

A Comparative Analysis of South Indian Bank's Performance Post Implementation of Information Technology: An Empirical Analysis

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Abstract

Technological advancement has created a competitive environment in view of diversified banking products. The study unleashes the performance of South Indian Bank's against the backdrop of technology adoption in the banking industry. It is evident from the study that the bank showed significant improvement in all the CAMEL parameters after the IT adoption. Even though the Net Interest Income margin of the firm decreased during the initial post adoption period; in the long run, it will definitely reap the benefits due to the economies of scale margin. Even though liquidity ratios were above the ideal values, a very high value is an indication of lower amount of advances. A balanced approach would be, to bring liquidity margin near to ideal, which would improve the total business, along with an increase in income from other sources and reduction in operating expenses to maintain profitability.

Keywords: Capital Adequacy, Asset Quality, Management efficiency, Earning Capacity, Liquidity.

Introduction

Banking environment has become highly competitive today. To be able to survive and grow in the changing market environment banks are going for the latest technologies, which is being perceived as an 'enabling resource' that can help in developing learner and more flexible structure that can respond quickly to the dynamics of a fast changing market scenario. It is also viewed as an instrument of cost reduction and effective communication with people and institutions associated with the banking business.

Information Technology enables sophisticated product development, better market infrastructure, implementation of reliable techniques for control of risks and helps the financial intermediaries to reach geographically distant and diversified markets. Internet has significantly influenced delivery channels of the banks. Internet has emerged as an important medium for delivery of banking products and services.

IT is increasingly moving from a back office function to a prime assistant in increasing the value of a bank over time. IT does so by maximizing banks of proactive measures such as strengthening and standardizing banks infrastructure in respect of security, communication and networking, achieving inter branch connectivity, moving towards Real Time Gross Settlement (RTGS) environment the forecasting of liquidity by building real time databases, use of Magnetic Ink Character Recognition and Imaging technology for cheque clearing to name a few. Indian banks are going for the retail banking in a big way

The banking system is slowly shifting from the traditional banking towards relationship banking. Traditionally, the relationship between the bank and its customers has been on a one-to-one level via the branch network. This was put into operation with clearing and decision-making responsibilities concentrated at the individual branch level. The head office had responsibility for the overall clearing network, the size of the branch network and the training of staff in the branch network. The bank monitored the organization's performance and set the decision making parameters, but the information available to both branch staff and their customers was limited to one geographical location.

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Significance of the Study

Nationalized banks had been computerizing their operations from 2005-06 onwards in a phased manner bringing all branches under CBS by 2009-10 (RBI report, 2004). So analyzing the direction of deviations in the financial performance indicator after 2010 (considered as post IT Adoption period) is of great importance. The management of the company is responsible for taking decisions and formulating plans and policies for the future. They, therefore, always need to evaluate their performance and effectiveness of their action to realize the company's level of achievement in the past for forecasting its future course of action. Keeping the above importance of services provided by SIB bank and its financial position, this study was conducted on the topic "South Indian Bank's Performance Post Implementation of Information Technology: An Empirical Analysis"

Company Profile

South Indian Bank Limited (SIB) (BSE:532218, NSE: SOUTH BANK) is a private bank headquartered at Thrissur city in Kerala, India. South Indian Bank has 831 branches, 4 service branches, 33 ext. counters and 20 regional offices spread across more than 26 states and 3 union territories in India. It has set up 1269 ATMs and Bulk Note Acceptor / Cash Deposit Machines all over India. One of the earliest banks in south India, "South Indian Bank" came into being during the Swadeshi movement. The establishment of the bank was the fulfillment of the dreams of a group of enterprising men who joined together at Thrissur, a major town (now known as the Cultural Capital of Kerala), in the erstwhile State of Cochin.

Literature Review

Ketan Mulchandani, Kalyani Mulchandani (2016) analyzed and compared the financial performance of selected listed gold loan non-banking financial companies in India. Results revealed that Muthoot Finance Ltd. outperformed as compared to Manappuram Finance Ltd. Muthoot Finance Ltd. had top ranking in Capital Adequacy Segment, Assets Quality Segment, Management Efficiency Segment, Earnings Segment and Liquidity Segment. It implied that it is well capitalized and has greater capability

absorb negative shocks. Muthoot Finance also had lowest nonperforming assets and its impact was positive on profitability and margins. The management of the Muthoot Finance is very efficient in terms of managing lower total expenses / total revenue ratio, lower cost of funds and higher assets under management per branch. Earnings of Muthoot as compared to Manappuram are higher, which implies that efficient use of assets, higher returns on shareholder's funds, higher profit per employee and greater returns on capital employed Muthoot is having sufficient funds to manage the short term liquidity requirements.

