
Empirical study on the performance evaluation of Chinese commercial Banks based on factor analysis.

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Abstract

The performance evaluation can provides investors with information on the status of the our country commercial bank management, at the same time helps to find problems existing in the management of commercial Banks, enhance the level of bank operation and management. This paper expounds the concept of commercial Banks business performance and its evaluation, analysing the particularity of commercial Banks and review summarizes the methods for performance evaluation of commercial Banks. On the basis of using the factor analysis method to 2016 listed on December 14 Banks' profitability, liquidity, security, and growth in terms of analysis and comprehensive evaluation on the operating performance. Finally based on the empirical analysis results puts forward related Suggestions, hope to contribute to the improvement of the operation and management of commercial Banks in China.

Keywords

Commercial Banks, performance evaluation, factor analysis.

1. Design of performance evaluation index of commercial Banks in China.

Factor analysis method is to use a few factors to describe the relationship between the numerous original variable or variables, is the high correlation, variables are classified as similar contact more closely, and low correlation of variables are classified into different classes, then each kind of variable actually represents a basic structure, including public factor [1]. A small number of common factors can reflect much of the original information [2]. The problem that needs to be studied is to try to describe each of the original variables with the combination of the linear combination of the least number of common factors and the sum of the special factors [3]. Factor analysis method to ensure that the data information loss under the principle of the least of high-dimensional variable space undertakes scientific and reasonable dimension, therefore, this article will make a corresponding empirical research USES the factor analysis method [4].

In this paper, according to the actual situation of our country commercial bank management, draw lessons from the domestic and foreign commercial Banks operating performance evaluation method, from the aspects of profitability, liquidity, security and growth four choose to suit our country commercial bank management performance evaluation index, and carries on the comprehensive evaluation.

- (1) Profitability indicators: Total return on assets. Return on equity. The net interest income ratio. Basic earnings per share.
- (2) Liquidity indicators: Flow ratio. Ratio of deposits and loans
- (3) Safety indicators: Capital adequacy ratio. The non-performing loan ratio.
- (4) Growth indicators: Rate of deposit growth. Loan growth rate. Total asset growth rate. Net profit growth rate.

2. Empirical analysis of the performance evaluation of commercial Banks in China.

2.1 Sample data.

On December 31, 2016, this article selects the data of 14 listed commercial Banks in China business performance comprehensive evaluation analysis, on the basis of various commercial bank annual report 2016 statistical data, respectively to arrange following twelve indicators: Total return on assets (X1); 2. Return on equity (X2); 3. Basic earnings per share (X3); 4. Net interest rate (X4); 5. Liquidity ratio (X5); 6. Loan-to-deposit ratio (X6); 7. Capital adequacy ratio (X7); 8. Non-performing loan ratio (X8); 9. Growth rate of total assets (X9); 10. Deposit growth rate (X10); 11. Loan growth rate (X11); 12. Net profit growth rate (X12)

2.2 Sample data processing and testing.

2.2.1 Homogenization treatment

(1) The evaluation index includes three indicators of different directions, namely forward index, reverse index and moderate index. In order to ensure the objectivity and scientificity of the conclusions after the factor analysis, we need to analyze the indicators and do the homologous treatment. Therefore, this paper also carries forward the positive treatment of the index, and its processing mode is as follows:

(2) The positive index remains unchanged. The characteristic of positive indicators is that the larger the index value is, the better the business performance of commercial Banks is, and we do not need to deal with them in the analysis of such indicators. Based on the factor analysis with positive indicators include: rate of return on total assets, net assets and basic earnings per share, net interest rate of return, capital adequacy, growth deposit and loan growth rate and growth rate of total assets and net profit growth rate.

reverse index homogenization. In this paper, the reverse index used in the factor analysis is only the non-performing loan ratio, and the treatment method of the reverse index is:

$$X'_{ij} = \frac{1}{X_{ij}}, i = (0, N], j \subseteq (0, K]$$

(3) Moderate indicators. In this paper, the appropriate indicators used in factor analysis include: liquidity ratio and loan-to-deposit ratio. The deposit and loan ratio of the people's bank of China to commercial Banks is as follows: The deposit and loan ratio of RMB business is less than 75%; The deposit and loan ratio of foreign currency business is less than 85%. According to the data from this paper, current ratio and the deposit-loan ratio are within the scope of the regulations of the people's bank of China, so in the process of factor analysis, just put the appropriate indicators remain motionless.

2.3 Standardized processing and related inspection.

The standardization process of raw data can be automatically carried out through SPSS19 software, which is usually standardized according to the mean value of 0 and the variance is 1, so no manual calculation is required. The original index data after normalization and normalization was imported into SPSS19 software, and its correlation coefficient matrix barrete test was calculated.

3. Factor analysis

3.1 Extraction factor

In the process of factor analysis, this paper selects the main component analysis method to extract the common factor. Four common factors were determined according to the cumulative contribution rate of variance to nearly 80%. The total variance explanation table is as follows: As can be seen from the above table, the eigenvalues of the first four components are 3.662, 2.498, 1.804 and 1.381 respectively. The cumulative variance contribution rate is 77.876. In general, the cumulative variance contribution

rate above 75% means that these four factors contain most of the information of the original indicator data, which can represent the original variables.

3.2 Factor naming and The factor score

The main factor with the cumulative contribution rate of more than 75% was rotated by the method of maximum rotation of variance. The matrix table of factor score coefficient calculated by regression method is as follows.

