

Impact of Financial Risks on the Profitability of Commercial Banks in India

Chetan Shetty

Assistant Professor, Department of Management Studies
Global Academy of Technology, Bangalore, Karnataka

OPEN ACCESS

Volume: 7

Issue: 1

Month: July

Year: 2019

ISSN: 2321-4643

Received: 12.06.2019

Accepted: 25.06.2019

Published: 01.07.2019

Citation:

Shetty, Chetan, and Anitha S. Yadav. "Impact of Financial Risks on the Profitability of Commercial Banks in India." *Shanlax International Journal of Management*, vol. 7, no. 1, 2019, pp. 25-35.

DOI:

<https://doi.org/10.34293/management.v7i1.550>



This work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

Anitha S Yadav

Professor, Department of Management Studies, Presidency University, Bangalore, Karnataka

Abstract

The Indian banking sector is exposed to various types of risks which arise from both the external and internal environments. Banks long-term sustainability and financial feasibility are vulnerable financial risk. Credit risk, operational risk, market risk, and liquidity risk stances a major challenge, despite growth in the banking system. This study examines the relationship between profitability and financial risks of 43 Indian commercial banks for the period of 11 years, (2008 to 2018). The quantitative research design was adopted in this study and the profitability measures that have been used in this study are the Return on Assets (ROA) and Return on Equity (ROE) while the financial risks are Interest Rate Risk (IRR) and Foreign Exchange Risk (FER). In this study, Time-Series Cross-Sectional secondary balanced panel data regression analysis of fixed effect and random effect model have been implemented. The findings of the study indicated that the relationship between ROE and IRR were found to be weakly significant, and on ROA the effect of IRR is significant for all the commercial banks. On both profitability measures, the FER was found to have an insignificant impact. The study concludes that there exists an inverse relationship between banks profitability and financial risk. Hence, the commercial banks in India together with the bank supervisors should make a trade-off between profitability and financial risk.

Keywords: Interest Rate Risk, Foreign Exchange Risk, Financial Derivatives, Return on Equity, Return on Asset, Off Balance Sheet.

Introduction

Profitability is the ultimate test for the effectiveness of risk management. It is the bottom-line of any financial institutions. After knowing the financial risk impact on the bank's profitability, it would be the most crucial aspect for all the banks as it would give heads-up to the bank to mitigate those risk effectively. Likewise, a profitable and healthy banking system promote comprehensive financial firmness and perceive to raise the economy's pliability to adverse macroeconomic surprises. Between risk and return the tradeoff is well recognized - the higher return comes with higher risk and viz versa. Therefore, in order to expand business and to increase profitability, financial institutions should be aware of the risk factors which have a major impact on profitability measures. Moreover, it's a known fact that the amount of risk faced by financial institutions is a great concern and is of a significant nature to the policymakers. The Basel committee report also highlights the importance of studying bank risks (BCBS-BIS 2001) ¹ and the Central bank's ongoing and consistent effort to record it in the capital adequacy guide lines (Shukla 2013).

¹ BCBS-BIS. (2001). Basel Committee on Banking Supervision, (May)

The present study focuses primarily on financial risks such as IRR and FER related to Indian commercial banks. Despite the fact that banks face various types of risks, these risks stand out and are often related to one another. “The interest rate is often the trigger for other forms of risk” (Narayana and Mahadeva 2016).

Review of Literature

This study describes the external and internal factors that affect the commercial banks’ profitability. It forms the basis for the development of the models in the present study by the impact of risks on banks profitability measures. The relationship between the bank and net interest margins (NIM), IRR, default risk, and off-balance sheet (OBS) banking activities of US banks between 1989 and 2003 were sampled by (Angbazo 1997). The pooled sample result in the documents like management efficiency, non-interest-bearing reserves, default risk, and leverage are associated positively with bank’s interest spread and the European bank’s profitability during the 1990s was explored by (Goddard, Molyneux, and Wilson 2004). (Muriithi 2016) examined the relationship between financial risk and banks profitability and the impact of the financial risks on the commercial banks’ profitability in Kenya. The findings of this study exhibited that, the operational, liquidity, market and credit risks have a significant negative impact on ROE. A cost to income ratio of the component of financial risk that had the most impact on financial performance and she concludes that there exists an inverse relationship between performance and financial risk of Kenyan commercial banks. (Narayana and Mahadeva 2016) made an attempt to identify the various types of risks handled by the banks and the risk management process. They also examined the different tools adopted by the banks for mitigating the risk. (Shukla 2013) explored the various indicators to evaluate the changes in the solvency position and capital structure of banks for highlighting risk profile of Indian banking system and in detail the risk profile of top ten private and public sector banks. (Tafri et al. 2009) examined the Islamic and Malaysians conventional banks’ relationship between financial risks and profitability measures for 10 years between 1996 to 2005. They employed a PDR analysis of GLS of FE and RE models and