Karri et al. (2015) conducted a study in which the objective of this study is to analyze the Financial Position and Performance of the Bank of Baroda and Punjab National Bank in India based on their financial characteristics. This study attempts to measure the relative performance of Indian banks. For this study, they have used public sector banks. From the CAMELS' analysis it is clear that there is no significant difference between the Bank of Baroda and Punjab National Bank's financial performance but we conclude that the Punjab National Bank performance is slightly less compared with Bank of Baroda.

Karri, Meghani and Mishra (2015) conducted a study to analyze the financial performance of public sector banks in India. Period of the study was 5 years from 2010-2014. Bank of Baroda (BOB) and Punjab National Bank (PNB) were considered as sample size for the study. CAMEL model and t-test applied for data analysis purpose. Results revealed that out of 14 ratios used in the CAMEL model the average figures of Bank of Baroda is the best for (6 ratios) followed by Punjab National Bank (5 ratios). Thus it is established that Bank of Baroda is the best bank in the selected public sector banks.

Muhammad and Hashim (2015) study evaluated the performance of selected banks operating in Malaysia. Results from this study suggested three contributing factors for better performance of banking institutions in Malaysia, namely capital adequacy, asset quality, earnings quality and liquidity. It was suggested that Malaysian banks must improve interest expenses to enhance their management competency. They need

to continuously monitor the health and profitability of bank borrowers to decrease the risk of non-performing loan. In addition, banks must take steps to improve employee productivity by controlling personnel expenses and operating profit. Although management competency was not significant and rejected the hypothesis, there is the possibility that the ratio used is not suitable for the banking situation in Malaysia for the period of study.

Ifeacho and Ngalawa (2014) investigated the impact of bank-specific variables and selected macro economic variables on the South African banking sector for the period 1994-2011 using the capital adequacy, asset quality, management, earnings, and liquidity (CAMEL) model of bank performance evaluation. The study employs data in annual frequency from South Africa's four largest banks, namely, ABSA, First National Bank, Ned bank, and Standard Bank. These banks account for over 70% of South Africa's banking assets. Using Return on Assets (ROA) and Return on Equity (ROE) as measures of bank performance, the study finds that all bank-specific variables are statistically significant determinants of bank performance. Specifically, the study shows that asset quality, management quality, and liquidity have a positive effect on both measures of bank performance, which is consistent with a priori theoretical expectations. Capital Adequacy, however, exhibits a surprising significant negative relationship with ROA, while its relationship with ROE is significant and positive as expected. Except for interest rates (in the ROA model), unemployment rate (in the ROA model), and the rate of inflation (in the ROE model), the rest of the macroeconomic variables are statistically insignificant. The study reveals that bank performance is positively related to interest rates and negatively related to unemployment rates and interest rates

Rahman and Masngut (2014) uses CAMEL (Capital Adequacy, Asset Quality, Management Quality, Earnings Efficiency, and Liquidity) ratings system, with the addition of Shari'ah Compliance Ratio (CAMELS) in order to detect the financial distress of Islamic banks in Malaysia. It was found that all Islamic banks have higher ETA ratios which portray a good performance of Capital Adequacy and are less likely to face financial distress. As for Asset Quality, all

Islamic banks did not have the possibility to face financial distress as they are able to handle their non-performing loans throughout the years. Meanwhile for management quality, all Islamic banks show lower ratios in paying salaries to their employee. Earning efficiency for all Islamic banks show better performance and will be less likely to face financial distress in terms of Return on Assets but not for Return of Equity. Liquidity indicates that the Islamic banks have large number of loans but they have sufficient liquid assets in order to cover their liabilities and commitments. Lastly for Shariah Compliance, Islamic banks have complied with all rules and regulations that have been regulated by Bank Negara Malaysia's Shari'ah Advisory Council.

