INVESTIGATING THE RELATIONSHIP BETWEEN INCOME VARIATION AND EFFICIENCY OF BANKS ACCEPTED IN THE STOCK EXCHANGE

Seyedeh Marzieh Rasouli,
Expert on the Contracts of Qaemshahr Municipality, Mazandaran Province, Iran
Khadijeh Heydari Gorji,
Master of Public Administration, Information Systems Trend, Qaemshahr Municipality, Mazandaran Province, Iran
Hamid Reza Khonakdar,
Master of Public Administration, Financial Trend, Qaemshahr Municipality, Mazandaran Province, Iran
Mahyar Kazemi,
Master of Public Administration, Financial Trend, Qaemshahr Municipality, Mazandaran Province, Iran
Pedram Tajer Mashayi,
Department of Applied Mathematics, Qaemshahr Municipality, Mazandaran Province, Iran

Abstract. The purpose of this research was to investigate the relationship between income variation and efficiency of banks accepted in the stock exchange. This research is descriptive-correlative method and is of applied research type. The statistical population of the study is all banks accepted in the Tehran Stock Exchange during the years 2012 to 2016, in which 15 banks have been active throughout the entire period of the research in the stock market. The research data were extracted from financial statements of banks and analyzed using regression models using combination data. The research findings showed that there was a relationship between the size of the bank and the efficiency of the banks accepted in the stock exchange, as well as between the equity and the efficiency of the banks accepted to the stock exchange.
Keywords: Income Variation, Bank Efficiency, Bank Size, Equity.

1. Introduction

Given the recent wave of financial liberalization, financial institutions have been encouraged to expand new products to meet the demands of market expansion, increased competitiveness, and diversification. The research that has been done so far on banking activities in Asian countries is very limited, but they are important because banks are permeable sources of financing for businesses. Asian banks have different organizational arrangements that include financial markets, legal traditions, bankruptcy procedures, and corporate ownership structures (Haye et al., 2013; Lee & Haye, 2013). Countries such as Australia, Bangladesh, Colombia, India, Malaysia, Maldives and Singapore are equally in line with their banking practices and governance. The desirable idea of all of them is to achieve diversification in banking with different financial systems (Dyssamack et al., 2004). Due to the collapse of the financial and financial sectors of the banks during the financial crisis in Asia, domestic bank partners were not able to engage in reinvestment in banks. As a result, Asian governments use foreign ownership limited to joint ventures (Manlangit, 2011).

Reforms and financial structure in the banks' sectors will lead to a lot of costs to encourage banks to internalize the costs of risky activities. The international banking law framework to create liquidity and capital of the highest quality should enable organizations to cope better with crises (Lee & Haye, 2013). Therefore, the financial structure will lead to greater competitiveness, and all this can lead to the help of diversified banks. Different definitions of financial structure are presented. The financial structure of a company is a combination of short-term debt, long-term debt and equity, through which the company's assets are funded. In other words, the composition of debts and equity is the financial structure of the company, which includes items on the left of the balance sheet (Yahyazadehfar et al., 2010). In recent years, the link between performance and diversity has become an empirical issue in financial management. Diversity strategies can influence the competitiveness of an industry (Tehrani et al., 2008).

Past investigations looked at diversity across Europe and the United States, but yielded uncertain results. Some studies using US data have shown that income diversity leads to an increase and improvement of banks' performance (Steve & Rumble, 2006). While other researchers, using European data, found that income diversification would increase the risk of banks (Friedley et al., 2011), and against Chiurazo et al. (2008), using European data, showed that the risk of banks with respect to the income variation is reduced. In the present study, we try to evaluate the relationship between income variation and the efficiency of accepted banks in the stock market.

2. History of research

- Doayi et al. (2016) in a research on the efficiency and effectiveness of companies accepted in the Tehran Stock Exchange: based on the diversity strategy. In this research, the companies listed in the Tehran Stock Exchange have been investigated, so that the efficiency of these companies is calculated by data envelopment analysis method and the suggested mathematical model is presented to improve the efficiency of inefficient companies. Finally, Malmquist productivity index and its analysis for the companies mentioned.

- Hosseini and Faramarzi Ebad (2016) studied the impact of electronic banking on the return on equity in selected banks active in the Tehran Stock Exchange. The results of the research in the form of return on equity and the ratio of the number of ATMs to the number of branches and shares of each bank from the total sales terminals as electronic banking tools and the Hirschman Hierpindal Index as a structural variable along with real GDP as an external factor affecting profitability on equity returns and show that the expansion of ATMs in bank branches and the ability of banks to increase the share of electronic tools to the entire sales terminals has had a significant and positive effect on the return on equity in the sample.

