A DETAILED ANALYSIS OF THE PROFITABILITY OF CHINESE BANKS FROM 2016 TO 2019

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Abstract: *Although, there is no generally definition for the term "Emerging Markets", there are two representative features for emerging countries. First, these markets are characterized by rapid growth which is usually expressed in terms of income levels and population. The term of emerging economies refers to nations with social and business activity in the process of fast growth and industrialization. Emerging markets countries are assumed to play a decisive role in international trade and finance as well as to contribute significantly to the global economic growth. Entering an emerging market is not easy. Opportunities in the emerging markets come with their own set of challenges. Doing business in Emerging Markets reflects the challenges and opportunities facing international businesses and professionals when operating in emerging markets. There is intense competition among emerging countries to capture their share of the global economy. Emerging markets are commonly considered relatively riskier than developed markets as they carry supplementary political, economical and currency risks. As a result, these markets could be good investments for diversification purposes. These economies are growing fast, so the information that is defining them is easily outdated as their structure is quickly evolving. My research contains a theoretical introduction, literature review and also applied statistics on a dataset. In this paper I apply linear regression using IBM SPSS Statistics in order to measure the profitability for 51 banks from China during the period 2016 to 2019. The purpose of my research paper is to analyze the profitability of Chinese banks using two important profitability indicators: Return on Assets and Net Profit Margin. ANOVA is used to verify if the regression model is a good fit for the data. Also, I present descriptive statistics that show a general overview for the variables. The variables that are in the center of analysis are Return of Assets and Net profit Margin. For a more detailed analysis, Pearson Correlation was performed in order to verify the association between the variables that are in the interest of my research paper.*

Keywords: *bank profitability; regression; statistics; China.*

JEL Classification: *M21; G21.*

1. Introduction

Although, there is no generally definition for the term "Emerging Markets", there are two representative features for emerging countries. First, these markets are characterized by rapid growth which is usually expressed in terms of income levels and population. Emerging markets usually start from a lower base than developed

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markets in terms of per capita Gross Domestic Product (GDP) and are in the process of catching up.

Emerging markets mutual funds are investment portfolios that offer foreign investors chances to invest in alternative markets based in Eastern Europe, Asia and Latin America. These funds are in the area of interest for individual and also institutional investor which aim to increase their returns and diversity risks.

This type of funds experienced an accelerated growth over the past 25 years following the liberalization of economic and financial policies in diverse countries in Eastern Europe, Asia and Latin America.

Emerging markets are usually considered relatively riskier than developed markets as they carry additional political, economical and currency risks. The term of emerging economies refers to nations with social and business activity in the process of fast growth and industrialization.

The seven largest emerging economies according to nominal gross domestic product (GDP) are: Brazil, Russia, India, China, Mexico, Indonesia and Turkey. Investing in emerging countries may lead to volatile return, like the probabilities of large profits and large losses are high. The performance of investing in emerging markets is often considered less correlated with developed markets.

As a result, these markets could be good investments for diversification purposes. These economies are growing fast, so the information that is defining them is easily outdated as their structure is quickly evolving.

Diversification in global trading benefits international business investments, especially in emerging markets, which have become a outstanding feature of the financial globalization sweeping the world over the last decade.

Whether supervising business or investing in emerging countries, corporations and investors are always exposed to political environments that are not typically present in developed economies.

Entering an emerging market is not easy. Opportunities in the emerging markets come with their own set of challenges. Sometimes, lack of education of the workforce require a lot of patience, perseverance and specialized assistance. Also, legal frameworks with regard to trade policies can be absent or underdeveloped. It is necessary to mention that infrastructure remains a significant problem in most emerging markets. Only China is investing seriously in roads, railway and ports, but somewhere else the progress is weak. Emerging markets such as India and China have huge and growing populations and thus demand rapid growth rate if they are to make any headway in social development. If India's economic growth falls below six percent the nation would be in crisis.

It is very important to understand the market, so the following aspects need to be considered of when it is an interest for investing in emerging markets: market potential, understanding the local customers, reaching the customers, competition, lessons learned by non-competitors, local culture, economic outlook, political outlook, government policies, finance, labor market, taxation, legal environment, bureaucratic obstacles to business, crime and corruption, infrastructure, and of course cost of building a business and a brand.

