity intensiveness and financial structure – are reasonably stable across the period 1965-66 to 1984-85. On the contrary, factors four and seven – short-term liquidity and activity – are least stable. Factors two, five, six, eight, ten and eleven – sales efficiency, current asset intensiveness, cash position, earnings appropriation, interest coverage and long-term capitalization do not reveal any discernible pattern as correlation coefficients are negative in some periods while positive in others. A note of caution may be sounded, however. The use of correlation coefficient results for assessing the intertemporal stability of financial patterns is afflicted by at least three limitations: First, the number of observations (factor loadings of ratios) could be very low to provide any meaningful interpretation of correlation coefficients. For example, in this study factors six, eight and eleven have less than six observations each. Second, the correlation results do not account for the magnitudes of factor loadings. Low factor loadings in a year can have strong co-movement with high factor loadings in another year resulting in a high correlation coefficient. For instance, factor six in 1970 has low factor loadings as compared to factor loadings in 1984. Third, signs of factor loadings has no intrinsic meanings, and in no way should it be used to assess the

magnitude of relationship between a variable and the factor (Kim and Mueller, 1978). However, the correlation coefficients will be affected by signs of factor loadings. It thus becomes difficult to meaningfully interpret stability of financial 'patterns when signs of correlation coefficients are different across various periods.

An alternate method which overcomes problems of signs and magnitudes of factor loadings is the percentage of mean of absolute deviations to mean of absolute values of factor loadings. Table 3 contains these results. Examination of results reveal that factors one, three and nine — return on investment, equity intensiveness and financial structure — were quite stable while factor two — sales efficiency — exhibited some degree of stability. Other factors did not show any discernible pattern.

Trends in Financial Patterns

In order to obtain a better insight into the stability/change of financial patterns between 1965-66 and 1984-85, a trend analysis and a differential R factor analysis were conducted. Table 4 presents means of financial ratios for five periods and t statistics for differences of means between the periods 1965-66 and 1984-85. The following is revealed from the table:

* an increasing dependence on both short and long term debt financing;

* no significant change in the use of internal finance;

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* declining asset efficiency, but not statistically significant;

* declining profitability in relation to sales, shareholder's' equity and total investment, whose impact has been deepened by the increasing interest burden;

* declining inventory and cash position;

* increasing receivables being more than compensated by increasing suppliers' credit resulting into increasing use of net credit.

Differential R factor analysis has been used as it help in examining the involvement of firms in the stability/change of financial patterns. High differential R factor loadings of financial ratios in a factor implies that the stability/change in financial patterns is related to a wide spectrum of firms. On the contrary, low factor loadings signify that firms differ in their contribution to the stability/change pattern. In this study we have employed differential R factor analysis on the "differential financial ratio matrix" which was obtained by taking the difference in financial ratios in 1965-66 and 1984-85. Our results show the following:

* a consistent downward trend in factors one, two, three and six - return on investment, sales efficiency, equity intensiveness and cash position across most of the firms;

* a consistently stable earnings appropriation (i.e. payout and retention);

* a consistent upward trend in the use of long-term debt financing across almost all firms;

* short-term bank borrowings showed a tendency of upward trend but not widespread across all firms;

* inventory and receivables exhibited different trends - inventory a declining trend (but not widespread) while receivables an increasing trend.

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CONCLUDING REMARKS

The objective of this study was two fold: (i) to identify groups of financial ratios based on empirical relationships between and among financial ratios using a large sample of industrial firms in India; and (ii) to examine the intertemporal stability and trend in the financial patterns so identified over the period 1965-66 to 1984-85. Employing factor analysis, we obtained eleven factors: (1) return on investment, (2) sales efficiency, (3) equity intensiveness, (4) short-term liquidity, (5) current asset intensiveness, (6) cash position, (7) activity, (8) earnings appropriation, (9) financial structure, (10) interest coverage, and (11) long-term capitalization. These eleven factors occured for each of five years examined - 1965-66, 1969-70, 1979-80, 1983-84 and 1984-85. Thus the Indian evidence is that ratios traditionally grouped under the liquidity, profitability, activity and leverage categories in fact have different correlation structures. Return on investment, sales efficiency, equity intensiveness, interest coverage and long-term capitalization factors were found consistent across all years while activity and financial structure factors were least consistent. Tests of stability indicated that return on investment, equity intensiveness and financial structure and to some extent, sales efficiency were stable over years. Differential R factor analysis and trend analysis showed downward trend in return on investment, sales efficiency, equity intensiveness and cash position and upward trend in the use of

debt and suppliers credit and receivables across almost all firms. Inventory showed declining trend and the use of short-term bank borrowing an increasing trend without the widespread involvement of firms. Earnings appropriation factor remained stable over years.

In sum, our results indicate that there are multiple dimensions of financial phenomena generally referred to as liquidity, profitability, activity and leverage. Studies using financial ratios as variables may take cognizance of this evidence. It is also revealed that financial ratio patterns show some amount of stability over time. It should be noted that in contrast to eleven factors obtained in this study, the U.S. studies have generally isolated seven factors. Also, those studies have found a higher degree of intertemporal stability in financial ratio patterns.

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TABLE 1

Financial Ratios and Factor Loadings Defining Eleven Financial
Patterns of Indian Manufacturing and Processing Companies

Financial Ratio	1984-85	1983-84	1979-80	1969-70	1965-66

Factor 1:Return on Investment

	1984-85	1983-84	1979-80	1969-70	1965-66
OCF/TTA	.9554	.9262*	.8829	.9036	.8192*
NCF/TTA	.9168	.8928	.8912	.9008	.8363*
OCF/CL	.8159	.8119	.7131	.6023	.5217***
NCF/CL	.8375	.8324	.7344	.6179	.5657***
NCF/TL	.8499	.8152	.7601	.7038	.7584*
OCF/TL	.8686	.8328	.7692	.7091	.5119**
TK/NS	.9469	.9109	.8865	.8917	.8540*
OP/TTA	.9343	.9126	.9204	.4591	.8497**
NOP/TTA	.8890	.8590	.8768	.4823	.8472**
PBT/TTA	.9076	.8706	.8848	.8726	.9377*
PAT/TTA	.9042	.8728	.8970	.8866	.8645*
ERN/QA	.7051	.5068	.4158	.4080	.3729
ERN/TL	.8823	.8760	.8011	.7486	.5369**
OCF/GK	.8041	.4709	.8177	.8883	.8479**
NCF/GK	.8303	.4429	.8452	.8939	.8934**
PBDIT/TTA	.9619	.9382	.9287	.8932	.9349*
PBDIT/CE	.7381	.6341	.8801	.8939	.9223**
PBDIT/GTTA	.9444	.9106	.9119	.8922	.9484*
PBIT/GTTA	.9289	.8803	.9031	.8857	.9514*
PAT-NOSD/TTA	.8834	.8562	.8784	.4350	.7631**
PBIT/TTA	.9540	.9187	.9227	.8839	.9480*
PBIT/CE	.6940	.6025	.8800	.8842	.9264***
RCF/TTA	.9051	.8769	.8581	.8897	.7778*
ERN/CE	.6702	.5632	.7879	.8854	.8622***
OP/CE	.6746	.6359	.8759	.4149	.8177
NOP/CE	.5517	.4425	.8312	.4864	.8209
PBT/CE	.5665	.4161	.8523	.8757	.9139***
PAT-NOSD/CE	.5253	.4062	.7725	.4591	.7664

