An attempt to comprehend the increasing popularity of IPOs based on firm performance

Bachelor Thesis Economics
Financial Economics

Erasmus School of Economics

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Date: 17-10-2021

Abstract

In this thesis the effect of an initial public offering (IPO) on the operating performance of a company is researched. To examine this effect a data sample is considered for the period of 2012 to 2019 for companies who issued an IPO in China. The researched literature underlines different dis- and advantages for issuing an IPO. This thesis concludes that an IPO has a negative effect on the operating performance of a company one and three years after the IPO is performed. Furthermore, a regression is constructed where the size and the leverage of a company have a significant effect on the operating performance.

Contents

Introduction

In 2020 the US stock market achieved a score of 480 Initial Public Offerings (IPO). An IPO refers to the process of offering shares of a private company to the public in a new stock issuance. By means of an IPO, public money is invested in a company, which leads to more opportunities to grow and expand. Altogether, an IPO is a popular way for a company to gain more publicity or enable a company to pay off debt.

The increase in IPOs is not only a phenomenon in the US stock market, but also in the Chinese stock market. Chinese companies have dominated foreign IPO listings in the US for the last three years, that might indicate a global shift from the US stock market to the Chinese stock market. In some cases, large companies go through a secondary listing in the Chinese stock market. For instance, the huge tech company Alibaba, who raised an additional 11,2 billion USD in 2019 on the HKEX after one of the biggest IPO listings ever on the NYSE for 25 billion USD in 2014. Also, in 2020 Ant Group planned to raise 34,5 billion USD, which would have been a record amount. However, the Chinese government stopped this IPO. For this reason, the all-time largest IPO remains the one of Saudi Aramco in 2019 (29,4 billion USD). It is not a surprise that the Hong Kong stock exchange, part of the Chine stock market, has been ranked as the world's number one IPO venue in seven of the last twelve years. As a result, the Chinese market is of great importance on the subject of IPOs.

A company can raise external capital either through debt or equity capital. The IPO is a form of equity capital. The choice for the capital structure can be very determinant for the results of a company. Myers (1984) describes the ''Pecking Order Theory'' which states that firms prefer internal to external funds and prefer debt to equity when external funds are needed. The increase in the popularity of raising external capital through an IPO contradicts with the paper of Myers (1984). This paper stated that firms are expected to prefer other type of capital. The paper of Myers (1984) forms the base of an on-going field of research on what the effect is on the company's operating performance. This is of great importance as it contributes to making the optimal decision in the tradeoff between raising capital and giving up ownership of a company.

Throughout the years many papers have studied the IPOs on the level of post-issue stock performance of different companies. This is important for stakeholders and the market value of companies. However, there has been little recent research on the operating performance of a company after an IPO. The study of Jain & Kini (1994) forms the basis for much research on IPOs and operating

performance as is the case for this research. The paper of Jain & Kini (1994) extends on the research of Degeorge & Zeckhauser (1993), who studied the operating performance of a company going public that has been subject to a leverage buyout (LBO). Jain & Kini examine companies making a transition to public ownership from 1976-1988 listed on the US stock market. In addition, Wang (2004) is very relevant to this paper, because his paper discusses the changes in operating performance around the IPO of Chinese listed companies with a strong focus on ownership difference. Although both papers considered the effect of an IPO on the performance of a company, these papers are based on an outdated timeframe which makes it interesting to assess the effects of an IPO on more recent years.

Since the studies on the operating performance by Jain & Kini (1994) and Wang (2004), some major economic events happened like the dotcom bubble in 2000 where a lot of IPOs issued by tech companies, the global financial crisis in 2008 and the European debt crisis. These events have led to structural changes on the regulatory aspect of the banking world. For two reasons it will be very useful to examine the effect of an IPO for the operating performance of companies listed on Chinese stock exchanges for the last decade. Firstly, the huge increase in IPOs during the past time. Secondly, the leading position obtained by the Hong Kong stock exchange. Furthermore, current papers lack in researching the operating performances for recent time periods. The aforementioned research gaps form the basis of this thesis that will analyze the effect of an IPO for the operating performance of companies listed on the Chinese stock exchanges for the time period of 2012-2019. This leads to the following research question:

''*What is the effect of an Initial Public Offering on the firm performance of a company listed on the Chinese stock exchanges?*''

In order to answer this research question this thesis will discuss the ROA and S/A of Chinese companies for the period of 2012-2019 before and after an IPO. In extension, a regression will be constructed to forecast the effect of issuing an IPO on the operating performance of a company. Based on the research by Jain & Kini (1994) and the research of Wang (2004) it is expected that the operating performance of a company will decline after issuing an IPO. To make a distinction in researching the effect of an IPO on a company's operation performance, the results are discussed with an extension to differences in sectors.

