

## DETERMINANTS OF KEY PERFORMANCE INDICATORS (KPIs) OF PRIVATE SECTOR BANKS IN SRILANKA: AN APPLICATION OF EXPLORATORY FACTOR ANALYSIS

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### **Abstract:**

*An efficient banking system facilitates linkage between mobilization and use of resources, which accelerates the process of economic growth. It is a widely accepted belief that a banking system which relies on a wide array of banking products, is able to carry out this function because it increases the efficiency of a banking systems to a large extent by offering a broader and flexible arrange of services to the benefits of both borrowers and investors. Meanwhile, there are no comprehensive and empirical researches in that field especially in banking sector.*

*In an attempt to fill in this gap, the present study is conducted determinants of key performance indicators (KPIs) of private sector banks in SriLanka with samples of hundred respondents in twelve branches in North and Eastern Provinces. Data were collected through a five points Likert type summated rating scales of questionnaire from strongly disagree (1) to strongly agree (5) were adopted to identify indicators. Sophisticated statistical model as "Exploratory Factor Analysis" (EFA) has been used. The results show that eight factors extracted from the analysis that together accounted 73.781% of the total variance. These factors were categorized as 1) Accident Ratio (AR); (2) Opportunity Succession Rate (OSR); (3) Cash Flow (CF); (4) Return on Capital Employed (ROCE); (5) Customer Satisfaction Rate (CSR); (6) Overall Equipment Effectiveness (OEE); (7) Return on Investment (ROI); (8) Internal Promotion (IP).*

**Keywords:** Key Performance Indicators; Banking; Measurement; Efficiency

**JEL Classifications:** M1, M4

## INTRODUCTION

Every organisation measures them to some degree. Often these measurements are based on historical information. While there is certainly value in historical analysis, it is a fundamental principle of Key Performance Indicators (KPIs) to be current or forward-looking metrics. It is also critical that KPIs be closely aligned to strategic company goals and implemented in such a way as to support positive change. KPIs are financial and non-financial metrics used to help an organization define and measure progress toward organizational goals. KPIs can be delivered through business intelligence techniques to assess the present state of the business and to assist in prescribing a course of action.

KPIs are quantifiable measurements, agreed to beforehand, that reflect the critical success factors of an organization. Whatever KPIs indicators are selected, they must reflect the organization's goals, they must be key to its success, and they must be quantifiable (measurable). KPIs usually are long-term considerations. The definition of what they are and how they are measured do not change often. The goals for particular KPIs may change as the organization's goals change, or as it gets closer to achieving a goal. The act of monitoring KPIs in real-time is known as Business Activity Monitoring (BAM). KPIs are frequently used to "value" difficult to measure activities such as the benefits of leadership development, engagement, service, and satisfaction. KPIs are typically tied to an organization's strategy (as exemplified through techniques such as the Balanced Score Card).

## LITERATURE REVIEW

Performance Indicators (PIs) have been implemented in many countries, from the United Kingdom (UK) to Australia labelled as essential management information (Sizer, 1990) and a management tool (CVCP/UGC, 1986), as well as claimed to bring about numerous benefits (e.g., improved accountability and planning), PIs are expected to be increasingly used by the

governments of the future (Carter, Klein & Day, 1992; Hughes, 1994). However, the literature on performance indicators suggests that their application may bring about dysfunctional effects. In particular, authors from countries such as the UK (Barnett, 1992), Australia (Marginson, 1995), United State of America (USA) (Porter, 1988), and the Netherlands (Vroeijenst ijin & Acherman, 1990) had voiced their concerns that performance indicators could set the criteria for performance.

Performance measurement and reporting is now widespread across the private sector as well as public sector of many industrialised and industrialising countries. The common tool that is used for this process, key performance indicators (KPIs), have been argued to provide 'intelligence' in the form of useful information about a public and private agency's performance (Williams, 2003).

