Drivers impacting bank risk in India

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Abstract:
This paper studies the factors/ drivers influencing bank risk using a database (panel) of top 30 banks (asset-wise) in India to study the different factors/ drivers that influence bank risk. The data has been sourced from Prowess IQ, Bloomberg and annual report(s) of the respective companies for 5 years, that is, 31 March 2014 to 31 March 2019. The major factors taken into consideration for this study have been banks' profitability, non-performing assets and regulation. Different proxies like net profit margin, percentage of non-performing loans with respect to the loans in totality and regulatory capital have been considered respectively. The banking sector of India provides a convincing demonstration to be scrutinized for its viewpoint towards risk mitigation. It is true that banks play an important part in the financial and economic development of aneconomy. Because of the process of the reforms in the business sector introduced in 1991, the structure has been easedmoderately, and large amount ofalteration has taken place. The Indian banking system comprises of distinct banks, with stark variations in governance structures and other metrics as well. However, not muchpragmaticcorroboration is available in the backdrop of India in spite of the noteworthy influence of varying types of risk in the banking. The consequence of these factors on the bank's potential to take risk in India have not been studied in minute detail. Hence, this study strives to achieve its objectives of examining the relationship between bank regulatory and performance metrics and risk exposures.Examination across different time periods helps us make inferences on whether these factors influence risk.

I INTRODUCTION

InIndia, the banking sector is regulated by the Reserve Bank of India (RBI) and is adequately capitalized. As per the Indian Brand Equity Foundation's banking sector report published in January 2020, the banking sector of India has altogether 22 private sector banks, 20 public sector banks aside from foreign banks, regional rural banks,rural cooperative banks, urban cooperative banks, cooperative credit institutions. In fact, various studies suggest that Indian banks are generally adaptable and strong and have withstood the globalslowdown well. The oldest and the strongest bank in India, today, is the State Bank of India having the highest asset size as of March 2019. It stood at around ₹36,809,142.4 million. It is followed by HDFC Bank Ltd and ICICI Bank Ltd. Currently, as a part of international regulatory framework requirements, banks in India follow international Basel III norms setup by the Basel Committee on Banking Supervision (BCBS), a group of central banks. These guidelines were released in 2010 in response to the global recession of 2008 and focus on pivotal parameters, namely, capital, funding, leverage and liquidity. Basel norms are focused primarily on the credit, operational, and market risk exposures of the banks, which in turn help the banks to quantify the risks and therefore standardize their risk management practices.

II RISKS IN BANKING

The major risks in banking business, can be broadly classified into the following types:

- **Operational Risk:** As per the BCBS, it is the risk of losses, incurred for flawed or insufficient processes, people and systems, existing in the internal environment or from events happening in the external environment. It includes varies classes of risk such as security, fraud, legal risks, privacy protection, infrastructure shutdown or even environmental risks. Operational risks greatly impact client satisfaction, shareholder value and reputation, all while leading to a rise in business return volatility. Operational risks are usually not revenue driven nor they arewillingly incurred contrary to other risks e.g. insurance risk, credit risk or market risk. Moreover, they are non- diversifiable and cannot be put to halt, implying that as long as people, systems and processes remain flawed, operational risk cannot be fully removed. Operational risk is almost everywhere—in people, processes and also systems. There are the obviousconsequences of an operational risk event: regulatory fines, legal costs and financial loss. indirect effects, which may be longer lasting include higher credit costs, mandated increases in risk-weighted asset thresholds, and reputational damage that can indelibly affect how customers, shareholders, regulators and counterparties view the bank.

- **Credit Risk:** Credit Risk is the kind of risk arising due to the loss of principal, or loss of a financial reward originating from a loanee's failure or inability to meet a contractual obligation or repay a loan. Investors have to be paid well for assuming credit risk. This can be in the form of additional interest payments from the borrower or issuer of a debt obligation. For many of the banks, loans are the most important source of credit risk. It's the foremost significant risk, more so within the Indian scenario, where the NPA level of the banking industry is considerably high. Rising debt in companies also always have additional capital structure related risks (Rastogi, 2011; Rastogi, 2016).

- **Market Risk:** The likelihood of unfavourable deviations of mark-to-market value of the trading portfolio because of varying movements of market during the amount required to liquidate the transactions is termed as Market Risk. This risk stems from adverse variations within the level or volatility of the market prices of rate of interest instruments, equities, commodities, and currencies. it's also called as Price Risk. There's no unique categorization as each classification may ask different aspects of market risk. Price Risk occurs when assets are sold before their pre-stated maturities. Bond prices and yields are inversely related within the financial market. This kind of risk is closely related to the trading book, which is made for creating profit out of short-term movements within the interest rates.

