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Firm size, firm age and firm profitability: Evidence from China

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ABSTRACT: The purpose of this study is to investigate the relationship between firm size, firm age and firm profitability in China stock market. We use the data of all the public firms in China stock market from 2008 to 2018, and adopt the fixed effect model to examine these relationships. As a result, we find a positive relationship between firm size and profitability and a negative relationship between firm age and profitability, which is in consistent with some of the studies conducted in other countries. The study can contribute to the future studies in China by offering a good reference point for them, since there has been no research done in China on this exact topic, this research can also set up a comprehensive model for future studies.

Key Words: *Firm Size; Firm Age; Firm Profitability.*

Data Availability: *The data are publicly available from the sources identified in the Paper.*

I. INTRODUCTION

Firm size has always been an important factor to determine a firm's profitability, to improve performance and be competitive in the market, a company would always try to increase its size (Opeyemi, 2019). Big firms enjoy bigger market share, and have more opportunities to make profit, thus, when there is a competition, big firms always outcompete small firms (Doğan, 2013). Furthermore, because of the abundant resources they possess, they are more possibly to get into those fields that require high capital rates, the chances for big firms to work in fields that are more profitable are higher (Doğan, 2013). Although larger size may bring more profit, some companies are experiencing a decline in profitability on a yearly basis with their size growing larger (Opeyemi, 2019). Whether the size of the firm has a positive effect on firm profitability, mixed results had been found based on the studies that had been reviewed (Doğan, 2013). According to the contradictory results, Majumdar (1997) argued that the relationship between the firm size and performance were extremely environmental specific, some institutional factor that would affect firm profitability can also affect this relationship.

There are various studies examining the relationship between firm size and profitability. According to Lee (2009), Doğan (2013), there was a positive correlation between firm size and profitability rate, mainly because of large firm's efficiency gain and high market power. Majumdar (1997) studied the effect of firm age and firm size on the performance and found that larger firm tended to have higher profitability but lower productivity, while older firm was just the opposite. On the other hand, Banchuenvijit (2012) found that firm size was negatively correlated with firm performance. In addition, study of Whittington (1980) found that there was no significant relationship between firm size and firm performance.

All the previous researches studied the relationship between firm size and profitability in different countries. The firms that had already been studied in the countries include Turkey (Doğan, 2013), United States (Lee, 2009), India (Majumdar, 1997), Vietnam (Banchuenvijit, 2012), United Kingdom (Whittington, 1980), Nigeria (Ilaboya, 2016). There has been no research conducted in China to investigate this correlation among Chinese firms, which means we still do not know if there is a relationship between firm size and profitability. This study would get data sample from China Stock Market Accounting Research (CSMAR), and try to investigate the relationship between firm size, age, profitability among Chinese companies.

This study uses the 2008-2018 data of all public firms (except for financial institutions) from CSMAR. The objective of this research is to study the relationship between firm size, age and profitability. As for the measurement of the variables, following the model developed by Ilaboya (2016), profit before interest and tax is used to measure profitability, firm size is measured by total assets, and firm age is measured by age of the company since incorporation.

This research is important because it can become a valuable reference for the future studies in China on this topic. It uses data of all the public firms (except financial institutions) in China from 2008 to 2018, the data includes a larger sample size and crosses a longer time period compared with other researches on the same topic. The selection of firms from all industries and a longer time period of data can contribute to more comprehensive results for this research. In addition, the results of this research would help revealing the true relationship between firm size, firm age and firm profitability, since mixed results had been found in previous studies. This research distinguishes itself from others because of its wide range of data selection, and

the country it studies. Different countries have different industrial structure, for example United States and Japan's industrial structures have more percentage in service industry, while China is still trying to transform its economy focus from secondary sector to tertiary sector. The study is unique because as the subject of the research, China is experiencing this transformation in the past 10 years.

This research has proposed two hypotheses, there is a positive relationship between firm size and profitability; there is a positive relationship between firm age and profitability. Fixed effect model has been adopted to this research, and the finding of the study reveals a positive correlation between firm size and profitability, a negative correlation between firm age and profitability.