The rest of the thesis is organized such that in section 2 the underlying theory is discussed, hereafter section 3 describes the data and methodology that is used. Next, section 4 discusses the results. Finally, in section 5 the conclusions are summarized, and possible further research is discussed.

Underlying Theory

2.1 The IPO Process

The IPO process consist of multiple stages where a company becomes public by issuing shares. During the first stage of a company, the company is considered private. In this phase there is often only shareholders in the form of entrepreneurs themselves, acquaintances, or professional shareholders in the form of Venture Capitalists (VCs) or angel investors. As a company grows further, it can consider raising more capital by switching from a private company to a public company through an IPO. To give an indication, this is typically around a private valuation of approximately 1 billion USD and is called the unicorn status. The issuing company can select an investment bank to advise on the IPO process and to provide underwriting services. After finishing the due diligence, the investment bank constructs a price by which they go to the market. When the company and the underwriter file the registration statement for their IPO the lock-up period and quiet period starts. The quiet period prohibits the company for 40 days from issuing new information that is not contained in the registration statement to obtain objectivity and prevent the appearance of inside information. The lock-up period prohibits original shareholders from selling their shares for a certain amount of time, usually 90-180 days after the IPO. When the lock-up period has come to an end, the share price settles.

2.2 The dis- and advantages of IPOs

According to Pagano et. al (1998), a company may have multiple reasons to go public by means of an IPO. This research stated that one of the key benefits of going public is overcoming borrowing constraints. A company gains access to an alternative source of capital and is able to avoid high interest rates. The paper states that an IPO makes it possible for the initial holders of the company to diversify their portfolio. The IPO ensures an increase in liquidity because it enables the shares of the company to be traded on an organized exchange that lowers the transaction costs. As mentioned before, the IPO might create investor recognition, where a company can gain more publicity and create an image. To summarize, when a company issues an IPO, it will gain capital and attention from investors through multiple ways.

Apart from the mentioned advantages, an IPO also can result in some disadvantages as stated by Pagano et. al (1998). This paper stated that the adverse selection cost of IPOs is an actively researched aspect. This phenomenon translates itself in ‘’IPO underpricing’’ that entails a big positive difference in the initial offer price and the closing price after the first trading day. Therefore, there is money left

on the table because the company benefits only from the initial offer price. Issuing an IPO is very costly as the investment banks charge relatively high underwriting and registration fees. Furthermore, going public forces companies to unveil information according to the Securities Exchange Act which might result in a loss of confidentiality for the issuing company.

2.3 Literature

Most of the research regarding the IPO process and the performance focusses on the post-issue stock performance. The papers that analyzed the operating performance have similar conclusions, the operating performance decreases on the long term of a company issuing an IPO.

The papers by Jain & Kini (1994), Pagano et. al (1998) and Wang (2004) have studied the effect of an IPO on the operating performance of a company and found similar results. Jain & Kini (1994) investigate the operating performance of a company after an IPO in the period 1976-1988 listed on the US stock market. The study measured the change in operating performance relative to the fiscal year prior to the IPO in the form of the return on operating assets (ROA). The industry-adjusted change is measured by matching IPO firms in the same industry sectors by means of standard industrial classification (SIC) codes. The paper concluded the decline in the operating performance post IPO is caused by the timing of the IPO. When pre-IPO high operating performance results are accomplished, these results are not sustained post-IPO. Therefore, the hypothesis that will be researched is: *The issue of an IPO has a negative effect on the operating performance post IPO*.

Pagano et. Al (1998) study the performance in the Italian market in the period 1982-1992. This paper found a decrease in the operating performance and a positive correlation between the size of the company and the probability of performing an IPO. Although the probability of performing an IPO is not of interest for this thesis, the size is an interesting variable for this thesis. According to Mikkelson et al. (1997), the size of a company is significantly related to the operating performance after an IPO. A few years later Wang (2004) underlined this conclusion. Larger firms are associated with superior performance. Therefore, the hypothesis that will be researched is: *The size of a company has a significant positive effect on the operating performance for the long term post-IPO*.

