



An Empirical Study of the Key Determinants of Competition in Indian Banking Sector

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Abstract

The present study has taken an attempt to determine the key determinants of competition in Indian banking sector by using panel data model for a sample of 21 public sector and 18 private sector banks. It also analysed the full sample of all the 39 banks of the sector together. The study period is spanning from 1995 to 2012 and the study broadly conclude that the Indian Banking sector can take advantage of the prevailing macroeconomic condition to influence their Total Revenue but due to some internal management inefficiency it is unable to channelize its revenue towards Profitability. The banks have to improve their operational efficiency in order to have a better performance and command over their market structure.

Key Words: Determinants of Competition, Banking Sector, Panel Regression

Introduction

In the present research, we are trying to capture the determinants of competitive structure of Indian Banks. What are the critical strengths of banking industry and how they are linked to the macroeconomic fundamentals of the economy is one of the essences of the study. Obviously, there can be various inter-economic and external factors responsible for financial and operating efficiencies of the industry. Some of the factors may be interrelated, correlated with each other or may be jointly determined or may be either observable or unobservable or may be quite exogenous to the system of models. These are some of the possible scenarios that a researcher may come across while attempting to decode the critical determinants of the competitiveness of Indian banking sector. While measuring competition, the study used two equations i.e. revenue equation and price equation. In revenue equation, total revenue (TR) is the dependent variable and in price equation, return on asset (ROA) is the dependent variable. The essence of P-R model was to find out how effectively the cost factor of the banking sector is incorporated with revenue or price of the sector. Under perfect competition, market is priced with marginal cost by equalizing price (P) with marginal cost and hence effectively with marginal revenue. The first order condition of market equilibrium equalizes marginal revenue (MR) with Marginal cost (MC). Since under perfect competition, price is equal to marginal revenue, hence market equilibrium takes place at $P = MC$. This is otherwise known as marginal cost pricing. Secondly, an individual firm is a price taker and cannot influence market clearing price. In such case, any increase in cost has to be adjusted by total revenue as firms are price takers and don't have power to influence price with increasing cost of service. In contrary to perfect competition, it is monopoly where firms equalize MR with MC and decide market clearing price and output. Each individual monopoly firm can influence price with respective to increasing cost condition and protect its contribution margin to profit. Although, a monopolist is not fully free to charge price in line with increasing cost, rather charges price with respect to elasticity of demand, but still carries control over prices. Other than these two extreme ends, market can be either monopolistic competition, or some form of oligopoly. But the entire issue of competition lies on how effective the banks in India are efficient to adjust its revenue with different cost scenarios. In the present study, we observed a mixed structure of competition that is monopolistic competitive structure of banks in India. Now the question arises that what are the macroeconomic determinants of the above studied market structure. In line with the first objective of the study, we are trying to capture the determinants through both revenue and price equations.

On the other way, the below discussed macroeconomic variable has certain relationship with the profitability of Indian Banking Sector. The importance to look into the profitability matter is really very important to put. The commercial banks are important financial institutions in the financial system and the economy. They accept demand deposits and make loans and provide other services to the public. These banks make a profit by intermediating between depositors (savers) and borrowers (investors). As financial intermediaries, banks play a crucial role in the operation of most economies. Banks require a good management team to enable them to segregate between different level of liquidity, maturity and risk preferences. As such, the commercial banks must be able to evaluate a borrower's creditworthiness and monitor performance if they are to stay in profit (Ithomovich, 2009). The importance of bank profitability can be appraised at the micro and macro levels of the economy. At the micro level, profit is the essential prerequisite of a competitive banking institution and the cheapest source of funds. The basic aim of a bank's management is to achieve a profit, as the essential requirement for conducting any business. At the macro level, a profitable banking sector is better able to withstand negative shocks and contribute to the stability of the financial system. The importance of bank profitability at both the micro and macro levels has made researchers, academics, bank managements and bank regulatory authorities to develop considerable interest on the factors that determine bank profitability (Aburime, 2008). Banking sector's financial soundness indicators are analysed under four main titles which are banking activities, capital adequacy, asset quality, income-expenses and profitability. The banking sector's profitability potential will probably contribute to encouragement of investors, strengthening of the economic motion and the increase of global orientation to the sector.

