

A study to check and analyze the Correlation between Operational Performance with Operational Risk in selected Banks of India

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Abstract

Indian Banks are at developing stage where they have to face new challenges as well as grab opportunities to perform at global level. As banking is full of risk, their performance is bound with Basel Accords. The present study is an attempt to check the Operational Performance of the Indian selected banks through secondary data collected from banks' annual report with having time frame of 7 years from 2013-2019. Multiple regression has been applied to find out the correlation between Operational Performance and Operational Risk by considering various measurement variables. Three separate multiple regression analysis were performed to check the effects of independent variables on dependent variable. Model I have considered as earning per share as dependent variable, in model II, Operating expense ratio is considered as dependent variable and in model III, revenue growth rate is considered as dependent variable.

Key Words: Operational Performance, Operational Risk, Multiple Regression, Correlation etc.

1. Introduction

The banks are the vital constituent of financial system of an economy. The banking sector contributes significantly towards gross domestic product (GDP) of any nation and work as life blood for smooth conduct of business with other related economic processes. The Indian banking sector is well capitalized and regulated. The studies reveal that in spite of credit, liquidity and market risks being faced by banks, these withstand with global economic downturn and seems resilient (as per RBI report). But it witnessed high volatility in performance during last few years. The reasons for such instability are low credit growth, mounting NPA of banks, increased number of banking frauds, NBFC crisis and default from major companies. The present study is an attempt to check the operational performance after the implementation of Basel accords in the selected banks. The study witnessed its result on the basis of secondary data analysis that has been collected from a time period of 2013-2019 for five different banks. The selected banks for the study are State Bank of India, Punjab National Bank, Canara Bank, Union Bank of India and Bank Of Baroda. Data have been collected for capital adequacy ratio, coverage ratio for allowances for bad debts, interest rate sensitivity gap, net worth ratio, employee turnover rate, earning per share, operating expense ratio and revenue growth rate. Initially data have been presented in terms of tables and charts to analyse the trends in the data. Correlation analysis and VIF statistics are also generated for Operational risk Management, Credit risk capital requirements and Market risk capital requirements to check the multi-collinearity in the data. Three separate multiple regression analysis were performed to check the effects of independent variables on dependent variable. Model I have considered as earning per share as dependent variable, in model II, Operating expense ratio is considered as dependent variable and in model III, revenue growth rate is considered as dependent variable. Total seven independent variables were considered for analysis. For this purpose, required statistical tools and techniques have been implemented and data presented in tabular as well as diagrammatic form.

2. Objectives of Study

The objectives for the present study are as follows:

- ✓ To find the correlation between operational performance and operational risk
- ✓ To analyze the operational performance of selected banks after the implementation of Basel Accords.

3. Descriptive Analysis of the study:

Below is the descriptive study. The sample had an average credit risk capital requirement of 114052.93crores and a standard deviation of 137593.17crore. The minimum requirement for credit risk capital is 17384.04 crores, and a maximum of 539722.90

crore. The study had a mean ratio of 11.76 capital adequacy, with a standard deviation of 1.00. The minimum adequacy ratio for capital is 9.20 and a limit of 13.18. With a standard deviation of 2.23, the study had a mean coverage ratio of 16.79. The minimum coverage ratio is 13.34 and 21.53 avg. The sample had an average market risk capital requirement of 8593.40 crores, and a standard deviation of 9534.86 crore. The minimum requirement for credit risk capital is 1760.06 crores, and a maximum of 34590.65 crore.

The study had a mean sensitivity interest gap of 0.88 with a standard deviation of 0.10. The minimum sensitivity gap for interest rates is 0.64, and a maximum of 1.02. The study had a 1.58 mean net worth ratio with a 12.10 standard deviation. The net worth ratio is a minimum of -32, 85 and a maximum of 15, 19. The study had an operational risk management mean of 11663.28 crores and a standard deviation of 15628.87 crore. The minimum risk management for operations is 1356.84 crores and a maximum of 63878.48 crore.

The study had an 88413.83 mean Employee turnover rate with a standard deviation of 73064.87. The minimum turnover rate for employees is 31798, and a high of 264041. The sample had mean earnings of 20.74 per share, with a standard deviation of 58.25. The minimum earnings are -70.47 per share and a high of 210.06 per share. The study had a mean ratio of 1.51 for operating expenses with a standard deviation of 0.24. The minimum ratio of operating costs is 1.07, and a limit of 1.99. The study had a mean growth rate of revenue of -12.70, with a standard deviation of 11.04. The minimum ratio of operating expenses is -44.09, and a maximum of 2.41.

