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A Comparison of Key Determinants on Profitability of India's Largest Public and Private Sector Banks

Rajveer Rawlin*
Associate Professor, Acharya Bangalore Business School, Bangalore - 560091
Email: samuelrr@yahoo.com

Dr. Ramaswamy Shanmugam
Professor (retired), BESMED, Bharathiar University, Coimbatore - 641 046

Vanashree Bhat
Graduate Student (MBA), Acharya Bangalore Business School, Bangalore - 560091

Abstract
The banking sector in India has come under the scanner following some key changes in monetary policy. With the Reserve bank of India (RBI) raising interest rates to support the falling Indian currency the Rupee, the cost of funds of banks has increased significantly. This could manifest itself in rising non-performing assets (NPAs) and declining profitability. The profitability of banks is impacted by both internal and external factors. This paper is an attempt to compare the key drivers of profits at India's largest public and private sector banks. Bank specific metrics and risk factors were important drivers of profits at both banks. Productivity measures were key drivers of profits at India's largest public sector bank SBI but had no effect on profits at India's largest private sector bank, HDFC bank. Asset usage efficiency measures were key determinants of profitability at HDFC bank but not at SBI. The single most important determinant of SBI proved to be business per employee, a productivity measure while advances and bank size which are traditional bank metrics were key drivers of profits at HDFC bank. Managers at both banks and their share holders thus can look at these drivers to develop a broad understanding of profitability at the two banks.
Keywords: Net Profit, Determinants, Key Performance Indicators, Indian Bank, Step Wise Multiple Regression

1. Introduction

Introduction of banking sector reforms have changed the face of the entire Indian banking landscape. The Reserve Bank of India's (RBI) efforts to adopt international banking norms such as Basel 3 norms has further forced banks to adopt measures to control and maintain margins. The banking sector in India has recently come under the scanner following some key changes in monetary policy. With the Reserve bank of India (RBI) raising interest rates to support the falling Indian currency the Rupee, the cost of funds of banks has increased significantly. This could manifest itself in rising non-performing assets (NPAs) and declining profitability. Evidence of this was seen in the recently released results of most public sector banks that indicated significantly deteriorating asset quality.

The profitability of a bank is predominantly driven by a series of internal and external factors. The internal determinants of bank profitability include but are not limited to bank size, capital, risk management procedures adopted, expenses, and diversification adopted (Molyneux and Thornton, (1992); Goddard et al., (2004); Bodla and Verma, (2006)). External determinants of bank profitability include both industry structural determinants such as market concentration, industry size and ownership, and macroeconomic determinants such as inflation, interest rates, money supply and Gross Domestic Product (GDP) (Athanasoglou et al., (2008); Chirwa, (2003)).

In the current study we focus primarily on the relationship of a selected group of internal factors with the profitability of India's largest public and private sector banks, State bank of India (SBI) and Housing Development Finance Corporation (HDFC) bank. These factors include key bank metrics such as deposits, advances, total assets and bank size, risk factors such as the capital adequacy ratio, gross and net NPAs, productivity measures such as business per employee and profit per employee, and asset usage efficiency measures such as the return on assets, interest income/average working funds, non-interest income/average working funds and operating profit/average working funds. The effect of these factors on bank profitability was examined over a 10 year period spanning from 2004-2013 through correlation, uni-variate and step wise multiple regression analysis.

2. Literature Review

The banking sector plays a pivotal role in fostering economic development. By mobilizing savings from the public and channeling them through advances, banking activities support developmental activities across the nation. Thus, a stable banking system is mandatory for a nations overall financial health and prosperity.

An understanding of factors instrumental in driving bank profitability can throw light not only in identifying profitable banking strategies but also will help uncover operational inefficiencies which can be eliminated.