This study contributes to the existing literature in several ways. First of all, this is the first research that studies the relationship between firm size, firm age and firm profitability in China. Furthermore, this research uses data of all public firms in China from 2008 to 2018, which crosses a wide range, this research would have a more comprehensive result compared to other researches in different countries and become a good reference for future studies. Finally, this research contributes to the current research on the relationship between firm size, age and profitability by investigating this relationship in a Chinese economy framework. Our results suggest that there is a positive relationship between firm size and profitability, and a negative relationship between firm age and profitability.

The following sections of this research include literature review and hypothesis development, methodology, expected results, theoretical contribution, results and analysis, discussion and conclusion.

II. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

Firm Profitability

According to Ilaboya (2016), "*profitability is the level of profit in relation to the volume of activities of the organization.*" Even though profitability can be used to measure both the firm performance and efficiency, profitability does not always equal to the efficiency of management. In addition, profitability and profit are two different concepts. According to Horton (2019), profit is the value of difference between a company's total revenue and expense, it would always be a company's object to increase its' profit. While profitability, though closely relates with profit, is defined as the relationship between a company's level of profit and its relevant business scale (Horton, 2019). Followed the model of Ilaboya (2016), this study would use the profit before the interest and tax to measure the profitability.

Firm Size

Firm size is one of the core problems of modern enterprise theory, enterprise size still plays an important role in the study of enterprise growth (Wang, 2011). According to Jiang (2003), firm size is defined as "*employees per establishment, employees per company, sales per firm, and value added per firm.*" In Shi's (2014), he pointed out that firm size is the carrier of firm production and business activities. At present, there are two kinds of criteria for enterprise scale classification in the theoretical field: qualitative index and quantitative index, qualitative division is mainly defined from four aspects, the degree of enterprise autonomy, the degree of

ownership concentration, the management mode and the status of the industry; quantitative division is mainly carried out from the aspects of the number of employees, assets and sales income (Shi, 2014). In the previous related studies, firm size was measured by firm's total assets, net sales, and the number of employees. This study would follow the model of Ilaboya (2016), and use the total assets as the measurement of firm size.

Firm Age

In the dictionary, age is defined as “*the time of life at which some particular qualification, power, or capacity arises or rests*” (Merriam-Webster, 2019). According to Ilaboya (2016), they defined a firm's age as “*the number of years of incorporation of the company*”. Although some argued that listing should be used to define firm age for the reason that listing is more economical, and because a company's life starts from the moment of listing (Shumway, 2001). Others refuted this argument by stating that a company is born through incorporation as a legal person (Gitzmann, 2008). In Wang's (2011) research, he defined Firm Age as the number of years that the enterprise has experienced from its establishment to the point of investigation, while if the enterprise dies at the point of investigation, it is also called the life of the enterprise. Followed the model of Ilaboya (2016), this study would use the age of the company since incorporation to measure firm age.

Relationship Between Firm Size and Profitability

Since the last century, various researches had been conducted to investigate the relationship between the firm size and profitability. The results were mixed, some of the research found a positive relationship (Hall and Weiss, 1967; Doğan, 2013; Lee, 2009; Majumdar, 1997), some of the research found a negative correlation (Banchuenvijit, 2012), there were also research that did not find a significant correlation (Whittington, 1980). Wang (2011) concluded the different opinions from researches that have opposite result, on the one hand large enterprises can generate economic efficiency through mass production; large enterprises reduce production costs by adopting larger and more efficient production equipment for mass production; large enterprises are easier to hire high-level talents with a high level of management and technological innovation. However, in large enterprises, there are large organizations and many levels of management, which would result in distortion of decision-making and control information, as well as tendencies that would lead to the bureaucratization of management organizations (Wang, 2011). The difference in results of the previous research indicated that future study was still needed to examine this relationship, to further investigate this topic, this research would establish the hypothesis:

H1: There is a positive relationship between firm size and profitability.