Wang (2004) examined the operating performance in the Chinese market in 1994-1999 and conducted results that are very relevant for this thesis. The paper measured the operating performance by means of the ROA, the operating income to assets (OI/A) and sales to assets (S/A). The performance indicators OI/A and S/A are considered because Chinese companies might manipulate accruals and profits from

non-core operations as stated by Aharony et al. (2000). The decrease in the operating performance is mainly explained by the change in ownership structure which results in agency costs because of the separation in ownership and corporate control.

Mikkelson et al. (1997) describes a positive correlation between the leverage and the change in operating performance. This is explained by the argument that high leverage stands for better monitoring associated with superior performance. Wang (2004) underlined this conclusion with the positive correlation between the leverage and the change operating performance in that research. Therefore, the hypothesis that will be researched is: *Leverage of company has a significant positive effect on the change in operating performance for the long term*.

In conclusion, several papers have researched the effect of an IPO on the operating performance. These papers draw similar conclusions. However, these papers are outdated, and it is not clear what the current situation is since the number of IPOs has increased in the last decade.

Data & Methodology

Most of this research is based on the methodology used by Wang (2004). First, the considered data is discussed. Hereafter the methodology will be discussed.

3.1 Data

In this research, the data sample of companies who issued an IPO in the Chinese markets from 2010 to 2020 is analysed. The databank Zephyr is used to analyse which companies issued an IPO. The search preferences used are ''IPO'' with ''China'' as target geography for the time period 2010 to 2020. In addition, it is crucial that only the completed IPOs are selected from the database. This specific search generates a data set of 14108 listed companies. Zephyr is not sufficient for generating financial firm specific data. This includes financial indicators like the aforementioned ROA and S/A. The ROA is defined as the after-tax net income of the company divided by total assets. The S/A is defined as the total sales divided by total assets. To retrieve that data, the databank Orbis is used. Due to the Bureau van Dijk number (BvD number), the data set received from Zephyr is linked to Orbis. The BvD number assigns a unique number such that the financial data for each firm specifically is shown in Orbis. Orbis provides the aforementioned ROA and S/A and allocates the companies in different sectors based on the SIC codes. The other variables that are used in the regression, which will be discussed later, are also retrieved form Orbis. The sample in Orbis consists of 12003 companies and entails a panel data set. The companies in 2020 will be excluded from the sample, due to the absence of financial data after an IPO. Furthermore, Orbis only contains financial data from up to 10 years from now. Since it is not possible to obtain financial data one year previous to the IPO date, the years 2010 and 2011 are removed from the sample as well.

Table 1: *Number of IPOs for each year. The number of IPOs issued in China for the period 2012-2019.*

Year	*Number of IPOs*
2012	147
2013	135
2014	1216
2015	3338
2016	4236
2017	2090
2018	535
2019	306
Total	*12003*

3.2 Methodology

3.2.1 Wilcoxon Signed Rank Test

In order to examine the effect of an IPO on the operating performance of an issuing company the Chinese market is analysed. The operating performance will be measured by means of the ROA and S/A, because of the Chinese environment as stated by Aharony et. al (2000). The economic indicators will be compared one year prior to the IPO and the period post-IPO. The period post-IPO consist of one year after the IPO date and three years after the IPO date. This is in line with Wang (2004). The companies who issued an IPO are divided in different sectors based on Standard Industrial Classification (SIC) codes to determine if there is a difference between industrial sectors. The different sectors with the corresponding number of IPOs are shown in Table 2.

Table 2: *Number of IPOs for each sector, with the range of the SIC code, in the period from 2012 to 2019.*

Sector	*Range SIC codes*	*number of IPOs*
Agriculture, Foresty & Fishing	010- 097	305
Mining	100-149	79
Construction	150-179	146
Manufacturing	200-399	5565
Transportation & Public Utilities	400-497	918
Wholesale Trade	500-519	1268
Retail Trade	520-599	340
Finance, Insurance & Real Estate	600-679	290
Services	700-899	2990
Public Administration	910-972	37
Others		65
Total		*12003*

The differences in the ROA and S/A are determined by constructing the differences in the median before and after an IPO. The median is the middle number in a sorted, ascending or descending, list of numbers and is more sufficient than the average because it is more stable and less sensitive for large outliers. The use of the median is in line with Jain & Kini (1994) and Wang (2004) since both papers analysed the differences in indicators based on the median of the ROA and S/A.

To assess the differences in the ROA and S/A the Wilcoxon Signed Rank Test is used. This test is used to compare different samples or repeated measurements on a single sample to assess whether the mean ranks differ. The Wilcoxon signed rank test assumes that the observations are independent and is sufficient when the differences between pairs of data are non-normally distributed.

