

Liquidity Performance Relationship in Nigerian Manufacturing Companies (1990-2002)

ADOLPHUS J. TOBY*

Abstract

This paper investigates the empirical relationship between liquidity and other performance measures in Nigerian manufacturing companies between 1990-2002. Using data from 87 quoted manufacturing companies, ten (10) multiple regression models were estimated with four liquidity measures as independent variables, and ten others covering profitability, efficiency and leverage measures as dependent variables. The results show statistically significant relationships between liquidity and profitability, efficiency and leverage measures as the computed F-values exceed the table F-ratio at the 5 per cent level of significance. The results (Multiple Rs) show that a 1 per cent increase in liquidity could bring about 21.9 per cent increase in profitability, 16.1 per cent increase in efficiency and 16.6 per cent increase in leverage. Within the framework of target money supply (M1 & M2), monetary policy could be used to facilitate the monetary transmission mechanism by integrating a minimum liquidity requirement for the manufacturing industry as one of the objectives of macroeconomic policy.

I. Introduction

RECENT THEORETICAL AND empirical literature has focused more on the soundness of the banking system than the soundness of the manufacturing industry. One of the reasons for this disparity in emphasis is the belief by some scholars that banks are "special" because of their importance for the transmission of monetary policy, their importance in recent international economic crises, and the recent (and on-going) structural change in banking, which may significantly alter their role in the transmission of monetary policy (Peek and Rosengren, 1995). It is shown in Himmelberg and Morgan (1995) that the manufacturing sector has not reduced its dependence on banks, and small firms still borrow almost exclusively from banks. Thus, the failure of banking institutions may spill over to other banks, the non-bank sector, the domestic macroeconomy and other countries (Kaufman, 1995).

* Lecturer, Rivers State University of Science and Technology, Department of Banking and Finance, Post Box 12046, Port Harcourt, NIGERIA.

Another reason for the little emphasis on the soundness of the manufacturing industry is the fact that the debate on the coevolution of the real and financial sectors has always produced mixed results. Assuming that all investment is financed by bank lending, Benciverga and Smith (1991), Cooley and Smith (1992), and Greenwood and Jovanovic (1990) argue that the level of activity in financial markets does not evolve with the economy, and the status of various markets is often exogenously imposed. This view contrasts with Michie (1987) and Gurley and Shaw (1967) which demonstrate that measures of financial market activity are positively correlated with measures of real activity across different countries.

In Nigeria, manufacturing contribution to the Gross Domestic Product (GDP) declined from 9.9 per cent in 1981 to 5.9 per cent in 1999. In a report by Anao (2004), the financial sector's contribution to the GDP declined by 9.54 per cent in 2003. There appears to be support for the coevolution thesis by the Nigerian data. However, Boyd and Smith (1996) show how various government policy actions might affect capital accumulation and financial market activity. A minimum liquidity requirement for the non-bank sector, particularly the manufacturing industry, as one of the objectives of monetary policy, could help in facilitating the effectiveness of the monetary transmission mechanism. It has been reported earlier that the improving liquidity profile of Nigerian banks is not correspondingly transmitted to the manufacturing sector (Toby, 2003).

This study is aimed at determining the empirical relationships between company liquidity measures and selected profitability, efficiency and leverage ratios. The extent that a variability of 1 per cent in liquidity affects corporate performance measures would assist us in redefining monetary policy and improving corporate financial management and policy in Nigerian manufacturing companies. Specifically, our results would enhance sound liquidity management practices by assisting manufacturing enterprises in managing assets and liabilities (on and off-balance sheet) to ensure that cash inflows have an appropriate relationship to the approaching size of cash outflows.

II. Hypothesis

Hypothesis H0: *There is no significant relationship between liquidity and profitability measures in Nigerian quoted manufacturing companies*

Hypothesis H1: *There is no significant relationship between liquidity and efficiency measures*

Hypothesis H2: *There is no significant relationship between liquidity and leverage measures*

The next section of this article provides a background to the study outlining the macroeconomic policy environment of Nigerian manufacturing and basic company financial analysis based on accounting information. The second section outlines our research methodology, followed by the third section which presents the empirical results. Section four summarises the policy implications of the study while the fifth section concludes the article.

III. Background

The market capitalisation of quoted companies on the Nigeria Stock exchange (NSE) grew by 350.68 per cent between 1999 and 2003 from ₦294.105 billion in 1999 to ₦1.325 trillion in 2003. The growth was grossly fueled by the manufacturing sector of the market. Capitalisation of the manufacturing sector went up by 483.96 per cent during the period from ₦105.65 billion in 1999 to ₦618.775 billion in 2003. This is an indication that the nation's real sector may have performed well during the period. The breweries sub-sector was a dominant player in the sector, with its market capitalisation increasing from ₦41.272 billion in 1999 to ₦340.052 billion by the end of December, 2003.

However, the data in Table I show the unfavourable macroeconomic environment the manufacturing sector in Nigeria has had to cope with. Although the real growth rate increased from 2.8 per cent in 1999 to 3.8 per cent in 2000, the contribution of the non-oil sector to this growth declined from 3.6 per cent in 1999 to 3.1 per cent in 2000. On one hand, this decline in the contribution of the non-oil sector to the nation's GDP could have been due to the decline in manufacturing capacity utilisation from 36.0 per cent in 1999 to 34.5 per cent in 2000, decline in gross national savings as a percentage of the GDP from 10.5 per cent in 1999 to 9.4 per cent in 2000, and decline in the GDP per capita from ₦1075.9 in 1999 to ₦1066.4 in 2000. On the other hand, the non-oil sector's performance, which includes the manufacturing industry, was further constrained by high lending rates which only moderated from 27.2 per cent in 1999 to 26.4 per cent in 2000, as net domestic credit to the economy declined from 30.1 per cent in 1999 to minus 23.1 per cent in 2000.