Wang et al. (2011) develop a performance efficiency value by using Data Envelopment Analysis (DEA) to integrate five perspectives of CAMEL (Capital Adequacy, Asset Quality, Management, Earnings, Liquidity), which is used by the Federal Deposit Insurance Corporation to evaluate banking performance. In addition, they utilize a tiered DEA to categorize banks into four groups. CAMEL variables are manifested more strongly in highly efficient groups when compared with inefficient groups. The banks that appear to have a better financial ratio performance in the five perspectives of CAMEL form the efficiency frontier. It implies that CAMEL financial ratios and non-parametric techniques can be used as a complement to each other for the evaluation of bank performance. Furthermore, they utilize a tiered data envelope analysis to form efficiency groups. Through CAMEL performance, the analysis is able to distinguish between efficient and inefficient banks. In addition, the study develops and tests the tradeoffs in Tier 1 efficiency bank performance to explain the performance difference across five perspectives of CAMEL in 35 Tier 1 efficiency banks and analyze how an inefficient bank should improve in CAMEL components.

CAMELS Model

CAMELS stand for capital adequacy, asset quality, management, earnings quality liquidity and sensitivity to market risk. It is considered as the best available method for evaluating bank performance and health

of the bank since it considers all areas of banking operations. The Uniform Financial Institution Rating system, commonly referred to the acronym CAMEL rating, was adopted by the Federal Financial Institution Examination Council on November 13 1979, and then adopted by the National Credit Union Administration in October 1987. It has proven to be an effective internal supervisory tool for evaluating the soundness of a financial firm, on the basis of identifying those institutions requiring special attention or concern. (The United States Uniform Financial Institutions Rating System 1997, APA).

Barr et al. (2002 p.19) states that “CAMEL rating has become a concise and indispensable tool for examiners and regulators”. This rating ensures a bank’s healthy conditions by reviewing different aspects of a bank

based on variety of information sources such as financial statement, funding sources, macroeconomic data, budget and cash flow. Nevertheless, Hirtle and Lopez (1999, p. 4) stress that the bank’s CAMEL rating is highly confidential, and only exposed to the bank’s senior management for the purpose of projecting the business strategies, and to appropriate supervisory staff. Its rating is never made publicly available, even on a lagged basis. CAMEL is an acronym for five components of bank safety and soundness.

- C-Capital Adequacy
- A-Asset Quality
- M-Management Efficiency
- E-Earnings Capacity
- L-Liquidity

Table 1: Bank Rating as per CAMEL Model

Rating	Capital(CAR)	Assets	Management	Earnings	Liquidity
Strong	9% & Above	10% & Below	Higher the best ratio	1.25% & Above	55% & Above
Satisfactory	8% & Above	11%-15%		0.75% & Above	60% & Above
Fair	7% & Above	16%-30%		0.40% & Above	65% & Above
Marginal	5% & Above	31%-40%		0.15% & Above	70% & Above
Unsatisfactory	Below 5%	41% & Higher		Below 0%	71% & Above

Source: AIA’s Annual Report 2010

Objectives

To Compare South Indian Bank’s performance during pre-post IT Adoption period using CAMEL model.

Hypotheses

- a. H1 (1a, 1b, 1c): There is a significant difference in Capital Adequacy between pre- and post-IT Adoption
- b. H2 (2a, 2b, 2c): There is a significant difference in Asset Quality between pre- and post-IT Adoption
- c. H3 (3a, 3b, 3c): There is a significant difference in Management efficiency between pre- and post-IT Adoption.
- d. H4 (4a, 4b, 4c, 4d): There is a significant difference in Earning Capacity between pre- and post-IT Adoption

- e. H5 (5a, 5b, 5c): There is a significant difference in Liquidity between pre- and post-IT Adoption.
- f. H1₆: There exists a positive relation of Capital Adequacy, Asset Quality and liquidity on financial performance.

Methodology

The financial performance of the South Indian Bank was analyzed with the pre and post-performance due to the introduction of information technology. The study focused on analyzing, comparing and interpreting the financial strength and weakness by considering 2010 as base year by comparing 6 years before and after the IT adoption. 2004 to 2009 is considered as pre IT adoption period and 2011 to 2016 is considered as post IT adoption period. The statistical tools applied were arithmetic mean, average annual

growth rate using geometric mean, standard deviation and student t-test, multiple linear regressions (Durbin Watson). CAMEL ratings were used an indicator to analyze the performance of the bank.

Multiple Linear Regression Models

Multiple linear regression analysis is a technique for

$$ROAi = \beta_0 + \beta_1.DERi + \beta_2.EPE + \beta_3.ATAi + \beta_4.CDRi + \epsilon_i$$

Where,

Dependent Variable,

$ROAi =$ Return on assess

Independent Variable,

$DERi =$ Debt Equity Ratio

$EPEi =$ Earnings per Employee

$ATAi =$ Total Advances to Total Asset Ratio

$CRi =$ Current Ratio

modeling the linear relationship between two or more variables. It is one of the most widely used of all statistical methods. In banking and finance literature (Kutner, Nachtsheim & Peter, 2004), regression analysis is a very common method used to find the determinants of bank performance.