So great is this faith in KPIs that many public and private agencies are now mandated by law or executive order to use them as one of the primary tools to account for their performance to main public accountability or reporting authorities, such as the Parliament and the Government auditor. It is apparent that, the way in which KPIs work to improve accountability is through the information they provide to the principal. Performance measurement systems assume that humans can use the information to make better decisions (Cavalluzo & Ittner, 1999). This assumption is consistent with the rational-comprehensive and bounded rationality perspectives on decision-making (Simon, 1955, 1992). The former perspective describes information as directly related to organisational goals and the organisational methods by which to achieve these goals. It also views information as available, unambiguous and directly influential on decisions.

Many scholars have maintained that the implementation of performance measurement systems possesses important symbolic value (Modell, 2004; Moynihan, 2005; Vakkuri & Meklin, 2006). KPIs are viewed as a 'good' management device and a socially constructed tool that makes sense (DeKool, 2004 & Weick, 1995). The fact that KPIs tend to be quantitative has helped to promote their image of objectiveness and rationality. The image of KPIs is further enhanced by their widespread application across the public sector of many industrialised countries. The importance of performance measurement is noted by Ingraham (2005) it is important to expect that citizens see and understand the results of government programs. It is necessary that public employees and their leaders not play their thumbs when public dollars are wasted on poorly planned or unrealistic public programs.

Based on the above literatures, there are no comprehensive and empirical researches in that field especially in private sector banks viz., EFA. In an attempt to fill in this gap, the present study is conducted the determinants of key performance indicators (KPIs) of private sector banks in SriLanka with samples of hundred respondents in twelve branches in North and Eastern Provinces.

## **OBJECTIVES**

The present study has the following objectives

1. To examine necessary indicators for the performance of the private sector banks.
2. To determine the key indicators for the performance of the private sector banks.

## **MATERIAL AND METHODS**

### **Sampling procedure**

The sample for this study was private sector banks in North and Eastern Provinces of SriLanka. A stratified random sampling technique was used to select the organizations. Initially we identified total number of banks which consists of four private sector banks (Seylan bank; Hatton National Bank; Commercial Bank& Sampath bank). Out of 16 branches of above four banks, 75% of the banks were selected for the study. Ultimately the present study is made with the samples of 12 private sector banks. Researchers, then, decided to distribute 10 questionnaires among each branch. In a way 120 questionnaires were distributed, of which only 110 were returned and 100 were used for the study as an ultimate samples.

### Data source

The study was complied with the help of primary data. Primary data were collected through the questionnaire. Moreover, the desk study covered various published and unpublished materials on the subject.

### Questionnaire Development

The questionnaire was administrated to banking executives in North and Eastern Province of Sri Lanka. The questionnaire was designed by the researchers with some modification from Kaplan & Norton, (1996). A five item scale from strongly disagree (1) to strongly agree (5) was adopted to identify the indicators.

### Statistical Tools Used

In the present study, we analyse our data by employing EFA. For the study, entire analysis is done by personal computer. A well known statistical package SPSS (Statistical Package for Social Sciences) 13.0 Version was used in order to analyze the data.

### Results and Discussion

To identify potential underlying dimensions of the KPIs of private sector banks development used in the current study, responses of the participants were subjected to factor analysis method. Before applying factor analysis, testing of the reliability of the scale is very much important as it shows the extent to which a scale produces consistent result if measurements are made repeatedly. This is done by determining the association in between scores obtained from different administrations of the scale. If the association is high, the scale yields consistent result, thus is reliable. Cronbach's alpha is most widely used method. It may be mentioned that its value varies from 0 to 1 but, satisfactory value is required to be more than 0.6 for the scale to be reliable (Malhotra, 2002; Cronbach, 1951). In the present study, we, therefore, used Cronbach's alpha scale as a measure of reliability. Its value is estimated to be 0.653, If we compare our reliability value with the standard value alpha of 0.6 advocated by Cronbach (1951), a more accurate recommendation Nunnally and Bernstein (1994) or with the standard value of 0.6 as recommended by Bagozzi and Yi's (1988) we find that the scales used by us are highly reliable for data analysis.