The hypothesis for the Wilcoxon Signed Rank Test is the following for the ROA (1) and the same hypothesis holds for the S/A (2):

$$H_0: \text{Median ROA}_{before} = \text{Median ROA}_{after} \quad (1)$$

$$H_a: \text{Median ROA}_{before} \neq \text{Median ROA}_{after}$$

H_0: Median S/A_{before} = Median S/A_{after} (2)

H_a: Median $S/A_{before} \neq$ Median S/A_{after}

This method enables to examine the effect of an IPO on the operating performance of an issuing company. Where ROA_{before} denotes one year prior to the IPO and ROA_{after} denotes one and three years after the IPO. This gives the opportunity to look at the effects on the longer term as is stated in Wang (2004). When the null hypothesis is not rejected at the 5 percent level, there is no significant difference in the ROA one year prior to the IPO and the year after or three years after the IPO. The same rejection mechanism holds for the S/A (2). When the p-value indicates that the null hypothesis is rejected, this suggests a significant difference in the ROA and S/A.

3.2.2 Regression

A regression is constructed to make a prediction about the effect of an IPO on the operating performance. First, it is important to determine which kind of regression is sufficient for this thesis. The Pooled Ordinary Least Squares (OLS) regression, Fixed Effects (FE) Model and Random Effects (RE) Model are considered.

The Pooled OLS regression applies multiple assumptions. The assumption for homoscedasticity and autocorrelation of the error term is researched. A violation of one of these two assumptions indicates a preference for one of the two FE and RE models. The normal distribution of the control variables is maintained for the variable size by taking the natural logarithm as is discussed later. The heteroscedasticity is researched by means of the Breusch-Pagan test. This test has the null hypothesis that the error term variances are all equal. This hypothesis is rejected at the p-value 0,05. This test gives a p-value of 0,000. Therefore, heteroscedasticity is present in this data set and in this type of regression. The assumption of no autocorrelation in the error term is researched by means of the Breusch-Godfrey test. The null hypothesis states that there is no autocorrelation in the error term of any order up to 8 years. This is because the period of the sample for the regression is from 2012 up to 2019. This test considers the residuals in a regression analysis. The null hypothesis is rejected at the p-value 0,05. Therefore, autocorrelation is present in this type of regression with this data set. This means that based on the test for heteroscedasticity and autocorrelation of the error term the RE and FE model are preferred for this data set.

To examine the RE and FE models the Hausman test is used. This test is used to assess whether the RE model or FE model is preferred. The null hypothesis is that the preferred model is the RE model. As is shown in table 3 the null hypothesis is rejected at the p-value level of 0,05. This means that there is significant prove to reject the null hypothesis and that the FE model is preferred.

Table 3: *Result for the Hausman (1978) specification test.*

	Coef.
Chi-square test value	15.371
P-value	.002

When performing the FE model the companies are assigned to different sectors based on SIC codes to assess whether a difference in sectors has an impact on the operating performance. The SIC code denotes the sector based on the 3 digits SIC code which divides the sample in 10 different sectors. This will control for any industry-specific deviations. According to Mikkelson et al. (1997), as is stated before the size of a company is significantly related to the operating performance after an IPO. A few years later Wang (2004) underlined this conclusion. Larger firms are associated with superior performance post-IPO to smaller firms. For this reason, the size of the firm is a control variable in the form of the natural logarithmic of the total assets, the LN[Total Assets]. Additionally, in line with Wang (2004) the leverage of a company is included as a control variable as well to control for possible leverage effects, this is the variable ''Lev''. This is in line with the paper of Jensen & Meckling (1976) that described that leverage has an impact on corporate governance. The companies with high debt to equity ratios are of interest for creditors to improve the performance of those companies. Altogether, the following regression for a company who issued an IPO is constructed (3):

$$\textit{Operating performance} = \beta_0 + \beta_1 IPO + \beta_2 SIC_i + \beta_3 ROA_t + \beta_4 Lev_t + \beta_5 Size_t + \varepsilon_{it} \quad (3)$$

By means of this regression an estimation can be made of the operating performance of a company post-IPO. The variables are summarized and defined in Table 4 and the descriptive statistics of the variables are described in Appendix A.