Factor 2:Sales Efficency

	1984-85	1983-84	1979-80	1969-70	1965-66
OCF/NS	.9946	.6928	.3320	.9345	-.5503
NCF/NS	.9948	.9133	-.2372	.9377	-.7773**
TNW/NS	-.7775	.8252	-.6992	-.6783	.8183**
CA/NS	-.9409	-.2672	.9644	-.6783	.6448
NFA/NS	-.7408	-.2983	.9484	-.2695	.6448
TK/NS	-.7574	.6624	.7343	-.8636	.9461**
INV/NS	-.9508	-.2228	.9643	-.8328	.9394**
QA/NS	-.7519	-.2198	.6366	-.3256	.5449
CASH/NS	-.9765	-.0529	.6855	-.0713	.7270
CE/NS	-.7252	.2774	.9415	-.0300	.7377
				-.7920	.9767 **

TABLE 1 ----(Contd.)

Financial Ratios and Factor Loadings Defining Eleven Financial
Patterns of Indian Manufacturing and Processing Companies

Financial Ratio	1984-85	1983-84	1979-80	1969-70	1965-66
ERN/NS	.9960	.8252	.2595	.9332	-.8218**
OP/NS	.9942	.8342	.2208	.7621	-.8966**
NOP/NS	.9910	.9304	-.2577	.8216	-.9356**
PBT/NS	.9926	.9269	-.2475	.9316	-.8735**
PAT/NS	.9950	.9231	-.2760	.9360	-.8929**
INT/NS	-.9182	-.8091	.8704	-.6879	.8741**
PBDIT/NS	.9911	.6750	.2197	.9304	-.5362
PAT-NOSD/NS	.9941	.9250	-.2905	.8839	-.9579**
GVA/NS	.9677	.3904	.4752	.3773	-.2754
PBIT/NS	.9948	.8151	.2143	.9292	.8001**
STBB/NS	-.0735	-.8405	.8890	-.1069	.3964
PBT/GVA	-.0074	.8507	-.0644	.0178	-.5819
TTA/NS	-.6568	-.0319	.9841	-.8028	.9365***
TK/NS	-.6118	-.4263	.9864	-.9634	.9383***
GFA/NS	-.6197	-.4183	.9027	-.9722	.9448***
SC/NS	-.3745	-.2776	.7720	-.6270	.6867
REC-SC/NS	.4047	.1908	-.7063	.5443	-.6603

Factor 3: Equity Intensiveness

	1984-85	1983-84	1979-80	1969-70	1965-66
OCF/TNW	.8531	.9710	-.9658	-.8308	-.9785*
NCF/TNW	-.9702	-.9841	-.9866	-.9678	-.9790*
LTD/TNW	.8944	.7151	-.0216	.8473	.0546***
TD/TNW	.8581	.7511	-.7355	.9334	.7853*
TL/TNW	.7859	.6405	-.5195	.9360	.9049***
CL/TNW	.8101	.4822	-.4250	.9065	.8297***
ERN/TNW	.7936	.8047	-.9765	-.8212	-.9800*
PAT/TNW	-.9820	-.9761	-.9833	-.9642	-.9792*
PAT-NOSD/TNW	-.9829	-.9764	-.9813	.4501	-.9804**
RCF/TNW	-.9702	-.9842	-.9870	-.9697	-.9818*
OCF/TK	.0074	.0494	-.9895	-.0272	-.9579
NCF/TK	.0018	-.0077	-.9893	-.0334	-.9593
RE/TNW	.0146	-.0149	-.9891	-.0759	.0160
ERN/TK	.0094	.0095	-.9982	-.0195	-.9613
TTA/TK	.0041	-.0165	-.9893	-.0261	-.9620

Factor 4: Short-term Liquidity

	1984-85	1983-84	1979-80	1969-70	1965-66
QA-CL/FEXP	-.9426	.9677	-.0125	-.0583	-.8090***
QUICK INTERVAL	.9576	-.9192	.9230	-.7894	.1810**
REC/NS	.8603	-.3083	.8952	-.0785	.2261
QA/FEXP	.9842	-.9763	.9252	-.7966	.1856**
NQA/FEXP	-.9426	-.9677	-.0125	-.0583	-.8090***
INV/CA	-.0703	.0091	-.7635	.2895	.2714

TABLE 1 ----(Contd.)

Financial Ratios and Factor Loadings Defining Eleven Financial Patterns of Indian Manufacturing and Processing Companies

Financial Ratio	1984-85	1983-84	1979-80	1969-70	1965-66
QA/NS	.5369	-.2740	.7134	-.7271	-.8080***
QA/TTA	.0897	-.0330	.7787	-.2977	-.1595
CASH/TTA	-.0315	.0187	.1321	-.6958	-.0710
CASH/NS	-.0003	-.0276	.0879	-.9667	-.8692
CASH/FEXP	.1372	-.5188	.2746	-.9642	-.7777
INV/COP	.6305	.1687	-.1325	-.0116	.7470
INV/NS	.1265	-.1397	-.0431	-.0049	.7000

FACTOR 5: Current Assets Intensiveness

	1984-85	1983-84	1979-80	1969-70	1965-66
REC/INV	-.8237	-.3426	-.0960	.8220	.7129**
INV/CA	.9245	.8603	.3156	-.7991	-.7744**
QA/TTA	-.7589	-.8259	-.2392	.7596	.7438**
QA/CL	-.6774	-.6865	-.2322	.5051	.5121
REC/NS	-.3139	-.7942	-.0569	.8019	.8055**
QA/NS	-.2079	-.7540	-.0591	.5579	.3855
RE/PBT	-.0361	-.0376	-.0991	-.0029	-.8498
INV/QA	.6339	.6009	.8564	-.5675	-.5993
ERN/QA	.1460	.1573	.7484	-.0892	-.3111

Factor 6: Cash Position

	1984-85	1983-84	1979-80	1969-70	1965-66
CASH/CL	.8530	-.8422	.8431	-.0109	-.8680**
CASH/TTA	.8984	-.9017	.9235	-.0576	-.6365**
CASH/FEXP	.8953	-.7828	.8306	.0060	-.5007**
CASH/NS	.1550	-.8640	-.0470	-.0075	-.2010
WC/INV	.0975	-.0449	-.0155	-.0415	-.7011
LTD/TTA	-.0270	-.0032	.0280	.8185	-.0310

Factor 7: Activity

	1984-85	1983-84	1979-80	1969-70	1965-66
CA/NS	.2353	.7941	.0147	.7779	-.0573
INV/COP	.2495	.1664	-.8832	.8642	-.1526
INV/NS	.2329	.7924	.0120	.8279	-.0676
TTA/NS	.7330	.2461	.0033	.4336	.0007
GK/NS	.7516	.2324	.0205	.1519	-.0079
GFA/NS	.7534	.0093	.0230	.0678	.0040
SC/NS	.7754	.0936	-.0780	.3687	.4708
REC-SC/NS	-.7789	.0322	.1073	-.1056	-.5000
SC/CA	.3439	-.1769	.0342	-.1154	.8253

Factor 8: Earnings Appropriation

	1984-85	1983-84	1979-80	1969-70	1965-66
DIV/PBT	-.9705	.9610	-.7779	-.1019	.8013**

TABLE   1 ---- (Concld.)