Regarding validity, a research instrument with small modifications from the model developed by Kaplan & Norton (1996) was used. The statements included in the questionnaire are most suitable for the variable, because many researchers used these variables to measure the performance indicators (Kaplan & Norton, 1996; Deming, 1986; Inner & Larcker, 1997). Hence the researchers satisfied with the content validity then it was decided to continue the analysis.

After checking the reliability of scale, we tested whether the data so collected is appropriate for factor analysis or not. The appropriateness of factor analysis is dependent upon the sample size. In this connection, Kaiser – Meyer- Olkin (KMO) measure of sampling adequacy is still another useful method to show the appropriateness of data for factor analysis. The KMO statistics varies between 0 and 1. Kaiser (1974) recommends that values greater than 0.5 are acceptable. Between 0.5 and 0.7 are mediocre, between 0.7 and 0.8 are good, between 0.8 and 0.9 are superb (Field, 2000). In this study, the value of KMO for overall matrix is 0.461 (For details please see table no 1), it is near to 0.5. Hence the sample taken to process the factor analysis is statistically significant.

**Table no 1. KMO and Bartlett's Test**

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.461
Bartlett's Test of Sphericity	Approx. Chi-Square	574.740
	df	210
	Sig.	.000

Source: Survey data

Bartlett's test of sphericity (Barlett, 1950) is the third statistical test applied in the study for verifying its appropriateness. This test should be significant i.e., having a significance value less than 0.5. In the present study, test value of Chi – Square 574.740 is significant (as also given in table no.1) indicating that the data is appropriate for the factor analysis.

After examining the reliability and validity of the scale and testing appropriateness of data as above, we next carried out factor analysis to identify the KPIs of private sector banks. For this, we employed Principal Component Analysis (PCA) followed by the varimax rotation, (Generally, researchers' recommend as varimax). When the original twenty-one variables were analysed by the PCA. Eight variables extracted from the analysis with an Eigen value of greater than 1, which explained 73.781 percent of the total variance (For details please see table no 2).

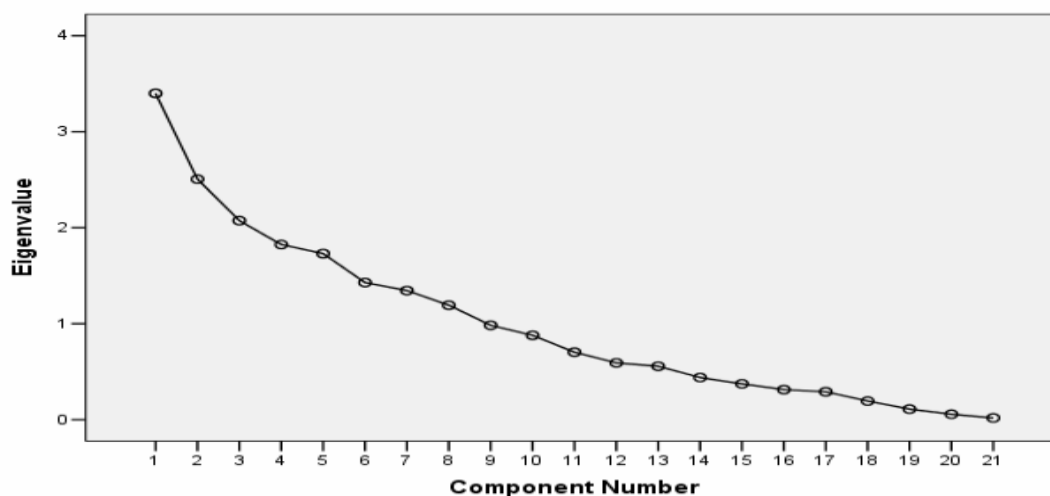
**Table no 2. Total Variance Explained**