Data Analysis

Capital Adequacy

- **Capital adequacy ratio =**
(Tier 1 capital + Tier 2 capital) x 100
Risk weighted assets
- **Debt-Equity Ratio (DER)=Total Debt/Total Equity**
- **Proprietary ratio = Shareholders fund / Total Tangible Assets*100**

Table 2: Statement showing Capital Adequacy Ratios (₹ in Millions)

Year	CAR (%)	DER (Times)	Proprietary Ratio (%)
2004	8.14	0.60	4.27
2005	8.49	0.35	4.80
2006	10.07	0.31	5.92
2007	9.55	0.28	5.30
2008	11.37	0.16	6.79
2009	14.48	0.32	6.40
2010	11.48	0.22	5.82
2011	10.43	0.16	5.63
2012	10.11	0.27	5.37
2013	13.49	0.43	6.04
2014	16.84	0.81	6.13
2015	15.58	0.62	6.07
2016	14.99	0.60	6.08
PRE	AM	10.35	5.58
	AAGR	2.14%	0.01%
	SD	2.33	0.97
POST	AM	13.57%	5.89
	AAGR	1.56%	0.01%
	SD	2.78	0.31
Pre-Post, t-value	1.58	-2.53	2.41

Source: Annual Reports of SIB from 2004 to 2016

Capital Adequacy Ratio (CAR): CAR ratio position of the bank showing an increasing trend during the period of study. It was observed that the highest value of 16.84% was observed in 2014 and the least of 8.14% in 2004. The statistical analysis shows that IT adoption has resulted in an increase in average value from 10.35% to 13.57%. The AAGR calculated with the help of geometric mean showed a lower value in the post IT adoption period. In both pre and post adoption period the standard deviation was found to be very low. The student's t-value of 1.58 was below the table value of 1.96 which shows that null hypothesis was accepted i.e. no significant difference in CAR between pre and post IT adoption period.

Debt-Equity Ratio (DER): DER ratio position of the bank showed a fluctuating trend during the period of study. It was examined that the highest value of 0.81 times was observed in 2014 and the least of 0.16 times in 2008 & 2011. The statistical analysis shows that IT adoption has resulted in an increase in average value from 0.34 times to 0.48 times, which shows a positive sign for the bank (ideal value 0.50:1). The AAGR calculated with the help of geometric mean showed a lower value in the post IT adoption period. Ratio values showed a high degree of deviation in the post adoption period due to adaptability to new system. The student's t-value of -2.53 was above the table value of 1.96 which shows that null hypothesis was rejected i.e. significant difference in DER between pre and post IT adoption period was observed.

Proprietary Ratio (PR): PR ratio position of the bank also showed a fluctuating trend during the period of study. It was examined that the highest value of 6.13% was observed in 2014 and the least of 4.27% in 2004. The statistical analysis shows that IT adoption has resulted in an increase in average value from 5.58% to 5.89%. The AAGR calculated with the help of geometric mean showed a lower value in the post IT adoption period. Post IT adoption period showed a lower level of variability with lower degree of standard deviation. The student's t-value of 2.41 was above the table value of 1.96 which shows that null hypothesis was rejected i.e. significant difference in PR between pre and post IT adoption period was observed.

Asset Quality

- Total Investments to Total Assets Ratio (IAR) = $\frac{\text{Total Investments}}{\text{Total Assets}} \times 100$
- Allowances to Loan Loss Ratio = $\frac{\text{Total Allowances}}{\text{Total Loans \& Advances}} \times 100$
- Provision for Loan Loss Ratio = $\frac{\text{Provisions \& Contingencies}}{\text{Loans \& Advances}} \times 100$

Investment to Assets Ratio (IAR): IAR ratio position of the bank showing a decreasing trend during the period of study. It was examined that the highest value of 43.81% was observed in 2004 and the least of 45.34% in 2004. The statistical analysis shows that IT adoption has resulted in decrease in average value from 30.48% to 24.77%. The AAGR calculated with the help of geometric mean showed a negative value of -1.23% and -0.94%. The post adoption period showed a lower level of variability in terms of standard deviation

The student's t-value of 0.94 was below the table value of 1.96 which shows that null hypothesis was accepted i.e. no significant difference in IAR between pre and post IT adoption period.