There are several factors that impact the profitability of banks (Sufian and Habibullah, (2010); Dietrich and Wanzenried, (2011)). These factors can be broadly classified as either internal determinants that originate within the firm such as bank size, capital, risk management, expenses management, and diversification (Molyneux and Thornton, (1992); Goddard et al., (2004); Bodla and Verma, (2006)) or external determinants that are outside the firm like market concentration, industry size and ownership, inflation, interest rates, money supply and Gross Domestic Product (GDP) (Athanasoglou et al., (2008); Chirwa, (2003)).

Several studies have examined the impact of key internal factors on profitability. Smirlock & Brown, (1986) studied the impact of demand deposits as a function of total deposits on profitability. Their findings suggest that demand deposits had a significant positive relationship with profits. Miller and Noulas, (1997) found that loan loss provision and net charge offs had a significant negative effect on the profitability of large banks. These results indicated that net charge offs were further affected by asset and liability composition. Thus, the asset liability portfolio decisions of commercial banks can be expected to affect the profitability of these institutions via net charge offs. It was also observed that higher salaries and benefits per employee were consistently associated with higher net charge offs to total assets. This suggested that banks with higher salaries and benefits would require higher net interest margins to maintain profitability.

Ganesan, (2001) examined the profitability of public sector banks in India and found that interest costs, interest income, other income, deposits per branch, credit to total assets and proportion of priority sector advances were key determinants of profitability of these banks. Holden and El-Bannany, (2004) investigated whether investment in information technology systems affects bank profitability in UK. The results showed that the number of automated teller machines installed by a bank has a positive impact on bank profitability. Bodla and Verma, (2006) made an attempt to identify the key determinants of profitability of public sector banks in India and their study indicated that the variables such as non-interest income, operating expenses, provision and contingencies and spread have significant relationship with net profits.

In a study done on Tunisian banks from 1980-2000, Ben Naceur and Goaied, (2008) find that banks with relatively high amount of capital and overhead expenses tend to exhibit higher net-interest margin and profitability levels. They also find that bank size is negatively related to profitability. Additionally stock market development had a positive impact on bank profitability. Further private banks were found to be relatively more profitable than their state-owned counterparts.

Sufian, (2009) examined the determinants of Malaysian domestic and foreign commercial bank profitability during the period 2000-2004. It was found that Malaysian banks with higher credit risk and loan concentration exhibit lower profitability levels. On the other hand, banks that have a higher level of capitalization, higher proportion of income from non-interest sources, and high operational expenses proved to be relatively more profitable.

External determinants of bank profitability cover the impact of macroeconomic variables such as concentration, growth and inflation on bank profitability (Rajan and Zingales (1998); Athanasoglou et al., (2008); Chirwa, (2003). Chirwa, (2003) investigated the relationship between market structure and profitability of commercial banks in Malawi using time series data between 1970 and 1994. The analysis shows a long-run relationship between bank performance and concentration. Sufian, (2009) found that economic growth negatively impacts the profitability of Malaysian banks. Higher inflation rates positively impacted the profitability of these banks. While studying a sample of eighteen European countries Molyneux and Thornton, (1992) found a significant positive relationship between the return on equity and the level of interest rates in each country, bank concentration, and government ownership.

3. Methodology

This study used historical data to compare the relationship of a series of independent variables on the profitability India's largest public sector bank SBI with that of India's largest private sector bank HDFC. The following variables were chosen:

Key bank metrics - Deposits, advances, total assets and bank size

Risk factors - The capital adequacy ratio, gross and net NPAs

Productivity measures - Business per employee and profit per employee

Asset usage efficiency measures - The return on assets, interest income/average working funds, non-interest income/average working funds and operating profit/average working funds.

The study was conducted with annual data for the ten year period spanning from the financial years 2004 to 2013. Historical data on all of the above were obtained from the *Capitaline* financial database (www.capitaline.com) and the Reserve Bank of India (www.rbi.gov.in). The relationship between the variables was analyzed with the SPSS 18.0 package. Q-Q plots were used to ascertain normality of the data. Correlation

coefficients were determined to study the relationship between the respective variables. F values and Significant F values from ANOVA analysis were used to assess the statistical significance of the correlations observed at 95% confidence intervals. Then Uni-variate and step-wise multiple regression analysis were used to study the impact of all the independent variables taken individually and together on the net profit of the banks. Variance Inflation Factor (VIF) was used to detect multi-collinearity. Durbin Watson coefficient was used to detect auto correlation in the data.