- **Liquidity Risk:** Liquidity risk takes place when an organisation fails to fulfill its obligations in time when payment falls due. The owners and purchasers of long-term assets should take into consideration the salability of assets when taking into account their own short-term cash needs. Assets that are quite difficult of being sold in a market which is quite illiquid carry a liquidity risk because they cannot be easily converted to cash when required. Liquidity risk can even decrease the value of certain assets or businesses because of the increased probability of capital loss.As per the Basel III requirements, banks should hold adequatefavourably liquid assets to envelope liability requirements in the difficult periods of strain.

- **Systemic Risk:** Systemic risk can lead to one of the worst scenarios for a bank. This sort of scenario happened in 2008. It's a scenario during which the whole economic system might come to a standstill. As an example, in 2008, the Lehman Brothers' collapse triggered a huge sell-off within the banking sector. An analogy of systemic risk would be a pandemic, like COVID-19, that needs safeguards in large number for health of the general public. It's an expository risk, as it's generally not limited to only one bank but instead to the whole financial system. It is generally observed that the small banks are more susceptible and vulnerable to being affected by systemic risk because of less availability of finance. Volatility in the market is also a considerable risk (Rastogi, 2014; Rastogi and Srivastava, 2011; Rastogi, 2010).

- **Residual Risk**: The mitigation techniques

for credit risk applied by the bank may sometimes prove less efficient than expected and therefore generate residual risk for banks. While the bank may mitigate the other risks by way of security or collaterals, suchsecuritiesmaygive rise to additional risks (liquidity, documentation and legal risks), thatcan decrease the effect of reduction of risk. For instance, the collateral liquidation can be either painstaking or tiresome. In fact, collaterals may be valued inappropriately (e.g. overvaluation) etc. Hence, it is necessary to have proper risk management procedures in place. This helps to reducethe risks that arise from the use of collaterals that reduces risk.

- **Moral Hazard:**Moral hazard refers to a scenariowherein a person, or a group, or an organization is likely to have a willingness or a tendency to take high amount of risk, even if it' not a wise decision in financial terms. This is because the entityis familiar with the fact that that the costs of such kind of risk-taking, if itsstart(s), won't be actually incurred by the same person, group, or organization bearing that risk.

- **Reputation Risk:** Reputation risk is the potential risk to capital and earningsstemming from unpleasant perception of the image of the financial organisation on the part of investors, debt holders,customers, counterparties, shareholders, analysts or regulatory bodies that mayterribly affect a bank's capabilityintaking care of thecurrent, or even set upbrand new business connections and extended access to different sources of finance. It is inherent in the incontrovertible belief that the outsideview on the institution is less appreciative than required. Indicationof large reputation risk are the voluminous and persistent voicing of a negative opinion on the execution and overall standard of an organisation by outside persons or organisations, specificallywhen such cynical opinion receives largepublic attention along with bad functioning of the organisation, which may lay the foundation for such belief.

III LITERATURE REVIEW

Various studies have been carried out in trying to assess the different factors that impacts the bank's risk-taking ability. Well-defined risk management systems have become a necessity

for banks to survive since they are exposed to at least one of the above defined risks at a particular point of time. After the global financial crisis (GFC) of 2008, it became quite obvious that banks need a stronger and more resilient risk management system in place to withstand the systemic shocks in the longer run. Hence, a robust need was felt to assess the drivers that directly or indirectly impact bank's risk taking since the risk management team wants to make sure that those variables or financial figures or even qualitative factors are thoroughly taken care of beforehand itself.

Agoraki, Delis and Pasiouras (2011) showed that "banks with market power tend to take on lower credit risk and have a lower probability of default. Capital requirements mitigate risk in general, but for banks with market power this effect considerablyreduces or may even be reversed. Excessive restrictions on activity along with additional market power diminish credit risk and therefore the risk of default, while official supervisory power has only a direct impact on bank risk" [1]. "The rationale given for these restrictions including capital constraints usually points to the lower probability of failure that will result when these constraints are binding. However,Koehn and Santomero (1980) observed that, this is not what necessarily obtains. In fact, they argued that the opposite result can be expected to that which is desired when higher capital requirements are imposed" [2].

This study has opted for a top-view approach by investigating few major factors contributing to bank risk across India.

