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Identifying Financial & Operating Issues and Measuring Systematic & Unsystematic Risks: A Study of Indian Banking Sector

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Abstract

The Indian banking sector has acted as a crucial determinant in shaping the current Indian economy. The research paper attempts to identify certain financial and operating issues prevailing in the Indian banking sector. These issues include rise in cyber-attacks, money laundering cases, non-performing assets of public sector banks, inability to implement Basel III due to weak capital position, and challenges in financial inclusion along with low profitability of public sector banks about their massive asset base. The research paper also measures the volatility, risk (comprising systematic and unsystematic) associated with 10 banks that are constituents of the S&P BSE banking index (BANKEX) based on their daily returns.

Keywords: Banking, Beta, Issues, Risk, Systematic Risk, Unsystematic Risk, Volatility

Introduction

Banking sector has played a pivotal role in ensuring India's economic growth. Banking sector in India has predominantly been a government-dominant sector as demonstrated by the nationalisation of banks in 1969 and 1980, done in order to realise financial inclusion, prohibiting the concentration of economic power, and controlling interest rate structure. The sector has since witnessed several reforms such as Report of the Committee on Financial System in 1991 and the Report of the Committee on Banking Sector Reforms in 1998 to name a few. The former report primarily dealt with increasing operational freedom (especially in commercial banking sector) and suggested the elimination of the administered interest rate structure gradually along with other measures. The latter report further recommended measures such as the need for better regulation and supervision along with the introduction of prudential norms for modernising banking sector.

The modern banking industry is characterised by stronger regulations and gradual reduction in administrative activities as well as absolute values of interest rates. For instance, requirements for cash reserve ratio reduced from 15% in 1991 to 4% in 2016 and similarly the statutory liquidity ratio also decreased from 38.5% in 1991 to 21.25% in 2016. Several key performance indicators have also demonstrated strong growth. For instance, indicators such as total deposits have grown from US$977 billion in FY10 to US$1,466 billion by FY16. Bank credit has also witnessed similar growth by reaching US$1,106 billion in FY16 from US$684 billion in FY10. The current banking sector comprises 26 public sector banks, 25 private sector banks, 43 foreign banks, 56 regional rural banks, nearly 1,600 urban cooperative banks, and over 93,500 rural cooperative banks.

While several key parameters such as bank credit, deposits, assets, etc., have demonstrated strong growth, several issues post significant roadblocks in its future growth. The paper is an attempt to identify financial and operating risks prevalent in the Indian banking sector. These issues have also resulted in making the banking sector more prone to market risks. Parameters such as volatility and total risk change with respect to time, vary with bank, and thus need to be measured to enable better

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investing decisions. The study measures these parameters for stocks included in the S&P BSE's banking index (BANKEX). For volatility, the paper calculates the beta value of stocks with reference to the market index (S&P BSE SENSEX). This calculated value of beta acts as an input for further measuring value of systematic as well as unsystematic risk.

Review of Literature

Indian banking industry has witnessed major structural changes post liberalisation including de-control of interest rates, privatisation, direct credit, etc. The implications of these reforms have created several financial and operating issues such as rising NPAs, weak capital position, increasing number of frauds, and slow pace of financial inclusion along with others. Various researchers have made their contributions in order to identify and tackle these issues. Bhide et al. (2001) through their study found that these structural changes resulted in increased competition, reckless lending, gap between capital requirements, and availability to raise the funds, recapitalisation of banks, and increasing non-performing assets. Kamath et al. (2003) further added that to tackle the competition post liberalisation, it was necessary for banks to adopt innovative banking practices. They identified that lack of operational efficiency of Indian banks was another setback which resulted in problem of low profitability and increasing non-performing assets. The reasons for increasing non-performing assets were identified by Ranjan & Dhal (2003). They stated that changes in cost of credit in expectation of higher interest rate is one of the reasons for increasing non-performing assets of banks. Their point of view was further supported by Mohan (2005) who found that a considerable stock of non-performing assets, increasing savings, and interest rates are a major concern for Indian financial system. Thus, low operational efficiency, weak capital position, and increasing non-performing assets remained a major concern for Indian banking industry.