Objective of the Study

From the insight of the above discussion, the present study has attempted to capture the key determinants of competition in Indian banking sector. Mostly we have analysed the macroeconomic determinants that broadly constitutes the systematic risk component of the sector. Although bank specific internal factors are micro by nature but it may be biased towards large size banks. Hence small banks in the sector may be underweighted or may be neglected. But in the present study we have considered external factors such as macroeconomic aggregates to capture the determinants of competition.

Literature Review

A large number of empirical studies covered developed economies have been conducted about factors influencing bank profitability or determinants of bank profitability. However, there is much less studies covered emerging economies (Al-Tamimi, 2010). The determinants of banks' profitability are usually assorted into internal and external factors. These studies specify return on asset (ROA), return on equity (ROE), return on capital employed (ROCE) and net interest margin (NIM) as the dependent variables and considering the internal and external factors as independent variables (Gul et al., 2011). In most studies, variables such as the level of liquidity, provisioning policy, capital adequacy, bank size, risk and overhead costs are used as internal determinants of banking profitability. On the other hand, the external determinants, both industry-related and macroeconomic, are variables that reflect the economic and legal environment where the credit institution operates. The following is a summary of the findings of some of these studies:

Mamatzakis and Remoundos (2003) examine the determinants of the performance of Greek commercial banks over the last decade. They measure the profitability of the commercial banks using the ratios return on assets (ROA) and return on equity (ROE). Their results provide weak evidence of the phenomenon of persistence in profitability. Athanasoglou et al. (2006) examine the profitability behaviour of bank-specific, industry related and macroeconomic determinants, using an unbalanced panel dataset of South Eastern European (SEE) credit institutions over the period 1998-2002. The estimation results indicate that, with the exception of liquidity, all bank-specific determinants significantly affect bank profitability in the anticipated way. The macroeconomic environment has a direct impact on the aggregate performance of the industry. Beckmann (2007) analyses structural and cyclical determinants of banking profitability in 16 Western European countries. The data set comprises aggregate annual country data and banking group data over the period 1979-2003. The estimation results show that financial structure matters, particularly through the beneficial effect of the capital market orientation in the respective national financial system. Furthermore, higher diversification regarding banks' income sources shows a positive effect. The industry concentration of national banking systems, though, does not significantly affect aggregate profitability. Business cycle effects, in particular lagged GDP growth, display a substantial pro-cyclical impact on bank profits. Athanasoglou et al. (2008) examine the effect of bank-specific, industry-specific and macroeconomic determinants of bank profitability, using an empirical framework that incorporates the traditional Structure-Conduct-Performance (SCP) hypothesis. They apply a GMM technique to a panel of Greek banks that covers the period 1985-2001 and found that profitability persists to a moderate extent, indicating that departures from perfectly competitive market structures may not be that large. Ilhomovich (2009) analyses the performance of domestic and foreign banks operating in Malaysia for the period of 5 years, from 2004 to 2008. He found that foreign banks have strong capital, but the statistics show that domestic banks more profitable. However, existing foreign banks are affecting financial services quality in Malaysia, because all banks offer better and low cost banking services for customer during strong competition. Krakah and Ameyaw (2010) examine the determinants of the profitability of commercial banks in Ghana. Results from the study reveal that the performance of the Banks has been highly volatile with the banks recoding negative profits during some periods within the two decade under study. The study also revealed that non-interest income, non-interest expense, bank's capital strength, natural log of total assets, growth of money supply, and annual rate of inflation are significant key drivers of banks' profitability in Ghana. However, the size of the Ghanaian economy and loan loss provision or provisions for bad debt did not have any significant impact on the banks profitability. Al-Tamimi (2010) investigates some influential factors in UAE's Islamic and conventional national banks during the period 1996-2008. The UAE Islamic banks have a small market share, though there is an increasing demand on their services. This might give a motivation to examine the influencing factors on the performance of these banks compared with conventional banks. ROE and ROA are used as dependent variables. The internal and external factors are considered as independent variables including: GDP per capita, size, financial development indicator, liquidity, concentration, cost and number of branches. The results indicate that liquidity and concentration were the most significant determinants of conventional national banks' performance. On the other hand, cost and number of branches were the most significant determinants of Islamic banks' performance. Rasiah (2010) represents a theoretical review of the profitability of commercial banks. The profitability determinants are basically divided into two main categories, namely the internal determinants and the external determinants. The internal variables included in this study are asset portfolio mix, total expenses, liability composition, and liquidity ratio and capital structure. The external determinants are taken as competition, regulation, inflation, market share, market growth, firm size and interest rate. The internal variables alone are adequate in explaining the profitability of the commercial banks in Malaysia and Singapore. On the other hand, the external variables are also relevant and hence should be included in the profitability models. Scott and Arias (2011) suggest that it is possible to discern relevant indicators of profitability for the banking industry today. The purpose of this study is to develop an appropriate econometric model whereby the primary determinants of profitability of the top five bank holding companies in the United States could be examined and understood. This study shows that profitability determinants for the banking industry include positive relationship between the return of equity and capital to asset ratio as well as the annual percentage changes in the external per capita income. The internal factor of size as measured by an organization's total assets has on its ability to compete more effectively, even in times of economic downturns. Davydenko (2011) examines the determinants of bank profitability in Ukraine. It relates bank specific, industry specific and macroeconomic indicators to the overall profitability of Ukrainian banks. Alper and Anbar (2011) examine the bank specific and macroeconomic determinants of the banks' profitability in

