Uncovering Key Performance Indicators for Private Sector Banks in Pakistan: An Application of Exploratory Factor Analysis

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Abstract

Efficiency of banking system leads to efficient allocation of scarce resources by the financial system of a country. Bank's efficiency is ascertained through different mechanisms. One of the mechanisms uses the aspect of Key Performance Indicators (KPIs). Considerable literature exists on KPIs for non-financial organizations. However, for the financial sector, deliberation on KPIs is uncommon. This research paper endeavors to fill this gap especially for Pakistani Commercial Banks belonging to the private sector. A total of 25 Pakistani commercial banks are listed with the State Bank of Pakistan, out which five are owned and controlled by the Government of Pakistan. The remaining 20 belong to the private sector. Out of these 20, secondary data of top 10 private sector banks selected on the basis of asset size was analyzed for the five year period from 2011 to 2015. Statistical technique of Exploratory Factor Analysis (EFA) was applied on 28 different financial ratios to uncover four categories of possible KPIs.

Introduction

Performance evaluation of banks in academic literature devotes considerable focus on competition, concentration, efficiency, productivity, and profitability. In context of social welfare, competition and efficiency are vital as they promote low prices, high quality, and innovation. Financial resources thus become readily accessible and affordable. Further, the speed and strength of monetary policy transmission becomes stronger because of better competitive environment. Techniques for the direct measurement of bank's efficiency are problematic. One of the obstacle is the non-availability of data on individual banks' output prices (or credit rates) and figures on cost of different individual banking products [1].

This paper attempts to identify the KPIs for private sector commercial banks in Pakistan through application of EFA technique. The use of KPIs in performance measurement and evaluation is wide spread amongst business firms. KPIs are popularly used along with balanced score card to outline the strategy map of an organization.

Literature Review

Efficiency investigations and study of performance indicators in context of commercial banks is of interest for academics, bank management, central banks, and for the financial markets. Performance measurement models include; analysis of financial ratios, production analysis, Delphi analysis, analytic hierarchical process (AHP), data envelopment analysis (DEA) and balanced scorecard (BSC).

A comprehensive theoretical and empirical frame work for evaluation of bank performance has been propounded by Biker and Bos [1]. Their work in the shape of a book outlines the theoretical framework of profit maximizing bank, its basic and more advanced models, their assumptions and the empirical results. The authors finally conclude by developing a balanced scorecard which they recommend for ultimate adoption by bank performance evaluators.

KPIs for private sector banks were investigated by Nimalathasan for Srilanka by using Exploratory Factor Analysis [2]. The study used primary data collected from banking executives through a questionaire containing 21 variables (both financial as well as non financial) and based on five points Likert scale, from strongly disagree (1) to strongly

agree (5). The sample for this study was private sector banks in North and Eastern Provinces of SriLanka. A stratified random sampling was used to select the organizations. The EFA analysis resulted in identifiaction of eight factors which constituted the following KPIs; Customer Satisfaction Rate, Opportunity Success Rate, Accident Ratio, Overall Equipment Effectiveness, Cash Flow, Return on Investment, and Return on Capital Employed.

Decision Making Trial and Evaluation Laboratory (DEMATEL) is another analytical technique used by Wu to construct a strategy map for banking institutions with key performance indicators of the balanced scorecard [3]. The study used six financial indicators, six indicators pertaining to customers, six internal process indicators, and five learning growth indicators as the possible performance parameters in accordance with the balanced score card perspectives. The findings indicate that the most essential KPIs for banking performance are customer satisfaction, sales performance, and customer retention rate.

Akroush conducted a comparative study on the structure-profit relationship of commercial banks in Korea and the USA [4]. To assess the profitability of the sample banks, they used ROA and ROE. These two variables were used as dependent variables. They also used seven independent variables namely: shareholders' equity to total assets, liquid assets to assets, total loans to total deposits, fixed assets to total assets, total borrowed funds to total assets, reserves for loans to total assets and a reciprocal value of total assets. They concluded that the banks in Korea lag far behind the USA banks in terms of efficiency and profitability. The findings also indicated that the capitalization rate,

reserves for loan losses, and the size of the bank were important factors affecting the profitability of the banks in both countries [5].

In Summary it can be concluded that ROA and ROE have been widely used as measures of banks' performance. Regarding factors affecting bank performance, different factors have been used by researchers such as; shareholders' equity to total assets, liquid assets to assets, total loans to total deposits, fixed assets to total assets, total borrowed funds to total assets, reserves for loans to total assets, market concentration, market size, labor productivity, bank portfolio composition, capital productivity, bank capitalization, financial ratios, level of capitalization, age of the bank, per capita GDP, cost to income ratio and customer satisfaction.