Table 3: Descriptive Statistic

Independent and Dependent Variable	Minimum	Maximum	Mean	Std. Deviation
Credit risk capital requirements (Crores)	17384.04	539722.90	114052.93	137593.17
Capital adequacy ratio	9.20	13.18	11.76	1.00
Coverage ratio	13.34	21.53	16.79	2.23
Market risk capital requirements (Crores)	1760.06	34590.65	8593.40	9534.86
Interest rate sensitivity gap	0.64	1.02	0.88	0.10
Net Worth Ratio	-32.85	15.19	1.58	12.10
Operational risk Management (Crores)	1356.84	63878.48	11663.28	15628.87
Employee turnover rate	31798.00	264041.00	88413.83	73064.87
Earnings per share	-70.47	210.06	20.74	58.25
Operating expense ratio	1.07	1.99	1.51	0.24
Revenue growth rate	-44.09	2.41	-12.70	11.04

4. Correlation between Operational Performance with Operational Risk

For correlation analysis in respect of operational risk, variables has been classified under major heads of Credit risk capital requirements, Market risk capital requirements and Operational risk Management. To avoid collinearity between the independent variables, the independent variables were used for this analysis to test for collinearity by the Variance Inflation Factor (VIF). The presence of collinearity was indicated by a VIF value greater than 10. The problems of collinearity occurred in this study according to the empirical findings shown in the table below. It can be observed from below table that Credit risk capital requirements (VIF=26.02), Market risk capital requirements (VIF=12.30) and Operational risk Management (VIF=38.97). While correlation analysis is also suggesting high degree of positive correlation amongst three independent variables, the operational risk Management is highly correlated with Credit risk capital requirements (0.95) and Market risk capital requirements (0.88). Market risk capital requirements and credit risk capital requirements are also correlated positively (0.903). To overcome this problem of multi-collinearity, the variable, credit risk capital requirement is not included in the multiple regression analysis.

Table 4.1: Correlation

		Credit risk capital requirements	Market risk capital requirements	Operational risk capital requirement
Credit risk capital requirements	Pearson Correlation	1	.903**	.959**
	Sig. (2-tailed)		.000	.000
Market risk capital requirements	Pearson Correlation		1	.880**
	Sig. (2-tailed)			.000
Operational risk capital requirement	Pearson Correlation			1
	Sig. (2-tailed)			.000

** Correlation is significant at the 0.01 level (2-tailed)

Table 4.2 : Collinearity Statistics

Sr. No.	Construct	Collinearity Statistics	
		Tolerance	VIF
1	Credit Risk Capital Requirements	.038	26.027
2	Market Risk Capital Requirements	.081	12.309
3	Operational Risk Management:	.026	38.970

5. Multiple Regression Analysis

Three separate multiple regression analysis were performed to check the effects of independent variables on dependent variable. In regression the accuracy level of prediction about the dependent variables have been checked by the value of R square that is the most important where maximum value of R square is 1 and minimum is 0. Value of R square lies between 0-1 to check the level of prediction of dependent variables with respect to independent variables taken for the study. Model I have considered as earning per share as dependent variable, in model II, Operating expense ratio is considered as dependent variable and in model III, revenue growth rate is considered as dependent variable. Total seven independent variables were considered for analysis.

Table: 5 Result of Multiple Regression Analysis of all three models

Y= Dependent variables	Earnings per share	Operating expense ratio	Revenue growth rate
Intercepts	B = -119.464	B= -0.26	B= 5.38
	t = -.360	t = -0.28	t = 0.26
	P = .722	P = 0.78	P= 0.78
X1= Credit risk capital requirements: Standard method	B = .001	B = 0.00	B= 0.00
	t = 1.931	t = -0.90	t = 0.974
	P = 0.064*	P = 0.37	P =0.338
X2=Capital adequacy ratio	B= 1.131	B= -0.003	B= -0.286
	t = 0.117	t =-0.099	t = -0.40
	P= 0.908	P= 0.921	P=0.686
X3=Coverage ratio of allowances for bad debt	B= -5.458	B= -0.015	B= -0.45
	t = -1.131	t =-0.993	t = -1.37
	P = 0.268	P =0.329	P = 0.180
X4=Market risk capital requirements: Standard method	B = -0.003	B= .000	B= -0.0001
	t = -1.749	t = .323	t =-1.33

	P= 0.092*	P= .749	P= 0.194
X5=Interest rate sensitivity gap	B = 216.859	B= 1.92	B= -6.48
	t = 1.015	t =3.56	t= -0.55
	P= 0.319	P =0.001***	P= 0.585
X6 =Net Worth Ratio	B=3.08	B= -0.00423	B= 0.871
	t = 4.60	t =-1.94721	t= 18.425
	P =0.000***	P= 0.061*	P= .000***
X7=Employee turnover rate	B= 2.595	B= 0.000	B= 0.000
	t = 3.656	t = 6.174709	t= -1.62945
	P= 0.001***	P =0.000***	P = 0.114831
F-value	F=7.91	F= 14.85	F= 82.18
	P=0.000***	P=0.000***	P=0.000***
Durbin-Watson	1.92	1.87	1.76
Adjusted R2	0.595	0.740	0.944

*P<0.1 **P<0.05 ***P<0.01

It can be observed from above table that all three models are significant at 1 percent level of significance. The adjusted R square values are also fairly explaining the variance in dependent variable. For earning per share, the adjusted R square is 0.59, for operating expense ratio, the adjusted R square is 0.74 and for revenue growth rate, the adjusted R square is 0.94. Hence for all three models, it can be concluded that overall, dependent variable can have fair amount of explanation through independent variables.