conclude that the relationship between ROE and IRR were found to be weakly significant for the conventional and insignificant for the Islamic banks. The impact of IRR on ROA is significant for the conventional banks. Liquidity risk (LR) was found to have an insignificant impact on both profitability measures. (Driga 2012)² focuses on measuring the performance of Romanian banking systems of a commercial bank to financial risks. (The et al. 2009) examined that, the OBS activities includes contingent indentures which produce income to a bank but are considered neither as sources of fund nor application of funds as per conventional accounting method. Contingent items may be considered as notes to balance sheet, invisible banking, contingent commitment banking or even asset less banking in banking records. (Hegde and Subramanian 2016) This work studies the current risk management practices of Indian banks and their adherence to Basel norms. (Aktan, Chan, and Evrim-Mandaci 2013) examined the effect of OBS activities on the bank’s profitability, listed on the Istanbul Stock Exchange. In this study, four performance measures were used i.e. bank’s liquidity position, profitability, risk exposures, and leverage. The OBS activity results indicate that banks stock returns have been improved due to its hedging perception, but have a negative impact on ROE. Furthermore, they conclude that the OBS activities of the banks do not have a statistically significant influence on banks liquidity position.

Though, there are few studies which examined the relationship between IRR & the NIM and also the IRR and effectiveness relationship of the banks. (Tafri et al. 2009) examined that interest rate unpredictability has a positive impact on NIM. (Angbazo 1997) found a mixed result for the IRR and NIM relationship. (Muriithi 2016) as per this study, there is also a mixed result between operating efficiency of the bank and IRR. Hence, from this literature, it is not clear that whether it will be a positive or negative impact on banks profitability measures. The gap of the study is there is no specific

2 Financial Risks Analysis for a Commercial Bank in the Romanian Banking System. *Annales Universitatis Apulensis : Series Oeconomica*

literature to discuss about the impact of IRR & FER on the profitability of the bank. This study describes how these two major risks are going to make an impact on profitability of the commercial banks in India.

Research Objective

- To study the relationship between Financial Risks and Profitability of the commercial banks
- To examine the impact of financial risk on the profitability of the commercial banks in India

Data Analysis and Empirical Framework

Sources of data & Methodology

The secondary data for this study was collected through the audited financial reports and annual reports of the Indian commercial banks from banks website and RBI Time series publications (Statistical Tables Relating to Banks in India). The study period contains 11 years data between 2008 to 2018, because all banks complete data were available during these periods. The above data set comprises of 43 Indian commercial banks which includes both private and public sector banks. Hence, this pool aggregated data comprises a total of 473 (43*11) observations. For the present study Panel Data Regression analysis technique is considered because of its many advantages over either cross-section or time series data (Paul 2012). Firstly, by combining time series and cross-section observations, more informative data can be collected through panel data with more variability but less collinearity among the variables. Furthermore, “it provides an augmented number of data points and hence produces additional degrees of freedom as well as more efficiency” (Paul 2012). Thus, for the present study it is appropriate as it increases the quality and quantity of data whereby the timeseries is short (11 years) and also the number of banks are fewer. Secondly, by integrating the information relating to variables cross-section and time series, heterogeneity is explicitly taken into account by consent for specific individual variables (Regression 1991)³,

According to (Gujarati 2004)⁴, “Panel Data analysis suggest that individuals, firms or countries are heterogeneous, if heterogeneity is not controlled, there is the possibility of running into the risk of obtaining influenced results”. Thirdly, “by integrating data pertaining to both cross-section and timeseries variables, it can significantly reduce the problems that may arise from omitted variables” (Baltagi 2014)⁵. PDR is chosen over the Ordinary Least Square method (OLS) because under certain assumptions, PDR will turn out to be more competitive compared to OLS (Gujarati 2004). In estimating the PDR, two of its important models of regression were used, namely, Fixed Effect (FE) & Random Effect (RE) model. Redundant FE test was used to select the most suitable method between Pooled regression method and FE model and also Hausman specification test was used to select the appropriate model for the study between FE & RE (Baltagi 2014).

Fixed Effect Model

The FEM is also termed as a Least Square Dummy Variable model (LSDV). In this model, it is assumed that the “coefficients are constant and time-invariant” (Gujarati, n.d.).

The basic equation for this model is as follows:

$$Y_{it} = \alpha + \beta X_{it} + \mu_{it} \quad (1)$$

Here, Y_{it} = a dependent variable for banks measures of profitability.

X_{it} = a vector of financial risks and bank-specific characteristics which have an impact on measures of profitability.