Financial Ratios and Factor Loadings Defining Eleven Financial Patterns of Indian Manufacturing and Processing Companies

Financial Ratio	1984-85	1983-84	1979-80	1969-70	1965-66
RE/PBT	-.9686	-.9105	.1878	-.0093	-.8498***
PBIT/PBT	.0472	.8065	-.2490	-.7408	.0474
RE/TTA	.0306	.0195	-.7757	-.7353	.1023
SW/GVA	-.8955	-.0209	.2868	.0167	-.0258

Factor 9: Financial Structure

CA/CL	-.2140	-.1823	-.6906	-.8557	-.2583
WC/INV	-.4237	-.0291	-.8099	-.7852	-.0444
TNW/CE	-.3204	-.2219	-.7750	-.4794	-.7502
WC/TTA	-.6264	-.3854	-.8306	-.8436	-.2092
TL/TTA	.7712	.6470	.8261	.5679	.8042***
CL/TTA	.6617	.5088	.7921	.6143	.2381
FBC/TTA	.7661	.6177	.6790	.4245	.6967
STBB/INV	.6188	.1001	.6758	.6482	.1178
TBB/TTA	.7000	.6374	.6754	.5734	.3073
TNW/TTA	-.4533	-.5611	-.6867	-.5835	-.7984
LTD/TK	.1025	.0957	.2110	.0809	.7312

Factor 10: Interest Coverage

PBIT/INT	.8736	-.8846	.8611	.1095	-.6927***
OCF/INT	.8762	-.8675	.8496	.0641	-.6659***
INT/TB	-.2744	.4185	-.2201	.8034	.0477

Factor 11: Long-term Capitalisation

OCF/TK	-.9655	.6504	.0015	-.9342	.0207
NCF/TK	-.9868	.9820	-.0126	-.9458	.0077***
LTD/TK	.8999	-.9341	.6923	.8957	-.1044***
ERN/TK	-.9784	.9630	.0009	-.9466	.0079***
PAT/TK	-.9888	.9904	-.0134	-.9530	-.0033***
STBB/INV	-.0084	-.8635	-.0327	-.0671	.7370
TNW/TTA	-.0569	.0750	.8177	-.0945	-.2209

Note: *** indicates factor loadings greater than 0.7 in three year
      ** indicates factor loadings greater than 0.7 in two years
      * indicates factor loadings greater than 0.7 in one year

TABLE 2

Correlation Coefficients of Financial Patterns of Indian Manufacturing and Processing Companies

Pair of Years	Factor										
	1	2	3	4	5	6	7	8	9	10	11
1985:1984	0.890	0.723	0.991	-0.421	0.886	-0.757	-0.030	0.295	0.921	-1.000	-0.926
1985:1980	0.374	-0.637	0.571	0.605	0.754	0.982	-0.032	-0.411	0.979	1.000	0.743
1985:1970	0.362	0.913	0.528	-0.344	-0.945	-0.549	0.132	-0.988	0.961	-0.999	0.999
1985:1966	0.110	-0.840	0.601	0.538	-0.843	-0.639	0.518	0.091	0.752	-0.999	0.055
1984:1980	0.389	-0.757	0.480	-0.461	0.765	-0.663	0.063	-0.598	0.887	-1.000	-0.500
1984:1970	0.195	0.699	0.447	0.378	-0.950	0.636	0.773	-0.370	0.844	0.998	-0.915
1984:1966	0.034	-0.684	0.510	-0.050	-0.867	0.322	-0.361	0.892	0.828	1.000	-0.407
1980:1970	0.440	-0.662	0.688	-0.535	-0.793	-0.404	-0.535	0.530	0.982	-0.998	0.745
1980:1966	0.822	0.712	0.704	-0.053	-0.614	-0.603	0.123	-0.722	0.788	-1.000	-0.529
1970:1966	0.514	-0.881	0.782	0.428	0.919	0.723	-0.243	-0.176	0.697	0.996	0.030

TABLE 3

Percentage of Mean of Absolute Deviation to Mean of Absolute Values of
Factor Loadings for Indian Manufacturing and Processing Companies

Current Year	Base Year	Factor										
		1	2	3	4	5	6	7	8	9	10	11
1985	1984	10.19	57.90	11.81	36.14	33.49	26.52	178.81	63.02	47.33	7.55	22.96
1985	1980	11.31	72.55	55.01	78.22	133.00	10.83	420.50	111.07	29.00	4.82	310.89
1985	1970	20.89	35.26	12.68	117.13	65.09	378.66	125.10	255.92	35.31	215.46	4.96
1985	1966	18.89	37.52	42.31	79.48	37.30	45.10	178.86	67.32	73.93	43.96	505.26
1984	1980	15.49	88.04	47.37	98.98	154.38	35.05	227.72	109.13	47.91	12.43	341.38
1984	1970	23.27	38.54	21.43	99.50	23.00	438.11	400.22	158.73	49.13	200.92	25.18
1984	1966	23.57	35.38	42.75	77.76	36.18	65.35	165.10	58.40	50.91	54.34	420.87
1980	1970	15.82	61.48	85.96	77.19	87.48	358.71	69.43	103.11	24.04	216.99	97.42
1980	1966	8.75	43.89	16.30	114.41	76.92	50.51	116.97	99.67	96.15	37.27	175.14
1970	1966	15.87	23.87	46.45	82.33	25.17	121.55	193.67	157.36	96.65	138.05	483.48