Relationship Between Firm Age and Profitability

Despite from the various study of relationship between firm size and profitability, many studies had been conducted to investigate the effect of firm age on profitability, mixed results had been concluded from those studies. In Guo and Zhang's (2017) research, they suggested that older firms have more stable capital structure as well as more social resources and experiences, thus they are able to spend more time and resources on R&D activities, thereby improving their own competitiveness and value. Moreover, younger firms have limited R&D

specialists, budget or even market information, blindly invest huge amount of money would not improve its core competitiveness, the firm performance would decrease instead (Guo and Zhang, 2017). Majundar (1997), Doğan (2013) had discovered a negative relationship between firm age and profitability, the older a firm is, the more productive and less profitability it would be. While in the study conducted by Ilaboya (2016), a significant relationship between firm age and profitability had been detected. The mixed results shown in the previous research indicate that future studies were still needed to examine this relationship, to further investigate this topic, this research would establish hypothesis:

H2: There is a positive relationship between firm age and profitability.

III. METHODOLOGY

Data and Source

We use all public firm's data from China Stock Market Accounting Research (CSMAR) form year 2008 to 2018. The variables are derived from balance sheet, income statement. This study determined the sample data following Ilaboya's (2016) paper. According to Ilaboya (2016), the data sample choice could provide a larger data points, which would help to increase the degree of freedom and minimize the explanatory variables' collinearity problem.

Framework and Model Specification

The framework of this study is to investigate the relationship between the firm size, age and performance, a figure is created below to show this framework.

According to the Hannan and Freeman's (1984) theory of structural inertia, the larger an organization, more bureaucracy would exist within this organization. The organization would become unwilling to change because of the inflexibility, which caused decrease in the organization's profitability. Therefore, functional relationship exists between firm size and profitability, according to Ilaboya (2016), this relationship can be expressed as

$$Profitability = f(FSIZE) \quad (1)$$

In the theory of learning by doing proposed by Garnsey (1998), company's product could be enhanced through increase in knowledge of productive production techniques. The longer a firm operated, the more resources, more allies in industry, more management experience would it process. Hence, a functional relationship exists between company age and profitability, and according to Ilaboya (2016), it is expressed in the following equation:

$$Profitability = f(FAGE) \quad (2)$$

New equation is formed by combining the equations (1), (2):

$$Profitability = f(FSIZE, FAGE) \quad (3)$$

Following Ilaboya's (2016) model, this study would also introduce control variable B Size, and the equation (3) would be transformed into:

$$\text{Profitability} = f(\text{FSIZE}, \text{FAGE}, \text{BSIZE}) \quad (4)$$

Following Ilaboya's (2016) model, equation (4) can be expressed in econometric form:

$$LPBIT = \beta_0 + \beta_1 FSIZE + \beta_2 FAGE + \beta_3 BSIZE + \varepsilon \quad (5)$$

$$PBIT_{it} = \beta_0 + \beta_1 FSIZE_{it} + \beta_2 FAGE_{it} + \beta_3 BSIZE_{it} + \varepsilon_{it} \quad (6)$$

Where: *LPBIT* = Log of profit before interest and tax; *LFSIZE* = Log of total assets which measure *FSIZE*; *FAGE* = Firm age of incorporation; *BSIZE* = Board; ε = error term; *i* = company; *t* = time covered.

The definitions of all the variables, Profitability, Firm Size, Firm Age, Board Size are shown in Table 1.

Table 1
Variable Definitions

Variable	Code	Definition	Source
Profitability	PBIT	Log of profit before interest and tax (Ilaboya, 2016)	CSMAR
Firm Size	FSIZE	Log of total assets (Ilaboya, 2016)	CSMAR
Firm Age	FAGE	Age of the company since incorporation (Ilaboya, 2016)	CSMAR
Board Size	BSIZE	Total number of board (Ilaboya, 2016)	CSMAR

IV. RESULTS AND ANALYSIS

Descriptive Statistics

As mentioned in the previous section, this research uses all public firm's except for financial institution data from China Stock Market Accounting Research (CSMAR) from year 2008 to 2018. There were 20,515 observations in the beginning, while some of the firms chose not to reveal their financial data in some specific years, we dropped observations with no data, which decreased the total number of observations for *BSIZE*, *FAGE*, *FSIZE*, *LPBT* from 20,515 to 16,935. In addition, there were few years when some firms suffered from a negative profit before interest and tax, when calculating the log of the profit before interest and tax, those observations could not have a valid result. Thus, we dropped those observations that did not have a valid result from our data collection, and left the observations in *LPBT* decrease from 16,935 to 13,918. Table 2 shows a detailed summary of our descriptive statistics.