μ_{it} = the residual term to reflect all other market imperfections and regulatory restrictions affecting profitability.

α_i , $i=1, \dots, N$, are constant coefficients specific to each bank

$i=1, \dots, N$, is the i th cross-sectional unit and $t=1, \dots, T$, is the t th time period

Random Effect Model

The REM is also termed as Error Component

3 Regression, P. D. (1991). Panel Data Regression Models, 591–613

4 Gujarati, D. N. (n.d.). Gujarati: Basic Econometrics, Fourth Edition

5 Baltagi, B. (2014). Dynamic Panel Data Models. Econometric Analysis of Panel Data, 155–187.

Model (ECM) because the composite error term μ_{it} consists of two or more error components. The basic equation for this model is:

$$Y_{it} = \alpha + \beta X_{it} + \mu_{it} \quad (2)$$

$i = 1, \dots, iN$; and $t = 1, \dots, T_i$

Here Y_{it} = a dependent variable for bank profitability measures

X_{it} = a vector of financial risks and bank-specific characteristics which have an impact on profitability.

μ_{it} = error component.

Model Specifications

Following the work of (Tafri et al. 2009), (Angbazo 1997), (Goddard, Molyneux, and Wilson 2004) and other comparable research in this extent, the basic model is:

$$\text{PROFITABILITY} = F(\text{RISKS}, \text{BANK})$$

RISK denotes the two foremost risks of the banks i.e., IRR and FER, while BANK is the control variables which represents a set of bank specific variables and ROA & ROE were considered as profitability measures. Precisely, the models are:

Dependent variable - ROA Model 1

$$ROA_{it} = \alpha + \beta_1 IRR_{it} + \beta_2 FER_{it} + \beta_3 OBS_{it} + \beta_4 OBS2_{it} + \beta_5 \text{Bank Size}_{it} + \beta_6 \text{Bank Capital}_{it} + \mu_{it} \quad (3)$$

Dependent variable - ROE Model 2

$$ROE_{it} = \alpha + \beta_1 IRR_{it} + \beta_2 FER_{it} + \beta_3 OBS1_{it} + \beta_4 OBS2_{it} + \beta_5 \text{Bank Size}_{it} + \beta_6 \text{Bank Capital}_{it} + \mu_{it} \quad (4)$$

Here,

ROA_{it} = ROA of bank i for year t

ROE_{it} = ROE of bank i for year t

IRR_{it} = IRR of bank i for year t

FER_{it} = FER of bank i for year t

$OBS1_{it}$ = OBS Activities

(credit related components) of bank i for year t

$OBS2_{it}$ = OBS Activities (financial derivatives) of bank i for year t

Bank Size_{it} = Log of total assets of bank i for year t

Bank Capital_{it} = Bank capitalization of bank i for year t

β = Coefficient of the variables

μ_{it} = Error term

Dependent Variables

In this study, ROA & ROE are measures of profitability, while a measure of spread is the

NIM, and the dependent variable is selected as profitability. These measures are preferred based on the literature (Tafri et al. 2009), (Muriithi 2016), (Angbazo 1997). ROE measures profitability from the shareholder's viewpoints while ROA measures the bank management's ability to make a profit from the bank's assets and it is defined as the ratio of net income to an average of total assets and it measures banks profitability per rupee of assets and another dependent variable ROE measures banks accounting profit per rupee of equity capital and hence, ROE is defined as net income divided by average equity.

Independent Variables

The independent variables namely IRR, FER and OBS activities are considered on the basis of its latent relevance to this model as well as for this study, and also because of its importance in representing a bank's real financial situation.

IRR: The maturity gap is proxy for IRR, which is derived by the ratio of the difference between the rupee value of assets and liabilities which is repriced within a year to total capital (Driga 2012).

Maturity gap = Rate Sensitive Assets (RSA) – Rate Sensitive Liabilities (RSL) / Total Capital (Fleeson et al. 2017).
 $IRR = (RSA - RSL) / \text{Total Capital}$ (Fleeson et al. 2017).

The following items like money market deposits accounts, loans maturing within a year, variable rate deposits, marketable securities maturing within a year and floating rate loans are all considered as rate sensitive (Fleeson et al. 2017) while cash, cash equivalent, liquidity reserves, assets and liabilities physical in nature such as owners' equity and long-term loans are the non-RSA and non-RSL (Tafri et al. 2009). As we have not come across any prior prospect studies conducted on the effect of IRR on profitability.

FER: The proxy for FER is Net Foreign Currency exposure between assets & liabilities to Total Assets.

OBS: It can be divided into a lending product or credit-related products and risk management derivative product. lending products such as loan commitments and letters of credit.