Turkey over the time period from 2002 to 2010. The results show that asset size and non-interest income have a positive and significant effect on bank profitability. However, size of credit portfolio and loans under follow-up have a negative and significant impact on bank profitability. With regard to macroeconomic variables, only the real interest rate affects the performance of banks positively. These results suggest that banks can improve their performance of banks positively.

Methodological Framework

The equation that is being used for testing determinants of competition in this study is:

Model-1:

$$\log ROA_{it} = \alpha_0 + \alpha_1 \log GDS_{it} + \alpha_2 \log GDCF_{it} + \alpha_3 \log REER_{it} + \alpha_4 M_{3it} + \alpha_5 \log Inflation_{it} + \alpha_6 \log InterestRate_{it} + \alpha_7 GROWTH_{t+n_{it}}$$

Model-2:

$$\log TR_{it} = \alpha_0 + \alpha_1 \log GDS_{it} + \alpha_2 \log GDCF_{it} + \alpha_3 \log REER_{it} + \alpha_4 M_{3it} + \alpha_5 \log Inflation_{it} + \alpha_6 \log InterestRate_{it} + \alpha_7 GROWTH_{t+n_{it}}$$

Nature and Description of Variables

The present study has considered a group of macroeconomic variables such as Gross Domestic Saving (GDS), Gross Domestic Capital Formation (GDCF), Real Effective Exchange Rate (REER), Broad Money (M_3), Inflation rate, Interest rate and GDP Growth Rate. All these variables are collected from Prowess spanning from 1995 to 2012, annual observation.

Theoretical justification between the Variables of the empirical model

The external determinants are variables that are not related to bank management but reflect the economic and legal environment that affects the operation and performance of financial institutions. According to Abebaw and Depaack (2011), the external factors, they have a relatively small impact on the profitability of Ethiopian banks. Turning to the external determinants, several factors have been suggested as impacting on profitability and these factors can further distinguish between control variables that describe the macroeconomic environment, such as real GDP growth, bank concentration, inflation, regulation, and other variables that represent market characteristics (Yuqi 2006).

Gross Domestic Product (GDP): Macroeconomic conditions affect banking profitability in a number of ways. There will be a higher demand for bank credit in times of economic boom than in times of recession. Economic growth is measured by the real GDP sector profitability (e.g. Belayneh (2011), Andreas and Gabrielle (2009), and Athanasoglou et al. (2008). Accordingly, they expect a positive relationship between bank profitability and GDP development as the demand for lending is increasing (decreasing) in cyclical upswings (downswings). According to Belayneh (2011) from microeconomic indicators, the only significant factor of bank profitability is real GDP growth. He stated that the current real economic growth of the country makes commercial banks to be more profitable. A high aggregate growth rate may strengthen the debt servicing capacity of domestic borrowers, and therefore, contribute to less credit risk. Alternatively, adverse macroeconomic conditions hurt banks by increasing the amount of non-performing loans. Thus, it is expected that an improvement in economic growth enhance bank performance.