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Therefore, at this time, developing countries are considerable investment targets, and these fast-growing economies are usually a growth relay for major banks.

2. Literature review

The term emerging markets entered the vocabulary of the investment world in the late 1980s. The International Finance Corporation described an emerging country this way: "A market growing in size and sophistication in contrast to a market that is relatively small, inactive, and gives little appearance of change." At that moment, the appellation was a expression of hope and faith on the part of those of us who were studying emerging stock markets, because many of these markets—such as those of Argentina, Peru, and Venezuela—were submerging quickly than they were emerging.

The problem of financial performance classification has been tackled in the literature for nearly 50 years. The general consent from the literature regarding modeling bank profitability favors a linear analysis approach.

Short (1978) and Bourke (1989) considered several functional forms and concluded that the linear model produced results as good as any other functional form.

Short (1978) and Bourke (1989) considered several functional forms and concluded that the linear model produced results as good as any other functional form. In the situation of factors within the control of management, the immediate factors that would have an impact on bank profitability would be those factors that affect a bank's net interest income (Guru et al., 2000). To this extent, the net interest margin could be expected to have a positive influence on the bank's profitability.

Statistical concepts and calculations form an important foundation for understanding applied financial methods and formulas.

The long-term fundamentals for emerging market growth are directly linked to the potential for emerging market companies to tap into the favorable long-term economic growth prospects for all the emerging economies.

Compared with other industries, China's outward investment across its financial sector represents a relatively small proportion of its total dollar investment abroad. However, China's outward financial investment has been increasing gradually, especially since 2006.

You are invited to use figures and tables in your paper wherever they will help to illustrate your text. The proceedings are delivered to conference participants in electronic format and therefore support colour figures, however, the book version is printed in black and white and therefore you are advised to refrain from using colours to deliver important information in your figures.

3. Analysis and results

The dataset used in this paper contains financial information about 51 banks from China during the period 2016 to 2019. The sample size contains 204 observations. The purpose of my research paper is to analyse the profitability of Chinese banks using two important profitability indicators: Return on Assets and Net Profit Margin.

The dataset was imported in IBM SPSS Statistics and all the variables were coded accordingly. The variables used in my research are: Company Name, Year, Net Income, Total Assets, Total Revenue, Return on Assets and Net Profit Margin. The below figure shows the Return on Assets for the 51 banks from China during the period 2016 to 2019.
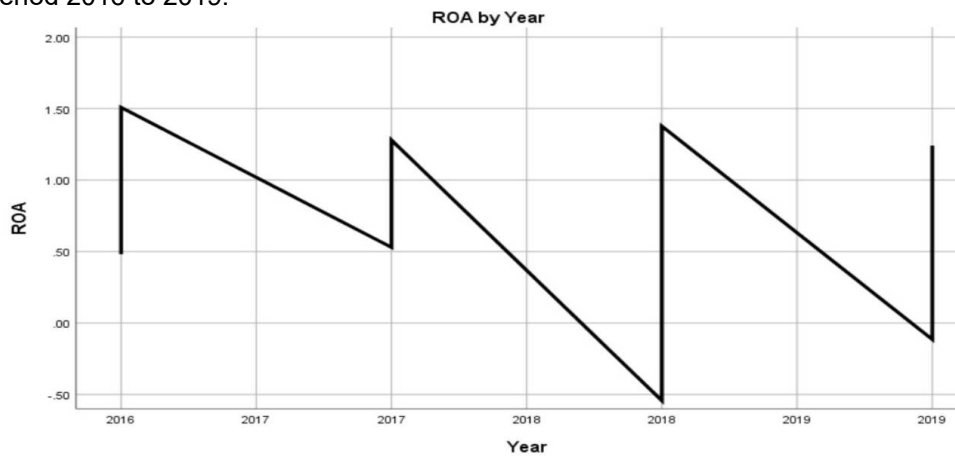
Figure 1: Return on Assets time series by year
Source: Author own research results in IBM SPSS Statistics

In order to see the profitability of Chinese banks I use in this paper linear regression where the dependent variable is Return on Assets (ROA) and the independent variable is Net Profit Margin.
Regression analysis is a statistical technique for investigating and modeling the relationship between variables. Equation of regression is: $\gamma = \beta_0 + \beta_1\, x$, where where β_0 is the intercept and β_1 is the slope.
ROA is an indicator of how profitable a company is relative to its total assets. Net Profit Margin is a measure of profitability.