Component	Initial Eigen values			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.398	16.182	16.182	3.398	16.182	16.182
2	2.505	11.927	28.109	2.505	11.927	28.109
3	2.073	9.871	37.980	2.073	9.871	37.980
4	1.824	8.685	46.666	1.824	8.685	46.666
5	1.730	8.237	54.903	1.730	8.237	54.903
6	1.428	6.800	61.702	1.428	6.800	61.702
7	1.345	6.404	68.106	1.345	6.404	68.106
8	<b>1.192</b>	<b>5.675</b>	<b>73.781</b>	<b>1.192</b>	<b>5.675</b>	<b>73.781</b>
9	.983	4.681	78.462			
10	.878	4.182	82.644			
11	.703	3.349	85.993			
12	.591	2.816	88.809			
13	.556	2.647	91.456			
14	.439	2.090	93.547			
15	.373	1.777	95.324			
16	.313	1.490	96.814			
17	.290	1.382	98.196			
18	.194	.922	99.118			
19	.110	.524	99.642			
20	.057	.271	99.913			
21	.018	.087	100.000			

Source: Survey data

Extraction Method: Principal Component Analysis.

One method to reduce the number of factors to something below that found by using the 'eigen value greater than unity' rule is to apply the scree test (Cattell, 1966). In this test, eigen values are plotted against the factors arranged in descending order along the X -axis. The number of factors that correspond to the point at which the function, so produced, appears to change slope, is deemed to be the number of useful factors extracted. This is a somewhat arbitrary procedure (For details please see figure no 1). Its application to this data set led to the conclusion that the first eight factors should be accepted. Within this solution, Factor 1 had fourteen items with their primary loadings on that factor, one item, two items had their primary loadings on Factor 2 and Factor 3 respectively, but Factor 4 did not contain any primary loadings.



**Figure no 1. Scree Plot**

It is worth mentioning out here that factor loading greater than 0.30 are considered significant. 0.40 are considered more important and 0.50 or greater are considered very significant. The rotated (Varimax) component loadings for the eight components (factors) are presented in Table no 3. For parsimony, only those factors with loadings above 0.50 were considered significant (Pal, 1986; Pal and Bagi, 1987; Hair, Anderson, Tatham, and Black, 2003).

**Table no 3. Principal Component Analysis – Varimax Rotation Indicators of Performance**

Variables	Indicators							
	Indicator 1 IP	Indicator 2 AR	Indicator 3 ROI	Indicator 4 OSR	Indicator 5 CSR	Indicator 6 OEE	Indicator 7 CF	Indicator 8 ROCE
IP	<b>.968</b>							
GR	<b>.948</b>							
FR	<b>.947</b>							
AR		<b>.951</b>						
NOA		<b>.926</b>						
ROI			<b>.759</b>					
ILR			<b>.675</b>					
CL			<b>.619</b>					
OSR				<b>.798</b>				
CR				<b>.774</b>				
IWE				<b>-.535</b>				
CSR					<b>.822</b>			
ROE					<b>.766</b>			
OEE						<b>.731</b>		
IE						<b>.667</b>		
DPCE						<b>-.564</b>		
CF							<b>.930</b>	
ET							<b>.610</b>	
ROCE								<b>.749</b>

DPCQ								<b>.711</b>
Eigen Value	3.398	2.505	2.073	1.824	1.730	1.428	1.345	1.192
Proportion of Variance	16.182%	11.927%	9.871%	8.685%	8.237%	6.800%	6.404%	5.675%
Cumulative Variance Explained	16.182%	28.109%	37.980%	46.666%	54.093%	61.072%	68.106%	73.781%

Source: Survey data

**Indicator 1: IP** – This indicator was represented by three variables with factor loadings ranging from .968 to .947. They were internal promotions, gender ratio, and financial result. This indicator accounted for 16.182% of the rated variance.