Inflation: High inflation is associated with higher costs as well as higher income. If a bank's income rises more rapidly than its costs, inflation is expected to exert a positive effect on profitability. Several economists have found that countries with high inflation rates have inefficiently small banking sectors and equity markets. This effect suggests that inflation reduces bank lending to the private sector, which is consistent with the view that a sufficiently high rate of inflation induces banks to ration credit as stated by John H. B and Bruce C. (2006). They also show the impact of inflation on asset returns and bank profitability, recall that the theory we have been discussing holds that inflation in sufficiently high doses kicks off a chain of events that ultimately leads to underdeveloped economic growth. The chain begins when high inflation lowers the real return on assets. They found that inflation is negatively associated with real money market rates, real Treasury bill rates, and real time-deposit rates; that is, as inflation increases, the real rate of return on these instruments falls. They found no significant statistical relationship between inflation and the real bank loan rate. However, inflation does appear to have a negative impact on bank profitability measures.

Interest Rate: Some banks may face extreme liquidity constraints, under severe stress scenario. Overall, the results of the macro-stress tests using different scenarios, suggested that the banking sector would be able to withstand macroeconomic shocks though the prevailing inflation and interest rate situation is expected to have an adverse effect on the asset quality of banks. Higher rates without meaningful economic growth are bad for banks. A lot of these banks have put on big securities portfolios at very low rates, trying to put their money to work. If rates move up materially, those things will be marked down. High real interest rates are associated with higher interest margins and profitability, especially in developing countries. This may reflect that in developing countries demand deposits frequently pay zero or below market interest rates. A sharp increase in short-term interest rates can lead to banking crises via at least two channels. High real interest rates can reduce banks' profits or produce losses, since typically the asset side of bank balance sheets is comprised of longer maturity instruments at fixed interest rates. Moreover, high interest rates make loan repayments harder for debtors and adversely affect banks by increasing non-performing loans. As a consequence, a sharp increase in short-term rates is likely to be a significant contributing factor to systemic banking sector problems. Depending on the type of interest rate, the relation will vary positively or negatively with bank profitability.

Exchange Rates: The exchange rate volatility is partly responsible for the profit or loss made by banks and hence has a significant impact on the financial industry. This impact is particularly noticeable when the banking industry is facing crisis periods. An understanding of the specific impact of the volatility of exchange rates on banking profits can therefore also help in better management, as bank instability can lead to wider negative repercussion. If the amount of liabilities in foreign currency is larger than that of foreign currency assets, then the total effects of the exchange rate depreciation on the profitability of the bank is negative.

Money Supply: An increase in money supply in the economy will increase the interest rate which in return will lead to more saving with banks mobilized from households and ultimately increases more scope for investors with availability of funds. This increases the scope for banking sector to perform well. Thus, it should bear a positive sign.

Gross Domestic Saving and Gross Domestic Capital Formation: Capital formation refers to the net addition to the capital stock after of any nation after depreciation. It is defined as an addition to stock of capital assets set aside for future productive endeavours in real sector which will lead to more growth in physical capital assets of the country. Capital formation captures all the real-value-added to the economy in real-asset-terms which will lead to further enhancement of savings, investment and generation of more wealth in future. Capital formation derives from savings accumulation. It has a positive impact on private savings accumulation in the sense that increase in capital formation will lead to more savings. When savings accumulate it will lead to an increase in gross domestic investment (GDI) and income generated as a result of the investment projects made will, in turn, lead to GDP growth. Thus, both GDS and GDCF have a positive relation with bank profitability.