Table I
Selected Macroeconomic Indicators

Indicator	1999	2000
Real GDP Growth	2.8	3.8
Oil Sector	-4.2	0.6
Non-oil Sector	3.6	3.1
Manufacturing Capacity Utilisation (%)	36.0	34.5
Gross National Savings (% of GDP)	10.5	9.4
Gross Fixed Capital Formation (% of GDP)	5.4	7.9
Inflation rate (%)	6.6	6.9
Net domestic credit (Growth rate %)	30.1	-23.1
Net Credit to Government	32.0	-162.3
Credit to the private sector	29.2	30.9
Growth in Narrow Money (M1)	18.0	62.2
Growth in Broad Money (M2)	31.0	48.1
₦/\$ Exchange Rate (end-period)	98.2	110.05
GDP Per Capita (₦)	1,075.9	1,066.4
Minimum Rediscount Rate (MRR) (%)	18.0	14.0
Savings Rate	5.3	4.9
Lending Rate	27.2	26.4
Cash Reserve Requirement	11.5	10.0
Bank Minimum Liquidity Ratio	40.0	35.0
Bank Average	50.9	56.2

Source: CBN Annual Report, 2000

Although net credit to all tiers of government declined by 162.3 per cent in 2000, the growth in credit to the private sector increased only marginally from 29.2 per cent in 1999 to 30.9 per cent in 2000. This was in spite of the fact that the minimum rediscount rate (MRR) declined from 18.0 per cent in 1999 to 14.0 per cent in 2000, and the cash reserve requirement was lowered from 11.5 per cent in 1999 to 10.0 per cent in 2000. Although banks' actual liquidity ratios exceeded the minimum liquidity requirement of 35-40 per cent, the gross fixed capital formation increased from 5.4 per cent in 1999 to 7.9 per cent in 2000, while monetary aggregates (M1 and M2) increased by wider margins in the 1999 - 2000 period. This reflected an appreciable depreciation in the value of the naira by 12.06 per cent and a marginal increase in inflation rate.

Our analysis of company financial performance is drawn from appendices I and II, and summarised in Table II. The measures of company financial performance include liquidity, profitability, efficiency and leverage ratios. Liquidity ratios measure the short-term solvency of the firm, with the acid-test being the most effective of the ratios (Khoury, 1983). The acid-test ratio excludes inventory, which is usually less liquid or has a high transaction cost (in terms of price discounts) attached to its liquidity. The profitability ratios measure the overall effectiveness and efficiency of management in the utilisation of capital and human resources. Efficiency or activity ratios measure the effectiveness of resource utilisation. Finally, the leverage ratios measure the extent to which the firm's assets are financed by debt and by the firm's ability to meet long-term commitments.

Table II
Selected Performance Indicators In Nigerian Quoted
Manufacturing Companies

Indicator (%)	1999	2000
<i>Liquidity Ratios</i>		
Acid-Test Ratio	82.0	37.0
Inventory/Net Working Capital	587.0	349.0
<i>Profitability Ratios</i>		
Return on Equity	2003.9	399.0
Net Profit Margin	1303.0	878.0
<i>Efficiency Ratios</i>		
Tangible Asset Turnover	149.0	205.0
Inventory Turnover	950.0	1009.5
Working Capital Turnover	727.0	635.0
<i>Leverage or Indebtedness Ratios</i>		
Fixed Asset/Net Worth	68.0	107.0
Current debt/Net Worth	65.0	79.0
Total debt/Total Assets	118.0	200.0

Source : Appendices I & II Based on data from 87 quoted manufacturing companies.

From Table II, we observe that the acid-test of Nigerian quoted manufacturing companies declined from 82.0 per cent in 1999 to 37.0 per cent in 2000. Moreover, the return on equity (ROE), and net profit margin declined substantially in the 1999 - 2000 period. Efficiency in operations, particularly

those related to working capital turnover, declined from 727 per cent in 1999 to 635 per cent in 2000. However, all leverage ratios showed reasonable increases, particularly to the employment of debt in the capital structure.

While ratio analysis can be quite informative, Khoury (1983) has demonstrated its weaknesses. First, all ratios are based on accounting data, which are influenced by many factors even within the domain of "generally acceptable accounting principle". For instance, Spacek (1973) has found that reported earnings per share of a company using various combinations of accounting methods, varied from US \$0.80 to US \$1.79. Secondly, ratios ignore time as an element in the maturity cycle of the firm. A new entrant into a market is usually compared, without sufficient consideration for its age, to a mature, well-established group within the industry. Thirdly, ratios can give conflicting signals, the net effect of which are hard if not impossible to discern.