India, as a highly populated country, poses a huge opportunity for banking institutions. The focus of banks was to increase the profitability by tapping the Indian consumer in all regions. This called for efforts towards financial inclusion. Dev (2006) in his study stated that financial inclusion plays a significant role and banking institutions should look at financial inclusions as a business opportunity. However, Mohan (2006) in his study discussed that despite financial deepening, breadth and coverage of formal finance is still inadequate. He further claimed that for entrepreneur, assessment, and management of risk at low cost, and simplification of delivery process in banks' outreach to untapped markets are the issues which should be given priority for sound financial inclusion. Golait (2007), Raman (2008), Ghosh (2010), and Goyal & Joshi (2011a & 2012) stressed that for sound financial inclusion and to reduce the stock of non-performing assets, it was necessary for banks to focus upon innovative banking practices, train and develop human resource, and achieve operational efficiency. Singh et al. (2014) highlighted that despite the efforts of banking institutions, 90% of the rural household remained deprived of banking services. The reason for such deprivation remains lack of financial literacy. Thus, financial inclusion is low due to operational inefficiency of banks. Singh et al. (2016) further contributed and identified that the underlying reasons for frauds included lack of proper supervision of top management, conspiracy between the staff, corporate borrowers & third party agencies, fragile regulatory framework, lack of appropriate equipment and technologies in banks to sense early warning signals of a scam, and lack of synchronisation among different banks including both the local as well as foreign banks.

These changes have resulted in making the Indian banks more susceptible to market risks than ever before. Several authors have attempted to measure the volatility of Indian banks and compared the banking index volatility with other sectors. However, very few studies have bifurcated the measured total risk into systematic and unsystematic risk. Lakshmi (2013) attempted to measure and compare the volatility of sector-related indices in Indian stock market. The author found that banking sector had the lowest volatility in contrast to realty sector for the test period (2008–2011). Rajmohan et al. (2014) further measured the influence of banking sector on other sectors using correlation analysis in both bear phase (January 2008 to October 2008) and bull phase (November 2008 to December 2013). They concluded that there existed a positive correlation between banking index and other indices in both phases. However, William et al. (2015) examined the volatility of five select private by using mean, standard deviation, and beta values. They concluded

that the measured value of volatility was similar for all the five banks.

It can be said that these issues of banking industry remain almost same ever since liberalisation; however, the underlying causes have changed. Although various studies have discussed these financial and operational issues in isolation but there are a few studies which made an attempt to study these issues as a whole. This study is an attempt to uncover these issues by analysing the current environment of banking industry. The study also measures the volatility along with the total risk (systematic and unsystematic) of these banks to better investor decisions.

Objectives of the Study

a. To identify financial and operational issues in the Indian banking sector through secondary qualitative research

b. To measure the β-coefficient of all constituents stocks of S&P BSE BANKEX Index

c. To calculate the variance, systematic & unsystematic risk, and co-efficient of determination associated with the constituents stocks of S&P BSE BANKEX Index

Research Methodology

a. **Sector Selected for the Study:** Banking

b. **Stock Market Selected for the Study:** Bombay Stock Exchange (BSE)

c. **Companies Selected for Estimation of Risks**: Ten banks listed on the Bombay Stock Exchange and also part of the S&P BSE BANKEX have been selected.

Table 1: Companies Selected for Estimation of Risks

	Name of Bank	*Type*
1.	IndusInd Bank	Private
2.	State Bank of India	Public
3.	Yes Bank	Private
4.	Punjab National Bank	Public
5.	Kotak Mahindra Bank	Private
6.	ICICI Bank	Private
7.	HDFC Bank	Private
8.	Federal Bank	Private
9.	Bank of Baroda	Public
10.	Axis Bank	Private

d. **Time Frame:** Data for daily stock returns have been collected for five years, i.e., from April 01, 2012 to March 31, 2017 for the purpose of calculation and analysis.

e. **Data Source:** The study uses secondary data of daily/weekly closing share prices for shares of selected companies from the website of Bombay stock exchange.

f. **Method of Calculation:** The study considered daily closing prices of S&P BSE BANKEX's constituent stocks as well as daily closing value of S&P BSE SENSEX for a period of five years (April 01, 2012 to March 31, 2017). After calculating daily returns for each of the 10 stocks as well as S&P BSE SENSEX, the study calculated several parameters such as beta, total risk, systematic risk, unsystematic risk, and coefficient of determination using the formula as mentioned in the table below.