4. Results:

Table 1: SBI and HDFC Bank, Some Key Metrics (Billion Rupees)

Bank	Size	Net Interest Income	Net Profit	Total Assets
SBI	1964	1364	109	17922
HDFC	2065	411	85	4916

Source: moneycontrol.com as on 12-9-2014

Table 2: Relationship between Profitability and Performance Indicators of SBI: Results of Correlation Analysis, Regression Analysis and ANOVA

Dependent Variable (Profitability)	Independent Variable (Performance Indicators)	Relationship	Correlation Coefficient (R)	Regression Coefficient (R^2)	F Value	Sig. F Value
Net Profit	Deposits	+	0.970	0.942	128.99	0.000
Net Profit	Advances	+	0.966	0.934	112.67	0.000
Net Profit	Total Assets	+	0.970	0.940	125.20	0.000
Net Profit	Bank Size	+	0.777	0.603	12.17	0.008
Net Profit	Gross NPA	+	0.911	0.830	39.10	0.000
Net Profit	Net NPA	+	0.965	0.932	109.73	0.007
Net Profit	Capital Adequacy Ratio	-	0.473	0.224	2.31	0.167
Net Profit	Business-per-Employee	+	0.972	0.944	135.26	0.000
Net Profit	Profit-per-Employee	+	0.958	0.918	89.80	0.000
Net Profit	Return on Assets	-	0.098	0.01	0.08	0.787
Net Profit	Interest Income / Average Working Funds	+	0.090	0.008	0.065	0.805
Net Profit	Non-Interest Income / Average Working Funds	-	0.639	0.408	5.51	0.047
Net Profit	Operating Profit / Average Working Funds	-	0.332	0.11	0.99	0.348

Table 2 shows the results of correlation analysis, linear regression analysis and Anova for SBI. Profitability as measured by net profit is considered as the dependent variable while the independent variables are deposits, advances, net NPAs, gross NPA's, return on assets, the capital adequacy ratio, business per employee , profit per employee, bank size, interest income/average working funds, non-interest income/average working funds and operating profit/average working funds. Among these variables, deposits, advances, Total assets, business per employee, profit per employee, Net NPAs, gross NPAs and bank size were found to be positively correlated with net profit. Non- interest income/average working funds were found to be negatively correlated with net profit. The correlations observed were also statistically significant at the 95% confidence level. The relationship between net profit and the other variables were not statistically significant at the 95% confidence level.

Table 3: Relationship between Profitability of SBI and Performance Indicators: Step Wise Multiple Regression Analysis

Dependent Variable	Independent Variable	Correlation Coefficient R	Regression Coefficient R^2	F Value	Sig. F Value	VIF	Durbin Watson
Net Profit	Business per Employee	0.972	0.944	135.26	0.000	1.0	1.634

Table 3 shows the results of a step wise multiple regression performed taking SBI's net profit as the dependent variable and performance indicators mentioned in Table 2were chosen as independent variables. The step wise regression eliminated most variables due to multi-collinearity issues and chose business per employee (VIF<5) as the most significant independent variable.

Table 4: Relationship between Profitability and Performance Indicators of HDFC Bank: Results of Correlation Analysis, Regression Analysis and ANOVA