Advances to Assets Ratio (ATA): ATA ratio position of the bank showing an increasing trend during the period of study. It was examined that the highest value of 67.68% was observed in 2012 and the least of 8.14% in 2004. The statistical analysis shows that IT adoption has resulted in an increase in average value from 56.35% to 64.91%. The AAGR calculated with the help of geometric mean showed a lower value in the post IT adoption period. The post adoption period ATA showed a lower level of variability in terms of standard deviation of 0.92.

The student's t-value of 0.92 was below the table value of 1.96 which shows that null hypothesis was accepted i.e. no significant difference in ATA between pre and post IT adoption period.

Provision to Loan loss Ratio (PLL): PLL ratio position of the bank showing an increasing trend during the period of study. It was examined that the highest value of 73.55% was observed in 2015 and the least of 12.23% in 2011. The statistical analysis shows that IT adoption has resulted in an increase in average value from 21.09% to 38.38%. The AAGR

Table 3: Statement showing Asset Quality Ratios (₹ in Millions)

Year	IAR (%)	Advances to total assets ratio (%)	Provision for Loan Loss Ratio (%)	
2004	42.81	45.35	21.73	
2005	33.06	56.61	21.54	
2006	25.30	58.83	21.70	
2007	25.12	58.00	22.05	
2008	26.75	61.17	20.52	
2009	29.81	58.14	19.00	
2010	28.02	62.02	17.77	
2011	27.19	62.60	12.23	
2012	23.28	67.78	20.23	
2013	25.15	64.08	33.78	
2014	26.09	66.06	53.16	
2015	23.81	63.51	73.55	
2016	23.12	65.42	36.72	
PRE	AM	30.48	56.35	21.09
	AAGR	-1.23%	0.90%	0.27%
	SD	6.76	5.59	1.15
POST	AM	24.77	64.91	38.28
	AAGR	-0.94%	0.56%	0.00%
	SD	1.65	1.89	22.33
Pre-Post, t-value		0.94	0.92	-0.54

Source: Annual Reports of SIB from 2004 to 2016

calculated with the help of geometric mean showed a minimal value in the post IT adoption period. In both pre and post adoption period the standard deviation was found to be very low.

The student's t-value of -0.54 was below the table value of 1.96 which shows that null hypothesis was accepted i.e. no significant difference in PLL between pre and post IT adoption period.

Management Efficiency

- Earnings per Employee = EBIT / No. of Employees
- Business per Employee = Total Business / No. of Employees

Earnings per Employee (EPE): EPE ratio position of the bank showing an increasing trend during the period of study. It was examined that the highest value of 0.80 was observed in 2013 and the least of 0.10 in 2005 & 2006. The statistical analysis shows that IT adoption has resulted in an increase in average value from 0.25 to 0.58. The increase in EPE was due to increase in net income of the bank during the post IT adoption period. The AAGR calculated with the help of geometric mean showed a lower negative value in the post IT adoption period. The growth rate was higher in the pre adoption period in comparison to the post period. The absolute variation was found to be lower during the period of the study.

Table 4: Statement Management Efficiency Ratios (₹ in Millions)

Year	PAT (₹)	Total Business (₹)	No. of Employee	EPE	BPE	
2004	843.3	124,768.50	4216	0.20	29.59	
2005	87	138,575.70	870	0.10	159.28	
2006	509	159,488.80	5090	0.10	31.33	
2007	1,041.20	201,581.30	3470	0.30	58.09	
2008	1,516.20	256,098.70	3790	0.40	67.57	
2009	1,947.50	299,402.50	4868	0.40	61.50	
2010	2,337.60	388,483.20	4675	0.50	83.10	
2011	2,925.60	502,659.20	5851	0.50	85.91	
2012	4,016.60	638,707.70	5738	0.70	111.31	
2013	5,022.70	761,699.70	6278	0.80	121.33	
2014	5,075.00	838,299.00	7250	0.70	115.63	
2015	3,072.00	894,861.50	7680	0.40	116.52	
2016	3,332.70	970,832.40	8332	0.40	116.52	
PRE	AM	990.7	196652.58	3717.74	0.25	67.90
	AAGR	7.86	3.30%	0.93	6.00	1.12%
	SD	672.99	69335.52	1525.30	0.14	47.52
POST	AM	3907.43	767843.25	6854.89	0.58	111.20
	AAGR	0.83	2.40%	2.54	-1.2	1.14%
	SD	960.33	172822.77	1058.80	0.17	12.79
Pre-Post, t-value		-1.09	5.53	1.09	-2.98	0.40

Source: Annual Reports of SIB from 2004 to 2016

The student's t-value of -2.98 was above the table value of 1.96 which shows that null hypothesis was rejected i.e. significant difference in EPE between pre and post IT adoption period. T-value among pre-post of PAT showed no significant difference in it values.