Table 2: Parameters and Formulae

Parameter	*Formula*
Daily stock or SENSEX returns	$(P_{i+1} - P_i)*100 / P_i$
Beta-coefficient	$(n\sum xy - \sum x\sum y) / n\sum x^2 - (\sum x)^2$
Variance	$(1/N)\sum(x_i - \mu)^2$
Systematic Risk	$\beta_i^2 * \sigma_I^2$
Unsystematic Risk	$\sigma_i^2 - \beta_i^2 * \sigma_I^2$
Coefficient of determination	$(n\sum xy - \sum x\sum y) / \sqrt{(n\sum x^2 - (\sum x)^2)(n\sum y^2 - (\sum y)^2)}$

where,

P_{i+1} = price of stock or value of S&P BSE SENSEX on $(i+1)^{th}$ day

P_i = price of stock or value of S&P BSE SENSEX on i^{th} day

n = number of observations

x = daily returns of S&P BSE SENSEX

y = daily returns of S&P BSE BANKEX's constituent stocks

σ = variance

μ = mean of all observations

β_i = beta factor of a particular i^{th} stock

Findings and Observations

The following section deals with identification of financial and operating issues as per the study's first objective:

Low Profitability vis-a-vis Asset Base of Public Sector Banks - Public banks continue to account for more than 70% of the total banking sector assets. However, despite their dominance in total banking assets, public sector banks accounted for only 42% of the total banking sector profits in FY15 due to lack of strong government and structural reforms.

To increase efficiency as well as reduce interference, the Reserve Bank of India has called for several public sector reforms including the dilution of government's stake to below 50% in order to increase the asset quality and reduce non-performing assets leading towards increased profitability of public sector banks.

Rising Non-Performing Assets of Public Banks - Public sector banks with high exposure to risky sectors such as infrastructure, steel, and transport (especially aviation) are facing reduction in asset quality. In contrast, private banks have continued to outperform public banks by posting much lower NPAs on account of more prudent lending policies. For instance in FY16, public sector banks reported 9.83% NPAs (INR5,020 billion NPAs from gross advances of INR51,049 billion) in contrast to only 2.7% NPAs in case of private sector banks (INR483 billion NPAs from gross advances of INR17,916 billion).

To solve this NPAs menace, the central bank is urging banks to promptly disclose NPAs and take remedial measures including making adequate provisions. Recently in 2017, the central bank introduced the preventive corrective action (PCA) framework to reduce NPAs. Under the framework, the RBI has listed three risk thresholds on the basis of capital to risk weighted assets ratio (CRAR), common equity tier-1 ratio and net-NPA ratio along with others. Based on the level of risk threshold, the RBI shall impose restrictions on several banking operation such as dividend distribution, branch expansion, compensation of management, and director's fees. This shall enable the banks to take corrective measures on time enabling them to reduce NPAs.

Weak Capital Position for Complying Basel III Framework - Since April 2013, the RBI has been implementing global capital to risk norms (under which banks shall have to maintain a minimum common equity and total capital ratio of 8% and 11.5%, respectively) which are to be fully implemented by March 2019. Even though most of the public sector banks meet the current statutory norms for CRAR, further improvements are required as the industry migrates to advanced Basel III framework.

However, owing to poor health of some of the public sector banks including IDBI Bank, Bank of Maharashtra, and Central Bank of India (which have already been put under PCA), the government is in negotiation with the RBI to defer the full implementation of Basel III framework. According to the RBI, public sector banks and the overall banking sector would require an additional capital of INR1,000 billion and INR5,000 billion, respectively, to meet these norms by 2019. The government is also planning to induct an additional capital of INR85.6 billion into 10 weak banks subject to commitment of quarterly milestones by banks.