Risk management derivative products such as forwards, futures, options and swaps (Baxter et al. 2008)⁶ (Angbazo 1997). The OBS activities are embodied by the ratio of OBS to total assets (The et al. 2009). However, in this study, a testable implication is that the independent variable OBS activities should improve the profitability of the banks, because they authorize banks to investments in risky projects that would be passed up if restricted to equity or deposit financing. However, it would lead to greater exposure to risks if the OBS activities are increased (Chaudhry, n.d.2009).

Controlled Variables

In order to segregate the impact of risk factors on the performance, it is very important to control the other factors which have a marginal influence on profitability. Some controlled variables are included in this study, based on the literature, where it was stated that they have a significant association with profitability. The following are some important controlled variables which are likely to influence the bank’s profitability.

Bank Size

A year-end log of total assets are being used to measure the size of the bank. (Tafri et al. 2009) study also supports that credit risk exposure is size related and large banks always have the advantage of lower credit risk. In this study, with relation to profitability measures, bank size is expected to have a positive relation.

Bank Capital

As per the study by (Shukla 2013), this variable is represented by the bank’s ratio of equity to total assets. Well capitalized banks have higher exposure to NIM and with that benefit makes more profit.

Hypothesis

Based on the above objective, the following hypotheses were formed:

H1: The financial risks have a significant impact on

6 Baxter, R., Hastings, N., Law, A., & Glass, E. J. (2008). Prudential Norms for Off-balance Sheet Exposures of Banks

the bank’s profitability.

Sub Hypotheses

H1a: IRR has a significant impact on the bank’s profitability.

H1b: FER has a significant impact on the bank’s profitability.

For hypotheses, H1, and sub-hypotheses H1a and H1b the method employed were PDR.

Limitation of the Study

- Short span of the study period (2008 - 2018).
- Foreign banks operating in India are not considered for the study.
- The study is based only on two major risks of the bank. (IRR & FER).

Results and Discussion

Table 1 Descriptive Analysis

All Commercial Banks		
Variables	Mean	SD
ROA	0.816131	0.699572
ROE	11.79261	10.44919
IRR	2.655704	0.684283
FER	0.009956	0.035323
OBS1	0.047120	0.109014
OBS2	1.148829	0.439289
Bank Size	5.988848	0.510765
Bank Capital	0.640190	2.137718
No. of Observation	473	
Jarque – Berra	414.4504	
Probability	0.00000	

Note: SD= Standard Deviation.

Source: Secondary data.

As per (Gujarati 2004), “a normally distributed data is an unbiased, efficient, and consistent estimator and a normally distributed data are reflected in its descriptive statistics”. Above table 1 summarizes the Mean & SD of the selected dependent and independent variables of the study. The above analysis shows the value of Jarque – Berra test is significant. Hence, we can conclude that the selected data is not normally distributed. Therefore, OLS estimation is not suggested to be used compared to Panel Data Regression method.

Table 2 Correlation Coefficients

	ROA	ROE	CAP	FER	IRR	OBS1	OBS2	SIZE
ROA1	1.000000							
ROE1	0.282290	1.000000						
CAP	0.190585	-0.07263	1.000000					
FER	0.106610	0.044401	0.209148	1.000000				
IRR	0.529957	0.348873	0.351012	0.002874	1.000000			
OBS1	0.091791	0.028764	0.207243	0.637786	0.092803	1.000000		
OBS2	0.422877	0.209967	0.352765	0.238197	0.333625	0.29579	1.000000	
SIZE	-0.10072	-0.11892	-0.05001	0.006641	-0.12707	-0.0302	-0.04193	1.0000

Source: Secondary data

Table 2 shows, the correlation matrix of all the selected variables in this study. Between bank size and both the dependent variables there is a negative correlation. Furthermore, between IRR & dependent variables, and also between FER and both the dependent variables there is a positive correlation. Therefore, we can conclude that the above-selected variables for the study is not highly correlated with each other.

Multivariate Result

The table 5 & 6 reports the coefficient estimation of the PDR analysis for FE & RE model with ROA as the dependent variable and table 10 & 11 reports PDR analysis of FE & RE model with ROE as the dependent variable for all the banks' aggregated data. The first regression analysis in each case is Pooled least square with no effects which act as a benchmark while second and third regression analysis are FE & RE model respectively. Looking at these models, we can say that the model seems satisfactory for judging the relationship between banks profitability and financial risks. Furthermore, the F test results generated show the significance of the models.