TABLE 4

Differential R Factor Loadings and Mean Values with t-statistics

Financial Ratio	dR	1984-85	1983-84	1979-80	1969-70	1965-66	t-Value (1965-1985)
Factor 1: Return on Investment							
OCF/TTA	.9068	.0883	.0979	.1320	.0876	.0965	-1.34
NCF/NS	.8774	.0248	.0368	.0819	.0550	.0706	-6.50
OCF/CL	.6240	.2132	.2227	.2691	.2769	.2773	-3.73
NCF/CL	.6488	.1000	.1131	.1819	.1976	.2093	-6.52
NCF/TL	.6075	.1542	.1657	.2204	.1989	.2015	-6.68
OCF/TL	.6055	.0744	.0861	.1497	.1469	.1577	-3.83
ERN/TTA	.9228	.0464	.0568	.0966	.0434	.0540	-1.27
OP/TTA	.8676	.0566	.0706	.1399	.1073	.1076	-7.66
NOP/TTA	.8391	-.0069	.0100	.0898	.0747	.0817	-11.52
PBT/TTA	.9164	.0013	.0169	.0942	.0473	.0718	-8.41
PAT/TTA	.8848	-.0171	-.0043	.0464	.0108	.0282	-6.83
ERN/CE	.7340	.0643	.0679	.1501	.0474	.0723	-.70
OP/CE	.7051	.0823	.0949	.2158	.1443	.1524	-5.40
ERN/QA	.5110	.2155	.3451	.8238	.2772	.6014	-3.20
ERN/TL	.6252	.0906	.1011	.1611	.1122	.1125	-1.88
OCF/GK	.8537	.0619	.0725	.0973	.0494	.0589	.48
NCF/GK	.8523	.1013	.1133	.1300	.0890	.0991	.35
PBDIT/TTA	.9373	.1052	.1178	.1778	.1230	.1392	-4.51
PBDIT/CE	.8184	.1596	.1682	.2750	.1554	.1916	-2.41
PBDIT/GTTA	.9345	.0821	.0918	.1312	.0941	.1093	-4.84
PBIT/GTTA	.9342	.0535	.0631	.1075	.0637	.0776	-4.38
PAT-NOSD/TTA	.7861	-.0253	-.0116	-.0420	.0383	.0381	-10.13
PBIT/TTA	.9465	.0648	.0780	.1444	.0799	.0977	-4.44
PBIT/CE	.7893	.0955	.1045	.2246	.0991	.1383	-3.12
RCF/TTA	.8576	.0150	.0262	.0650	.0354	.0487	-5.67
NOP/CE	.5732	-.0283	-.0222	.1330	.1017	.1193	-8.35
PBT/CE	.6453	-.0151	-.0126	.1418	.0564	.1051	-6.62
PAT-NOSD/CE	.4964	-.0595	-.0588	.0585	.0500	.0533	-7.11
Factor 2: Sales Efficiency							
OCF/NS	-.9924	-.0266	.0853	.0985	.0389	.0950	-1.25
NCF/NS	-.9913	-.1139	.0205	.0554	.0002	.0505	-1.47
TNW/NS	.7374	.5588	.2227	.2272	.4274	.7199	-0.73
CA/NS	.8873	.6234	.5476	.5371	.6218	.7510	-1.29
INVT/NS	.9036	.4123	.3434	.3628	.3696	.4819	-0.89
QA/NS	.6500	.2177	.2015	.1718	.2014	.2001	1.02
CASH/NS	.3402	.0461	.0373	.0342	.0262	.0508	-0.35
ERN/NS	-.9932	-.0939	.0447	.0697	-.0079	.0262	-1.03

Table 4 contd.

Financial Ratio	dR	1984-85	1983-84	1979-80	1969-70	1965-66	t-Value (1965-1985)
OP/NS	-.9908	.0602	.0546	.0995	.0973	.0870	-1.69
NOP/NS	-.9849	-.1475	-.0102	.0564	.0586	.0425	-1.85
PBT/NS	-.9856	.1409	-.0029	.0595	-.0151	.0212	-1.51
PAT/NS	-.9903	-.1812	-.0201	.0266	-.0466	-.0183	-1.23
INT/NS	.8878	.0873	.0648	.0431	.0387	.0450	2.61
PBDIT/NS	-.9876	.1021	.1013	.1292	.0692	.1331	-1.68
PAT-NOSD/NS	-.9899	-.1877	-.0273	.0235	.0271	.0031	-.1.50
GVA/NS	-.9645	.2280	.2756	.2940	.3154	.3402	-3.39
PBIT/NS	-.9901	.0536	.0619	.1026	.0236	.0636	-1.28
NFA/NS	.6217	.8373	.3842	.2843	.4822	.9742	-.50
TK/NS	.6593	.7981	.4357	-.3602	.6301	1.1333	-1.32
CE/NS	.6263	1.0805	.6835	.5816	.8855	1.4704	-1.44
STBB/NS	.0649	.2340	.1975	.1866	.2336	.3007	1.72
TTA/NS	.5687	1.507	1.0740	.9091	.1341	1.7647	-0.85
GK/NS	.5406	1.5987	1.0864	.9450	1.2586	1.7836	-0.59
GFA/NS	.5541	1.2777	.7430	.5822	.8890	1.3017	-.08
SC/NS	.3492	.3095	.2324	.1774	.1508	.1697	2.38
REC-SC/NS	-.3828	-.1443	-.0752	-.0478	-.0035	-.0398	-2.33
PBT/GVA	-.0125	-.3950	-.1754	.1636	-.0149	.0123	-2.05

Factor 3: Equity Intensiveness

Financial Ratio	dR	1984-85	1983-84	1979-80	1969-70	1965-66	t-Value (1965-1985)
OCF/TNW	.7044	.7021	-.5658	.6748	.1741	.1663	2.19
NCF/TNW	-.9337	-.3014	-.0583	.4198	.0316	.0831	-1.49
LTT/TNW	.9258	1.2466	.4757	.2677	.5182	.3217	2.63
TD/TNW	.9230	2.4311	2.0994	1.7433	1.5101	1.1322	3.36
TL/TNW	.8673	3.9569	3.7057	3.1414	2.2183	1.8208	4.76
CL/TNW	.8728	2.5372	1.7945	1.9755	1.5800	1.2703	2.90
ERN/TNW	.6112	.4618	.2825	.5443	.0498	.0519	1.95
PAT/TNW	-.9523	.4813	.2391	.2893	.0928	.0313	-1.72
PAT-NOSD/TNW	-.9603	-.5242	-.2685	.2741	.0946	.0192	-2.09
RCF/TNW	-.9337	-.3294	-.0886	.3757	-.0124	.0352	-1.42
OCF/TK	-.0679	.1635	.1671	.4979	.1263	.1324	.42
NCF/TK	-.0487	-.0344	-.1827	.3335	.0498	.0766	-1.06
RE/TNW	.1059	.0712	.0270	.2936	.0654	.0607	1.17
ERN/TK	-.0530	.0462	.0336	.4112	.0394	.0508	-.05
PAT/TK	-.0397	-.1517	-.3162	.2412	-.0371	-.0050	-1.20

Factor 4: Short-term Liquidity

Financial Ratio	dR	1984-85	1983-84	1979-80	1969-70	1965-66	t-Value (1965-1985)
QA-CL/FEXPDT	-.9307	-.5298	-.5089	-.3670	-.3418	-.4434	-0.70
QUICK INTERVAL	.9048	3.7527	3.7241	3.3431	3.9681	3.7844	-0.16
INV/COP	.5239	.3698	.4197	.3380	.4378	.4831	-5.11
REC/NS	.8527	.1652	.1572	.1297	.1473	.1300	3.52

Table 4 contd.