Dependent Variable (Profitability)	Independent Variable (Performance Indicators)	Relationship	Correlation Coefficient (R)	Regression Coefficient (R^2)	F Value	Sig. F Value
Net Profit	Deposits	+	0.988	0.975	314.42	0.000
Net Profit	Advances	+	0.994	0.989	712.85	0.000
Net Profit	Total Assets	+	0.991	0.982	436.62	0.000
Net Profit	Bank Size	+	0.914	0.836	40.78	0.000
Net Profit	Gross NPA	+	0.887	0.786	29.41	0.001
Net Profit	Net NPA	+	0.618	0.383	4.96	0.057
Net Profit	Capital Adequacy Ratio	+	0.818	0.669	16.17	0.004
Net Profit	Business-per-Employee	-	0.100	0.010	0.08	0.784
Net Profit	Profit-per-Employee	+	0.307	0.094	0.83	0.389
Net Profit	Return on Assets	+	0.872	0.760	25.37	0.001
Net Profit	Interest Income / Average Working Funds	+	0.843	0.711	19.68	0.002
Net Profit	Non-Interest Income / Average Working Funds	+	0.615	0.378	4.87	0.058
Net Profit	Operating Profit / Average Working Funds	+	0.744	0.553	9.91	0.014

Table 4 shows the results of correlation analysis, linear regression analysis and Anova for HDFC bank. Profitability as measured by net profit is considered as the dependent variable while the independent variables are deposits, advances, total assets, bank size, gross NPAs, net NPAs, business per employee and profit per employee. Among these variables, deposits, advances, total assets, bank size, gross NPA, the capital adequacy ratio, return on assets and interest income / average working funds were found to be highly correlated with net profit. The net NPA, non-interest income / average working funds and operating profit / average working funds were also positively correlated to net profit but to a lesser extent than the earlier discussed variables. The correlations observed were also statistically significant at the 95% confidence level for most of the above variables. The relationship between net profit and the other variables were not statistically significant at the 95% confidence level.

Table 5: Relationship between Profitability of HDFC Bank and Performance Indicators: Step Wise Multiple Regression Analysis

Dependent Variable	Independent Variable	Correlation Coefficient R	Regression Coefficient R^2	F Value	Sig. F Value	VIF	Durbin Watson
Net Profit	Advances	0.999	0.998	30.04	0.001	4.201	2.879
	Size					4.201	

Table 5 shows the results of a step wise multiple regression performed taking HDFC bank's net profit as the dependent variable and performance indicators mentioned in Table 4 were chosen as independent variables.

The step wise regression eliminated most variables due to multi-collinearity issues and chose advances and bank size (VIF<5) as the most influencing independent variables.

5. Discussion and Analysis:

SBI is India's largest public sector bank having profits in excess of 100 billion rupees, net interest income of over a trillion rupees and a total asset base exceeding 17.5 trillion rupees. HDFC bank is India's largest private sector bank having profits north of 80 billion rupees, net interest income of over 400 billion rupees with a total asset base well over 4.9 trillion rupees. Both banks have market capitalizations of about 2 trillion rupees (Table 1). An understanding of what drives profitability at these benchmark banks is therefore important. In the current study we focus on the relationship of a set of key bank metrics such as deposits, advances, total assets and bank size, risk factors such as the capital adequacy ratio, gross and net NPAs, productivity measures such as business per employee and profit per employee, and asset usage efficiency measures such as the return on assets, interest income/average working funds, non-interest income/average working funds and operating profit/average working funds with the profitability of India's largest public and private sector banks .

We find a strong positive correlation between the key bank metrics deposits, advances, total assets and bank size and net profit for both banks (Table 2, 4). Deposits are often seen as a barometer of a bank's financial health and stability. Similar results have been observed earlier by Smirlock & Brown (1986), who found a strong positive relationship between demand deposits and bank profitability. Ganesan (2001) also found a strong correlation between deposits and profitability for a group of public sector banks in India. Given that advances are a major component of the bank's total assets and its correlation with net profit is nearly equal to or greater than the correlation of net profits observed with the bank's total assets, both banks must focus on maximizing this key metric and reduce their focus on other assets. Ganesan, (2001) found a similar relationship between priority sector advances and profitability for a group of Indian public sector banks. Both banks showed a strong relationship between net profits and their respective sizes. Thus larger the bank greater will be the profitability. In a study of 12 Tunisian banks over a period from 1995-2005 Ayadi and Boujelbene, 2012 find bank size has a significant effect on bank profitability.