IV DATA AND METHODOLOGY

For measuring bank risk, a lot of literature including McKinsey Insights [3] has been studied to arrive at the right proxy for the same. Efforts were made to choose something that is contemporary and as per the current industry norms since different financial firms define it differently when using one particular measure. Hence, the ratio for measuring bank risk is Tier 1 Capital Adequacy Ratio, that is, Tier 1 Capital divided by risk-weighted assets, or RWA. Tier 1 Capital can withstand losses because it offers banks the fluidity with respect to the contract either to reduce or abolish the repayments completely or to postpone them for increased periods of time. Tier 1 capital is the prime measure of the financial standing of a bank because it is composed of core capital.The core

capital is consistingmajorly of reserves that are disclosed (or retained earnings) and common stock. Also, it can include non-cumulative and non-redeemable preferred stock.

The three major factors that have an influence on risk as per my understanding are regulation, profitability and non-performing assets. Since Basel norms insist greatly on maintaining capital requirements as per the risk weighted assets, capital adequacy ratio has been taken as a proxy for regulation. For profitability, the net profit margin seems an appropriate measure. For non-performing assets, the non-performing loans as a percentage of total loans have been considered. It can be noted that all the figures or measures taken into consideration in the study are percentage figures, hence, they make the analysis more robust giving a relative view as well. Thus, it can be summarized as follows:

S.No.	Variable	Source
1	Risk (Tier 1 Capital/ RWA)	ProwessIQ, Bloomberg Terminal, Annual Report
2	Regulation (Capital Adequacy Ratio)	ProwessIQ, Bloomberg Terminal, Annual Report
3	Profitability (Net Profit Margin)	ProwessIQ, Bloomberg Terminal, Annual Report
4	NPA (Non-performing loans/ Total Loans)	ProwessIQ, Bloomberg Terminal, Annual Report

The data has been sourced for top thirty Indian banks in accordance with the size of assets since they constitute major portion of the Indian banking industry. The annual data has been sourced from ProwessIQ for the past 5 years, that is, from March 2014 to March 2019. For the values not available here, Bloomberg terminal or the respective bank's annual report was referred. Hence, the data we obtain is panel data. Panel Data Regression Model has been used to make analysis.

V   RESULTS

Both Fixed Effects Approach and Random Effects Approach has been considered. The null hypothesis is that that the dependent variable has no significant impact on the independent variable. The alternate hypothesis is that the dependent variable has significant impact on the independent variable. The following **rules** have been adhered to in the panel data regression model to arrive at inferences:

Table 1 Assessment of the impact of fixed effect, random effect & pooled effect

Fixed Effects Approach	Random effects Approach	Further Action/ Results
Reject the null hypothesis.	Accept the null hypothesis.	We consider the Fixed Effects Approach.
Accept the null hypothesis.	Reject the null hypothesis.	We consider the Random Effects Approach.
Reject the null hypothesis.	Reject the null hypothesis.	Perform Hausman test. If rejected, Fixed Effects approach is taken. In case of accepting null hypothesis, random effects approach results are taken.
Accept the null hypothesis.	Accept the null hypothesis.	Perform pooled ordinary least square method.

The results can be explained in the following order:

1. Panel 1: Here, the dependent variable is risk (Tier 1 capital adequacy Ratio)and the independent variable taken is regulation (Total capital adequacy ratio).

Table 2: Statistics of fixed effect test

	Co-efficient	Std. Error	p-values
Regulation	0.5189	0.0753	0.00
Constant	3.8525	0.9829	0.00

In fixed effects approach, it is observed that the regulatory requirement has a significant impact on the banks' risk as the p value is less than .05.

Table 3: Statistics of random effect test

	Co-efficient	Std. Error	p-values
Regulation	0.7765	0.0567	0.00
Constant	0.5001	0.7584	0.75

In random effects approach as well, it is observed that the regulatory requirement has a significant impact on the risk that can be taken by banks. Thus, we use the Durbin–Wu–Hausman test (Hausman specification test). The null hypothesis, here states that the random effects approach is preferred over fixed effects approach. The alternate hypothesis gives preference to the fixed effects approach. Since we reject the null hypothesis, we use the fixed effects approach. In fact, the coefficient of determination, or the explained variation stands at 87% implying that the regulatory requirements have a significant impact on the bank's risk, thus, reiterating the fact the norms existing in place like Basel III requirements imposed by the RBI in India contribute positively in building a better financial system within the country thus making the shock absorbing capacity of the banks stronger in the long run. As a part of diagnostics, two tests, namely, Durbin-Watson Stats Test and White Test for examining autocorrelation and heteroskedasticity respectively. The results show that there is no significant autocorrelation in residuals from regression analysis. The resemblance of a time series over successive time intervals is autocorrelation. It could lead to us inferring that predictors are significant when they are not. However, white test proves that heteroskedasticity exists and hence, it can impact the validity of econometric analysis.