Table 4: *Definition of variables used in Wilcoxon signed rank test and the regression.*

Symbol	Variables	Definition
ROA	Return on assets	Aftertax income / total assets
S/A	Sales to assets	Total sales / total assets
SIC_i	Standard Industrial Classification	Three-digits Standard Industrial Classification for sector i
Lev	Leverage ratio	Total debt / total assets
Size	Size	Natural logarithm of total assets (in IPO year)

Results

The results, that are obtained from the Wilcoxon Signed Rank Test and regression, are discussed. Table 1, table 2 and Appendix A describe the data that is used in this thesis.

In Table 1 and Table 2 the data is described that is used in this thesis. It is very remarkable that the number of IPOs is much higher in the years 2014, 2015, 2016 and 2017. This increase is difficult to explain by means of literature as there is no clear indication stated in each of the researched papers and additional more recent literature. Still there are no double values in the data set. Therefore, conclusions are drawn cautiously based on this sample of the data. However, the Wilcoxon signed rank test does not assume a normal distribution and is sufficient for when the differences between pairs of data are non-normally distributed. Possible explanations for these large numbers of IPOs during those years are multiple listings on different stock exchanges and insufficient data.

In Table 5 the results of the Wilcoxon signed rank test are shown for each year companies issued an IPO. The table indicates the significance level of this difference existing of 1%, 5% or 10%. In Appendix B the same table is constructed. However, instead of indicating the information for each year, the sample is divided into several sectors based on the 3-digit SIC code. By means of the 3-digit SIC code there are 10 sectors distinguished and one residual category.

Table 5: *The difference between the median before an IPO and 1 year and 3 years after an IPO. * denotes a significance level of 10%. ** denotes a significance level of 5%. *** denotes a significance level op 1%.*

IPO Year		ROA		S/A	
		i=1	i=3	i=1	i=3
2012	Before	0,1232		0,8081	
	i years after	0,0582	0,0449	0,5255	0,4561
	z-Statistics	4,596***	5,919***	-2,225**	-1,217
2013	Before	0,0679		0,7756	
	i years after	0,0577	0,0403	0,6878	0,5224
	z-Statistics	2,731***	4,821***	3,828***	5,606***
2014	Before	0,0579		0,7398	
	i years after	0,0553	0,0418	0,5800	0,5720
	z-Statistics	6,697***	12,471***	17,07***	15,920***
2015	Before	0,0525		0,7793	
	i years after	0,0485	0,0366	0,6262	0,6262
	z-Statistics	8,613***	16,518***	22,171***	16,659***
2016	Before	0,0620		0,8480445	
	i years after	0,0515	0,0368	0,7714	0,7381
	z-Statistics	12,851***	17,385***	11,042***	12,141***
2017	Before	0,0638		0,8448	
	i years after	0,0442	0,0511	0,7363	0,5774
	z-Statistics	12,600***	12,701***	11,517***	14,523***
2018	Before	0,0574		0,8601	
	i years after	0,0452		0,7638	
	z-Statistics	5,876***		4,613***	
2019	Before	0,0693		0,7782	
	i years after	0,0686		0,4751	
	z-Statistics	6,683***		8,907***	
total		2,521***	2,201**	2,251***	2,201**

From Table 5 it can be deducted that for each year, except for 2012, a significant decline in the ROA and in the S/A has occurred, based on a significance level of 1%. This denotes a possible negative effect of an IPO for the operating performance of a company that issued an IPO in China.

Furthermore, the difference in the median is in most of the years greater 3 years after the IPO. This is indicated by the greater differences in the median and the higher z-statistics shown in the Table 4.

The difference in the median of the ROA and S/A by means of the different sectors is visualized in the appendices. Appendix B shows the difference for the sample divided in eleven different sectors. For the sectors Agriculture, Manufacturing, Retail Trade, Transportation and Services all the differences in the median of the ROA an S/A are significant at a significance level of 1%. These values indicate a severe decline in the ROA and S/A of a company in those sectors after an IPO is issued. The appendix indicates much lower values of the ROA and S/A three years after the IPO than one year after the IPO, as was the case in Table 5. The decline of the ROA and S/A is in line with Table 5 and the paper of Wang (2004) and Jain & Kini (1994). However, it is important to notice that these sectors have the most numbers of IPO's and the other sectors do not have the same levels of IPOs. This might has an effect on the significant decline in the ROA and S/A. It is not clear if one sector, with high levels of number of IPOs, does have a significant impact on the operating performance relative to another sector, that has lower levels of IPOs. Therefore, the results need to be interpreted with caution.