Table 1: Regression results of ROA and Net Profit Margin

Model Summary	
R	.738
R Square	.545
Std. Error of Estimate	1.141
Sig. F Change	0.000

Source: Author own research results in IBM SPSS Statistics

Using linear regression in IBM SPSS Statistics, there are generated the R and R Square. R Value equals 0.738, which indicates a high degree of correlation. R Square indicates how much of total variation in the dependent variable (ROA) is explained by the independent one (Net Profit Margin), so it is the correlation between the observed and predicted value of dependent variable. R Square=0.545,

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so 54.5% of the variance in ROA can be predicted by Net Profit Margin. Coefficient Beta is measured in standard deviation and has a value equal with 0.738. So, a one standard deviation increase in Net Profit Margin leads to a 0.738 standard deviation in predicted ROA. Net Profit Margin has a positive impact on ROA.

Table 2: Coefficients

Coefficients	
Constant B	.171
Slope	.019
Sig	.000
VIF	1.000

Source: Author own research results in IBM SPSS Statistics

The Coefficients Table provides the needed information to predict ROA from Net Profit Margin and also if Net Profit Margin contributes statistically significantly to the model. This can be verified by looking at the Sig. (which is less than 0.05). The variance inflation factor (VIF) = 1.000 is less than 10, which indicates that there is no multicollinearity.
ROA and Net Profit Margin are continuous variables. The regression equation is ROA= 0.171+ 0.019 * Net Profit Margin.
Below, is is presented the regression line when the dependent variable is Return on Assets and the independent one si Net Profit Margin.
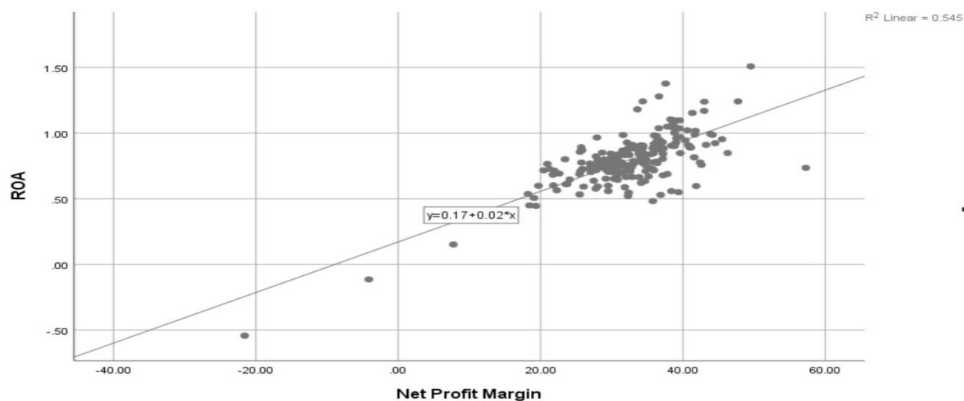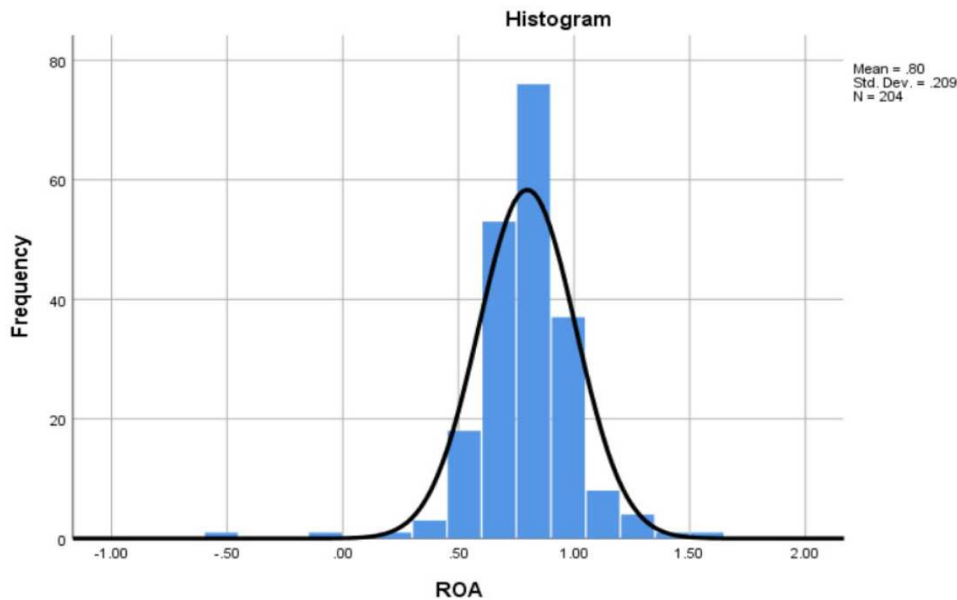