Increasing Money Laundering Activities - In 2015, several urban cooperative banks were scanned by the RBI for violation of anti-money laundering laws; whereas later in the year, as many as 16 cooperative banks were penalised for violation of KYC and anti-money laundering norms. The issue concerning money laundering accentuated after the government announced its decision to demonetise currency of INR500 and INR1000 denomination in November 2016.

Banks also need to understand the plethora of risks arising from potential delinquency or fraud, as well as legal and reputational risks arising from exposure to customers having links to terrorist activities. They should strictly comply with norms such as know your customer, know your customer's business, and know your customer's business risks to reduce these activities apart from complying with the RBI's orders.

Challenges in Financial Inclusion - From the 1960s, the government has taken several initiatives such as nationalisation of banks, setting up regional rural banks, self-help group (SHG), bank linkage programme, and priority sector lending requirements along with others to facilitate financial inclusion in the country. However, even with implementation of these programmes, India's financial inclusion remains a distant dream. Out of its

massive population (1.3 billon), nearly 58% citizens still lack the access to financial services. Key challenges such as low financial literacy, inconsistent KYC norms, vast span of country (including inaccessible villages), non-operational accounts along with strong influence of moneylenders continue to act as deterrents against financial inclusion.

While the government has been putting continued efforts by launching new schemes such as Prime Minister's Jan Dhan Accounts, stress needs to be laid out in ensuring the opened accounts remain operational. For achieving this, strong government support, extending the role of business correspondents, greater role of technology, and leveraging Aadhaar card details for complying with KYC norms can play a key role.

Rise in Cyber Attacks - With steps such as digital India, digital locker, BHIM app (mobile application for digital payments), and demonetisation, the Indian government is working hard to transition the Indian economy into a digital economy. However, with rising digitalisation, technological risks have also risen significantly. Over the last 5 years, number of cyber frauds (such as misuse of credit/debit cards by attacking ATM infrastructure, breaching payment platform and others) increased from 4,235 (with a value of INR97.5 billion) to 5,064 (with a value of INR167.7 billion) in FY16. Recently in 2017, hackers diverged funds worth INR4.5 million by finding a security loophole in the government's BHIM mobile application.

Continued efforts involving assessment of risky assets, increased efficacy in cyber security management, conducting simulated testing (to identify and deal with weak or prone areas), along with setting up minimum standards and enhancing security through robust defence strategies are needed to solve this growing security concern.

The section below measures the beta-coefficient, systematic & unsystematic risk and co-efficient of determination as per the study's second and third objective.

Table 3: Beta Factor, Coefficient of Determination (CoD), Systematic Risk, Unsystematic Risk and Total Risk of S&P BSE BANKEX Constituents

Company	*Beta*	*CoD*	*Systematic Risk*	*Unsystematic Risk*	*Total Risk*
IndusInd Bank	1.24	0.39	0.01%	0.02%	0.03%
State Bank of India	1.38	0.16	0.02%	0.09%	0.11%
Yes Bank	1.67	0.40	0.02%	0.04%	0.06%
Punjab National Bank	1.39	0.15	0.02%	0.09%	0.11%
Kotak Mahindra Bank	1.11	0.23	0.01%	0.04%	0.05%
ICICI Bank	1.55	0.23	0.02%	0.07%	0.09%
HDFC Bank	0.99	0.51	0.01%	0.01%	0.02%
Federal Bank	1.38	0.14	0.02%	0.10%	0.12%
Bank of Baroda	1.45	0.16	0.02%	0.10%	0.12%
Axis Bank	1.52	0.21	0.02%	0.08%	0.10%

Values of beta factor of constituents stocks of BANKEX with reference to the market index (SENSEX) range from 0.99 to 1.67. Almost all stocks (except HDFC Bank) are more volatile than the overall market (beta factor of overall market is taken as 1). Stock of Yes Bank is the most volatile among the group with highest beta factor value of 1.67 followed by ICICI Bank (1.55) and Axis Bank (1.52). On the other hand, HDFC Bank is the least volatile and mimics the market volatility with beta factor value of 0.99 followed by Kotak Mahindra Bank (1.11) and IndusInd Bank (1.24).