There are multiple explanations for the decline in the operating performance of a company that issued an IPO. Public companies need to share information, while a private company is not obliged to do so. As is stated in the underlying theory, going public is very expensive because of underpricing and the high underwriting costs of investment banks. Shareholders of public companies can hold the management accountable for the performance. As a consequence, conflicts of interest and agency costs can occur. Furthermore, It is likeable that the timing of an IPO is such that the financial statements of a company are favorable at that specific moment. All these factors can play a certain role in the decline in the operating performance after an IPO. The differences throughout multiple sectors can be explained by the fact that certain sectors are more sufficient for issuing IPOs than others, besides the quality of the data.

In Table 6 the results of the FE model of the operating performance are shown. Additionally, Appendix C and D show the Pooled OLS regression and RE model. The regression in Table 6 consists of the regression (3). As is shown in the Table, the Size has a significantly positive effect on the operating performance, which is in line with Mikkelson et al. (1997). According to this paper, the size of a larger firm was associated with post-issue operating performance. The Size has a significant positive effect on the operating performance which is in line with the expectation. Furthermore, the leverage has a significant negative effect on the ROA. This is not in line with Mikkelson et al. (1997) and Wang (2004) as they concluded that leverage had a significant positive effect on the change in

operating performance. This means that leverage should cause a positive grow of the operating performance. The dummy variables "IPO'' and ''SIC_i'' do not give sufficient information as they are not significant according to this data sample. Although the focus is mainly on the FE Model, the RE Model and the Pooled OLS regression do not give other information as is shown in Appendix C and D.

Table 6: *The Fixed Effect model for the operating performance expressed in ROA. IPO is a dummy variable and denotes the year in which the IPO was issued. Size denotes the size by means of the natural logarithmic of the Total Assets. Lev denotes the leverage by means of the total debt divided by the total assets. SIC_i is a dummy variable and denotes the sector based on the 3-digit SIC code. * denotes a significance level of 10%. **denotes a significance level of 5%. *** denotes a significance level op 1%.*

Regression results

ROA	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
IPO	-.003	.021	-0.16	.87	-.045	.038	
Size	.169	.011	15.72	0	.148	.191	***
Lev	-.285	.004	-66.54	0	-.293	-.276	***
SIC_Agr	-.057	.12	-0.48	.632	-.292	.178	
SIC_Min	-.079	.143	-0.55	.581	-.359	.201	
SIC_Con	-.053	.13	-0.40	.686	-.308	.203	
SIC_Man	-.051	.111	-0.46	.649	-.269	.168	
SIC_Tra	-.092	.114	-0.80	.421	-.315	.132	
SIC_Who	-.027	.113	-0.24	.809	-.249	.194	
SIC_Ret	-.128	.119	-1.07	.284	-.362	.106	
SIC_Fin	-.082	.123	-0.67	.504	-.323	.159	
SIC_Ser	-.044	.112	-0.39	.696	-.263	.176	
SIC_Pub	-.018	.175	-0.10	.918	-.361	.325	
o	0	.	.	.	.	.	
Constant	-.529	.12	-4.41	0	-.763	-.294	***

Mean dependent var	0.019	SD dependent var	1.856
R-squared	0.076	Number of obs	57503
F-test	363.989	Prob > F	0.000
Akaike crit. (AIC)	229737.627	Bayesian crit. (BIC)	229863.061

**** p<.01, ** p<.05, * p<.1*

Conclusion

In this thesis the effect of an IPO on the operating performance of a company is researched. There are already multiple papers about this subject like Wang (2004) and Jain & Kini (1994). Both papers found a negative effect of an IPO on the operating performance of a company in the period after an IPO. However, this thesis aims to give a current view on the effect of an IPO in China as these papers mentioned before discussed outdated samples. The motives for an IPO are discussed and the dis- and advantages are examined. For instance, an IPO can ensure liquidity and it can overcome borrowing constraints. On the other hand, an IPO is very expensive, and a public company needs to share information. In addition, agency costs can get very high as the shareholders are able to hold the management accountable for their performance.

The results in section 4 state in most of the cases a significant negative effect of an IPO on the ROA and the S/A of a company. This is shown in the decline in the median of the ROA and S/A after an IPO. This decline is more severe three years after the IPO which indicates a stronger effect on the longer term. This is in line with the first hypothesis. The results divided per sector, as shown in Appendix B, are less clear. A possible reason is the enormous difference in the distribution of number of IPOs in different sectors. Therefore, it is difficult to compare the results from different sectors. However, in Appendix B the decline after three years is more severe than after one year, which coincides with Table 4. Furthermore, in Table 4 and Appendix B the ROA seems to react more on the IPO than the S/A as the difference in the median is more evident for the ROA.