Business Per Employee (BPE): BPE ratio position of the bank showing an increasing/fluctuating trend during the period of study. It was examined that the highest value of 159.28 was observed in 2005 and the least of 29.59 in 2004. The statistical analysis shows that IT adoption has resulted in an increase in average value from 67.90 to 111.20. The increase in EPE was

due to increase in total business of the bank during the post IT adoption period with an AAGR of 2.40%. The AAGR of BPE calculated with the help of geometric mean showed a lower positive value in the post IT adoption period.. The absolute variation in terms of standard deviation was found to be very low in the comparison to the pre IT adoption period

The student's t-value of 0.40 was below the table value of 1.96 which shows that null hypothesis was rejected i.e. no significant difference in BPE between pre and post IT adoption period. T-value among pre-post of total business showed significant difference with greater value.

Table 5: Statement showing Earnings Capacity (₹ in Millions)

Year	ROE (%)	ROA (%)	CIR (%)	NIIM (%)	
2004	21.36	0.91	72.46	2.24	
2005	1.91	0.09	77.40	2.79	
2006	7.94	0.47	77.00	2.97	
2007	14.38	0.76	74.32	2.76	
2008	13.06	0.89	80.37	2.25	
2009	14.93	0.96	79.91	2.62	
2010	15.74	0.92	78.67	2.28	
2011	15.84	0.89	78.11	2.48	
2012	18.51	0.99	81.15	2.59	
2013	16.71	1.01	80.67	2.63	
2014	15.06	0.92	81.84	2.59	
2015	8.55	0.52	83.42	2.47	
2016	8.67	0.53	83.50	2.56	
PRE	AM	12.26%	0.68%	76.91	2.61%
	AAGR	5.73%	5.45%	0.35%	0.23%
	SD	6.64	0.34	3.09	0.30
POST	AM	13.89%	0.81%	81.45	2.55%
	AAGR	6.53%	-0.49%	0.15%	0.53%
	SD	4.25	0.23	2.01	0.06
Pre-Post, t-value		-1.01	-2.09	3.50	30.56

Source: Annual Reports of SIB from 2004 to 2016

Earning Quality

- Return on Equity = Net Profit after Interest and Tax / Shareholder's equity * 100
- Return on Assets = Net Interest Income / Total assets * 100
- Cost to Income Ratio = Operating Expense / Net interest & Noninterest income * 100
- Net interest income margin = net interest income / Average earning assets * 100

Return on Equity (ROE): ROE ratio position of the bank showed a fluctuating trend during the period of study. It was observed that the highest value of 16.71% was observed in 2013 and the least of 1.91% in 2005.

The statistical analysis shows that IT adoption has resulted in an increase in average value from 12.26% to 13.89%. The AAGR calculated with the help of geometric mean showed a lower value in the post IT adoption period. The relative variation of the ROE was very low during the post adoption period.

The student's t-value of -1.01 was below the table value of 1.96 which shows that null hypothesis was accepted i.e. no significant difference in ROE between pre and post IT adoption period.

Return on Assets (ROA): ROA ratio position of the bank showed a fluctuating trend during the period with decreasing values during the last three years. It

was observed that the highest value of 1.01% was observed in 2013 and the least of 0.09% in 2005. The statistical analysis shows that IT adoption has resulted in an increase in average value from 0.68% to 81%. The AAGR calculated with the help of geometric mean showed that the rate of increase was very low negative during the post IT adoption period. In both pre and post adoption period the standard deviation was found to be very low.

The student's t-value of -2.09 was above the table value of 1.96 which shows that null hypothesis was rejected i.e. significant difference in ROA between pre and post IT adoption period was observed.

Cost to Income Ratio (CIR): CIR ratio position of the bank showed an increasing trend during the period with decreasing values during the last three years. It was observed that the highest value of 83.50% was observed in 2016 and the least of 72.46% in 2004. The statistical analysis shows that IT adoption has resulted in an increase in average value from 76.91% to 81.45%. The AAGR calculated with the help of geometric mean showed that it decreased during the post IT adoption period. In both pre and post adoption period the standard deviation of the ratio was found to be constant.