Analysis of Empirical Result

The determinants are captured by panel regression analysis. In order to capture the determinants of competitiveness, the presented study has used panel OLS estimates and the estimated statistics are presented in Table 1 to 12. Table 1 and 2 presents estimated statistics of public sector banks under two models, one without controlling standard error and one after controlling standard error. In the first case, we are trying to capturing the relationship between ROA and seven macroeconomic indicators such as GDS, GDCF, REER, M_3 , Inflation rate and economic growth considered under the study. Under both of the model, the estimated coefficients are same, but standard errors are varying. This is because of the existence of heteroskedasticity within the panel. As standard error is changing, it will lead to suspects about the level of significance of the estimated coefficients. Under such situation, a small change in sample size may make substantial changes in significance level of the model. Hence some control over varying variations of the estimated random component is inevitable. In the second model we tried to set control for heteroskedasticity the tried to analyse estimated coefficients after adjusting standard error. The adjusted standard error is lower than unadjusted standard error, and the impact is clear on t-statistics and probability level of the parameters. Among the seven independent variables constant, GDCF, REER, M_3 and inflation rate is significantly influencing the return on asset of public sector banks. Out of which, other than REER rest of the significant variables are impacting ROA negatively. Similarly we have analysed a panel of private sector banks and the estimated results are presented in table: 3 and 4 for without adjusting standard error and with adjusting standard error respectively. With the effects of heteroskedasticity, none of the macroeconomic indicators are able to influence ROA of private sector banks significantly. But after adjusting standard error, other than constant, only DGCF is influencing ROA negatively and significantly. It is quite interesting to note that return on asset on private sector banks are not significantly influenced by major macroeconomic indicators of the economy. The third panel is the panel of all banks i.e. sum of all public sector and private sector banks that are considered under panel one and two. The estimated test statistics are presented in table 5 and 6 under without adjusting standard error and with adjusting standard error. Without adjusting standard error, it is only GDCF that is only influencing ROA of all the banks negatively at 7% probability level which is again quite weak part of acceptance. But after adjusting standard error, the level of significance of the model changed substantially. Here itself we can note the impact of heteroskedasticity and the usefulness of the adjustment parameter. After adjusting standard error, other than constant, it is GDCF, M_3 , and rate of inflation that is influencing ROA of Indian banking sector significantly. All these indicators carry negative impact on ROA. In order to have a proper insight about the structure of determinants, we have taken an attempt to analyse the impact of these macroeconomic indicators on total revenue of the banks. It is in line with the same structure as we estimated competition under revenue and price equation. The estimated statistics of revenue equation is presented in table 7 to 12. Table 7 and 8 presents the estimated test statistics (without adjusting and with adjusting standard error respectively) for the model capturing the impact of macroeconomic indicators on total revenue of public sector banks during our studying period. If we concentrate on the estimated statistics of the model after adjusting standard error, we notice except REET, all the explanatory variables are significant at more than 1% probability level. GDS, M_3 , Interest rate, Inflation rate and Growth rate of the economy has positive impact whereas GDCF have negative impact on total revenue. The overall significance level of the model is also quite good as indicated by quite high Wald Chi square statistics with zero probability. Autocorrelation parameter is also zero stating a very strong model where error terms are non-auto correlated. Similarly, the estimated parameters for private sector banks are presented in table 9 and 10 for without and with adjusting standard error. The overall significance level of the model indicated by Wald chi square statistics is significant at above 1% level. Out of seven macroeconomic indicators, GDS, GDCF, M_3 , and Growth rate is significantly impacting the total revenue of Indian private sector banks. Out of which, GDS and M_3 and Growth rate of the economy is impacting TR positively whereas GDCF is impacting TR negatively. In case of the entire banks sample, the estimated parameters are presented in table 11 and 12. Table 12 presents the parameters after adjusting the standard error. Surprisingly, all the parameters except REER are statistically significant. This clarifies that in case of all the banks of the sector, the total revenue is significantly influenced by macroeconomic indicators of the country. In contrary to ROA, TR is much better explained by macroeconomic aggregates. This provides a very important insight about Indian banking sector. Look at the issue again, Banking sector total revenue is much better explained by GDS, GDCF, M_3 , Inflation rate, Interest rate and aggregate GDP growth rate. But when this total revenue is taken as a percentage of total asset i.e. return of asset (ROA) it is getting detached from economic aggregated. Hence it clearly indicates a disproportional asset structure of the banking sector or in a more economic sense we may call it that the Indian banking sector is under structural disequilibrium. It obviously indicated the asset distribution of the industry has been examined thoroughly to extract more insights about the industry. Though banks are financial institutions, its asset includes both financial as well as physical assets. Hence the efficiency level of the sector has to be explored from both of the dimensions. Now financial as well as operating efficiency or as a whole the overall efficiency level of the sector is at stake.