Specification Test

There dundant fixed effect test has been used to select the model between Pooled regression and FE model. The RE estimator is the asymptotically efficient estimator while the FE is unbiased*and consistent estimator but not*efficient. In order to*specify the model, in the static panel data analysis,a model specification test was performed. In choosing the model between the 2FE model and

the RE model, this study employs the*specification test developed by(Levin, Lin, and Chu 2002). The Hausman specification (HS) test compares the FE and RE under the null hypothesis that the individual effects are uncorrelated with other regressors in the model. The test statistics has a symptotic 2 distribution. If the null hypothesis is rejected, it means that the effects are correlated, thus an RE model produces biased results, violating one of the theL Gauss-Markov assumptions; the conclusion is that RE model is not appropriate and it is suggested to use FE model(Levin, Lin, and Chu 2002).

Pooled Regression

Dependent Variable: ROA
Method: Panel Least Squares
Sample: 2008 - 2018
Time period: 11 years
Cross-sections included: 43 Banks
Total panel (balanced) observations: 473

Table 3

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.495412	0.339885	-1.457589	0.1456
CAP	-0.02706	0.013606	-1.988790	0.0473
IRR	0.473999	0.042230	11.22434	0.0000
FER	2.229684	0.964982	2.310597	0.0213
OB1	-0.608968	0.314748	-1.934776	0.0536
OB2	0.473071	0.067027	7.057919	0.0000
SZ	-0.050854	0.051095	-0.99528	0.3201

R-squared	0.362603	Mean dependent var	0.816131
Adjusted R-squared	0.354396	S.D. dependent var	0.699572
S.E. of regression	0.562102	Akaike info criterion	1.700423
Sum squared resid	147.2370	Schwarz criterion	1.761975
Log-likelihood	-395.1501	Hannan-Quinn criteria.	1.724633
F-statistic	44.18305	Durbin-Watson stat	1.054716
Prob(F-statistic)	0.000000		

Source: Secondary data
Redundant Fixed Effects Tests%
Test cross-section fixed effects

Table 4

Effects Test	Statistic	d.f.	Prob.
Cross-section F	4.117465	(42,424)	0.00000
Cross-section Chi-square	161.800202	42	0.00000

Source: Secondary data

It can be observed that the chi-squared statistic of redundant effects test has high statistical significance (p-value zero till the fourth decimal). Thus, it can be concluded that pooled sample regression is not suitable for this data. Hence, the FE model and the RE model are fitted to the data and the outcomes are shown.

Cross-section fixed (dummy variables)

Dependent Variable: ROA

Method: Panel Least Squares %

Sample: 2008 - 2018

Time period: 11 years

Cross-sections included: 43 banks

Total panel (balanced) observations: 473

Table 5

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	4.382388	0.763618	5.738982	0.0000
CAP	-0.018034	0.025668	-0.702586	0.4827
IRR	0.549553	0.048584	11.31149	0.0000
FER	1.519189	1.031821	1.472337	0.1417
OB1	-1.332827	0.332566	-4.007709	0.0001
OB2	0.302488	0.080616	3.752181	0.0002
SZ	-0.869247	0.122543	-7.093429	0.0000

R-squared	0.547259	Mean dependent var	0.816131
Adjusted R-squared	0.496005	S.D. dependent var	0.699572
S.E. of regression	0.496644	Akaike info criterion	1.535941
Sum squared resid	104.5820	Schwarz criterion	1.966799
Log-likelihood	-314.2500	Hannan-Quinn criteria.	1.705406
F-statistic	10.67744	Durbin-Watson stat	1.277218
Prob(F-statistic)	0.000000		

Source: Secondary data

Method: Panel EGLS1

(Cross-section random effects)

Dependent Variable: ROA

Sample: 2008 - 2018

Time period: 11 years

Cross-sections included: 43 banks

Total panel (balanced) observations: 473

Swamy & Arora estimator of component variances

Table 6

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.271428	0.418734	0.648213	0.5172
CAP	-0.032998	0.015841	-2.083031	0.0378
IRR	0.508152	0.042955	11.82990	0.0000
FER	1.582182	0.938808	1.685310	0.0926
OB1	-0.591313	0.294653	-2.006814	0.0453
OB2	0.461563	0.066964	6.892733	0.0000
SZ	-0.184314	0.064190	-2.871386	0.0043

Effects Specification			
	S.D.	Rho	
Cross-section random	0.183349	0.1199	
Idiosyncratic random	0.496644	0.8801	
Weighted Statistics			
R-squared	0.349434	Mean dependent var	0.51625
Adjusted R-squared	0.341057	S.D. dependent var	0.645146
S.E. of regression	0.523699	Sum squared resid	127.8056
F-statistic	41.71647	Durbin-Watson stat	1.131512
Prob(F-statistic)	0.000000		
Unweighted Statistics			
R-squared	0.350154	Mean dependent var	0.816131
Sum squared resid	150.1126	Durbin-Watson stat	0.998085