The student's t-value of 3.50 was above the table value of 1.96 which show that null hypothesis was rejected i.e. significant difference in PR between pre and post CIR adoption period was observed.

Net Interest Income Margin (NIIM): NIIM ratio position of the bank was between 2 to 3 percent during the period of study. It was examined that the highest value of 2.79% was observed in 2005 and the least of 2.24% in 2004. The statistical analysis shows that IT adoption has resulted in a decrease in average value from 2.61% to 2.55%. The AAGR calculated with the help of geometric mean showed a higher growth rate in the post IT adoption period. In post adoption period the standard deviation was found to be very low.

The student's t-value of 30.56 was above the table value of 1.96 which shows that null hypothesis was rejected i.e. significant difference in NIIM between pre and post IT adoption period was observed.

Liquidity

Current Ratio = Current Assets / Current Liabilities

Absolute Liquid Ratio = Cash or Cash Equivalents / Current Liabilities

CDR = Customer Deposits / Total Assets

Current Ratio (CR): (Table 6) CR ratio position of the bank showed a fluctuating trend during the period of study. It was observed that the highest value of 6.61 times was observed in 2016 and the least of 2.22 times in 2005. The statistical analysis shows that IT adoption has resulted in an increase in average value from 3.52 times to 4.88 times, which shows a positive sign for the bank (ideal value - 1.33 times). The AAGR calculated with the help of geometric mean showed a higher rate of increase in comparison to the pre adoption period. Ratio values showed a higher level of deviation among the Current ratio values.

The student's t-value of 0.92 was below the table value of 1.96 which shows that null hypothesis was accepted i.e. no significant difference in Current ratio between pre and post IT adoption period.

Absolute Liquid Ratio (ALR): ALR ratio position of the bank showed a fluctuating trend during the period of study. The highest value of the ratio was 0.90 times and the least value was 0.88 times. AAGR during the pre as well as post adoption period was uniform and negligible. The absolute variability among the ratio values was also very low.

The student's t-value of -0.58 was below the table value of 1.96 which shows that null hypothesis was accepted i.e. no significant difference in customer deposit ratio between pre and post IT adoption period.

Customer Deposit Ratio (CDR): CDR ratio position of the bank showed a value which is near 0.90 times during the period of study. It was examined that the highest value of 0.81 times was observed in 2014 and the least of 0.16 times in 2008 & 2011. The statistical analysis shows that IT adoption has resulted in an increase in average value from 0.30 times to 0.53 times,

Table 6: Statement showing Liquidity (₹ in Millions)

Year	Current Ratio (Times)	Absolute Liquid Ratio (Times)	Customer deposit to total assets ratio (times)	
2004	2.79	1.90	0.89	
2005	2.22	1.57	0.90	
2006	3.79	2.82	0.88	
2007	4.42	3.63	0.90	
2008	3.23	2.54	0.89	
2009	4.65	3.60	0.89	
2010	3.82	2.63	0.90	
2011	4.47	3.29	0.91	
2012	3.38	2.41	0.90	
2013	4.93	3.91	0.89	
2014	3.48	2.46	0.86	
2015	6.41	3.27	0.88	
2016	6.61	4.05	0.88	
PRE	AM	3.52	2.68	0.89
	AAGR	1.11%	7.11%	0.10%
	SD	0.95	0.85	0.01
POST	AM	4.88	3.23	0.89
	AAGR	3.83%	5.46%	0.60%
	SD	1.40	0.70	0.02
Pre-Post, t-value	0.92	0.79	-0.58	

Source: Annual Reports of SIB from 2004 to 2016

which shows a positive sign for the bank (ideal value 0.50:1). The AAGR calculated with the help of geometric mean showed a lower value in the post IT adoption period. Ratio values showed a high degree of deviation in the post adoption period due

adaptability to new system.

The student's t-value of -1.01 was below the table value of 1.96 which shows that null hypothesis was accepted i.e. no significant difference in ROE between pre and post IT adoption period.