Financial Ratio	dR	1984-85	1983-84	1979-80	1969-70	1965-66	t-Value (1965-1985)
QA/FEXPDT	.9748	.2383	.2354	.1859	.2353	.2205	.58
NOP/FEXPDT	-.9307	-.5298	-.5089	-.3670	-.3418	-.4434	-0.90
INV/NS	.1297	.4123	.3434	.3628	.3696	.4819	-.89
INV/CA	-.0982	.6104	.6206	.6623	.5996	.6299	-1.98
QA/NS	.4964	.2177	.2015	.1718	.2014	.2001	1.02
CASH/TTA	.0269	.0363	.0385	.0371	.0338	.0315	1.56
CASH/NS	.0348	.0461	.0373	.0342	.0362	.0508	-.35
CASH/FEXPDT	.1286	.0378	.0396	.0349	.0453	.0527	-2.46
QA/TTA	.1004	.2162	.2189	.2064	.1956	.1613	7.90

Factor 5: Current Asset Intensiveness

INV/QA	-.5624	2.7251	3.1952	3.5666	4.3336	5.0519	-5.94
REC/INV	.7231	.6508	.6482	.4962	.5189	.5294	5.60
INV/CA	-.8553	.6104	.6206	.6623	.5996	.6299	-1.99
QA/TTA	.9296	.2162	.2169	.2064	.1956	.1613	7.90
QA/CL	.4179	.4147	.4124	.3918	.4963	.4322	-.85
REC/NS	.2740	.1652	.1572	.1297	.1473	.1300	3.52
QA/NS	.1939	.2177	.2015	.1718	.2014	.2001	1.02
ERN/QA	-.2172	.2155	.3451	.8238	.2772	.6014	-3.20
RE/PBT	.0097	.2054	.2465	.3911	.2175	.2607	-.71

Factor 6: Cash Position

WC/INV	-.6300	-.3046	.3456	.0403	.4169	.4904	-4.38
CASH/CL	-.9151	.0732	.0777	.0755	.1041	.1067	-2.56
CASH/TTA	-.7366	.0363	.0385	.0371	.0338	.0315	+1.56
CASH/FEXP	-.7165	.0378	.0396	.0349	.0453	.0527	-2.46
CASH/NS	-.2939	.0461	.0373	.0342	.0362	.0508	-.35
LTD/TTA	.0042	.1836	.1705	.1115	.1458	.1404	4.49

Factor 7: Activity

TTA/NS	.7806	1.5073	1.0740	.9091	1.1741	1.7647	-0.85
GK/NS	.7956	1.5987	1.0864	.9450	1.2586	1.7836	-0.59
GFA/NS	.7935	1.2777	.7430	.5822	.8890	1.3017	-0.68
SC/NS	.7680	.3095	.2324	.1774	.1508	.1697	2.38
REC-SC/NS	-.7900	-.1443	-.0752	-.0478	-.0035	-.0398	-2.33
CA/NS	.3254	.6234	.5476	.5371	.6218	.7510	-1.29
INV/COP	.2694	.3698	.4197	.3380	.4378	.4831	-5.11
INV/NS	.3021	.4123	.3434	.3629	.3696	.4819	-0.39
SC/CA	.3438	.4854	.4465	.3708	.3499	.2335	17.53

Table 4 contd.

Financial Ratio	dR	1984-85	1983-84	1979-80	1969-70	1965-66	t-Value (1965-1985)

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Factor 8: Earnings Appropriation

Financial Ratio	dR	1984-85	1983-84	1979-80	1969-70	1965-66	t-Value
DIV/PBT	.9728	.2768	.2546	.1591	.3147	.2410	-0.46
RE/PBT	-.9836	.2054	.2465	.3911	.2175	.2607	-0.71
PBIT/PBT	.1437	2.9162	3.0921	2.1567	2.7432	1.7975	2.52
RE/TTA	-.1161	.0303	.0288	.0314	.0269	.0250	-3.43
SW/GVA	.0013	.8083	.6074	.4912	.4899	.4690	2.04

Factor 9: Financial Structure

Financial Ratio	dR	1984-85	1983-84	1979-80	1969-70	1965-66	t-Value
TNW/TTA	-.5146	.2845	.2817	.3284	.3996	.4219	-14.85
WC/TTA	-.7855	-.0434	-.0152	.0301	.1412	.1230	-10.50
TL/TTA	.8184	.7836	.7597	.6906	.6054	.5722	11.01
CL/TTA	.8300	.5974	.5871	.5788	.4591	.4318	10.47
FBC/TTA	.7198	.4294	.4144	.3691	.4048	.3818	3.07
STBB/INV	.6866	.6212	.5755	.5467	.6356	.5909	0.75
TBB/TTA	.7582	.2281	.2173	.2244	.2247	.2063	1.97
CA/CL	-.4424	1.0526	1.0801	1.1503	1.4758	1.4429	-10.81
WC/INV	-.2356	-0.3046	.0403	.4169	.4904	-4.3800	-4.38
TNW/CE	-.3354	.2745	.2340	.4164	.5127	.5599	-10.50
LTD/TK	.0546	.4949	.7370	.2830	.2876	.2366	3.18

Factor 10: Interest Coverage

Financial Ratio	dR	1984-85	1983-84	1979-80	1969-70	1965-66	t-Value
PBIT/INT	.8911	3.1176	3.7842	6.2280	7.7327	8.5547	-6.07
OCF/INT	.8692	3.4289	3.7605	5.3179	7.1809	7.7782	-5.33
INT/TB	-.0178	.1596	.1561	.1486	.1097	.0851	11.62

Factor 11: Long-term Capitalisation

Financial Ratio	dR	1984-85	1983-84	1979-80	1969-70	1965-66	t-Value
OCF/TK	.9333	.1635	.1671	.4979	.1263	.1124	0.41
NCF/TK	.9737	-.0344	.1827	.3335	.0498	.0756	-1.06
LTD/TK	-.8356	.4949	.7370	.2830	.2876	.2366	3.18
ERN/TK	.9585	.0462	.0337	.4112	.0394	.0508	-0.05
PAT/TK	.9780	-.1517	-.3112	.4212	.0371	.0050	-1.20
TNW/TTA	.0780	.2845	.2817	.3284	.3996	.4219	-14.85
STBB/TTA	.0008	.2281	.2173	.2244	.2247	.2063	1.97

Note: dR indicates differential R factor loadings.