Figure 2: The Regression Line
Source: Author own research results in IBM SPSS Statistics

In order to verify if the overall regression model is a good fit for the data, I use in my paper ANOVA. ANOVA is the analysis of variance and consists of calculations that provide information about levels of variability within a regression. The dependent variable is ROA and the predictor is Net Profit Margin.

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Table 3: ANOVA

	Sum of Squares	F	Sig.
Regression	4.845	241.988	0.000
Residual	4.045		
Total	8.890		

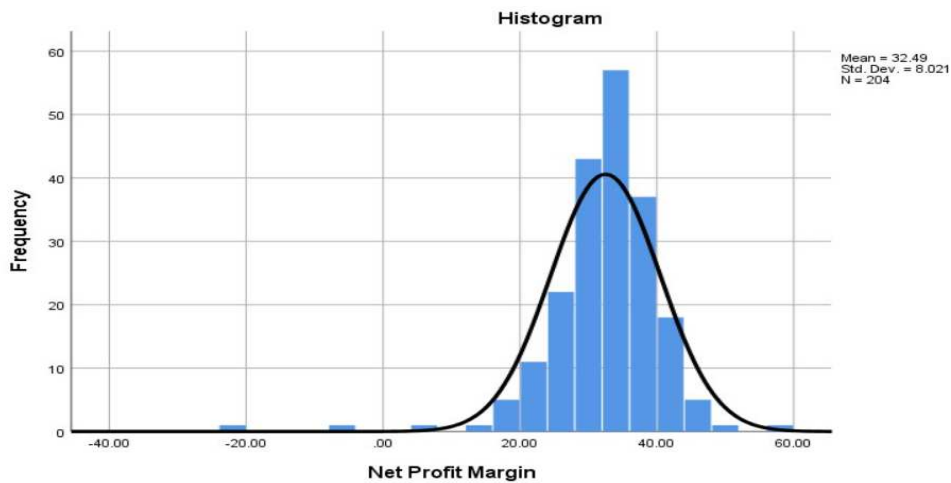Source: Author own research results in IBM SPSS Statistics

Figure 3: Return of Assets Histogram
Source: Author own research results in IBM SPSS Statistics

ANOVA is used for answering a question that sounds like this: "Do the Net Profit Margin reliably predict the ROA?". In this case, Sig = 0.000, which is less than 0.05, and it can be concluded that Net Profit Margin reliably predict Return on Assets. Also, the regression model is a good fit for the data and is statistically significant.

Regarding descriptive statistics, Skewness is a measure of the asymmetry of the probability distribution of a real-valued random variable about its mean. For ROA, Skewness = -1.362 meaning that the asymmetry is negative and the distribution is tilted to the right and has extreme values on the left side.

Like Skewness, Kurtosis describes the shape of a probability distribution. Kurtosis for ROA= 9.918 which indicates that the distribution is leptokurtic, so there are more values concentrated around the mean.