Now let us discuss and the other part of the result which implies a certain relationship of different macroeconomic indicators with the Total Revenue and bank profitability, i.e., ROA. In Table 8 we see the relation between different macroeconomic indicators with the Total Revenue for the public sector bank. We find GDCF and REER are negatively related to Total Revenue whereas the other variables has positive relation with the Total Revenue. Other than GDCF all

other relation found are in the line with the theory. On the other hand, in Table 2 we see the relation between different macroeconomic indicators with the bank profitability, i.e., ROA for the public sector bank. We find only Growth (GDP), Interest rate and REER has positive relation and the rest have negative relation. Looking Total Revenue and ROA differently we find almost different signs prevailing in the relationship. If we see the previous result we will find Total Revenue is significantly affected by the macroeconomic indicators rather than ROA. It means the public sector banks can take advantage of the prevailing macroeconomic condition to raise/ affect their Total revenue but due to some internal management inefficiency it is unable to channelize its revenue towards Profitability. Now let us see how the private sector banks are capable of channelizing its revenue towards Profitability. In Table 10 we see the relation between different macroeconomic indicators with the Total Revenue for the private sector bank. We find GDCF and REER are negatively related to Total Revenue whereas the other variables has positive relation with the Total Revenue. Other than GDCF all other relation found are in the line with the theory. On the other hand, in Table 4 we see the relation between different macroeconomic indicators with the bank profitability, i.e., ROA for the private sector bank. We find GDS, REER and Interest rate has positive relation and rest of the variables have negative relation. This is somewhat not in line with the theory. But as explained above, the reason could be the operational inefficiencies in channelizing the revenue.

Conclusion

After capturing competitive structure, the study attempted for capturing the determinants of competitiveness. We understood from the review of earlier studies that the determinants can be captured through internal factors as well as through external factors. Looking critically, internal factors are bank specific whereas external factors are economic specific by nature. For that we have considered GDS, GDCF, REER, M_3 , Inflation rate, Interest Rate and GDP growth rate. These are the exogenous or independent factors to the model. The present study tries to capture the impact of all these factors on total revenue (TR) and return on asset (ROA). We tried to capture determinants through price equation and revenue equation in order to have a better clarity over the findings of this issue. Again the entire sample of banks is further divided to three panels, the panel of public sector, private sector and the panel of all banks. The estimated statistics of the above two models and for the all the three panels are quite interesting to note. In case of public sector banks, after adjusting standard error GDCF, REER, M_3 , and revenue equation, except REER, all the macroeconomic indicators are influencing TR significantly. Looking at the sign of the estimated parameters GDS, M_3 , Inflation, Interest rate and GDP growth rate are influencing TR positively which is in line with the logical expectation. But in case of price equation, GDCF, M_3 , and inflation rate have negative influence on ROA which is sometimes not in line with logical expectation. In overall scenario, TR is better explained by macroeconomic aggregated than ROA in case of public sector banks. Similarly, in case of private sector banks, only GDCF is influencing ROA significantly, in revenue equation, GDS, GDCF, M_3 , and GDP growth rate are having significant impact on TR. GDCF is impacting TR negatively whereas all others are impacting TR positively which is again in line with logical expectation. Similarly, in case of all the bank panel, TR is significantly influenced by all the macroeconomic aggregated other than REER where as in case of ROA, it is GDCF, M_3 and inflation rate that is having significant impact on ROA. In overall, we can conclude that TR of the banking sector is better explained than ROA. As said above we find Total Revenue is significantly affected by the macroeconomic indicators rather than ROA. We may conclude that the Indian Banking sector can take advantage of the prevailing macroeconomic condition to raise/ affect their Total revenue but due to some internal management inefficiency it is unable to channelize its revenue towards Profitability. The banks have to improve their operational efficiency in order to have a better performance. The banks have all the potential to increase their income but the question lies in its better management.

Tables of Estimated Test Statistics

Table 1: Panel Regression - Public Sector Banks (Without Adjusted Standard Error)

Number of Obs.	378	R-Square	0.75	
Number of Groups	21	Wald Chi (7)	1349.81	
	1851.91	Prob.	0.000	
		Rho	0.209	
ROA (Dependent)	Coefficient	Stand. Error	't' statistics	Prob.
Constant	12.52	1.107	11.31	0.000
GDS	-0.017	0.562	-0.31	0.754
GDCF	-0.187	0.036	-5.13	0.000
REER	0.031	0.011	2.71	0.007
M_3	-0.030	0.009	-3.24	0.001
Inflation	-0.003	0.0006	-5.02	0.000
Interest rate	0.037	0.035	1.07	0.286
GROWTH	0.010	0.032	0.31	0.754