- Sheykh et al. (2014) examined the effect of business diversification on financial performance of Tehran Stock Exchange companies. In this study, we used parametric tests such as t-test, k-s test, Kolmogorov-Smirnov simple nonparametric test and Mann-Whitney test to compare independent and dependent variables. The collected data were analyzed for three financial periods, the results of which show that there is no relationship between business diversification and financial ratios.

- Lee et al. (2014) examined the effect of the financial structure on the relationship between the income diversification and the performance of banks in Asia, and found that banks' performance improved with respect to income diversification. As a result, due to different financial systems, the relationship between income diversification, financial structure and performance of banks has multiple dimensions.

- Maliesx and Yip (2013) examined the relationship between income diversification and the performance of Islamic banks in Malaysia. The results of their research showed that the higher the income variation in the banks, the greater the volatility of profits and the negative impact on performance.

Therefore, it is important to understand the diversity of income and efficiency of banks. Therefore, in this research, the relationship between income variation and the efficiency of banks accepted in the stock market is discussed and the main question of the research is that: "Is there a relation between the income variation and the efficiency of the banks accepted to the stock exchange?"

2.1 Research hypothesis

The main hypothesis

There is a relationship between the income variation and the efficiency of the banks accepted to the stock exchange.

Sub-hypotheses

There is a relationship between the size of the bank and the efficiency of the banks accepted to the stock exchange.

There is a relationship between the equity and the efficiency of the banks accepted to the stock exchange.

3. Methodology

The methodology of this research is correlation between nature and content, which uses correlated data from the financial statements of accepted banks in Tehran Stock Exchange. This research will be carried out within the framework of deductive-inductive reasoning. The reason for using the correlation method is to discover the correlation relations between variables. Correlation research is one of a kind of descriptive research. On the other hand, the present study is post-event (semi-experimental), which is based on the analysis of past and historical information. This research is also a library and analytical-casual study. The research is considered as an applied and descriptive method.

Society and statistical sample

Since the realm of this research is from the beginning of 2012 to the end of 2016, the statistical society includes all banks active in the Tehran Stock Exchange during the period that the final sample size is determined after the following restrictions are imposed:

- The information needed to calculate the operational variables of the research is available to them.
- At least from 2012, they will be admitted to the Exchange and will be active until the end of the Bourse.
- The end of their fiscal year is March 29th.
- There are no more than three months of trading breaks.

According to the above indicators, the number of banks whose financial information was available during the full time period of the research (2012-2016) and were not withdrawn from the exchange, 15 banks including banks: Ansar, Mellat, Pasargad, Parsian, Saderat Iran, Tejarat, Karafarin, Eqtesad-e Novin, Khavarmianeh, Shahr bank, Tourism bank, Post Bank, Iran Zamin, Saman and Sina have been studied in this research.

Method of data collection

In this research, a library method has been used to collect data and information. Also, the theoretical foundations of the research have been collected from Persian and Latin specialized books and journals.

Variables: The variables of the research include dependent and independent variables.

Dependent variable

$U_{(i,t)}$= Represents the performance of bank i in year t, which is calculated from the ratio of net income to total bank assets.

Independent variables

, = Indicates the size of the bank i in year t, which is calculated from the natural logarithm of the total assets of the bank.

, = Equal to the equity of the bank i in year t to the total assets of the same bank.

Control variables

hh , = The revenues of the bank's operating income i in year t are the total assets of the bank.

, = Equal to the loss of a bank loan i in year t to the total loan of the same bank.

, = Equal to the ratio of bank loan i in year t to total assets of the same bank.

, = Equal to the ratio of fixed assets of the bank i in year t to the total assets of the same bank.

hh , = Equals to the hierpindal index calculated from the following equation.

$$\text{HHI}_{i,t} = \sum_{=1} (\textrm{--})^2$$

Where x_i is the sale of bank i in year t and X is the total sales of the industry.

Research model

The theoretical model of the research is based on the research of Abdul Latif Alhassan (2015) according to the research hypothesis as follows.

$$, = {}_0 + {}_1hh , + {}_2 \quad , + {}_3 \quad , + {}_4 \quad , + {}_5 \quad , + {}_6 \quad , + {}_7hh , + ,$$

4. Research findings

Descriptive Statistics

A summary of the status of descriptive statistics relating to the variables of the model is presented in Table 1.