For the Board Size, among all the firms we selected, we have a maximum board member of 18 people and a minimum board member of 1 people. The mean for Board Size is 9 people, which means the selected firms have an average of board member of 9 people.

The selected firms have a maximum firm age of 61, a minimum age of 1, and a mean of

18. The firm size is calculated by the log of the firm's total assets, among all the firms, the largest firm has a firm size of 12.38606, which equals to 2,432 billion RMB in total assets, while the minimum firm size is 4.708707 (51,133.68 RMB in total assets), and the average firm size is 9.645708 (4.423 million RMB). The profit before interest and tax of all the firms has a maximum of 11.27364 (187.777 billion RMB), a minimum of 4.321476 (20.964 thousand RMB), and an average of 8.356638 (227.32 million RMB).

The standard deviation for BSIZE, FAGE, LFSIZE, LPBT are 1.947865, 5.808731, 0.662388, 0.7303054 respectively, which all suggested that the data in all four data sets were highly concentrated to their means, and had a low level of dispersion.

The Skewness for BSIZE, FAGE, LFSIZE, LPBT are 0.5971423, 0.5403579, 0.2207923, -0.0939148 respectively. It meant that among four variables, BSIZE, FAGE, LFSIZE were positively skewed, which meant the right tails of their distribution was longer than their right tails. While LPBT is negatively skewed, which suggested that the left tail of its distribution was longer than its right tails. The Kurtosis for BSIZE, FAGE, LFSIZE, LPBT are 5.912886, 4.87125, 4.341174, 4.227778 respectively, the values are all larger than 3, which suggested that the four variables had high peak near the center of their distribution.

Table 2
Descriptive Statistics

	BSIZE	FAGE	FSIZE	LPBT
Mean	8.916	18.386	9.646	8.357
Median	9.000	18.000	9.597	8.344
Maximum	18.000	61.000	12.386	11.274
Minimum	1.000	1.000	4.709	4.321
Std. Dev.	1.948	5.808	0.662	0.730
Skewness	0.597	0.540	0.221	-0.0939
Kurtosis	5.913	4.871	4.341	4.228
Sum	150993	311369	163350.1	116307.7
Observations	16935	16935	16935	13918

This research uses all public firms' except for financial institution data from China Stock Market Accounting Research (CSMAR) form year 2008 to 2018, we delete: (1) 3,580 observations that do not reveal their financial data; (2) 3,017 observations that have negative profit before interest and tax.

Spearman Rank-Order Correlation Test

Followed Ilaboya's (2016) model, this research adopts Spearman-Rank-Order correlation, the results of this test are shown in Table 3.

In Table 3, we can easily see that there is a correlation of 1.00 between the variables with

themselves. Other than that, the rest of the correlations all show high significant levels (0.000), which suggested that the variables were all independent with each other, and there was no problem of multicollinearity. All of the variables showed a positive correlation, except for the FAGE and BSIZE, which showed a negative correlation. Variance Inflation Factor Test is conducted in the following to further make sure that there is no problem of multicollinearity.

Table 3
Result of the Spearman Rank-Order Correlation Test

<i>Correlation</i>				
<i>Number of Obs</i>				
<i>Sig. Level</i>	BSIZE	FAGE	FSIZE	LPBIT
BSIZE	1.000			
	13918			
FAGE	-0.0361	1.000		
	13918	13918		
	0.000			
FSIZE	0.250	0.143	1.000	
	13918	13918	13918	
	0.000	0.000		
LPBIT	0.202	0.0442	0.811	1.000
	13918	13918	13918	13918
	0.000	0.000	0.000	

There are three attributes in each interaction between two variables, these attributes are Correlation, Number of Observations and Significant Level respectively.