Is a low profitability ratio bad per se? Is it a reflection of bad management? Is a low profitability ratio compared with industry averages a reflection of bad management? The answer to all of these questions is not necessarily. It all depends on the reasons (tornadoes, heavy outlays on research and development, etc.) for low profits, on the time period over which they were realised (the short versus the long-run view of profitability), and on whether or not they are expected to continue. Are high profitability ratios desirable per se, regardless of all else? Are high profitability ratios desirable per se, regardless of all else? Are high profitability ratios desirable concurrently with high leverage ratios if a soft economy is expected?.

However, the development of an integrated picture of the corporation using ratio analysis - despite the difficulties - is possible, as copiously documented in Altman, Halderman and Narayanan (1977) and Dambolena and Khoury (1980). Chen and Shimerda (1981) summarise the empirical results of a number of earlier studies based on accounting ratios and their significance in both financial analysis and the prediction of firm failure. In another study Lev (1969) examines the movement of companies' financial ratios across time and attempts to determine whether firms adjust financial ratios to some industry standard such as industry mean. Other studies that have used accounting ratios extensively include the works of Lee and Zumwalt (1981) which uses important financial ratios with single-index market model to construct a multi-index security rate-of-return model, Pinches and Mingo (1973) which uses financial ratios in developing a model to predict bond ratings, and Kim's (1979) investigation of the effect of inflation on net operating income.

IV. Research Methodology

The data for this study were derived from the financial statements of 87 Nigerian quoted manufacturing companies with a market capitalisation of N302.5436 billion. Table C shows the spread of the companies using the Nigerian Stock Exchange (NSE) classification as at December 31, 2003.

4.1 Definition of Variables

There are three classes of dependent variables in this study involving three profitability measures, three efficiency measures, and four leverage or indebtedness measures. The independent variables are four widely used liquidity measures. Both dependent and independent variables are popular measures of relative performance as documented in Khoury (1983).

Specifically, the following definition of variables is used in this study:

4.1.1 Dependent Variables

4.1.1.1 Profitability Measures

- PROE - Return on Equity
- PROFA - Return on Fixed Assets
- PNPM - Net Profit Margin

4.1.2 Efficiency Measures

- ETAT - Tangible Asset Turnover
- EWCT - Working Capital Turnover
- EIT - Inventory Turnover

4.1.3 Leverage or indebtedness measures

- LFA - Fixed Assets/Net Worth
- LCD - Current debt/Net Worth
- LTD 1 - Total debt/Total assets
- LTD 2 - Total debt/net Worth

4.2 Independent Variables

4.2.1 Liquidity Measures

- LCFR - Cash flow/total debt
- LCR - Current Ratio
- LNWC - Inventory to Net Working Capital
- LATR - Acid -test Ratio

Note that net worth is a measure of the company's capital that is equal to the difference between the market value of its assets and the market value of its liabilities; the value of a company to its owners.

4.2 The Multiple Regression Models

In this study we tested 10 multiple regression models, specified in equations 1-10

$$\text{PROE} = \alpha + \beta_1 \text{LCFR} + \beta_2 \text{LCR} + \beta_3 \text{LNWC} + \beta_4 \text{LATR} \quad (1)$$

$$\text{PROFA} = \alpha + \beta_1 \text{LCFR} + \beta_2 \text{LCR} + \beta_3 \text{LNWC} + \beta_4 \text{LATR} \quad (2)$$

$$\text{PNPM} = \alpha + \beta_1 \text{LCFR} + \beta_2 \text{LCR} + \beta_3 \text{LNWC} + \beta_4 \text{LATR} \quad (3)$$

$$\text{ETAT} = \alpha + \beta_1 \text{LCFR} + \beta_2 \text{LCR} + \beta_3 \text{LNWC} + \beta_4 \text{LATR} \quad (4)$$

$$\text{EWCT} = \alpha + \beta_1 \text{LCFR} + \beta_2 \text{LCR} + \beta_3 \text{LNWC} + \beta_4 \text{LATR} \quad (5)$$

$$\text{EIT} = \alpha + \beta_1 \text{LCFR} + \beta_2 \text{LCR} + \beta_3 \text{LNWC} + \beta_4 \text{LATR} \quad (6)$$

$$\text{LFA} = \alpha + \beta_1 \text{LCFR} + \beta_2 \text{LCR} + \beta_3 \text{LNWC} + \beta_4 \text{LATR} \quad (7)$$

$$\text{LCD} = \alpha + \beta_1 \text{LCFR} + \beta_2 \text{LCR} + \beta_3 \text{LNWC} + \beta_4 \text{LATR} \quad (8)$$

$$\text{LTD 1} = \alpha + \beta_1 \text{LCFR} + \beta_2 \text{LCR} + \beta_3 \text{LNWC} + \beta_4 \text{LATR} \quad (9)$$

$$\text{LTD 2} = \alpha + \beta_1 \text{LCFR} + \beta_2 \text{LCR} + \beta_3 \text{LNWC} + \beta_4 \text{LATR} \quad (10)$$

Table III
Number of Nigerian Quoted Manufacturing Companies Used in the
Study with Market Capitalisation as at December 31, 2003

NSE Classification	Number	Market Capitalisation (₦)
Breweries	7	40.9 billion
Building Materials	8	43.0 billion
Computer and office Equipment	5	459.9 million
Emerging Market/Second-Tier Securities	12	667.2 million
Engineering Technology	3	662.5 million
Food/Beverages & Tobacco	13	98.2 billion
Footwear	2	95.4 million
Healthcare	11	6.3 billion
Industrial & Domestic Products	12	4.4 billion
Packaging	8	3.2 billion
Textiles	6	3.8 billion
Total	87	₦302.5436b

Source: Self compilation from the Nigerian Stock Exchange (NSE) Factbook (2003).