Multiple Regression Analysis

Table 7: Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.923 ^a	.851	.777	.12980	2.170

a. Predictors: (Constant), CDR, EPE, ATA, DER

b. Dependent Variable: ROA

Table 8: ANOVA^a

Model	Sum of Squares	d.f	Mean Square	F	Sig.
Regression	.772	4	.193	11.448	.002 ^b
1 Residual	.135	8	.017		
Total	.906	12			

a. Dependent Variable: ROA

b. Predictors: (Constant), CDR, EPE, ATA, DER

Table 9: Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	12.175	5.115		2.380	.045
DER	-.915	.340	-.675	-2.688	.028
1 EPE	1.663	.250	1.334	6.646	.000
ATA	-.042	.010	-.880	-4.202	.003
CDR	-10.339	5.345	-.486	-1.935	.089

a. Dependent Variable: ROA

From Table 7 the Durbin-Watson statistic was 2.170 it means that there was no serial correlation between independent variables and NIIM.

Looking at regression from table 7 and 8, we find that the explanatory power of the whole second regression model is about 77.7%, where at the same time, the F-stat is 0.002 and is less than 5%, which is significant.

$$ROA_i = 12.175 - 0.915 DER_i + 1.663 EPE_i - 0.042 ATA_i - 10.339 CDR_i + \epsilon_i$$

Findings of the Study

Capital Adequacy Position (C): Considering the capital adequacy parameters CAR, DER and PR, it was observed that CAR showed a continuous increasing trend and a higher average value in the post period. DER and PR showed a fluctuating trend with higher average value in the post IT adoption period. Testing of sub hypotheses pertaining to first hypothesis showed that both Debt-Equity Ratio and Proprietary showed significant fluctuations in its value during the post and pre IT adoption period. This is an indication that IT implementation has resulted in significant improvement in the capital adequacy position

It is evident from the model that DER, EPE and ATA is significant in explaining earning capacity of total assets of South Indian Bank during the entire period of study.

Thus, we can predict the average ROA (Earnings indicator) with about 77% explanatory power by the following model at 5% level of significance:

considering the period under study.

Asset Quality (C): Considering the Asset Quality parameters IAR, ATA and PLL, it was observed that IAR showed a continuous decreasing trend and a lower average value in the post period. Whereas the ATA and PLL showed an increasing trend with higher average value in post period. This is an indication that the bank was focusing more on its primary business of advances and deposits. Testing of sub hypotheses pertaining to first hypothesis showed that both all the asset quality ratios showed no significant fluctuations in its value during the post and pre IT adoption period. Overall it can be observed that bank started

focusing more on its primary business after forced IT adoption.

Management Efficiency (M): Consider the management performance indicators, both earnings and business per employee showed improved average values in the post IT adoption period. This increase was due to the increase in total business and net income of the business. Total business of the bank showed significant difference in its value during the post IT adoption period. Hypothesis testing showed only significant difference in the EPE value of the bank during the period of study.

Earning Capacity (E): Considering the earning capacity indicators ROE, ROA, CIR and NIIM, only NIIM showed decreased average value during the post adoption period. The decrease in NIIM is due to the increased operating expenses associated with implementation of new IT enabled platform for transactions. The testing of sub hypotheses shows significant difference in value between pre-post values for ROA, CIR and NIIM. This is an indication that the earnings capacity showing improvements in its values which will be reflected through the concept of economies of scale.

Liquidity (L): Among the liquidity indicators, Current Ratio, Absolute Liquid Ratio and Customer Deposit Ratio, Current and Absolute liquid ratio showed improvement in its mean value in the post adoption period. Even though these ratios were above the ideal

values, a very high value is an indication of lower amount of advances. This in turn will affect the bank in term of lower amount of business resulting in lower profitability. The banks must try to reduce the blocked cash so that more amount can be released to the customers, which will generate operating income.

Multiple Linear Regression Model: It is evident from the model that Total Investment to Asset Ratio, Allowances to loans & Advances and Current ratio is significant in explain the Net Interest Income margin of South Indian Bank during the entire period of study.

Conclusion

CAMEL rating system has been introduced to assess the performance of the banks. This system evaluated various parameters, such as Capital Adequacy, Asset Quality, Management, Earnings Quality, and Liquidity. By analyzing the 13 years data, it is found that SIB is making healthy improvement in their CAMEL indicators. The liquidity position of the bank needs to be improved as it can have an immediate impact on its functioning if left unwarranted. Bank must ensure that unused cash balances must be converted into business so that decrease in Net Interest Income Margin can be revamped. Thus SIB needs to catch upon the efficient management of liquidity parameters. Earlier people used to talk about the foreign banks, nationalized banks and private banks, but, today it is all about the quality and services provided by the competitors.

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