Banks	S1	rank	S2	rank	S3	rank	S4	rank	finals	rank
Ping An	0.91458	4	-0.51762	9	-1.7265	14	0.67124	4	-0.06800	6
BOC	-1.18315	14	-0.02921	8	-0.76874	11	0.79254	3	-0.35324	13
ABC	-0.86785	12	1.24428	2	-0.30998	9	-1.25658	12	-0.18907	8
SPD	0.77163	5	-1.004	12	0.76581	5	0.07563	9	0.13751	5
ICBC	-1.12043	13	0.55462	6	0.85817	3	-0.70442	11	-0.13173	7
CMBC	-0.76548	8	-1.0174	13	1.19829	2	0.197	7	-0.19101	9
CCB	-0.81403	11	1.33983	1	0.84938	4	0.55323	5	0.27789	3
CEB	-0.7802	9	-1.72302	14	-0.20304	8	0.25299	6	-0.57411	14
BCM	-0.80872	10	0.76065	4	-1.41658	13	0.80912	2	-0.19425	10
CNCB	1.1063	3	0.42268	7	-0.84732	12	0.13968	8	0.26157	4
CMB	1.27773	2	0.60416	5	1.54143	1	2.02774	1	0.99751	1
CIB	0.31755	7	-0.91134	11	0.6079	6	-1.52994	14	-0.20119	11
HUAXIA	0.34924	6	-0.88096	10	-0.58252	10	-0.66201	10	-0.27579	12
NINGBO	1.60284	1	1.15734	3	0.03369	7	-1.36624	13	0.50392	2

4. Analysis result evaluation

(1) Profitability analysis.

State-owned commercial bank branch number, wide distribution, large scale of resources, bloated, in pursuit of profit, and there are certain gaps when compared with some non-state joint-stock commercial Banks, there is no obvious advantage on the indices such as return on equity. Other part of the network agency distribution range is wider national joint-stock commercial Banks such as China merchants bank, minsheng bank, Shanghai pudong development bank and societe generale, etc., ranking the front, better profitability; Peace and HuaXia bank, citic bank and other ranking relatively, the main reason is the two Banks have lower rate of return on total assets and net worth, they are in the business of non-performing loans is a bit more, so that profitability is low.

(2) Analysis of asset liquidity.

State-owned commercial Banks and a few joint-stock Banks under the asset liquidity is still in the average level in liquidity management, it is necessary to strengthen and improve the also reminds us that both state-owned and non-state-owned joint-stock Banks, don't blindly pursuit of profit, while ignoring the liquidity of assets, for a bank liquidity is critical, no asset liquidity, time will not be able to meet customer demand, will lose the customer confidence in the Banks. Generally speaking, the non-state most liquidity management than state-owned Banks, joint-stock Banks are large state-owned Banks, but if we don't strengthen liquidity management, its hidden dangers it may break out again, cause money shortage crisis.

(3) Asset security analysis.

Before comprehensive analysis, the state-owned commercial Banks in the pursuit of profit and asset liquidity management is still in the middle and lower levels, so the state-owned Banks cannot just blindly assets security management, and ignore the pursuit of profit and asset liquidity management, bank profitability, liquidity and safety of the organic coordinated the relationship between three aspects as long as you can, can it be the true level of comprehensive management performance. For joint-stock commercial Banks, in addition to Ningbo bank, China merchants bank, citic bank ranked

in the top position, the rest are back, shows that the majority of the joint-stock commercial Banks in the pursuit of profit maximization, at the same time, ignore the management of the liquidity and asset security, in this respect, joint-stock Banks should be quite seriously.

(4) Future development capability analysis.

The state-owned Banks still have a lot of room for improvement in their future development capacity. In addition, the Everbright bank, HuaXia bank, Minsheng bank and so on several joint-stock Banks, also has a very competitive deposit growth and revenue growth, the future development has a stronger growth, this is mainly for joint-stock commercial Banks business development ability and the innovation ability is relatively strong compared with the deposit bank, and the base of state-owned Banks is bigger, so not much advantage in growth index.

(5) Comprehensive ability analysis.

It can be seen that the state-owned commercial Banks in the overall management level is generally lags behind that of the joint-stock commercial Banks, the main reason is that state-owned Banks with poor ability, profitability and future development in this regard, state-owned Banks are in urgent need of improvement. However, the overall performance of non-state-owned joint-stock commercial Banks shows a polarization, among which Minsheng bank, Huaxia bank and Everbright bank are ranked low. The main problem of non-state-owned joint-stock commercial Banks is the low security of assets. In general, commercial Banks in China are in better operating condition than 2015.

Main conclusions of this paper: This article uses the factor analysis method, in reference to domestic and foreign existing, on the basis of commercial Banks business performance evaluation system, design a set of accord with our country commercial bank management performance index system, and the 14 listed Banks in China in 2016 has carried on the empirical analysis, the following conclusions: in 2016, the national joint-stock commercial Banks operating performance is better than state-owned commercial Banks as a whole. In terms of profitability, both state-owned commercial Banks and national joint-stock commercial Banks have strong and weak points, indicating that Banks need to continue to strengthen their profitability. In terms of liquidity, Banks' liquidity ratios and loan-to-deposit ratios are under the supervision of the banking sector, but the liquidity level of joint-stock commercial Banks is slightly better. Look from the assets security, basically all the non-performing loans of commercial Banks are below 2%, all state-owned commercial bank's capital adequacy ratio is higher than joint-stock commercial Banks, but generally higher non-performing loans. It shows that both have advantages in asset security, but in general, state-owned commercial Banks do better, and their operations are more stable. From the growing smaller joint-stock Banks showed strong growth momentum, due to its large state-owned commercial Banks, development speed is limited, growth is difficult to match the other joint-stock Banks.

Both state-owned commercial Banks and the national joint-stock commercial Banks, on the management idea and methods have their own advantages and disadvantages, they are business performance analysis is based on the analysis of the purpose of evaluation found the existing problems in management, in order to solve in time, improve their management level, finally in complex impregnable in the fierce economic environment.

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