Variance Inflation Factor Test

According to Table 4, the VIF for BSIZE, FAGE, FSIZE are 1.08, 1.01, 1.09 respectively, which are much lower compared to the benchmark of 10.00. It further confirmed that the variables were all independent with each other, and there was no problem of multicollinearity in these variables.

Once confirmed that there is no such problem exists in our model, the Panel Least Square Regression would be conducted in the following.

Panel Least Square Regression

In Table 5, the Panel Least Square Regression shows a F-Statistic of 7754.13 and a related probability of 0.000, which suggested that the null hypothesis of F-test is rejected, the regression model had explanatory power, and there were significant relationships between firm’s profitability and board size, firm age, firm size. The Panel Least Square Regression also shows R-squared of 0.626 and Adjusted R-Squared of 0.626, it suggested that 62.6% of the variation in firms’ profitability could be explained by the independent variables BSIZE, FAGE

Table 4
Result of the Variance Inflation Factor Test

Variable	VIF	1/VIF
BSIZE	1.08	0.924
FAGE	1.01	0.990
FSIZE	1.09	0.917
Mean VIF	1.06	

and FSIZE, and it further indicated that the regression model fits the data well. The coefficient of correlations showed negative relationships between board size, firm age and firm profitability, as well as a positive correlation between firm size and firm profitability.

Table 5
Result of the Panel Least Square Regression

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.818	0.00312	262.45	0.000
BSIZE	-0.000161	0.000106	-1.52	0.129
FAGE	-0.000454	0.0000342	-13.28	0.000***
FSIZE	0.0488	0.000332	147.05	0.000***
R-Squared	0.626		F-Statistic	7754.13
Adj R-Squared	0.626		Prob(F-Statistic)	0.000

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Hausman Test

This research uses the Hausman Test to determine whether to adopt a fixed effect or a random effect model, the results are shown in Table 6.

The result of the Hausman Test indicates a probability value of 0.000, thus the null hypothesis of preferred model is random effect was rejected, and this research would adopt a fixed effect model.

Fixed Effect Model

The results of the fixed effect model show a F-Statistic of 1976.29 and a probability value of 0.000, which suggested that the regression model was highly significant. The R-Squared for the fixed effect model was 0.682, it indicated that 68.2% of the variance in the firms' profitability could be explained by the independent variables, BSIZE, FAGE and FSIZE.

According to the results, firm size was found to have a highly significant relationship with firm profitability. Table 7 shows a t-Statistic of 60.94 and a probability of 0.000. The positive correlation of 0.0530 suggested that the firm's profitability would experience an increase of 5.30%, if there was an increase in firm size. In this case, our proposed hypothesis of there is a

Table 6
Result of the Hausman Fixed/Random Effect

	Coefficients			
	(b) fe	(B) re	(b-B) Difference	Sqrt(diag(V_b-V_B)) S.E
BSIZE	0.000161	-0.000137	0.000298	0.0000912
FAGE	-0.000745	-0.000560	-0.000185	0.0000573
FSIZE	-0.0530	0.0500	0.00306	0.000683

Test: H0: difference in coefficients not systematic

chi2(3)	=	(b-B)'[(V_b-V_B)^(-1)](b-B)
	=	30.81
Prob>chi2	=	0.000

positive relationship between firm size and profitability was accepted. This result was in accordance with the previous researchers' findings (Opeyemi, 2019; Majumdar, 1997; Ilaboya's, 2016). However, this result contradicted with the results of some early studies on this topic that there was no significant relationship between firm size and profitability (Hall and Weiss, 1967; Whittington, 1980)

The results of the fixed effect model also indicated a highly significant relationship between firm size and firm profitability. Table 7 shows a t-Statistic of -9.75 and an associated probability of 0.000. The coefficient of -0.000745 suggested that there was a negative correlation between firm age and firm profitability, which meant that firm's profitability would experience a decrease slightly if there was an increase in firm age. This result contradicted with our second hypothesis that there was a positive relationship between firm age and profitability, thus the second hypothesis was rejected. The result of this negative correlation conformed with some previous studies (Majumdar, 1997; Doğan, 2013), while it contradicted with some other findings that observed a positive relationship between these two variables (Ilaboya's, 2016; Banchuenvijit, 2012).