We also find a strong positive relation between the risk factors such as the capital adequacy ratio, gross and net NPAs and net profit (Table 2, 4). This suggests as the bank's profitability increases the non performing assets also increases. Thus profitability may come at the expense of deteriorating asset quality. Nonperforming assets are charge off's against profits and therefore can negatively impact performance. In an earlier study Miller and Noulas, (1997) found that loan loss provision and net charge offs had a significant negative effect on the profitability of large banks. Bodla and Verma, (2006) have also indicated that provisioning for bad loans significantly impacted profits of public sector banks in India. The capital adequacy ratio was observed to be positively correlated to net profit for HDFC bank. The capital adequacy ratio can be used to gauge the credit risk of the bank. A higher ratio would imply lesser risk from the banks credit exposure. Sufian, (2009) found that Malaysian banks with higher credit risk and loan concentration exhibited lower profitability levels. Further banks that have a higher level of capitalization, higher proportion of income from non-interest sources, and high operational expenses proved to be relatively more profitable.

. We find a strong positive correlation between productivity measures such as business per employee and profit per employee and net profit for SBI but this was not observed in the case of HDFC bank (Table 2, 4). Thus productivity of the workforce was important for India's largest public bank but not for India's largest private bank. These two indicators help in assessing the productivity of the work force and the extent of their contribution to the operational efficiency of banks. Ben Naceur and Goaied, (2001) found that the best performing Tunisian banks are those that improve labor and capital productivity.

We find a significant positive relationship between asset usage efficiency measures such as the return on assets, interest income/average working funds, non-interest income/average working funds and operating profit/average working funds with net profit for HDFC bank but this was not observed for SBI. For SBI there was actually a negative relationship between net profit and non-interest income/average working funds (Table 2, 4). Taken together the data suggests that while SBI must be careful in deploying its funds to generate funds from non-interest sources HDFC bank can generate substantial incomes from deploying its funds in interest and non-interest generating sources. Sufian, (2009) found that Malaysian banks that generate higher proportion of income from non-interest sources to be relatively more profitable.

Step wise multiple regression analysis (Table 3, 5) showing the combined effect of all the variables on net profit was carried out in the study. Multi-collinearity and auto correlation issues were mostly accounted for. The results showed that the key determinant of the profitability of SBI was business per employee while the key determinants of profitability for HDFC bank were advances and bank size. Thus while bank specific metrics were drivers of profitability at HDFC bank, productivity measures impacted profits at SBI. Managers and shareholders of the two banks may focus on these metrics to try and understand what drives profits. With a multi-variate analysis Bodla and Verma, (2006) found that variables such as non-interest income, operating

expenses, provisions, contingencies and spread had significant relationships with net profits.

Conclusion

This paper is a comparative study which attempts to understand the key drivers of profits at India's largest public and private sector banks. Bank specific metrics were drivers of profits at both banks. Risk factors were important influencers of profits at both banks. Productivity measures were key drivers of profits at India's largest public sector bank SBI but had no effect on profits at India's largest private sector bank, HDFC bank. The reverse was true of asset usage efficiency measures which were determinants of profitability at HDFC bank but not at SBI. The single most important determinant of SBI proved to be business per employee, a productivity measure while advances and bank size which are traditional bank metrics were key drivers of profits at HDFC bank. Thus the profits at both banks are driven by a different set of determinants. Managers at both banks and their share holders thus can look at these drivers to develop a broad understanding of profitability at these banks.

Limitations

The study only considered a select group of internal determinants. External determinants like macro-economic factors and exchange rates are not considered. Additionally qualitative factors such as customer preferences and customer service are not considered. The impact of technology is also not considered.