Note that α is alpha or the model's constant, while β_1 to β_4 represent the model's betas, also known as the partial correlation coefficients. The coefficient β measures the amount of change in the mean value of the dependent variable that we can expect if the independent variable changes by one unit, the values of the remaining explanatory variables remaining unchanged. The Multiple R (R^2) is called the coefficient of multiple determination which measures the proportion of the variability in the dependent variable that is 'explained' by the regression relationship.

The F-ratio was used to test the significance of the multiple regression as a whole¹. In the case of equation 1, for instance, the null hypothesis to be tested is that none of the liquidity measures has a statistically significant effect on return on equity (PROE). If the null hypothesis is true, the F-ratio has the F-distribution with $v=4$ and $v_2 = N-5$ degrees of freedom. But if the sample of the F-ratio is so large that it exceeds the critical value of $F_{0.05}$, it is unlikely that it could have been drawn from an F-distribution. We can then reject the null hypothesis $H_0: \beta_1 = \beta_2 = \beta_3 = \beta_4 = 0$ and conclude that the return on equity (PROE) is linearly related to cash flow ratio (LCFR), current ratio (LCR), net working capital ratio (LNWC) and acid-test ratio (LATR).

V. Empirical Results

Our empirical results are summarised in Tables IV, V and VI. The data in Table VII are the author's projections of the potential impact of liquidity on corporate performance under three different scenarios. Table IV shows the statistical relationship between selected profitability measures (dependent variables) and selected liquidity ratios (independent or explanatory variables). Table V relates liquidity to selected efficiency measures, while Table VI summarises the multiple regression results on the liquidity-leverage relationship.

By regressing the return on equity (PROE) on cash flow ratio (LCFR), current ratio (LCR), net working capital ratio (LNWC) and acid-test ratio (all measures of company liquidity), we find all computed F-ratios within the region of \pm

Fo.o5. In the case of the statistical relationship between return on fixed assets (PROFA) and the liquidity measures, we find that $F > F_{o.o5}$ for LCR, LNWC and LATR. Infact, a 1 per cent increase in the acid-test ratio of Nigerian quoted manufacturing companies will lead to a 56.43 per cent increase in the return on fixed assets (PROFA) as shown by the Multiple R or the coefficient of multiple determination (R^2). Furthermore, the relationship between the net profit margin (PNPM) and current ratio exhibits an F-ratio of 0.8985, which is greater than the table value of 0.3636 at the 5 per cent level of significance.

Table IV
Relationship between Liquidity and Profitability in Nigerian Quoted Manufacturing Companies (1990 – 2002): Multiple Regression Results

Dependent/Independent Variables	F-ratio	Multiple R
<i>Return on Equity (PROE)</i>		
Cash flow ratio (LCFR)	0.3223 (0.5815)	0.1688
Current ratio (LCR)	0.0028 (0.6431)	0.0159
Net Working Capital Ratio (LNWC)	0.2099 (0.6558)	0.1368
Acid-Test Ratio (LATR)	0.0075 (0.9327)	0.0261
<i>Return on Fixed Assets (PROFA)</i>		
Cash Flow Ratio (LCFR)	0.3959 (0.5420)	0.1864
Current Ratio (LCR)	1.1507 (0.3064)	0.3077
Net Working Capital Ratio (LNWC)	1.1595 (0.3046)	0.3088
Acid-Test Ratio (LATR)	5.1393 (0.0445)	0.5643
<i>Net Profit Margin (NNPM)</i>		
Cash Flow Ratio (LCFR)	0.2270 (0.6431)	0.1422
Current Ratio (LCR)	0.8985 (0.3636)	0.2748
Net Working Capital Ratio (LNWC)	2.2682 (0.1602)	0.4135
Acid-Test Ratio (LATR)	0.0809 (0.7814)	0.0854
Overall Average	0.9885 (0.5229)	0.2192

Note: Self Computed; Parenthesis encloses the table values of F ($F_{o.o_3}$)

Source: Software Package for Social Sciences (SPSS)

The relationship between PNPM and LNWC is also statistically significant as the F-value of 2.2682 exceeds the table value of 0.1602 at the 5 per cent level of significance. On the average, the effect of a 1 per cent increase in liquidity on profitability is statistically significant as the F-value of 0.9885 exceeds the $F_{o.o5}$ value of 0.5229, with a multiple R of 21.92 per cent. This overall average result means that we reject our null hypothesis of no significant relationship between liquidity and profitability in Nigerian quoted

manufacturing companies, and accept the alternative hypothesis. The result also means that on the average a 1 per cent increase in liquidity would bring about a 21.92 per cent increase in company profitability.

The results in Table V show the relationship between tangible asset turnover (ETAT) and LCFR, LCR is statistically significant since in each of the two cases, $F > F_{0.05}$. No significant relationship is established between the working capital turnover (ENWC), and each of the liquidity measures (LCFR, LCR, LNWC AND LATR) in a multiple regression model. The same observation can be made when we regress inventory turnover (EIT) on LCFR, LCR, LNWC and LATR. However, the pronounced deviations of the computed F-ratios of 6.9950 (relating ETA to LCR) and 1.4500 (relating ETAT to LCFR) from $F_{0.05}$ could have explained the performance of our overall average results. An overall average F-value of 0.8102 is greater than the table value of 0.6643 at the 5 per cent level of significance, with a coefficient of multiple determination of 16.06 per cent. This means that there is a statistically significant relationship between liquidity and company efficiency. The Multiple R shows that a 1 per cent increase in liquidity will improve company efficiency by 16.06 per cent particularly with respect to tangible asset turnover.