**Indicator 2: AR** – Two variables with loadings ranging from .951 to .926 belonged to this factor and they included accident ratio and number of activities. This indicator explained 11.927% of the rated variance.

**Indicator 3: ROI** – This indicator comprises three variables representing return on investment, illness rate, and customer loyalty. Factor loadings of these variables ranged from .759 to .619. A variance of 9.871% was explained by this factor.

**Indicator 4: OSR** – Three variables were included in this indicator. They were opportunity success rate, customer retention, and internal working environment. Their factor loadings ranged from .798 to -.535. The factor explained 8.685%.

**Indicator 5: CSR** – This indicator comprised two variables, namely customer satisfaction rate, return on equity. They carried factor loadings of .822 and .766. The factor explained 8.237% of the variance.

**Indicator 6: OEE** – Three variables with loadings ranging from .731 to -.564 to this indicator and them included overall equipment effectiveness, internal efficiency, and deliver performance to customer – by date. This indicator explained 6.800% of the rated variance.

**Indicator 7: CF** - This indicator consisted two variables representing to cash flow and employee turnover. Factor loadings of these variables ranged from .930 to .610. A variance of 6.404 % was explained by this indicator.

**Indicator 8: ROCE** - This last indicator comprised of two variables relating to the return on investment and deliver performance to customer – by quality. Their loadings ranged from .749 to .711. The variance explained by this indicator amounted to 5.675%.

Ranking of the above eight indicators in order to their importance, along with mean and standard deviation, is shown in Table no 4. The importance of these indicators, as perceived by the respondents, has been ranked on the basis of their mean values.

**Table no.4 Ranking of Indicators according to their importance**

Indicators	No. of. Variables	Mean	S.D	Rank
Indicator 1: IP	03	4.1552	.8214	8
Indicator 2: AR	02	4.2586	.73294	1
Indicator 3: ROI	03	4.1609	.59968	7
Indicator 4: OSR	03	4.2529	.51227	2
Indicator 5: CSR	02	4.1983	.72511	5
Indicator 6: OEE	03	4.1782	.47229	6
Indicator 7 : CF	02	4.2500	.69617	3
Indicator 8 : ROCE	02	4.2155	.66959	4

Source: Survey data

As depicted in table no. 4, the indicators “AR”; “OSR”; “CF”; “ROCE”; “CSR”; “OEE”; “ROI”; and “IP” got the ranks of first, to eight respectively and constitute the KPIs of Private sector banks in North and Eastern Provinces of SriLanka.

## CONCLUSIONS

Through an empirical investigation, this study has identified eight indicators that are major contributors to the performance of the private sector banks in North and Eastern provinces of Sri Lanka. These factors in order to importance are (1) AR; (2) OSR; (3) CF; (4) ROCE; (5) CSR; (6) OEE; (7) ROI and (8) IP.

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## Appendix- A:

**Table no 5: Code Sheet**

Code	Descriptions of the Indicators
DPCD	Deliver Performance to Customer – by Date
DPCQ	Deliver Performance to Customer – by Quality
CSR	Customer Satisfaction Rate
CL	Customer Loyalty
CR	Customer Retention
NOA	Number of Activities
OSR	Opportunity Success Rate
AR	Accident Ratio
OEE	Overall Equipment Effectiveness
IWE	Internal Working Environment
IE	Internal Efficiency



<b>IR</b>	Investment Rate
<b>IIR</b>	Illness Rate
<b>IP</b>	Internal Promotions
<b>ET</b>	Employee Turnover
<b>GR</b>	Gender Ratios
<b>CF</b>	Cash Flow
<b>ROI</b>	Return on investment
<b>FR</b>	Financial Result
<b>ROCE</b>	Return On Capital Employed
<b>ROE</b>	Return on Equity