The regression in Table 6 shows that the variables Size and Leverage have a significant effect on the operating performance of a company. The variable Size has a significant positive effect on the operating performance. This is in line with the second hypothesis based on Mikkelson et. al (1997) and Wang (2004). This is explained by the association that larger firms are superior in operating performance. Larger companies are often more established and issue an IPO under more certainty. Furthermore, the leverage has a significant negative effect on the operating performance. This is not in line with the third hypothesis based on Mikkelson et. al (1997) and Wang (2004). This hypothesis is based on the argument that high leverage stands for better monitoring associated with superior performance. The negative significant effect can be explained by the argument that companies with high leverage are more likely to issue an IPO when the situation is not optimal.

Based on the results it can be concluded that the IPO has a significant negative effect on the operating performance of a company. This effect is more severe three years after the IPO than one year after the IPO. The conclusions on differences in operating performance throughout different sectors should be drawn cautiously. The regression shows that larger companies who issue an IPO perform superior and that companies who issue an IPO with higher leverage perform inferior.

However, this thesis could obtain some improvement on certain aspects. First, the sample is limited to companies who issued an IPO in the period from 2012 to 2019. This is due to the database Orbis which only contains information about companies up and until 10 years ago. Secondly, the data is not normally distributed throughout the years and there no valid explanations that can be found for this observation. The large numbers of IPOs in certain years cannot be explained by the literature or other economic events. This could be explained by multiple listings or insufficient data. Furthermore, the financial indicators used in this thesis are limited to the ROA and S/A while there are other indicators to describe the operating performance of a company. So, it is recommended to add additional financial indicators to assess a company's performance in further research. For further research it will be interesting to examine the influence of difference in type of ownership on the operating performance of a company around an IPO. The data provided by Orbis for type of ownership was not sufficient to include in the regression constructed in Table 6 because of too much lacking variables. Additionally, there are other variables that can be included in the regression to give a better prediction for the change in operating performance. Further research can focus more on the difference in sectors of companies as no clear conclusions are drawn from that table because of the differences in distribution.

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Appendix

A Descriptive table

Descriptive statistics for the operating performance which denotes the ROA. The Size is the natural logarithm of the total assets, the Lev is the total debt divided by the total assets. As the variables IPO and SIC_i are dummy variables, these are left out of the tables.

Summary statistics

	Mean	Median	Min	Max	Skewness	SD
ROA	.02	.049	-329.000	96.266	-130.49	1.714
Size	4.324	4.241	-0.844	9.24	.85	.756
Lev	.392	.37	-0.005	342.5	177.214	1.501

Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
ROA	68857	.02	1.714	-329	96.266
Size	70056	4.324	.756	-.844	9.24
Lev	81151	.392	1.501	-.005	342.5

B Difference in operating performance for each sector

*The difference between the median before an IPO and 1 year and 3 years after an IPO. * denotes a significance level of 10%. **denotes a significance level of 5%. *** denotes a significance level op 1%.*

Sector	**number of IPOs**		**ROA**		**S/A**	
			i=1	i=3	i=1	i=3
Agriculture	305	Before	0,0587		0,6137	
		i years after	0,0500	0,0248	0,5136	0,4159
		z-statistic	4,034***	7,786***	6,454***	7,171***
Mining	79	Before	0,0507		0,7404	
		i years after	0,0459	0,0359	0,6465	0,5280
		z-statistic	1,3060	2,935***	2,179**	3,156***
Construction	146	Before	0,0395		0,8975	
		i years after	0,0357	0,0229	0,7346	0,6833
		z-statistic	1,688*	3,232***	5,119***	4,587***
Manufacturing	5565	Before	0,0561		0,7867	
		i years after	0,0528	0,0412	0,6612	0,6337
		z-statistic	13,930***	20,595***	25,900***	23,256***
Transportation & Public Utilities	918	Before	0,0611		0,7713	
		i years after	0,0456	0,0297	0,6556	0,6217
		z-statistic	6,464***	8,951***	6,343***	7,450***
Whole Sale Trade	1268	Before	0,0580		0,8604	
		i years after	0,0564	0,0359	0,7441	0,6917