Source: Secondary data

In order to identify the most appropriate model between RE and FE, the HS test of Correlated RE is applied and the result is shown

Correlated Random Effects – Hausman Test

Test cross – section random effects

Table 7

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.	
Cross-section random	58.154170	6	0.0000	
Cross-section random effects test comparisons:				
Variable	Fixed	Random	Var (Diff.)	Prob.
CAP	-0.018034	-0.032998	0.000408	0.4587
IRR	0.549553	0.508152	0.000515	0.0682
FER	1.519189	1.582182	0.183295	0.8830
OB1	-1.332827	-0.591313	0.02378	0.0000
OB2	0.302488	0.461563	0.002015	0.0004
SZ	-0.869247	-0.184314	0.010896	0.0000

Source: Secondary data

The output of the Hausman test shows that the p-value of 0.000 and this is less than 0.05. Hence the null hypothesis is rejected and the fixed effects model is considered appropriate.

Multivariate Result with ROA as the Dependent Variable

The effect of IRR on ROA is positive & significant. This indicates that a significant impact of IRR on profitability measures. (Angbazo 1997)

examined the relationship between IRR and NIM and found that they have an inverse relationship. The impact of FER on ROA is insignificant. Looking at the effect of the OBS1 credit-related activities, the calculated coefficients are positively related to ROA for all the selected banks. As for OBS2, the relationship is found to be significantly negative for all the banks, the impact of bank size variable on ROA is significant and negative for all the banks. This finding is in line with the findings of (Azam and Siddiqui 2012) . Bank size is usually used to take the potential advantage of economies of scale in the banking sector. The positive relationship between profitability and size means that the banks benefit from the scale and there is risk divergence according to the size of the bank(Goddard, Molyneux, and Wilson 2004). As for the effect of bank capital on ROA is insignificant.

Multivariate Result with ROE as the Dependent variable

Pooled Regression

Dependent Variable: ROE

Method: Panel Least Squares

Sample: 2008 - 2018

Time period: 1years

Cross-sections included: 43banks

Total panel (balanced) observations: 473

Table 8

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	10.28393	5.675585	1.811959	0.0706
CAP	-1.371315	0.227202	-6.035666	0.0000
IRR	5.893716	0.705172	8.357841	0.0000
FER	31.37120	16.11380	1.946852	0.0522
OB1	-6.700413	5.255842	-1.274850	0.2030
OB2	4.097279	1.119255	3.660720	0.0003
SZ	-1.626549	0.853215	-1.906375	0.0572
R-squared	0.203350	Mean dependent var	11.79261	
Adjusted R-squared	0.193093	S.D. dependent var	10.44919	
S.E. of regression	9.386300	Akaike info criterion	7.331068	
Sum squared resid	41055.83	Schwarz criterion	7.392619	
Log-likelihood	-1726.798	Hannan-Quinn criteria.	7.355277	
F-statistic	19.82492	Durbin-Watson stat	1.102183	
Prob(F-statistic)	0.000000			

Source: Secondary data

Redundant Fixed Effects Tests

Test cross-section fixed effects %

Table 9

Effects Test	Statistic	d.f.	Prob.
Cross-section F	4.869045	(42,424)	0.0000
Cross-section Chi-square	186.173919	42	0.0000

Source: Secondary data

It could be observed that the chi-square statistic of redundant effects test has high statistical significance (p-value zero till the fourth decimal). Thus, it can be concluded that pooled sample regression is not appropriate for the above data. Hence, the FE model and the RE model are fitted to the above data and the results are shown

Cross-section fixed (dummy variables)

Dependent Variable: ROE

Method: 1Panel1Least1Squares \$

Sample: 2008 - 2018

Time period: 11years

Cross-sections included: 43banks

Total panel (balanced) observations: 473

Table 10

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	12β.7025	12.42697	9.954352	0.0000
CAP	-1.128418	0.417711	-2.701434	0.0072
IRR	6.260802	0.79064	7.918648	0.0000
FER	23.41935	16.79167	1.394701	0.1638
OB1	-23.71487	5.412116	-4.381811	0.0000
OB2	0.145941	1.311937	0.111241	0.9115
SZ	-20.09187	1.994234	-10.07498	0.0000

Effects Specification			
	S.D.	Rho	
Cross-section random	2.515244	0.0883	
Idiosyncratic random	8.082297	0.9117	
Weighted Statistics			
R-squared	0.211040	Mean dependent var	8.205696
Adjusted R-squared	0.200881	S.D. dependent var	9.945539
S.E. of regression	8.890659	Sum squared resid	36834.42
F-statistic	20.77513	Durbin-Watson stat	1.158973
Prob(F-statistic)	0.00000		
Unweighted Statistics			
R-squared	0.189351	Mean dependent var	11.79261
Sum squared resid	41777.29	Durbin-Watson stat	1.048722