Coefficient of determination, which depicts the percentage of market variance explained by a particular stock, ranges from 0.14 to 0.51. Among the stocks under consideration, coefficient of determination is the highest for HDFC Bank at 0.51 followed by Yes Bank (0.4). The coefficient value is the least for Federal Bank at 0.14 followed by Punjab National Bank (0.15).

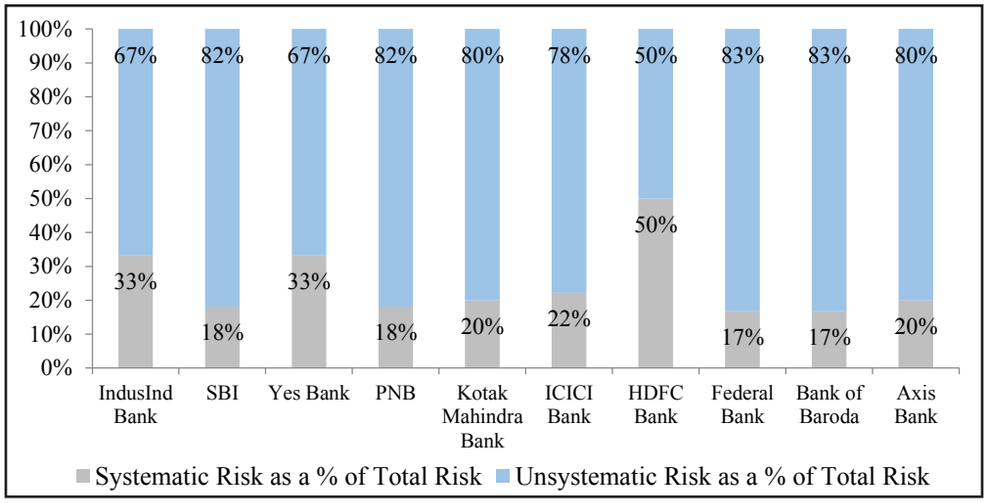

Fig. 1: Systematic and Unsystematic Risk as a Percentage of Total Risk

As shown in Table 3 and Figure 1, total risk is the highest for Federal Bank and Bank of Baroda at 0.12% (the value corresponds to variance in daily stock price returns) followed by Punjab National Bank and State Bank of India at 0.11%. The total risk is the least for HDFC Bank at 0.02% followed by IndusInd Bank (0.03%). Stocks of almost all banks (except HDFC Bank) have a greater proportion of unsystematic risk than systematic risk. Whereas HDFC Bank has an equal proportion of systematic as well as unsystematic risk, stocks such as Federal Bank and IndusInd Bank have a greater proportion of unsystematic risk (83% of total risk as unsystematic risk) than systematic risk.

The study also computed the degree and direction of correlation between volatility and risk. As expected, they have strong positive relationship with a correlation of 0.58. Interestingly, systematic risk showed even stronger correlation of 0.85 with volatility in contrast to moderate level of relationship between unsystematic risk and volatility with a correlation value of 0.52.

Conclusion and Implications

The study highlighted key reforms in the past that have enabled the current banking scenario. It identified several issues prevalent in the modern banking industry such as high operating costs & NPAs of public sector banks, rising cases of money-laundering & cyber-attacks, low profitability of public banks compared to their asset base along with distant dream of financial inclusion. The study also measured the volatility and systematic & unsystematic risks associated with S&P BSE BANKEX constituent stocks. Stocks of almost all banks had a beta factor greater than one inferring to a higher volatility than market index SENSEX and was highest for Yes Bank and lowest for HDFC Bank. The value for total risk was highest for Bank of Baroda & Federal Bank and lowest for HDFC Bank. Upon deeper inspection, the proportion of systematic and unsystematic risk also varied as per different stocks; however, the former was lower in proportion compared to the latter in all cases but HDFC Bank.

The study has multiple implications for the government, central bank, policy makers, and portfolio or fund managers. The government, central bank, and other policy makers can introduce reforms to tackle issues discussed in the paper. Computation of beta factor and classification of systematic & unsystematic risk can help individual investors as well as fund managers in building well-diversified portfolios. The reforms and performance indicators discussed can provide the basis for further industry analysis.

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