Table 1: Descriptive statistics of the research variables

Variable	Symbol	Average	Middle	Standard deviation	Skidding	Elongation
Bank Efficiency	U	0.014	0.014	0.006	-0.063	2.580
Bank size	LNTA	19.978	20.631	1.888	-0.0323	2.199
Equity to equity ratio	EQT	0.213	0.184	0.141	0.551	2.010
Ratio of Operating Income to Total Assets	HHI	0.054	0.032	0.075	1.939	3.826
The ratio of the loan loss to the total loan loss	LLP	0.011	0.007	0.013	1.679	3.721
Bank loan to total assets ratio	LOTA	0.034	0.033	0.030	0.643	2.611
The ratio of fixed assets to total assets	TANG	0.041	0.027	0.033	1.244	3.351
Harpindal Index	HHIL	0.165	0.078	0.232	2.128	3.817

According to the indicators presented in Table 1, it can be seen that the average efficiency index of banks is 0.014 and the average bank size is 19.978. The ratio of equity to total assets is equal to 0.213, the ratio of operating income to total assets is equal to 0.054, the ratio of the bank's loan loss to total loans with an average of 0.011 and the ratio of the bank's loan to total assets also equaled 0.034. Also, the ratio of fixed assets to total assets is equal to 0.041 and the average index of their HF is equal to 0.165. Also, in the case of slip and elongation indices, it should also be noted that the proximity of the data slope to zero and the proximity of the elongation values to 3 are indicative of the normal distribution of the experimental data. According to the estimation of these indices for the research variables, it is seen that the values of skewness are small and the elongation values are close to 3, and it can be concluded intuitively that the research data were normal.

Model diagnostic test results

Prior to estimating the regression model, the diagnostic tests were performed to determine the significance of the cross-sectional effects of the model. Table 2 shows the findings for these tests.

Table 2: The results of diagnostic tests in the diagnosis of cross-sectional effects of the model

Test	statistic	df	prob
Chow Test	1.955608	(40,36)	0.0197

Hausman Test	9.248564	7	0.2353

Considering the significant level of Chow test for determining the significance of cross-sectional effects in the regression model of the research, which is less than the error of the first type of 0.05, the assumption zero of this test is based on the lack of significance of cross-sectional effects in the research model and it can be accepted that the regression model of this section should be estimated in the form of panel data. Also, the significance level of the Hausman test for determining the constant or random effects of the cross-sectional effects in the model is also greater than the type-1 error of 0.05, which confirms the assumption of zero in this test, based on the randomness of the cross-sectional effects in the research model. Therefore, the regression model of the research is estimated using panel data with random effects.

5. Discussion and conclusion

In this section, the model for model estimation is firstly determined and then the model of the research is estimated and the results are interpreted. As a result of fitting the model, the results of the research hypotheses are presented.

The first hypothesis test results: Considering the significance level obtained for measuring the effect of bank size on bank efficiency and comparing it with the first type error of 0.05, it can be seen that the size of banks has a reciprocal and significant effect on bank efficiency. Therefore, there is a significant relationship between bank size and the efficiency of banks accepted in Tehran Stock Exchange. The first hypothesis of the research is confirmed at the error level of 0.05.

The second hypothesis test results: Considering the significance level obtained for measuring the effect of equity on performance of the bank and its comparison with the type 1 error of 0.05, it can be seen that bank size has a direct and significant effect on bank efficiency. Therefore, there is a significant relationship between equity and performance of accepted banks in Tehran Stock Exchange and the second hypothesis of the research is confirmed at the error level of 0.05.

Table 3: Results of estimating the regression model of the research with the dependent variable of bank efficiency

Independent variable	Beta	std.	t-stat	prob.	VIF
C	0.046333	0.016942	2.734762	0.0076	-
LNTA	-0.001939	0.000752	-2.579514	0.0117	8.682061
EQT	0.044158	0.006763	6.529427	0.0000	3.344546
HHI	-0.008658	0.020202	-0.428598	0.6693	1.198802
LLP	-0.020845	0.043156	-0.483017	0.6304	1.828172
LOTA	0.023432	0.036585	0.640481	0.5236	5.501112
TANG	-0.067059	0.042407	-1.581319	0.1177	9.338787
HHIL	0.000468	0.001814	0.257865	0.7972	1.104586
Adjusted R-squared	0.522030				
F-statistic	10.28389				
Prob(F-statistic)	0.000				

The results of goodness of fit: Based on goodness indicators, the fit of the model shows that the significance level of the F-analysis of variance analysis is less than the type-1 error of 0.05 and indicates the significance of the regression model. Also, the correction coefficient of the model also shows that 52.20% of the changes in the efficiency of banks are explained by the independent variables of this model.

Suggestions

- ✓ It is suggested that the Bank's investment and operating policies be tailored to centralize activities in specific areas and the small share of other activities in other sources of income.
- ✓ It is suggested that the structure of the bank's capital and its debt ratios should be considered by the managers in order to adjust the investment and operational plans of the bank.

Whatever the research, though comprehensively, in terms of some material and material constraints, both temporally and temporally, cannot cover all aspects of the subject and deal with it in various ways. This research has not been an exception to this, so for some research in line with this topic as well as its development, the following suggestions are presented for further research and future researchers:

✓ It is proposed to study the role of macroeconomic indicators in the relationship between income diversification and bank efficiency.

✓ It is suggested that the impact of corporate governance mechanisms on the relationship between income diversification and bank efficiency should be studied.

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