Table V
Relationship between Liquidity and Efficiency Measures in Nigerian
Quoted Manufacturing Companies: Multiple Regression Results

Dependent/Independent Variables	F-ratio	Multiple R
<i>Tangible Asset Turnover (ETAT)</i>		
Cash Flow Ratio (LCFR)	1.4500 (0.3080)	0.3070
Current Ratio (LCR)	6.9950 (0.0230)	0.6235
Net Working Capital Ratio (LNWC)	0.0300 (0.5950)	0.1630
Acid-Test Ratio (LATR)	0.0300 (0.5510)	0.0523
<i>Working Capital Turnover</i>		
Cash Flow Ratio (LCFR)	0.0030 (0.9590)	0.0168
Current Ratio (LCR)	0.0590 (0.8130)	0.0766
Net Working Capital Ratio (LNWC)	0.3390 (0.5730)	0.1810
Acid-Test Ratio (LATR)	0.0757 (0.7889)	0.0867
<i>Inventory Turnover (EIT)</i>		
Cash Flow Ratio (LCFR)	0.0390 (0.8480)	0.0654
Current Ratio (LCR)	0.0390 (0.8470)	0.0661
Net Working Capital Ratio (LNWC)	0.3846 (0.5510)	0.2024
Acid-Test Ratio (LATR)	0.0686 (0.8001)	0.0866
Overall Average	0.8102 (0.6643)	0.1606

Source: Self Computed; SPSS

In testing the relationship between the ratio of fixed assets to net worth (LFA) and the liquidity measures, we find statistically significant relationships with current ratio (LCR), and acid-test-ratio (LATR) Table VI. In the first multiple regression model, there is no statistically significant relationship between LFA and LCFR and LNWC. A statistically significant relationship exists between the ratio of current debt to net worth (LCD) and the net working capital ratio (LNWC) in our second leverage-liquidity multiple regression model. In this case the computed F-value is 19.6720 which is greater than $F_{0.05} = 0.0010$. The Multiple R is 80.09 per cent showing a significant impact on LCD by a 1 per cent change in LNWC.

Table VI
Relationship between Liquidity and Leverage Measures in Nigerian Quoted Manufacturing Companies: Multiple Regression Results

Dependent/Independent Variables	F-ratio	Multiple R
<i>Fixed Assets/Net Worth (LFA)</i>		
Cash Flow Ratio (LCFR)	0.0240 (0.8800)	0.0465
Current Ratio (LCR)	1.0050 (0.3380)	0.2893
Net Working Capital Ratio (LNWC)	0.0050 (0.9450)	0.0202
Acid-test Ratio (LATR)	0.7220 (0.4130)	0.2482
<i>Current debt/Net Worth (LCD)</i>		
Cash Flow Ratio (LCFR)	0.2590 (0.6220)	0.1510
Current Ratio (LCR)	0.1760 (0.6830)	0.1254
Net Working Capital Ratio (LNWC)	19.6720 (0.0010)	0.8009
Acid-test Ratio (LATR)	0.2370 (0.6360)	0.1453
<i>Total debt/Total assets (ETDI)</i>		
Cash Flow Ratio (LCFR)	0.0540 (0.8200)	0.0700
Current Ratio (LCR)	3.6860 (0.0810)	0.5010
Net Working Capital Ratio (LNWC)	0.1080 (0.7480)	-0.0988
Acid-Test Ratio (LATR)	0.1290 (0.7260)	0.1077
<i>Total debt/Total assets (LTD 2)</i>		
Cash Flow Ratio (LCFR)	0.0090 (0.9270)	0.0295
Current ratio (LCR)	0.4820 (0.5030)	0.2145
Net Working Capital Ratio (LNWC)	0.2980 (0.5970)	-0.1701
Acid-Test Ratio (LATR)	0.3220 (0.5830)	0.1767
Overall Average	1.6991 (0.5941)	0.1661

Source : Self Computed; SPSS

Moreover, a 1 per cent change in current ratio will lead to a 50.1 per cent increase in total debts to total assets. On the whole we find a statistically significant relationship between liquidity and corporate indebtedness as the F-value of 1.6991 exceeds the table value of 0.5941 at the 5 per cent level of significance. The coefficient of multiple determination is 16.61 per cent, which means that a 1 per cent increase of liquidity would mean a 16.61 percent increase in average corporate indebtedness.

Table VII shows the projected impact of liquidity on corporate performance indicators under three scenarios. The first scenario is the normal determined in our foregoing analysis, that is, the impact of a 1 per cent increase in average corporate liquidity. However, if average liquidity increases by 5 percent, our multiple regression models show that profitability is expected to increase by 109.5 per cent, company efficiency by 80.5 per cent, and leverage by 83.0 per cent. When liquidity improves by 10 per cent, we should expect average company profitability to increase by 219.0 per cent, efficiency by 161 per cent, and corporate indebtedness by 166.0 per cent.