Coefficient of variation = $\frac{Standard\ Deviation}{Mean} * 100$

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Coefficient of variation (ROA)= 26.12%, which is less than 35%, so it can be stated that the mean is representative for the sample. The sample is homogeneous for ROA variable.

Figure 4: Net Profit Margin Histogram
Source: Author own research results in IBM SPSS Statistics

For Net Profit Margin, Skewness is -1.982, which means that the asymmetry is negative and the distribution is tilted to the right and has extreme values on the left side. Kurtosis= 11.631, so the distribution is leptokurtic.
Coefficient of variaton (Net Profit Margin)= 24.68% < 35%, so the mean is representative for the sample. The sample is homogeneous for Net Profit Margin variable.

Table 4: Pearson Correlation which is significant at the 0.01 level (2-tailed)

		ROA	Net Profit Margin
ROA	Pearson Correlation	1	0.738
	Sig. (2-tailed)		0.000
	N	204	204
Net Profit Margin	Pearson Correlation	0.738	1
	Sig. (2-tailed)	0.000	
	N	204	204

Source: Author own research results in IBM SPSS Statistics

For a more detailed analysis, it is recommended to verify the association between the variables Return on Assets and Net Profit Margin. As a result, the correlation

matrix between the variables selected for analysis is obtained. A cell in the table contains the value of the correlation coefficient, the critical probability of the significance test and the sample size.

The hypotheses are:
$H_0 : \rho = 0$
$H_1 : \rho > 0$
According to the decision procedure in a statistical test, if Sig. (2-tailed) is less than 0.01, then the correlation coefficient is statistically significant. In this case, Sig.(2-tailed) is equal with 0.000, so the null hypotheses is rejected and Pearson Correlation is statistically significant. There is sufficient evidence to conclude that there is a significant linear relationship between ROA and Net Profit Margin because the correlation coefficient is significantly different from zero. Pearson Correlation measures the strength and direction of linear relationship between pairs of continuous variables, in this case ROA and Net Profit Margin. Pearson Correlation Coefficient is 0.738, so that indicates that the correlation is direct, strong and guaranteed with a probability of 99%.

4. In conclusion

In this paper, I generated a model of the profitability of Chinese Banks during the period 2016-2019 for Return of Assets and Net Profit Margin. The main objective of this method was to evaluate how banking has been affected by these measures.
R Value equals 0.738, which indicates a high degree of correlation between Return on Assets and Net Profit Margin. Also, 54.5% of the variance in ROA can be predicted by Net Profit Margin. A one standard deviation increase in Net Margin Profit leads to a 0.738 standard deviation increase in predicted ROA. So, Net Margin Profit has a positive impact on ROA. Because VIF is equal with 1.000, that indicates that there is no multicollinearity.
I used ANOVA to verify if the regression model is a good fit for the data. It can be concluded that Net Profit Margin reliably predict Return on Assets and the regression model is a good fit for the data.
Also, descriptive statistics was used in order to observe how the distribution is for both variables and to check if the mean is representative for the sample. For Return on Assets asymmetry is negative and the distribution is tilted to the right and has extreme values on the left side. The distribution is leptokurtic, so there are more values concentrated around the mean. For ROA it can be stated that the mean is representative for the sample. The sample is homogeneous for ROA variable.
For Net Profit Margin, asymmetry is negative and the distribution is tilted to the right and has extreme values on the left. For this variable, the distribution is also leptokurtic. Regarding the representativeness of the sample for Net Profit Margin, the coefficient of variation is less than 35%, so the mean is representative for the sample and is also homogeneous.
After that, for a more detailed analysis, I verified the association between the variables Return on Assets and Net Profit Margin. As a result, the correlation matrix

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between the variables selected for analysis is obtained. It can be stated that there is sufficient evidence to conclude that there is a significant linear relationship between ROA and Net Profit Margin because the correlation coefficient is significantly different from zero. Pearson Correlation Coefficient is 0.738, so that indicates that the correlation is direct, strong and guaranteed with a probability of 99%.

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