ANNEXURE 1

Industry Classification:Manufacturing and Processing Companies

Grains & pulses	2	Aluminium ware	
Edible vegetables &		Other ferrous/non-	
hydrogenated oils	6	ferrous metal products	1·
Sugar	33	Chemical fertilisers	(
Other food products	12	Dyes & dyestuffs	(
Cigarettes	3	Man-made fibres	(
Tobacco other than		Plastic raw materials	(
cigarettes		Other basic industrial	
Cotton spinning	53	chemicals	1]
Cotton weaving	1	Medicines & pharmaceutical	
Cotton composite	62	preparations	2[
Cotton others	5	Paints, varnishes & other	
Jute textiles	18	allied products	(
Silk & rayon spinning	4	Other chemical products	1[
Silk & rayon weaving	2	Matches	]
Woolen textiles	4	Miscellaneous	[
Ginning, pressing &		Mineral oils	]
other textile products	6	Cement (hydraulic)	1]
Breweries & distilla-		Asbestos & asbestos/	
ries	7	cement products	[
Leather & leather		Structural clay products	]
products	2	Pottery, china & earthen-	
Miscellaneous	7	ware (ceramics)	1
Iron & steel	1	Tyres and tubes	[
Aluminium	3	Other rubber products	]
Other non-ferrous		Paper	1[
metals (basic)	2	Products of pulp, paper &	
Automobile-vehicles	9	board	[
Automobile-components,		Wood products & furniture	
repairs, etc.	14	and fixtures	]
Railway equipment		Glass containers	]
Other transport		Other glass products	4
equipment	4	Printing	1
Cables	11	Publishing	1
Dry cells	2	Printing & publishing and	
Electric lamps	2	other allied activities	5
Other electrical		Plastic products	4
machinery, apparatus,		Miscellaneous	9
appliances, etc.	35		
Machine tools	4		
Textile machinery &			
accessories	6		
Misc. machinery (not			
elsewhere classified)	63		
Steel tubes & pipes	8		
Steel wire ropes	6		
Steel forgings	8		
Foundries & enginee-			
ring workshops others	6		

ANNEXURE 2

Definition of Financial Variables

Sr No	Ref Code	Variable	Variable Description
1.	SHC	Shareholders' Capital	Paid-up capital plus forfeited shares where paid-up capital includes ordinary, bonus and preference
2	TRS	Total Reserve and Surplus	Capital reserve plus premium on shares plus investment allowances plus sinking funds and other reserves and surplus
3	PC	Preference Capital	Preference paid-up capital
4	LTBB	Long-term Bank Borrowings	Borrowings from banks against debentures and others on long-term basis
5	STBB	Short-term Bank Borrowings	Bank borrowings which excludes long-term bank borrowings
6	TBB	Total Bank Borrowings	Short-term plus long-term bank borrowings
7	TD	Total Debt	Total borrowings from Indian and foreign financial institutions, government, banks and others such as public deposits
8	CL	Current Liabilities	Provision for tax plus other current provisions plus short-term bank borrowings, plus sundry creditors plus miscellaneous current liabilities which includes liabilities to subsidiaries and holding companies, deposits from customers, agents etc. and other trade dues and remaining current liabilities
9	LTD	Long-term Debt	Total borrowings excluding short-term bank borrowings and public deposits
10	MNCL	Miscellaneous Non-current Liabilities	Non-current liabilities not classified elsewhere

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11	TOL	Total Outside Liabilities	Total of current liabilities, long-term borrowings and miscellaneous non-current liabilities
12	FBC	Fixed-burden Capital	Sum of total debt and preference capital
13	INV	Inventories	Sum of raw material, components etc., work-in-progress, finished goods and spares and other inventories
14	REC	Receivables	Sundry debtors net of bad and doubtful provisions and other receivables
15	CASH	Total Cash and Bank Balance	Sum of fixed deposits with banks, other bank balances and cash in hand
16	LADP	Loans and Advances on Deferred Payments	Loans and advances on deferred payments
17	AIT	Advance Income Tax	Advance income tax
18	CA	Current Assets	Sum of inventories, receivables, loans and advances on deferred payments, total cash and bank balance and advance income tax
19	QA	Quick Assets	Sum of receivables and total cash and bank balance
20	NQA	Net Quick Assets	Quick assets less current liabilities
21	NC	Net Credit	Receivables less sundry creditors
22	GFA	Gross Fixed Assets	Sum of land, buildings, plant and machinery, capital work-in-progress, furniture, fixtures and office equipments and other fixed assets
23	NFA	Net Fixed Assets	Difference of gross fixed assets and accumulated depreciation/amortization

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24	IA	Intangible Assets	Intangible assets
25	IS	Industrial Securities	Investments in securities other than in the shares and debentures of subsidiary companies
26	TA	Total Assets	Sum of current assets, other loans and advances, net fixed assets, intangible assets and other non-current assets
27	WC	Working Capital	Difference between current assets and current liabilities
28	WCG	Working Capital Gap	Working capital plus short-term bank borrowings and public deposits
29	TNW	Tangible Net Worth	Sum of shareholders' capital and total reserve and surplus less intangible assets
30	LTK	Long-term Capitalization	Sum of tangible net worth and long-term debt
31	CE	Capital Employed	Sum of tangible net worth and total debt (long-term as well as short-term)
32	GK	Gross Capital	Sum of gross fixed assets and inventories
33	TTA	Total Tangible Assets	Total assets less intangible assets
34	GTTA	Gross Total Tangible Assets	Total tangible assets (TTA) plus accumulated depreciation (ADEP)
35	NFAIS	Net Fixed Assets Industrial Securities	Sum of net fixed assets and industrial securities
36	NS	Net Sales	Sales net of excise, rebate etc. (unadjusted for change in stocks)
37	NOSD	Non-operating Surplus/Deficit	Non-operating surplus/deficit excludes dividend, interest and rent received

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38	REV	Revenues	Sum of net sales adjusted for change in stocks, other incomes such as dividend, interest, and rent received and non-operating surplus and deficit
39	SW	Salaries and Wages	Salaries and wages
40	DEP	Depreciation	Annual amount of depreciation including amortization
41	PBDIT	Profit before Depreciation, Interest and Taxes	Revenues less all expenses except depreciation, interest and taxes
42	PBIT	Profit before Interest and Taxes	PBDIT less depreciation
43	PBT	Profit Before Tax	PBIT less interest paid
44	PFT	Provision for Tax	Provision for tax
45	PAT	Profit after Tax	PBT less PFT
46	DIV	Dividends	Profit distributed to share-holders
47	OP	Operating Profit	Profit before interest and tax less non-operating surplus/deficit
48	NOP	Net Operating Profit	Operating profit minus interest
49	ERN	Earnings	Profit after tax plus interest paid
50	NFE	Non-fund Expenditure	Sum of bad and doubtful debts, depreciation and provisions except for taxes
51	NCF	Net Cash Flows Operations	Profit after tax plus non-fund expenditures
52	OCF	Operating Cash Flows	Net cash flows from operations plus interest
53	FEXP	Fund Expenditure	All expenses except non-fund items (defined as NFE in 50)