Table VII
Projected Impact of Liquidity On Corporate Performance
(In Percent)

Change In Liquidity	IMPACT ON		
	Profitability	Efficiency	Leverage
1 Per cent	21.9	16.1	16.6
5 Per cent	109.5	80.5	83.0
10 Per cent	219.0	161.0	166.0

Source: Self Computed

VI. Financial Policy Implications

The preceding empirical results imply that the liquidity behaviour of manufacturing companies is significant both for macroeconomic policy management and company financial policy. First, the behaviour of liquid assets in company balance sheets, including the associated portfolio adjustments in times of deregulation, reregulation and guided deregulation could be related to monetary policy variables like cash reserve requirements (CRR), banks' minimum liquidity ratio (MLR) and the minimum rediscount rate (MRR). In line with target growth in money supply (both M1 and M2), the CRR, MLR and MRR can be reduced to effect marginal increases in company liquidity, which according to our multiple regression models, could lead to substantial increases in corporate profitability, efficiency and indebtedness. The other critical macroeconomic variables are interest rate, inflation rate and exchange rate, which when lowered marginally could lead to marginal improvements in real liquidity in both domestic and foreign currencies.

Under uncertain policy environments and a regime of tight monetary policy, company management must evolve liquidity management strategies that are consistent with the goals of survival in the short-run and shareholder-wealth maximisation in the long-run. In a distressed financial sector which

has witnessed unprecedented bank failures in recent times² manufacturing companies must explore cheaper means of enhancing corporate liquidity as a way of enhancing profitability, efficiency and their financial leverage. Deteriorating liquidity could provoke negative profitability, operational inefficiency and low debt capacity. Strategic liquidity considers liquidity needs on a longer-term basis and recognises the possibility of various unexpected and potentially adverse business conditions³. Strategic Liquidity is a key consideration of asset/liability management because of its potential effect on the ultimate viability of the company.

However, the potential increase in company liquidity and the accompanying increase in company indebtedness means adopting such a financial structure⁴ that minimises its average cost of capital. More importantly, the structure of company redeemable debentures must take into consideration the company's current cash flow position and the current interest rate. If current cash flow position is high, the debenture may be redeemed before the latest redemption rate; if cash flow position is low, redemption may be deferred to the latest redemption date. On the other hand, if market interest rate exceeds the debenture coupon rate, then it is reasonable to defer repayment till the latest redemption date; if current market interest rate is lower than the debenture coupon rate, and provided current cash flow position is sufficient, it is reasonable to redeem before the latest redemption date.

VII. Conclusion

The regression results shows statistically significant relationships between measures of liquidity and selected measures of profitability, efficiency and indebtedness in Nigerian quoted manufacturing companies. The impact of a 1 per cent increase in average liquidity measures produces a more significant increase in average profitability (21.9%), efficiency (16.1%) and indebtedness (16.6%).

The dilemma confronting monetary policy in a developing economy like Nigeria is integrating the portfolio adjustments in the non-bank sector, particularly the manufacturing industry, into monetary policy formulation assuming a target growth rate in money supply. Linking monetary policy techniques to minimum liquidity requirements in the manufacturing sector could help achieve the other objectives of price stability, employment generation and external balance of payments.

Within the framework of corporate financial policy, company managers must evolve strategies for dealing with possible liquidity shortages in a distressed banking sector and under a tight monetary policy regime. Managing liquidity is a fundamental component in the safe and sound management of companies. Company financial executives must avoid excess funding costs realised through, for example, raising funds at market premiums or through the forced sale of assets.

Notes

- 1 In the general case of 4 explanatory variables, the test is based on the ratio, $F = (\text{Explained variation in dependent variable} / 4 \text{ all over (unexplained variation independent variable)}) / (N-4-1)$ which is the test statistic for the null hypothesis $b_1 = b_2 = b_3 = b_4 = 0$.
- 2 Between 1929 - 59, only 21 banks failed while the number increased to 37 between 1994 and 2003.
- 3 See Standards of Sound Business and financial Practices -Liquidity Management February, 1998.
- 4 Financial structure includes short-term, medium-term and long-term sources of finance, the financing mix and its impact on enterprise value.

References

- Altman, E. I., R. G. Haldeman, and P. Narayanan, (1977), "Zeta Analysis: A New Model to identify Bankruptcy Risk of Corporations", *Journal of Banking and Finance*, Spring 1977.
- Anao, B (2004), "Nigeria's GDP Per Capita Grows by 11.61% in 39 Years", *Business Day*, Wednesday, January 28, 2004, pp. 9.
- Bencivenga, V. R. and B. D. Smith, (1991), "Financial Intermediation and Endogenous Growth" *Review of Economic Studies* Vol. 58, No. 2, pp. 195-209.
- Boyd, J and B Smith, (1996), "The Coevolution of the Real and Financial Sectors in the Growth Process", *The World Bank Economic Review*, Vol. 10, No. 2, pp. 371 - 396.
- Chen K. H. and T. A. Shimerda, (1981), "An Empirical Analysis of Useful Financial Ratios", *Financial Management*, Spring 1981, pp. 51 - 60.
- Cooley, T. F. and B. D. Smith, (1992), "Financial Markets, Specialisation, and Learning By Doing", Draft Cornell University, Department of Economics, Ithaca, N. Y. Processed.
- Dambolena, I. G. and S. J. Khoury, (1980), "Ratio Stability and Corporate Failure", *Journal of Finance*, Vol. 35, No. 4, pp. 1017-1026.
- Greenwood, J. and B Jovanovic, (1990), "Financial Development, Growth, and the Distribution of Income", *Journal of Political Economy*, Vol. 98, No. 5, October 1990, pp. 1076-1107.
- Gurley, J.G. and E. S. Shaw, (1967), "Financial Structure and Economic Development", *Economic Development and Cultural Change*, Vol. 15, pp. 257-268.
- Himmelberg, C. P. and D. P. Morgan, (1995), *Is Bank Lending Important for the Transmission of Monetary Policy?*, " Conference Series No.39, June 1995, Federal Reserve Bank of Boston.
- Kaufman, G. G. (1995), "Bank Failures, Systemic Risk, and Bank Regulation", Being Paper Presented at a Conference on Public Regulation of Depository Institutions, Koc University, Istanbul, Turkey, November 1995.
- Khoury, S. J. (1983), *Investment Management -Theory and Applications*, " Macmillan Publishing, New York, USA.
- Kim, M. K. (1979), "Inflationary effects in the Capital Investment Process: An Empirical investigation", *Journal of Finance*, Vol. 34, pp. 941-950.