According to the Table 7, there was an insignificant but positive relationship between board size and firm profitability. The result shows a coefficient of 0.000161, t-statistic of 0.96 and a profitability value of 0.338. Although the result was insignificant, the positive correlation confirmed with our expected result that there is a positive relationship between board size and firm profitability.

Fixed Effect Model – Robust Test

After examining Table 8, we found that the coefficient and R-squared were consistent with the fixed effect model conducted. The robust test has a F-Statistic of 607.61 and a probability of 0.000, indicating that this model was highly significant. The t-Statistics for BSIZE, FAGE, FSIZE are 0.77, -5.84, 32.00 respectively, and the associated probability are 0.442, 0.000, 0.000. The t-Statistics and probability in this robust test varied a little with the fixed effect model

Table 7
Result of the Fix Effect Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.779	0.00759	102.63	0.000
BFSIZE	0.000161	0.000168	0.96	0.338
FAGE	-0.000745	0.0000764	-9.75	0.000***
FBSIZE	0.0530	0.000870	60.94	0.000***
R-Squared	0.682		F-Statistic	1976.29
			Prob(F-Statistic)	0.000

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

conducted previously, but the overall significant level remained unchanged, firm age, firm size still had significant correlations with firm profitability, while the relationship between board size and firm profitability was still insignificant.

The robust test helped to eliminate the potential problem of heteroskedasticity and autocorrelation, and in the meanwhile, it further confirmed the result of the previous fixed effect model.

Table 8
Result of the Fix Effect Model – Robust Test

Variable	Coefficient	Robust Std. Error	t-Statistic	Prob.
C	0.779	0.0144	54.25	0.000
BFSIZE	0.000161	0.000209	0.77	0.442
FAGE	-0.000745	0.000127	-5.84	0.000***
FBSIZE	0.0530	0.00166	32.00	0.000***
R-Squared	0.682		F-statistic	607.61
			Prob(F-statistic)	0.000

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

V. DISCUSSION

Main Result

Our results discussed in the previous section reveal a highly significant positive relationship between firm size and profitability, a highly significant negative relationship between firm age and profitability, and an insignificant positive relationship between board number and firm profitability. According to the results, our proposed hypothesis one, there is a positive relationship between firm size and profitability is accepted, while the proposed hypothesis two, there is a positive relationship between firm age and profitability is rejected. In general, this study has successfully found out two highly significant relationships between our dependent and independent variables, which fully fulfill the purpose of our study.

Unexpected Result and Explanation

However, the negative relationship between firm age and firm profitability is unexpected, which causes the rejection of the second hypothesis. Our interpretation to this unexpected result is that the older the company, more rules and regulations would exist within the company, the firm's structure would also be more centralized, and it takes longer time for an information to travel from lower level to higher level, the decision making process for the company would be longer. When the company is doing business with other firms in the capital market, the employees in that company may bound by the complicated regulations exists within the company, thus decreases the efficiency in doing business, as a result, there is probability for the company to suffer losses due to this inefficiency. As mentioned in the previous section, this unexpected result is conformed with the results in some early studies (Majumdar, 1997; Doğan, 2013), while their interpretations to the results were based on the economy framework in their countries, India and Turkey, thus could not possibly explain our results. However, there are also researches in China on the related topic, in Lei's et al. (2017) research, he found out that political resource enterprises with a longer listing age are exceeded by political resource enterprises with a shorter listing age, considering aspects of capital turnover efficiency reflected by the turnover ratio of total assets and accounts payable, the working capital guarantee capability reflected by the multiple of surplus cash and the investment ratio of cash satisfaction. They suggested that the gradual expansion of firm's operation and production scale causes the older firm's operating efficiency to decrease, the firm's performance is affected by "growth inertia" (Lei, et al., 2017). Moreover, "indigestion" caused by the oversupply of resources in older firms could also lead to lower operating efficiency (Lei, et al., 2017). Their explanation in part conforms with our interpretation on this unexpected result.