54	RCF	Retained Cash Flows	Net cash flows from operations less dividends paid
55	NCI	Net Credit Interval	Net quick assets (QA-CL) per rupee of fund expenditure
56	QF	Quick Flow	Quick assets plus monthly sales per rupee of monthly fund expenditure
57	GVA	Gross Value Added	Sum of salaries and wages, rent, interest and operating profit and depreciation. Salaries and wages include bonus, provident fund, employee's welfare expenses and managerial remuneration

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Definition of Financial Items

1. CA = INV + REC + LADP + CASH + AIT
2. CL = PFT + OCP + STBB + CL + MCL
3. STBB = TBB - LTBB
4. WC = CA - CL
5. WCG = CA - (CL + STBB + PD)
6. QA = CA - INV - LADP - AIT
7. NQA = QA - CL - (PFT - AIT)
8. TNW = SHC + TRS - IA
9. TBB = STBB + LTBB
10. LTD = TD - STBB - PD
11. LTF = TNW + LTD
12. CE = TNW + TD
13. TOL = CL + TD + MNCL
14. FPC = TD + PC
15. GK = GFA + INV
16. TTA = TA - IA
17. GTTA = TTA + ADEP
18. NFAIS = NFA + IS
19. NFA = GFA - ADEP
20. OCF = NCF + INT = PAT + NFE + INT
21. NFE = BREC + DEP + OPROV
22. NCF = PAT + NFE
23. FEXP = REV - (PBIT + NFE)
24. OP = PBIT - NOSD
25. EARN = PAT + INT
26. PBDIT = PBIT + DEP
27. RCF = NCF - DIV
28. QF = [12xQA+NS]/FEXP = [(QA + NS/12)] / [FEXP/12]
29. NCI = (QA - CL)/FEXP
30. NC = REC - SC
31. NOP = OP - INT
32. PBT = PBIT - INT
33. PAT = PBT - PFT
34. GVA = SW + REN + OP + DEP

Note: Financial variables not defined elsewhere: OCP = Other current provisions; PD = Public deposits; BREC = Bad and doubtful provisions; OPROV = Other provisions except for taxes; and PC = Preference capital

FINANCIAL RATIOS COMPUTED IN THIS STUDY WITH INDICATION OF
  RATIOS ALSO USED IN OTHER STUDIES

Financial Ratio	ICICI	RBI	LCC	RAY	US Studies	BSE	JN
1. WC/NS			X	X	X		
2. OCF/TTA			X	X			X
3. NCF/TTA					X		X
4. OCF/TNW				X			X
5. NCF/TNW					X		X
6. OCF/LTD					X		X
7. NCF/LTD							X
8. OCF/NS	X		X	X			X
9. NCF/NS					X	X	
10. CA/CL	X	X	X	X	X	X	X
11. QA/CL	X		X	X	X	X	X
12. OCF/CL			X				
13. NCF/CL					X		
14. NQA/FEXP				X	X		
15. (QAx12+NS)/FEXP					X		
16. TNW/NS			X	X	X		X
17. TTA/NS		X	X	X	X	X	X
18. CA/NS		X	X	X	X		X
19. INV/COP					X		X
20. NFA/NS		X					
21. LTK/NS						X	X
22. INV/NS	X		X	X	X		X
23. INV/QA					X		
24. REC/INV							X
25. INV/CA							
26. REC/NS	X	X	X	X	X	X	X
27. WC/INV					X		X
28. QA/NS				X	X		X
29. CASH/CL				X	X		X
30. CASH/TTA				X	X		X
31. CASH/NS					X		X
32. QA/FEXP				X	X		X
33. CASH/FEXP				X			X
34. NQA/FEXP							X
35. GK/NS	X						
36. GFA/NS	X	X		X			
37. SC/NS	X	X	X				
38. SC/CA		X					
39. SC/WS		X					
40. STBK/NS			X				
41. NC/NS			X				
42. CE/NS							

	1	2	3	4	5	6	7	8
43. TNW/TTA		X			X		X	X
44. LTD/TTA				X	X			X
45. LTD/TNW	X		X	X	X			X
46. TNW/CE	X							
47. TD/TNW	X	X	X	X				
48. WC/TTA			X	X	X		X	X
49. CE/TTA				X	X			X
50. QA/TTA				X	X			X
51. LTD/LTK								X
52. TOL/TNW		X			X		X	X
53. TOL/TTA			X	X	X			X
54. RE/TTA			X		X			
55. RE/TNW	X							
56. CL/TNW					X			X
57. NCF/TOL					X			
58. OCF/TOL			X	X				X
59. CL/TTA			X	X	X			X
60. FEC/TTA								X
61. STBB/INV	X	X						
62. WCG/STBB		X	X					
63. TEE/TTA		X	X		X			
64. ERN/NS								X
65. OP/NS		X			X		X	
66. NOP/NS							X	
67. PBT/NS	X				X		X	
68. PAT/NS			X	X		X		
69. ERN/TNW								X
70. PAT/TNW	X		X	X	X			
71. ERN/TTA								X
72. OP/TTA		X						
73. NOP/TTA								
74. PBT/TTA					X			
75. PAT/TTA				X	X		X	
76. ERN/CE							X	
77. OP/CE		X						
78. NOP/CE								
79. PBT/CE	X		X		X			
80. PBIT/INT			X	X	X		X	
81. OCF/INT								
82. ERN/LTK							X	X
83. ERN/QA								
84. ERN/TOL				X				X
85. RE/PAT	X		X		X			
86. OCF/GK	X							
87. NCF/GK								
88. DIV/PBT	X							
89. RE/PBT	X				X			
90. INT/NS			X					

91. PBDIT/NS			X			
92. PBDIT/TTA			X			
93. PBDIT/CE						
94. PBDIT/GTTA			X			
95. PBIT/GTTA			X			
96. PAT-NOSD/TTA						
97. PAT-NOSD/TNW						
98. PAT-NOSD/CE						
99. PAT-NOSD/NS				X		
100. PAT/LTK						
101. TNW/NFAIS			X			
102. GVA/LTK	X					
103. GVA/NS	X					
104. SW/GVA	X					
105. DEP/GVA	X					
106. PBT/GVA	X					
107. GVA/TBP		X				
108. PBIT/PBT						
109. PBIT/NS	X	X	X	X	X	X
110. PBIT/TTA	X		X	X	X	X
111. PBIT/CE	X					
112. INT/TD						
113. RCF/TTA			X			
114. RCF/TNW						

Note: 1. Financial ratios used in other studies as indicated in this annexure are represented in terms of definitions in this study. List also includes those ratios which close to the ones used in this study.

2. Studies in this annexure refer to the following: Industrial Credit Corporation of India (ICICI);Reserve Bank of India (RBI); LC Gupta (LCG); RA Yadav (RAY); Bombay Stock Exchange (BSE); Johnson (JN). U.S. Studies include those given in Exhibit 1 in Chen and Shimerda (1981).