		z-statistic	7,856***	10,684***	11,515***	10,328***
Retail Trade	340	Before	0,0577		1,0968	
		i years after	0,0470	0,0259	0,9181	0,8455
		z-statistic	3,796***	5,035***	3,885***	3,951***
Finance, Insurance & Real Estate	290	Before	0,0719		0,8963	
		i years after	0,0695	0,0353	0,7491	0,7101
		z-statistic	1,2670	2,658***	3,381***	2,284**
Services	2990	Before	0,0748		0,8899	
		i years after	0,0541	0,0352	0,7665	0,7152
		z-statistic	14,160***	17,917***	14,871***	1,4356***
Public Administration	37	Before	0,0542		0,8172	
		i years after	0,0487	0,0373	0,7321	0,7616
		z-statistic	1,5320	1,3810	1,1160	-0,0370
Others	60	Before	0,0466		1,1925	
		i years after	0,0249	0,0684	0,6243	0,5028
		z-statistic	1,1830	-0,4470	1,859*	0,4470

C Pooled OLS Regression

*The Pooled OLS regression for the operating performance expressed in ROA. IPO is a dummy variable and denotes the year in which the IPO was issued. Size denotes the size by means of the natural logarithmic of the Total Assets. Lev denotes the leverage by means of the total debt divided by the total assets. SIC_i is a dummy variable and denotes the sector based on the 3-digit SIC code. * denotes a significance level of 10%. **denotes a significance level of 5%. *** denotes a significance level op 1%.*

Linear regression

ROA	Coef.	Robust St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
IPO	.021	.014	1.51	.132	-.006	.049	
Size	.15	.062	2.42	.016	.028	.271	**
Lev	-.284	.115	-2.47	.014	-.51	-.058	**
SIC_Agr	-.03	.034	-0.89	.375	-.096	.036	
SIC_Min	-.053	.04	-1.33	.184	-.132	.025	
SIC_Con	-.029	.034	-0.86	.392	-.095	.037	
SIC_Man	-.028	.031	-0.89	.375	-.088	.033	
SIC_Tra	-.07	.048	-1.46	.145	-.163	.024	
SIC_Who	-.003	.03	-0.10	.924	-.061	.055	
SIC_Ret	-.104	.092	-1.13	.26	-.285	.077	
SIC_Fin	-.068	.074	-0.91	.361	-.213	.078	
SIC_Ser	-.024	.039	-0.61	.545	-.101	.053	
o	0	.	.	.	.	.	
SIC_Other	.002	.03	0.08	.934	-.056	.061	
Constant	-.47	.267	-1.76	.079	-.994	.054	*

Mean dependent var	0.019	SD dependent var	1.856
R-squared	0.075	Number of obs	57503
F-test	1.870	Prob > F	0.028
Akaike crit. (AIC)	229810.972	Bayesian crit. (BIC)	229936.406

*** p<.01, ** p<.05, * p<.1

D Random Effect Model

*The Random Effect Model for the operating performance expressed in ROA. IPO is a dummy variable and denotes the year in which the IPO was issued. Size denotes the size by means of the natural logarithmic of the Total Assets. Lev denotes the leverage by means of the total debt divided by the total assets. SIC_i is a dummy variable and denotes the sector based on the 3-digit SIC code. * denotes a significance level of 10%. **denotes a significance level of 5%. *** denotes a significance level op 1%.*

Regression results

ROA	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
IPO	.021	.02	1.06	.291	-.018	.06	
Size	.15	.01	14.38	0	.129	.17	***
Lev	-.284	.004	-66.50	0	-.293	-.276	***
SIC_Agr	-.032	.12	-0.27	.788	-.267	.203	
SIC_Min	-.056	.143	-0.39	.697	-.336	.224	
SIC_Con	-.031	.13	-0.24	.81	-.287	.224	
SIC_Man	-.03	.111	-0.27	.788	-.248	.188	
SIC_Tra	-.072	.114	-0.63	.527	-.296	.151	
SIC_Who	-.005	.113	-0.05	.962	-.227	.216	
SIC_Ret	-.107	.119	-0.89	.372	-.341	.127	
SIC_Fin	-.07	.123	-0.57	.569	-.311	.171	
SIC_Ser	-.026	.112	-0.24	.814	-.246	.193	
SIC_Pub	-.002	.175	-0.01	.989	-.345	.34	
o	0	.	.	.	.	.	
Constant	-.467	.119	-3.91	0	-.701	-.233	***

Mean dependent var	0.019	SD dependent var	1.856
Overall r-squared	0.075	Number of obs	57503
Chi-square	4685.881	Prob > chi2	0.000
R-squared within	0.076	R-squared between	0.026

**** p<.01, ** p<.05, * p<.1*