Objectives

The objectives of this research paper are as under;

1. To uncover the relevant performance indicators of private sector commercial banks in Pakistan.

2. To extract the key indicators of performance of private sector commercial banks in Pakistan.

Research Design

Sampling procedure

A total of 25 commercial banks are listed with the State Bank in Pakistan as on 30th September, 2016. Out of these, five are owned and controlled by the Government of Pakistan [6]. The remaining 20 are owned and controlled by the private sector. This study focuses on 10 largest private sector banks selected on the basis of asset size. All of the 10 banks selected are listed on the Pakistan Stock Exchange. As such these commercial banks have partial general public ownership as well.

Data source

The study has been compiled on the basis of secondary data extracted from the published annual reports of the ten selected banks [7]. The sample period is from 2011 to 2015.

Statistical tool used

EFA has been employed to uncover the KPIs from a large list of possible performance indicators. The well-known software package SPSS version 23 was used to analyze and apply EFA technique [8].

Variables and factors analyzed

The following Table 1 contains the list of different variables, for which data was analyzed and the pertinent factors were extracted [9]. It may be noted that all of these variables are quantitative and are of ratio level. The code used in the SPSS software for the variables is also mentioned in the table.

Extraction of factors

Statistical technique of Exploratory Factor Analysis was applied on the 28 variables obtained from the financial ratios of the 10 selected commercial banks. The relevant statistics of the extracted factors which are given below indicates that the four factors (components) impound nearly 74% of the total variance explained. The extracted components have eigenvalues greater than one which is a common criterion for a factor to be useful. When eigen value is less than one, this means that less information is explained by the particular factor and there would

S. No.	Code	Description	Formula
1	ADVBDEP	Gross Advances to Borrowings and Deposits	Gross Advances/(Borrowings+Deposits)
2	ADVDEP	Gross Advances to Total Deposits	Gross Advances/Deposits
3	ADVTA	Advances net of Provisions to Total Assets	Advances Net of Provisions/Total Assets
4	AENII	Administrative Expenses to Non-Interest Income	Administrative Expenses/Non-Interest Income
5	AEPBT	Administrative Expenses to PBT	Administrative Expenses/Profit Before Tax
6	BVPS	Book Value per Share	Total Equity/Number of Shares
7	CGEQ	Contingent Liabilities to Total Equity	Contingent Liabilities/Total Equity
8	COPAT	Cash Flow to Profit after Tax (PAT)	Cash Generated from Operating Activities/PAT
9	CR	Capital Ratio	Total Equity/Total Assets
10	CTA	Cash and bank Balances to Total Assets	Cash/Total Assets
11	DEPEQ	Total Deposits to Total Equity	Total Deposits/Total Equity
12	DEPTA	Total Deposits to Total Assets	Total Deposits/Total Assets
13	EPS	Earnings Per Share	Net Income/Number of Shares
14	INVTA	Long Term Investments to Total Assets	Investments/Total Assets
15	IR	Interest Ratio	Interest Expense/Interest Income
16	NIETI	Non-Interest Income to Total Income	Non-Interest Expense/Total Income
17	NIITA	Non-Interest Income to Total Assets	Non-Interest Income/Total Assets
18	NIM	Net Interest Margin	(Interest Income – Interest Expense)/Total assets
19	NIMTA	Net Interest Margin to Total Assets	Net Interest Income/Total Assets
20	NPLEQ	Non-Performing Loans to Total Equity	Non-Performing Loans/Total Equity
21	NPLGA	Non-Performing Loans/Gross Advances	Non-Performing Loans/Gross advances
22	NPLWNPLP	Non-Performing Loans Write Off to Non-Performing Loans Provisions	Non-Performing Loans Write off/Non-Performing Loans Provisions
23	PNPLGA	Provisions against Non-Performing Loans to Gross Advances	Provision Against Non-Performing Loans/Gross Advances
24	PNPLNPL	Provisions against Non-Performing Loans to Non-Performing Loans	Provisions Non-Performing Loans/Non-Performing Loans
25	ROA	Return on Total Assets	Profit After Tax/Total Assets
26	ROE	Return on Equity	Net Income/Total Equity
27	SPREAD	Spread ratio	Interest Income/Interest Earned
28	TLTA	Total Liabilities to Total Assets	Total Liabilities/Total Assets

Table 1: List of indicators/variables.

be less justification to keep the factor. Since four factors were specified to the software, as many factors were extracted [10]. If small number of factors were not specified, then the software would have extracted the best factors, which in this case would have been seven. The extracted factors were also rotated. The rotation method employed was orthogonal (varimax). The results are shown on the following pages in Tables 2 and 3.