5.1 Model-I: Earning per share is taken as dependent variable and seven independent variables are considered for prediction of EPS. It can be observed that R square value for this model is 0.682; it can be understood as 68.2 percent of the variance in earning per share can be explained or accounted for by all independent variables.

It can be noted that three independent variables operational risk management (B=0.001, t=2.02, P<0.05), Net worth ratio (B= 3.08, t=4.60, P<0.05), employee turnover rate (B=2.59, t= 3.65. P<0.05) are found significant. Other variables are not found significant. It can be observed that overall model is also found significant (F=7.91, P<0.05). Durbin-Watson statistics is used to diagnose, autocorrelation in data. Value nearer to 2 indicates that there is no autocorrelation present in data. In this model, Durbin-Watson is found to be 1.92, it can be interpreted the assumption of as autocorrelation is not violated. The adjusted R square is 0.58; it is also nearer to R square value. The regression equation for model I am presented below.

Earnings Per share=-119.46+0.001 (Operational Risk Management)+1.131(Capital adequacy ratio)-5.458 (Coverage ratio of allowances for bad debt)-0.003 (Market risk capital requirements: Standard method)+216.859 (Interest rate sensitivity gap)+3.08 (Net Worth Ratio)+2.595 (Employee turnover rate)

5.2 Model-II: Revenue growth rate is taken as dependent variable and seven independent variables are considered for prediction of Operating expense ratio.

It can be observed that R square value for this model is 0.792; it can be understood as 79.2 percent of the variance in operating expense ratio can be explained or accounted for by all independent variables. It can be noted that three independent variables Interest rate sensitivity gap (B=1.92, t=3.56, P<0.05), Employee turnover rate (B= 000, t=6.17, P<0.05) are found significant. Other variables are not found significant. It can be observed that overall model is also found significant (F=14.85 P<0.05). Durbin-Watson statistics is used to diagnose, autocorrelation in data. Value nearer to 2 indicates that there is no autocorrelation present in data. In this model, Durbin-Watson is found to be 1.87, it can be interpreted the assumption of as autocorrelation is not violated. The adjusted R square is 0.74; it is also nearer to R square value. The regression equation for model I am presented below.

Operating Expense ratio=-0.26 -0.00 (Operational Risk Management) -0.003 (Capital adequacy ratio) -0.015 (Coverage ratio of allowances for bad debt) +0.000 (Market risk capital requirements: Standard method) +1.92 (Interest rate sensitivity gap) + 0.00423 (Net Worth Ratio) + 0.000 (Employee turnover rate)

5.3 Model-III: Revenue growth rate is taken as dependent variable and seven independent variables are considered for prediction of Operating expense ratio.

It can be observed that R square value for this model is 0.954; it can be understood as 95.4 percent of the variance in operating expense ratio can be explained or accounted for by all independent variables. It can be noted that net worth ratio (B=0.871, t=18.42, P<0.05) is found significant. Other variables are not found significant. It can be observed that overall model is also found significant (F=82.18 P<0.05). Durbin-Watson statistics is used to diagnose, autocorrelation in data. Value nearer to 2 indicates that there is no autocorrelation present in data. In this model, Durbin-Watson is found to be 1.76, it can be interpreted the assumption of as autocorrelation is not violated. The adjusted R square is 0.94; it is also nearer to R square value. The regression equation for model I am presented as below.

Revenue growth rate = 5.38 -0.00 (Operational Risk Management) -0.286 (Capital adequacy ratio) -0.45 (Coverage ratio of allowances for bad debt) - 0.0001 (Market risk capital requirements: Standard method) -6.48 (Interest rate sensitivity gap) + 0.871 (Net Worth Ratio) + 0.000 (Employee turnover rate).

6. Conclusion

The objective of the study was to find the correlation between operational performance and operational risk and to analyze the operational performance of selected banks after the implementation of Basel Accords. Independent variables and dependent variables has been classified to attain the objectives. Multiple regression has been applied and three models has been formed to know the accuracy level of value expectations of capital requirements to dealt with risk. The main results of this chapter found that Credit risk capital requirements are significant at 10 percent for earning per share and it is not significant for other two models. Capital adequacy ratio is not found significantly affecting for any of the model. Coverage ratio of allowances for bad debt is not found significantly affecting for any of the model. Market risk capital requirements are significant at 10 percent for earning per share and it is not significant for other two models. Interest rate sensitivity gap is affecting operating expense ratio but not significant for rest of the two models. Net worth Ratio is significant for all three models. Employee turnover rate is significantly affecting earning per share and operating expense ratio but not significantly affecting revenue growth rate.

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