Source: Secondary data

Panel EGLS (Cross-section random effects)

Dependent Variable: ROE

Sample: 2008 - 2018

Time period: 11years

Cross-sections included: 43banks

Total panel (balanced) observations: 473

Swamy & Arora estimator of component variances
\$

Table 11

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	24.46536	6.388636	3.829512	0.0001
CAP	-1.441466	0.244536	-5.894690	0.0000
IRR	6.013059	0.683600	8.796161	0.0000
FER	22.13979	15.03857	1.472201	0.1416
OB1	-6.287546	4.744215	-1.325308	0.1857
OB2	3.888477	1.066350	3.646531	0.0003
SZ	-3.917513	0.975544	-4.015723	0.0001

Effects Specification			
	S.D.	Rho	
Cross-section random	2.515244	0.0883	
Idiosyncratic random	8.082297	0.9117	
Weighted Statistics			
R-squared	0.211040	Mean dependent var	8.205696
Adjusted R-squared	0.200881	S.D. dependent var	9.945539
S.E. of regression	8.890659	Sum squared resid	36834.42
F-statistic	20.77513	Durbin-Watson stat	1.158973
Prob(F-statistic)	0.00000		
Unweighted Statistics			
R-squared	0.189351	Mean dependent var	11.79261
Sum squared resid	41777.29	Durbin-Watson stat	1.048722

Source: Secondary data

In order to discover the most appropriate model between RE and FE, the HS test of Correlated Random Effects is implemented and the result is proven.

Hausman Test

Test cross-section random effects

Table 12

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	103.876733	6	0.0000
Cross-section random effects test comparisons			
Variable	Fixed	Random	Var (Diff.) Prob.
CAP	-1.128418	-1.441466	0.114684 0.3553
IRR	6.260802	6.013059	0.157803 0.5329
FER	23.419354	22.139791	55.801707 0.8640
OB1	-23.714867	-6.287546	6.783421 0.0000
OB2	0.145941	3.888477	0.584078 0.0000
SZ	-20.091867	-3.917513	3.025285 0.0000

Source: Secondary data

The output of the Hausman test shows that the p-value of 0.000 and this is less than 0.05. Hence the null hypothesis is rejected and the fixed effects model is considered suitable.

As per the above analysis, Table 12 describes that, IRR is significant for all the banks, this indicates

a significant impact of IRR on profitability measures and FER is insignificant for all banks. In the case of controlled variables, OBS1 which is related to credit activities is negatively significant with ROE, but Derivative related activity i.e., OBS2 is insignificant with ROE for all the banks. Furthermore, Bank capital & Bank size are significant with ROE for all the banks. Bank Size is commonly used to get the advantage of the potential economies of scale in the banking sector. Excessive profitability tends to be associated with banks that keep a notably high amount of capital. consequently, a positive relationship between profitability and size means that the banks benefit from the scope of economics and there is risk divergence according to the size of the bank (Goddard, Molyneux, and Wilson 2004). The result exhibits that the size of the bank impact is insignificant. The viable motive will be that the size isn't the finest one that might contribute to higher profitability. A positive relationship indicates that higher owner's capital offers the banks the opportunity to maximize their ROE and hence their profitability.

Conclusion

The previous literature shed some light on the relationship between profitability measures and various financial risks of the commercial banks. Based on the empirical analysis, it cannot be concluded that financial risks have an impact on the selected profitability measures of the banks (Table 5 & 10). Based on the above empirical evidence it is clear that FER does not have any major impact on the profitability of the banks in India, however, another independent variable IRR has a major impact on banks profitability measures, and it is statistically significant indicating the fact that higher risk results in lower return.

As per the above result, it can be concluded that, Interest Rate Risk has a positive significant impact on ROA & ROE of the banks. It means if IRR increase by 1%, then ROE & ROA also increase to that extent and viz versa. Similarly, FER is insignificant with ROA & ROE, i.e., If any percentage increase in FER will not make any impact on ROE & ROA.

As for the measures of profitability study, several extensions would be very useful. In the current

scenario, the Indian new generation private sector banks are still in their infancy stage, hence in this study dynamic models could not be employed effectively, however, it is possible to extend the study period in the future. It would also be suggested to use quarterly data so that a clearer understanding of the dynamic responses of bank profitability movements can be obtained. It is therefore suggested that future research may consider a wider cross-section data, a different and longer time period and can also add diverse and a wider range of variables. In this study, the main limitation is the short span of the study period, as most of the new generation private banks in India are still new. Therefore, it is not suggested to apply the dynamic PDR analysis in the present study. There are still a lot of avenues and opportunities to explore further in this area. As a matter of fact, further studies should not be limited to the banking industry only but should also be extended to other industries as well.