Grouping of factors

As per the rotated component matrix, four categories have been developed which impound the large number of 28 variables. The four categories have been assigned names on the basis of the common characteristics of the different variables. The four newly named groups or indicators are as under:

1. Interest Coverage (IC)
2. Assets Coverage (AC)
3. Deposits Efficiency (DE)
4. Loan Efficiency (LE)

Interest coverage (IC)

This category or indicator represents seven variables with factor loadings ranging from 0.953 to 0.653. The list of seven variables include; Spread, Interest income/interest Income, Net Interest Margin, Net Interest Income/Total Assets, Capital Ratio, Total Liabilities/Total Assets, and Return on Assets. This indicator accounted for 35.859% of the rated variance.

Assets coverage (AC)

This indicator also represents seven variables. Factor loadings range from 0.567 to 0.809 out of 1. These seven variables include; Administrative Expenses/Non-Interest Income, Non-interest Income/Total Assets, Non-Performing Loans/Gross Advances, Provisions Non-Performing Loans/Non-Performing Loans, Total Deposits/Equity, Provisions Non-Performing Loans/Gross Advances, and Deposits/Total Assets. Variance of 20.652% was explained by this indicator [11].

Deposits efficiency (DE)

Six variables are included in this indicator. Factor loadings of these variables range from 0.619 to 0.872 out of 1. The list of variables include; Advances/Total Assets, Gross Advances/Borrowings+Deposits, Investments/Total Assets, Gross Advances/Deposits, Administrative Expenses/Profit Before Tax, and Non-Interest Expense/Total Income. Proportion of Variance explained by this factor is 10.39.

Loan efficiency (LE)

This indicator represents six variables. Their factor loadings range from 0.367 to 0.755 out of 1. Variable included in this category are; EPS, ROE, BVPS, Contingent Liabilities/Equity, NPLs/Equity, and NPLs Write off/ NPLs Provisions. Variance of 7.022 % is accounted for by this factor [12].

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	10.041	35.859	35.859	10.041	35.859	35.859	6.735	24.052	24.052
2	5.783	20.652	56.511	5.783	20.652	56.511	4.917	17.560	41.611
3	2.909	10.390	66.901	2.909	10.390	66.901	4.835	17.267	58.879
4	1.966	7.022	73.923	1.966	7.022	73.923	4.212	15.044	73.923
5	1.543	5.511	79.434						
6	1.507	5.382	84.815						
7	1.134	4.050	88.865						
8	.882	3.150	92.015						
9	.510	1.823	93.838						
10	.455	1.626	95.464						
11	.287	1.024	96.488						
12	.263	.940	97.429						
13	.238	.849	98.278						
14	.168	.600	98.878						
15	.106	.377	99.255						
16	.077	.274	99.529						
17	.047	.169	99.698						
18	.032	.115	99.813						
19	.017	.062	99.875						
20	.014	.050	99.925						
21	.008	.029	99.954						
22	.004	.015	99.968						
23	.004	.013	99.981						
24	.002	.008	99.989						
25	.002	.006	99.995						
26	.001	.003	99.998						
27	.001	.002	100.000						
28	5.000E-17	1.786E-16	100.000						

Extraction Method: Principal Component Analysis.

Table 2: Total variance explained.

Indicators/ Variables CODE	Component			
	Markup/Interest Coverage	Assets Coverage	Deposits Efficiency	Loan Efficiency
ADVBDEP		-.317	.867	
ADVDEP		-.388	.787	
ADVTA	-.377		.872	
AEN I I		.809		.355
AEPBT			.744	
BVPS				-.668
C R	.762	-.571		
CGEQ	-.494			.650
COPAT				
CTA		.319	.332	
DEPEQ	-.625	.661		
DEPTA	-.423	.567		
EPS				-.755
INVTA			-.846	
IR	-.953			
N I I TA		-.794		
N I M	.913			
N I M T A	.867			-.415
NIETI	.320	.306	.619	.407
NPLEQ	-.455		.474	.537
NPLG A		-.736		.500
NPLWNPLP PNPLGA		-.625		.367 .580
PNPLNPL		.685	-.462	
ROA	.653			-.606
ROE				-.703
SPREAD	.953			
TLTA	-.755	.570		
Eigen Value	10.041	5.783	2.909	1.966
Proportion of Variance	35.859	20.652	10.390	7.022
Cumulative Variance Explained	35.859	56.511	66.901	73.923

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

Rotation converged in 10 iterations.

Table 3: Principal component analysis – Varimax rotation indicators of performance.

Conclusion

Through an empirical investigation, this study has identified four indicators that are the major contributors to the performance of private sector commercial banks in Pakistan. These factors in order of importance are; (1) Interest Coverage, (2) Assets Coverage, (3) Deposits Efficiency, and (4) Loan Efficiency. These four factors may constitute the Key Performance Indicators (KPIs) for the private sector banks in Pakistan.

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