Lee, C. F. and J. K. Zumwalt, (1981), "Association between alternative accounting profitability measures and security returns", *Journal of Financial and Quantitative Analysis*, Vol. 16, pp. 1-22.

Lev, B. (1969), "Industry Averages in Targets for financial ratios," *Journal of Accounting Research* (Autumn), pp. 290-299.

Michie, R. C. (1987), "The London and New York Stock Exchanges, pp. 1850-1914

OSFI, (1998), *Standards of Sound Business and Financial Practices - Liquidity Management*, F-10, Office of the Superintendent of Financial Institutions, Caradat, February, 1998.

Peek, J and E.S. Rosengren, (1995), "Is Bank Lending Important For the Transmission of Monetary Policy?", in J. Peek and E. S. Rosengren (eds), *Is Bank Lending Important for the Transmission of Monetary Policy? Conference Series*, No.39, June 1995, Federal Reserve Bank of Boston.

Pinches, G. E. and K. A. Mingo, (1973), "A multivariate analysis of industrial bond rates", *Journal of Finance*, March 1973 pp. 1-18.

Spacek, L. (1973), *The Stock Market: Theories and Evidence*, in J. Lovie and M. Hamilton, Irwin, Homewood, 111, pp. 146.

Toby, A. J. (2003), "Analysis of the Role of Banks in the Corporate Financing Mix of Quoted Manufacturing Enterprises", *Journal of Business Studies*, Vol. 1, No. 1, July 2003.

Appendix I
Selected Liquidity Ratios of Nigerian Quoted
Manufacturing Companies (1990 - 2002)

Year	Current Ratio (LCR)	Acid-test ratio (LATR)	Cash flow ratio (LCFR)	Inventory to networking capital (LNWC)
1990	0.16	0.49	0.30	0.50
1991	1.18	0.53	0.90	0.29
1992	0.92	0.26	10.50	217.16
1993	1.25	0.46	3.42	307.36
1994	1.27	0.60	1.43	1.54
1995	1.46	0.19	0.41	5.53
1996	1.53	1.02	0.40	4.12
1997	1.29	1.28	2.01	5.34
1998	3.06	0.82	1.89	34.99
1999	1.49	0.82	2.33	5.87
2000	1.58	0.37	2.69	3.49
2001	1.47	0.45	0.21	11.09
2002	3.64	0.66	0.04	9.44

Source: Self Computed from the Annual Reports and Accounts of quoted of Nigerian manufacturing companies (1990-2002)

Appendix II
Selected Profitability, Activity And Leverage Ratios of Nigerian Quoted
Manufacturing Companies (1990 - 2002)

Year	Profitability Ratios			Activity Ratios			Leverage Ratios			
	PROE	PROFA	PNPM	ETAT	EIT	EWCT	LFA	LCD	LTD1	LTD2
1990	71.0	6.38	13.90	1.00	2.47	4.00	2.07	1.46	0.88	1.76
1991	13.53	2.34	4.27	1.95	5.55	4.40	2.90	0.95	1.04	1.72
1992	13.65	9.12	6.86	1.63	9.25	8.73	1.57	1.39	0.99	1.24
1993	11.96	8.97	4.12	1.69	4.31	10.88	1.11	1.07	1.17	1.01
1994	13.98	11.96	7.97	1.88	6.31	8.65	1.05	0.66	1.36	0.98
1995	21.92	26.65	8.49	2.25	2.76	5.51	0.65	0.51	0.91	938.81
1996	15.71	31.34	7.85	1.87	2.57	8.99	0.66	0.81	1.01	1.17
1997	14.53	42.28	7.72	1.61	2.88	16.61	0.46	0.77	0.94	0.95
1998	16.08	46.88	9.54	1.99	1.75	25.97	1.73	0.88	0.95	1073.29
1999	20.39	23.13	13.03	1.49	95.04	7.27	0.68	0.65	1.18	5283.35
2000	3.99	22.03	8.78	2.05	109.05	6.35	1.07	0.79	2.00	1.27
2001	29.16	28.80	9.12	54.89	2.50	83.80	0.95	0.73	0.89	0.89
2002	10.93	9.91	4.21	83.63	11.0	26.50	2.54	0.96	2.00	0.81

Note : PROE Return On Equity,
 PROFA Return on Fixed Assets,
 PNPM Net Profit Margin,
 ETAT Tangible Asset Turnover,
 EIT Inventory Turnover,
 EWCT Working Capital Turnover,
 LFA Fixed Asset to Net Worth,
 LCD Current debt to Net worth,
 LTD 1 Total debt to total assets
 LTD 2 Total debt to Net Worth.