Limitation

This research has its own advantages over other researches that has the same topic, in Ilaboya's (2016) model, he only used sample data of 30 firms from 2006 to 2012, the research of Banchuenvijit (2012) used listed firms' data in Vietnam stock market from 2004 to 2010, while this research uses data of all public companies (except for financial institutions) in China stock market from 2008-2018. The data sample of this research includes more firms and crosses a longer time range compares to other research, which can provide a more general and comprehensive result. Despite the advantages, this research also has its limitations. Although this research includes all the data of public firm from China stock market, the data of private firms is left out, different research results might be proposed, if the research is incorporated with data from private firms. The research studies firms from all the industries and comes up with a general result, but it fails to study the effect of firm age, firm size on firm profitability by different industries, there might be probabilities exists that in different industries, the effect of firm age, firm size on firm profitability might be different. In addition, as mentioned earlier, those observations that have negative profit before interest and tax are excluded from the model, which suggests that the results of our study are only plausible to those firms that have positive earnings.

Reliability and Validity

The results of this research show a positive relationship between firm size and profitability,

a negative relationship between firm age and profitability. These results are totally consistent with Majumdar's (1997) research, in which he also found larger firms were tended to be more profitable, older firm were less profitable. His interpretation to the results indicated that the larger firm has a larger market power, because they pre-empted large amount of market capacity, by which gave them more chances to earn higher profits (Majumdar's, 1997). While the older firms in India failed to realize that the dominant power in the market had switch from government to customer, and lack of the culture of competition, that was why older firms in India were less profitable (Majumdar's, 1997). The results of this study agree with his first interpretation of larger company were more profitable, but do not agree with his second interpretation on firm age. China has a totally different market than India, the explanations for why older firms in India are less profitable might not be plausible to Chinese firms. There is no right and wrong between our interpretation and his, future studies can study specifically on firm age and firm profitability, and give detailed explanations for this result. In the end, although there are several limitations in this research, the results of this research are accurate and correct, in addition, the data are all collected from the CSMAR, there is no extraneous variables that affect the data model, no validity problem exists in this research.

Theoretical Contribution

This research studies the relationship between firm size, firm age and firm profitability in China stock market. Firm age, size and profitability are the main variables in this study. This research uses the data from 2008 to 2018, which crosses a huge time span, and selects all the listed companies' data in China stock market, the relatively large data sample could provide a more comprehensive results and benefit future studies on the same topic. The previous research on this topic were all conducted in other countries, while the market structure varies in different countries, thus the explanations for other researches' results could not totally interpret the result of this research. Therefore, since there is no research in China that studies this topic, the results of this research can provide a high reference value for future studies as well. At last, more future studies could be conducted to examine this relationship in different industries, and future studies could also incorporate the private firms in China.

VI. CONCLUSION

In conclusion, the aim of this research is to find the relationship between firm size, firm age and firm profitability, and the results suggest a significant positive relationship between firm size and profitability, and a negative relationship between firm age and profitability. This research is important because it uses data of all the public firms in China, the sample size is huge, and there has rarely been researches that examine these relationships in China stock market. This research uses firms' data from 2008 to 2018, the data crosses a longer time period compared other researches on the same topic. The selection of firms from all industries and a longer time period of data can contribute to more comprehensive results for this research, which can become a valuable reference for the future studies on this topic.

This research only includes the data of public firms in China, while other private firms are left out, the result of this result might be different if private firms' data are incorporated in this model. The research also failed to study the effect of firm size, firm age on firm profitability by different industries, there might be probabilities that different industries would generate

different results. In addition, those firms' data that have negative profit are excluded from the model, which suggests that the results of our study are only plausible to those firms that have positive earnings.

Future studies on this topic should try to incorporate private firms to the model, and get a more comprehensive result. Furthermore, more researches can be conducted to study the effect of firm age, firm size on profitability by different industries, and represent their results by each industry they study. In addition, future studies should invent a way to study these relationships in those companies that have experienced a negative profit.

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