Table 2: Panel Regression - Public Sector Banks (With Adjusted Standard Error)

Number of Obs.	378	R-Square	0.75	
Number of Groups	21	Wald Chi (7)	1522.92	
	1851.91	Prob.	0.000	
		Rho	0.209	
ROA (Dependent)	Coefficient	Stand. Error	't' statistics	Prob.
Constant	12.52	0.740	16.92	0.000
GDS	-0.017	0.035	-0.490	0.621
GDCF	-0.187	0.028	-6.58	0.000
REER	0.031	0.007	4.06	0.000
M ₃	-0.030	0.007	-4.19	0.000
Inflation	-0.003	0.0002	-11.88	0.000
Interest rate	0.037	0.036	1.05	0.296
GROWTH	0.010	0.018	0.55	0.579

Table 3: Panel Regression - Private Sector Banks (Without Adjusted Standard Error)

Number of Obs.	324	R-Square	0.69	
Number of Groups	18	Wald Chi (7)	115.05	
	1851.91	Prob.	0.000	
		Rho	0.329	
ROA (Dependent)	Coefficient	Stand. Error	't' statistics	Prob.
Constant	19.65	26.72	0.74	0.462
GDS	1.057	1.355	0.78	0.435
GDCF	-1.363	0.879	-1.55	0.121
REER	0.040	0.281	0.14	0.885
M ₃	-0.151	0.230	0.66	0.509
Inflation	-0.004	0.014	-0.34	0.735
Interest rate	0.721	0.849	0.85	0.395
GROWTH	-0.54	0.77	-0.70	0.485

Table 4: Panel Regression - Private Sector Banks (With Adjusted Standard Error)

Number of Obs.	324	R-Square	0.69	
Number of Groups	18	Wald Chi (7)	1522.92	
	1851.91	Prob.	0.000	
		Rho	0.209	
ROA (Dependent)	Coefficient	Stand. Error	't' statistics	Prob.
Constant	19.65	9.169	2.14	0.032
GDS	1.057	0.9005	1.17	0.240
GDCF	-1.363	0.7700	-1.77	0.077
REER	0.040	0.147	0.28	0.782
M ₃	-0.151	0.103	-1.47	0.141
Inflation	-0.004	0.003	-1.35	0.176
Interest rate	0.721	1.016	0.71	0.468
GROWTH	-0.54	0.342	-1.58	0.115

Table 5: Panel Regression - All Banks (Without Adjusted Standard Error)

Number of Obs.	702	R-Square	0.51	
Number of Groups	39	Wald Chi (7)	57.26	
	1851.91	Prob.	0.000	
		Rho	0.34	
ROA (Dependent)	Coefficient	Stand. Error	t' statistics	Prob.
Constant	15.81	12.49	1.27	0.205
GDS	0.478	0.633	0.76	0.450
GDCF	-0.729	0.411	-1.78	0.076
REER	0.035	0.131	0.27	0.785
M ₃	-0.086	0.107	-0.81	0.420
Inflation	-0.003	0.006	-0.57	0.566
Interest rate	0.353	0.396	0.89	0.373
GROWTH	-0.243	0.361	-0.68	0.500

Table 6: Panel Regression - All Sector Banks (With Adjusted Standard Error)

Number of Obs.	702	R-Square	0.51	
Number of Groups	39	Wald Chi (7)	57.26	
	1851.91	Prob.	0.000	
		Rho	0.34	
ROA (Dependent)	Coefficient	Stand. Error	t' statistics	Prob.
Constant	15.81	4.200	3.77	0.0000
GDS	0.478	0.416	1.15	0.250
GDCF	-0.729	0.361	-2.02	0.043
REER	0.035	0.066	0.54	0.591
M ₃	-0.086	0.047	-1.81	0.070
Inflation	-0.003	0.001	-2.36	0.018
Interest rate	0.353	0.463	0.76	0.445
GROWTH	-0.243	0.161	-1.51	0.131

Table 7: Panel Regression - Public Sector Banks (Without Adjusted Standard Error)