Source : Company Accounts (1990 - 2002).



www.iif.edu

भारतीय वित्त संस्थान

Estd. 1987

INDIAN INSTITUTE OF FINANCE

ADMISSION NOTICE

Full Time (Regular) Post Graduate Programs (Session Beginning July 2008)

Management of Business Finance (MBF) - 2 Year

Eligibility : Graduation in any discipline with min. 60% marks [55% marks for SC/ST/OBC]. Candidates appearing in Final year may apply.

Selection : Written Test [XAT (> 60 %) / AIMA-MAT (> 600) / GMAT (> 700)] and G. D. + Interview.

Exemption From Written Exam.: Grad / PG marks > 85 % (for Engg./Technical/Science Stream) & >70% (for Commerce/Arts stream); NRIs, First 3 Univ. Toppers & Celebrities in Sports, Arts, Music, Dance, Modelling etc.

Financial Assistance : Scholarship of Rs. 20,000/- per Semester for University Toppers (Top 3 only) & College Topper (with Distinction). Other freeships, fellowships & graduate assistantships for deserving candidates.

Last Date : 31st May, 2008

For more details : <http://www.iif.edu>

Fellow Program in Finance (FBA Finance)

(3 year Research Program along the lines of Ph.D.)

Eligibility : Post Graduation in any discipline with 60% + Written Test, G. D. & Interview.

Distance Learning Programs

(Session Beginning Nov. 2007 & May 2008) for Senior working Executives

One Year P.G. Prog.: Basic Business Finance (BBF)

Two Year P.G. Prog.: Management of Business Finance (MBF)

Three Year : Post Graduate Diploma in Business Finance (PGDBF)

Eligibility : Graduation in any discipline with min. of 60% and 3 year Work Experience

Last Date : For Nov. Session - 20th October 2007 & For May Session - 20th April 2008

THE INSTITUTE

- IIF set up in 1987 as Non-profit educational institution is unique and a *centre of excellence*, base for scholarship and high quality professionally oriented education, research and training. It aims to foster *creativity, innovativeness and analytical ability* through *total personality development*, with an appropriate blend of *Indian Ethos & Western Philosophy* of Management and to foster a sense of *hard work, commitment, devotion, discipline and nationalism* in an aesthetic and cultural atmosphere matching global standards. Teaching of 36 papers in 2 years with over 500 case studies on Indian firms & MNCs developed at IIF.
- IIF ranked at 30th place among top 100 out of 3546 Universities/Institutes in Regional & Global Ranking of Indian Sub-continent Region - CINDOC-CSIC (Madrid, Spain) in July 2007.
- IIF has established linkages (signed MOUs) with several leading Universities/Institutions from USA, U.K., France, Russia, Japan, Canada, Belgrade, Hungary, Poland, Romania, Uzbekistan, Malaysia, & Philippines etc. and with more than 750 leading professionals both from India and abroad including Nobel Laureates and from institutions like London School of Economics, London Business School, Harvard University, MIT, Wharton School, University of Chicago, IITs, IIMs and trade and industry associations - FICCI, ASSOCHAM, PHDCCI & CII. It has provided academic support to more than 100 institutions/Universities globally.
- IIF faculty has to its credit over 140 books, more than 200 articles, 600+ book reviews; 75+ bibliographies of about 25 pages each; over 300 Radio/TV talks and its views & opinions appearing more than 2500 times in national dailies on economic issues and organising/participating in 1000+ seminars & conferences and organised/ lectured in 550+ MDPs globally. It is well known for its Significant Pathbreaking Research Contributions.
- IIF is publishing its prestigious (400 pages) *Quarterly Journal of Finance - FINANCE INDIA* since 1987 regularly to promote & facilitate dissemination of Research in Finance. FI has some of the most eminent experts including Nobel Laureates on its editorial board. It is indexed & abstracted by over 21 institutions internationally and Rated 3rd Best Worldwide by *B & E Index USA*.
- IIF has Distinguished & Committed Faculty, well equipped Classrooms, Computer Centre and Library with over 55,000 volumes & more than 950 national & international journals. It is depository Library for UN, WIDER & IMF & over 25 central banks & institutions. A well-established Placement & Career Development Division to facilitate and assist its students in proper placement. *IIF Alumni* holds senior positions in Government & Industry.

IIF believes in Self Regulation, Market Recognition & holds highest respect for law.

Prospectus & Application form can be obtained on payment of Rs. 1000/- [US\$ 50 or Rs 2500 for overseas] by account payee Demand Draft drawn in favour of "Indian Institute of Finance" payable at Delhi, from IIF, Plot 4, Community Centre-II, Ashok Vihar-II, Delhi-110052. Ph: 27136257, 27136437;

21 Yrs. in the service of the Nation

Fax: 27454128; Email: admission@iif.edu For more details, visit <http://www.iif.edu>

Prof. J. D. Agarwal, Chairman

An Island of Excellence in the World of Finance