Comparison of **Definitions** of Common Financial Variables Used in Our Study and Studies by ICICI, RBI, and LC Gupta

Sr No	Financial Variable	ICICI's Study	RBI's Study	LC Gupta's	Our Study
1	Gross Capital	**Gross** fixed assets **plus** inventories	ND	ND	Same as ICICI's definition
2	Gross Fixed Assets	**All** fixed assets **including** capital **work-in-progress**	ND	ND	Same as ICICI's definition
3	Net Fixed Assets	ND	All fixed assets including capital work-in-progress net of depreciation	ND	Same as RBI's defin
4	Current Assets	Inventories, receivables, advances and cash and bank balance	Inventories, book value of quoted investments, loans and advances, debtors, cash and bank excess of advance income tax paid over tax provisions	Specifically excludes (a) investment in quoted/unquoted industrial securities, (b) security deposits with government departments, (c) loans and advances other than advance payments to suppliers. Debtors include unexpired discounted bills	Inventories, receivables loans and advances, deferred payments, cash and bank and advance income tax
5	Capital Employed	**Share** capital, **reserves** and surplus **and** all borrowings	ND	ND	Same as ICICI's definition
6	Net Worth	**Share** capital and **reserves** and surplus	Total of paid-up capital, forfeited shares, reserves and surplus adjusted for losses and is net of intangible and miscellaneous and non-current assets	Total of all types of share capital and reserves, debit balance of profit & loss and all other intangible assets have been excluded	Same as LC Gupta's definition, but we referred to it as Tangible Net Worth (TNW)
7	Total Debt	**Debentures**, long-term **borrowings**, all bank **borrowings** & unsecured **loans** and deposits	Same as ICICI's definition	Same as ICICI's definition	Same as ICICI's definition

8	Total Outside Liabilities	ND	Comprises both short-term and long-term liabilities to outside sources excluding liabilities to shareholders	ND	All outside liabilities
9	Current Liabilities	Creditors, bank borrowings for working capital, unsecured loans and deposits and other current liabilities	Short-term borrowings, trade dues and other current liabilities, provision for dividend and other current provisions and the excess of tax provision over the advance income tax paid	Trade creditors, short-term bank borrowings, including that represented by unexpired discounted bills, unsecured loans, public deposits and miscellaneous current liabilities	Same as RBI's definition except that advance income tax paid is not netted against tax provision
10	Working Capital	ND	ND	Excess of long-term sources over non-current assets	Excess of current assets over current liabilities
11	Working Capital Gap	ND	Difference between current assets and current liabilities excluding short-term bank borrowings	Difference between current assets and current liabilities as defined in the study	Difference between current assets and current liabilities as defined in the study
12	Total Tangible Assets	Balance sheet total of assets net of depreciation (referred as total net assets) (Intangible assets have not been excluded)	Total gross assets net of depreciation, intangible assets, miscellaneous non-current assets and tax provision/advance tax whichever is less, after making adjustments for carried forward losses	Assets other than such intangible assets	Same as LC Gupta's definition
13	Profit Before Interest and Tax (PBIT)	Referred to as gross profit	ND	ND	PBIT
14	Operating Profit	Gross profit (PBIT) minus interest (referred as profit before tax)	Profit before tax excluding non-operating surplus/deficit (Note: This is definition of net operating profit in our study.)	ND	Profit before interest and tax excluding non-operating surplus/deficit

No	Item				
15	Net Operating Profit		AC	NC	Operating profit minus interest
16	Profit after Tax	Profit before tax (as operating profit in their definition) minus tax provision. This has also been referred to as net profits.	ND	ND	Profit after tax includes non-operating surplus/deficit (NOSD) as in ICICI's definition
17	Profit after tax minus non-operating surplus/deficit	ND	ND	This has been referred to as net profits.	PAT minus NOSD
18	Operating Cash Flows	Profit before tax plus depreciation	ND	Profit after tax (excluding non-operating surplus/deficit) plus depreciation	Profit after tax (including non-operating surplus/deficit) plus interest plus non-fund expenditures such as depreciation
19	Net Operating Cash Flow	ND	ND	NC	Profit after tax (including NOSD) plus non-fund expenditure or operating cash flow minus interest
20	Retained Cash Flows	ND	Total of retained profits and depreciation provision. This has been simply referred to as cash flows.	ND	Same as RBI's definition or net cash flows minus dividends
21	Gross Value Added	Sum of incomes received by factors of production i.e. rent, salaries, interest and profit and loss (referred to as net value added) plus capital consumption allowance (viz. depreciation)	ND	ND	Same as ICICI's definition

Note: ND indicates not defined

List of Financial Ratios Not Included in This Study

Financial Ratio	ICICI	RBI	BSE	LCG	RAY	US Studies
PAT/WC					X	
PBDIT/INT+.25LTD				X		
OCF/GTTA				X		
RCF/TD				X		
E-.3^(AR+INV)/TTA				X		
:CF-.3^(AR+INV)/TTA				X		
:CF/ ^(INV+FA)				X		
)EP/NS				X		
)EP/NFA			X	X		
)EP/GFA			X	X		
;TBB-CS/INV+REC				X		
JC/TD				X		
JC/LTK				X		
:L/NS				X		X
;C+MCL/NS				X		
Avg.CA/NS				X		
VFA/GFA				X		
)A/CA				X		
_TDFI/NFA	X					
RM(No.of days)	X	X				
FG(No.of days)	X	X				
PFT/PBT	X		X			
DIV/PAIDUP	X					
ORD DIV/ORD PAIDUP	X					
INV/VA	X					
WIP(No.of days)		X				
Stores Spares (No. of days)		X				
STBB/CA		X				
STBB/.75CA-OCL		X				
CA/NFA		X				
RCF/NS		X				
IF/TF		X				
GVA/GFA		X				
TNW/NFA						X
Cash Interval						X
NS/NFA						X
CA/TD						X
LTK/NFA						X
CAP.EXP./NS						X
OP/TD						X
LTD/CA						X
INT/CASH+MS						X
EPS						X
NFA/TNW			X			

NS/GROSS FM	X
FC+DEB/ORD PAIDUP	X
DEB/DEB+TNW	X
FC/TNW+DEB	X
ORD PAIDUP+TRS/TNW+DEB	X
DEB INT+PAT/DEB INT+ PREF DIV	X

Note: 1. Financial variables not defined elsewhere: MCL = Miscellaneou
current liabilities; LTDFI = Long term debt from financial
institutions; ORD DIV = Ordinary dividend; IF = Internal fund
TF = Total funds; MS = Marketable securities; RM = Raw
material; WIP = Work in progress; FG = Finished goods; CAP
EXF = Capital expenditure; EPS = Earnings per share; and
DEB = Debentures.

2. Sign ^ indicates increase.

JS/GROSS PM	X
PC+DEB/ORD PAIDUP	X
JEB/DEB+TNW	X
C/TNW+DEB	X
JRD PAIDUP+TRS/TNW+DEB	X
JEB INT+PAT/DEB INT+	
PREF DIV	X

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       current liabilities; LTDFI = Long term debt from financial
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       EXP = Capital expenditure; EPS = Earnings per share; and
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