Number of Obs.	378	R-Square	0.22	
Number of Groups	21	Wald Chi (7)	109.67	
	1851.91	Prob.	0.000	
		Rho	0.209	
TR (Dependent)	Coefficient	Stand. Error	t' statistics	Prob.
Constant	-85.23	55.73	-1.53	0.126
GDS	5.48	2.837	1.93	0.053
GDCF	-5.11	1.841	-2.78	0.005
REER	-0.105	0.589	-0.18	0.859
M ₃	2.25	0.481	4.68	0.000
Inflation	0.081	0.030	2.66	0.008
Interest rate	3.410	1.777	1.92	0.055
GROWTH	5.972	1.618	3.69	0.000

Table 8: Panel Regression - Public Sector Banks (With Adjusted Standard Error)

Number of Obs.	378	R-Square	0.22	
Number of Groups	21	Wald Chi (7)	350.78	
	1851.91	Prob.	0.000	
		Rho	0.000	
TR (Dependent)	Coefficient	Stand. Error	t' statistics	Prob.
Constant	-85.23	26.00	-3.28	0.001
GDS	5.48	1.88	2.92	0.004
GDCF	-5.11	1.363	-3.75	0.000
REER	-0.105	0.461	-0.23	0.820
M ₃	2.25	0.324	6.96	0.000
Inflation	0.081	0.025	3.23	0.001
Interest rate	3.410	1.050	3.25	0.001
GROWTH	5.972	1.136	5.26	0.000

Table 9: Panel Regression - Private Sector Banks (Without Adjusted Standard Error)

Number of Obs.	324	R-Square	0.22	
Number of Groups	18	Wald Chi (7)	42.65	
	1851.91	Prob.	0.000	
		Rho	0.036	
TR (Dependent)	Coefficient	Stand. Error	t' statistics	Prob.
Constant	-40.27	107.07	-0.38	0.707
GDS	9.94	5.449	1.82	0.068
GDCF	-9.929	3.536	-2.81	0.005
REER	-0.456	1.132	-0.40	0.687
M ₃	1.898	0.924	2.05	0.040
Inflation	0.013	0.059	0.23	0.814
Interest rate	2.572	3.413	0.75	0.451
GROWTH	10.065	3.109	3.24	0.001

Table 10: Panel Regression - Private Sector Banks (With Adjusted Standard Error)

Number of Obs.	324	R-Square	0.23	
Number of Groups	18	Wald Chi (7)	724.23	
	1851.91	Prob.	0.000	
		Rho	0.360	
TR (Dependent)	Coefficient	Stand. Error	t' statistics	Prob.
Constant	-40.27	85.19	-0.47	0.636
GDS	9.941	2.038	4.88	0.000
GDCF	-9.929	1.557	-6.38	0.000
REER	-0.456	0.867	-0.53	0.599
M ₃	1.898	0.491	3.86	0.000
Inflation	0.013	0.043	0.32	0.748
Interest rate	2.572	1.945	1.32	0.186
GROWTH	10.065	2.788	3.61	0.000

Table 11: Panel Regression - All Banks (Without Adjusted Standard Error)

Number of Obs.	702	R-Square	0.24	
Number of Groups	39	Wald Chi (7)	117.56	
	1851.91	Prob.	0.000	
		Rho	0.024	
TR (Dependent)	Coefficient	Stand. Error	't' statistics	Prob.
Constant	-64.48	57.99	-1.11	0.266
GDS	7.540	2.952	2.55	0.011
GDCF	-7.338	1.915	-3.83	0.000
REER	-0.267	0.613	-0.44	0.663
M ₃	2.090	0.501	4.17	0.000
Inflation	0.050	0.032	1.57	0.115
Interest rate	3.023	1.848	1.64	0.102
GROWTH	7.861	1.684	4.67	0.000

Table 12: Panel Regression - All Sector Banks (With Adjusted Standard Error)

Number of Obs.	702	R-Square	0.24	
Number of Groups	39	Wald Chi (7)	515.92	
	1851.91	Prob.	0.000	
		Rho	0.024	
TR (Dependent)	Coefficient	Stand. Error	't' statistics	Prob.
Constant	-64.48	41.03	-1.57	0.116
GDS	7.540	1.404	5.37	0.000
GDCF	-7.338	1.081	-6.78	0.000
REER	-0.267	0.462	-0.58	0.564
M ₃	2.090	0.282	7.40	0.000
Inflation	0.050	0.024	2.07	0.038
Interest rate	3.023	1.042	2.90	0.004
GROWTH	7.861	1.435	5.48	0.000

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