2. Panel 2: Here, the dependent variable taken is risk (Tier 1 Capital Adequacy Ratio) and the independent variable is profitability (Net Profit Margin).

Table 4: Statistics of fixed effect test

	Co-efficient	Std. Error	p-values
Profitability	-0.008	0.0107	0.94
Constant	10.6081	0.0784	0.00

In fixed effects approach, it is observed that the profitability has a significant impact on the banks' risk.

Table 5: Statistics of random effect test

	Co-efficient	Std. Error	p-values
Profitability	0.7765	0.0567	0.00
Constant	0.5001	0.7584	0.51

In random effects approach as well, it is observed that the profitability has a significant impact on the banks' risk. However, Hausman Test, in this case, is not deterministic. Hence, we performed pooled data analysis. Here, we can observe that the profitability also has a significant impact on the risk.

3. Panel 3: Here, the dependent variable taken is risk and the independent variable is non-performing assets (NPA).

Table 6: Statistics of fixed effect test

	Co-efficient	Std. Error	p-values
NPA	0.0360	0.0389	0.35
Constant	10.4342	0.2015	0.00

In fixed effects approach, it is observed that the NPA has a significant impact on the banks' risk.

Table 7: Statistics of random effect test

	Co-efficient	Std. Error	p-values
NPA	-0.9768	0.4125	0.01
Constant	11.0745	0.3542	0.00

In random effects approach as well, it is observed that the NPA has a significant impact on the banks' risk. However, Hausman Test, in this case, is not deterministic as the data fails to meet the asymptotic assumptions of the Hausman Test. Hence, we performed pooled data analysis. Here, we can observe that the NPA also has a significant impact on the risk.

VI CONCLUSUION

In this paper, we conduct empirical assessment of how different bank's performance metrics and regulatory measures influence the bank's risk. This analysis is pivotal from banking and the financial system perspective because bank risk affects business cycle fluctuations, economic fragility, and hence, business and economic growth. All the three panels indicate that these factors, namely, regulation, profitability and NPA, have a significant impact on the bank's risk-taking ability. With respect to regulation, different parts of the regulatory norms designed to prevent a reoccurrence of the GFC of 2008 are now in place in the banking industry. Government exert regulatory pressure in different forms. Increasingly, banks are being mandated to assist in elimination of illegal as

well as unethical financial transactions by discovering early signs of financing of terrorism, money laundering, fraud,sanctions busting and the, and also to aid in the collection of taxes. Previous studies have indicated a strong correlation between risk and profitability of banks. In fact, Hawley Economic Theory states that profit is a reward for risk taken in business. Our studies indicate that the opposite is also true, that is, profitability has a strong bearing on a bank's risk.High profits increase the bank's capacity to take risk since it is more confident of withstanding any future shocks. Lastly, the NPA has a significant impact on the bank's risk. This is backed by considerable theories as well. In fact, some previous literature has considered NPA as a proxy for risk. Increasingratio of NPAshakes the trust of investors, depositors, lenders and various other stakeholders. It also leads tobad recycling of funds,which canresult indamaging effect on the disposition of credit. The non-recovery of loans affects not only the availability of credit further but also the financial strength and solvency of the bank in the long-run. Hence, all the variables/ factors considered in our study (regulation, profitability and NPA) have a significant impact on risk and hence, these are key determinants of a bank risk. Therefore, it is important for a bank to give due consideration to these metrics and maintain them as per the right industry standards and requirements for ensuring financial soundness.

VII LIMITATIONS AND FUTURE SCOPE

First and foremost, instead of taking all the determinants or the drivers in the study, we have kept the scope limited to the key measures of a bank. Secondly, in the panel 1 regression analysis, where we observe that regulatory requirements have a bearing on bank's risk, diagnostics test reveals that heteroscedasticity is present. Due to this, some coefficients which are not significant can appear significant in the results. In the panel two and three, we observe that the Hausman test was not deterministic since the data fails to meet the asymptotic assumptions of the Hausman Test.

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AUTHORS' PROFILE

Ishita Singh was born in 1994 and brought up in Delhi, India. Since an early age, she was keen on making a career in business and finance which led her to pursue her Bachelors in Financial & Investment Analysis from Shaheed Sukhdev College of Business Studies, University of Delhi. Post this, she worked with Ernst & Young (EY) for two years in the business research and consulting domain. She was supporting EY India and EY Global Leadership by providing thorough support in the competitive intelligence reports, strategic market intelligence reports and thought leaderships. She is now pursuing MBA (Finance) from Symbiosis Institute of Business Management, Symbiosis International University to broaden her management skills. She is currently keen on developing expertise in different areas of finance including banking and risk management.

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