References

- Aktan, B., Chan, S and Evrim-Mandaci, P. "Off-balance Sheet Activities Impact on Commercial Banks Performance: An Emerging Market Perspective. *Ekonomika Istraživanja – Economic Research*, vol. 26, no. 3, 2013, pp. 117–132. <https://doi.org/10.1080/1331677X.2013.11517625>
- Angbazo, L. "Commercial bank net interest margins, default risk, interest risk, and off-balance sheet banking." *Journal of Banking and Finance*, vol. 21, 1997, pp. 55–87.
- Azam, M and Siddiqui, S. "Domestic and Foreign Banks' Profitability: Differences and Their Determinants. *International Journal of Economics and Financial Issues*, vol. 2, no. 1, 2012, pp. 33–40.
- Baltagi, B. *Dynamic Panel Data Models, Econometric Analysis of Panel Data*, 2014, pp. 155–187.
- Baxter, R., Hastings, N., Law, A and Glass, E. J. "Prudential Norms for Off-balance Sheet Exposures of Banks." *Animal Genetics*, vol. 39, no. 5, 2008, pp. 561–563.
- BCBS-BIS. Basel Committee on Banking Supervision, 2001.
- Chaudhry, M. X. (n.d.). Commercial Bank 's Off-Balance Sheet Activities and Their Relationship With Market-Based Risk Measures. In 4th AFIR *International Colloquium*, (Orlando), pp. 1241–1274.
- Driga, I. "Financial Risks Analysis for a Commercial Bank in the Romanian Banking System." *Annales Universitatis Apulensis: Series Oeconomica*, vol. 14, no. 1, 2012, pp. 164–177.
- Fleeson, W., et al. "Draft Guidelines on Governance, Measurement and Management of Interest Rate Risk in Banking Book." *Journal of Personality and Social Psychology*, vol. 1, no. 1, 2017, pp. 1188–1197. <https://doi.org/10.1111/j.1467-7610.2010.02280.x>
- Goddard, J., Molyneux, P and Wilson, J.O.S. "The Profitability of European Banks: A Cross-sectional and Dynamic Panel Analysis." *The Manchester School*, vol. 72, no. 3, 2004, pp. 363–381. <https://doi.org/10.1111/j.1467-9957.2004.00397.x>
- Gujarati, D. N. (n.d.). *Gujarati: Basic Econometrics*, Fourth Edition, 2004.
- Hegde, T and Subramanian. "A Study of the Risk Management Practices of Banks in India." *International Journal of Management and Social Sciences Research (IJMSSR)*, vol. 5, no. 2, 2016, pp. 46–52.
- Isaac, L. "Assessing the Impact of Exchange Rate Risk on Banks Performance in Nigeria." *Journal of Economics and Sustainable Development*, vol. 6, no. 6, 2015, pp. 1–13.
- Levin, A., Lin, C and Chu, C. J. "Unit root tests in panel data: asymptotic and finite-sample properties." vol. 108, 2002, pp. 1–24.
- Muriithi, J. G. Effect of Financial Risk on Financial, 2016.
- Narayana, A and Mahadeva, K.S. "Risk Management in Banking Sector - An Empirical Study." *International Journal of Marketing*, vol. 2, no. 8, 2016, pp. 1218–1221. Retrieved from: www.indianresearchjournals.com
- Paul, R.K. Econometric analysis using panel data, 2012.
- Regression, P. D. *Panel Data Regression Models*, 1991, pp. 591–613.

-
- Shukla, S. “Risk Analysis of Public and Private sector Banks.” *IOSR Journal of Economics and Finance*, vol. 3, 2013, pp. 48–59. Retrieved from www.iosrjournals.org.
- Tafri, F. H. H., Hamid, Z., Meera, A and Omar, M. A. A. “Impact of Financial Risk on Profitability of Malaysian Pommmercial Bank: 1996–2005.” *International Scholarly and Scientific Research & Innovation*, vol. 3, no. 6, 2009, pp. 1320–1334.
- The, A., Run, L., Of, E., Policy, M., Bank, O., Asset, F and In, L. Off-balance sheet activities in banking: Theory and Indian experience, 14331, 2009.

Author Details

Chetan Shetty, Assistant Professor, Department of Management Studies, Global Academy of Technology, Bangalore, Karnataka. **Email ID:** shetti.chetan@gmail.com.

Dr.Anitha S Yadav, Professor, Department of Management Studies, Presidency University, Bangalore, Karnataka.