References

1. Athanasoglou, P.P., S.N. Brissimis, and M.D. Delis. (2008)"Bank-Specific, Industry-Specific and Macroeconomic Determinants of Bank Profitability". Journal of International Financial Markets, Institutions & Money, Vol.18, Issue 2, p121-136.
2. Ayadi, N., & Boujelbene, Y. (2012). The Determinants of the Profitability of the Tunisian Deposit Banks. IBIMA Business Review Journal, 1–21.
3. Balance sheet and Profit & Loss Account of SBI and HDFC bank, available from www.moneycontrol.com, accessed on 1/08/2014.
4. Barros, A. R. (2008). How to make bankers richer: The Brazilian financial market with public and private banks. Quarterly Review of Economics & Finance, Vol.48 Issue 2, p217-236.
5. Ben Naceur S. and M. Goaied. (2001). The determinants of the Tunisian deposit banks' Performance. Applied Financial Economics, Vol.11:317-19.
6. Ben Naceur, S. and M. Goaied. (2008). The Determinants of Commercial Bank Interest Margin and Profitability: Evidence from Tunisia. Frontiers in Finance and Economics 5, no. 1 106-30.
7. Bodla, B.S. and R. Verma. (2006). Determinants of profitability of Banks in India: A Multivariate Analysis. Journal of Services Research, Vol.6 Issue 2, p75-89.
8. Boyd, J.H. and D.E. Runkle. (1993). Size and Performance of Banking Firms. Testing the Predictions of Theory, Journal of Monetary Economics 31, 47-67.
9. Chirwa, E. W. (2003). Determinants of Commercial Banks Profitability in Malawi: A Co Integration Approach. Applied Financial Economics, vol.13 Issue 8, p565-571.
10. Dietrich, A. and G. Wanzenried. (2011). Determinants of Bank Profitability before and during the Crisis: Evidence from Switzerland. Journal of International Financial Markets, Institutions &Money,Vol.21 Issue 3,p307-327.
11. Ganesan, P. (2001). Determination of profits and Profitability of Public Section Banks in India: A Profit Function". Journal of Financial Management & Analysis & Analysis, Vol.14 Issue 1, p27-37.
12. Goddard, J., P. Molyneux, and J.O.S. Wilson. (2004). The Profitability of European Banks: A Cross-Sectional and Dynamic Panel Analysis, Manchester School, Vol. 72, No. 3, pp. 363-381.
13. Holden, K. and El-Bannany, Magdi. (2004). Investment in information technology systems and other determinants of bank profitability in the UK. Applied Financial Economics, Vol. 14 Issue 5, p361-365.
14. Kumar, S., & D. P. Warne. (2009). Parametric Determinants of Price-Earnings Ratio in Indian Capital Markets. IUP Journal of Applied Finance, 15(9), 63-82.
15. Miller, S. M. and A. G. Noulas (1997). Portfolio Mix and Large-Bank Profitability in the USA, Applied Economics, Vol. 29, No. 4, pp. 505-512.
16. Molyneux, P. and J. Thornton. (1992). Determinants of European bank Profitability: A note. Journal of banking & Finance, Vol.16 Issue 6, p1173-1178.performance, Applied Financial Economics, Vol.11:317-19.
17. Rajan R.G. and L. Zingales. (1998). Financial dependence and growth, American Economic Review, 88:2, 559-586.
18. Report on the profile of banks 2012-2013, available from http://rbidocs.rbi.org.in/rdocs/Publications/PDFs/APB30091213F.pdf, accessed on 2/10/ 2014.

19. Smirlock, M. and D. Brown. (1986). Collusion, Efficiency and Pricing Behavior: Evidence From the Banking Industry, Economic Inquiry, vol. XXIV, no. 1, pp.85-96.
20. Sufian, F and M.S. Habibullah. (2010). Accesing the Impact of Financial Crisis on Bank Performance: Empirical Evidence from Indonesia". ASEAN Economic Bulletin Vol. 27, No. 3, pp. 245-62.
21. Sufian, F. (2009). Factors Influencing Bank Profitability in a Developing Economy: Empirical Evidence from Malaysia. Global Business Review 10, no. 2: 225-41.

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