

Research on the Impact of Private Equity on the Business Performance of GEM Listed Companies

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Abstract: Private Equity (PE) refers to the use of non-public fundraising (private placement) to invest funds in non-listed company equity or invest funds in non-public offerings of listed company stocks. PE institutions promote the growth and development of the company by providing funds, technical support and improving corporate governance, and consider the exit methods and mechanisms in the future implementation of the transaction process, and PE can gain profit by helping target companies to go public, mergers and acquisitions, management buybacks, etc. 107 companies listed on the GEM are used as research samples of this paper, and 107 annual cross-sectional data of 2017 are used for OLS regression and robustness test to obtain the qualitative impact of PE on GEM listed companies. The research results show that the existence of PE has a positive impact on the company's business performance. Finally, the paper proposes corresponding policy suggestions for PE development from the government, private equity investment institutions and enterprises.

1. Introduction

With its rich social resources, extensive business network, rich management investment experience and high level of financing, PE institutions have grown and become an important financing channel for SMEs. There are two main reasons why PE can develop rapidly in the domestic market. On the one hand, since the reform and opening up of China, the rapid development of the economy has created a group of high-net-worth investors who are actively looking for legal high-return and high-risk diversified investment channels, while the high risk and high return of PE are consistent with their risk-reward preferences. On the other hand, institutional investors have a large amount of idle funds in their account, and they can use PE to increase the efficiency of idle funds. By the end of 2017, most companies listed on the GEM have the support of PE institutions. Whether the large-scale PE market will have a positive impact on the operation and development of GEM listed companies is worthy of further discussion. At this time, it is of great theoretical and practical significance to deepen the research on the impact of PE on the business performance of GEM listed companies.

2. Review of Literature

2.1. Private equity investment has a positive impact on the business performance of the invested company

Chesini, Giusy and Giaretta^[1] found that companies with the support of PE tend to have higher business performance and development capabilities after IPOs than companies without the support of PE. Through research, Scellato G, Ughetto E^[2] found that PE provides enterprises with value enhancement and promotes high-speed and good development by providing rich enterprise management experience, market-oriented operational experience and legal support. Zhao Wenshu^[3] conducted empirical research on the listed companies of China's GEM, and the results show that the involvement of PE has played a positive role in the business performance of GEM

listed companies. Wang Liangliang^[4] studied the IPO listed enterprises in China from 2013 to 2017, and the results showed that PE has a positive effect on the operating performance of enterprises, and the higher the shareholding ratio of PE is, the longer the shareholding period is, and the better the business performance of the enterprise is.

2.2. Private equity investment has no impact on the business performance of the invested company

Rosa S, Velayuthen G and Walter^[5] used the main board market of Australia as a research object to study the impact of private equity on the invested companies' business performance, and found that the existence of PE did not affect the performance of companies. Zhao Yan and Lu Ying^[6] selected SME listed companies as research samples, and the empirical results showed that there was no significant difference in business performance between enterprises with PE and those without. Duan Xinsheng^[7] conducted research on SME listed companies as the research object, and came to the same conclusion.

2.3. Private equity investment has a negative impact on the business performance of the invested company

Wang C K, Wang K, Lu Q^[8] took listed companies in Singapore as the research object to study the role of PE before the IPO of enterprises, and the results show that the profit growth rate of enterprises with PE support is higher than those without PE support, but the rate of return on net assets and total assets is lower, therefore PE is negatively correlated with corporate performance. Caselli S, Ippolito Fa, Carcia-Appendini E^[9] found that PE participation reduced corporate profits. Ma Xiang^[10] used empirical analysis to study the impact of PE on company value, and the results show that the performance of enterprises with the support of PE is not better than those without PE.

3. Development Status of Private Equity Investment

First of all, the domestic PE market is becoming more and more active. Since the development of China's PE in the 1990s, the scale of financing has gradually expanded. Besides, PE funds of foreign occupy a large proportion in the Chinese market. Foreign capital of developed countries and regions has developed for many years and accumulated rich experience, and the scale and cost of raising funds are in a leading position, while China is still in a relatively primary stage for the time being. Therefore, foreign private equity investment is currently relatively high in China. What's more, the sources of funding in China is still relatively single, not as extensive as those in developed countries and regions. Therefore, China needs to broaden the sources of funding and make the threshold entry more reasonable. Finally, in the past, the exit method of PE was based on the initial public offering (IPO), but it is mainly based on mergers and acquisitions(M&A) at the present.

4. Theoretical Analysis of Private Equity Investment

4.1. Private equity investments have opened up new sources of financing for the company

Due to the high threshold of bank loans, China's small and medium-sized enterprises are difficult to finance. PE is relatively less restrictive and has a lower threshold for small and medium-sized enterprises, so it provides a new way for small and medium-sized enterprises to obtain the fund. After the company obtains the support of PE, it does not have the pressure to repay the principal and interest. Instead, it can devote all its energy to improving the operation and competitiveness, so that the capital can play its advantages and its service or technology can quickly occupy the market.

4.2. Private equity investment helps companies optimize governance structures

PE can help the invested company identify industry development opportunities and identify key growth drivers for the business. Start-up SMEs usually have a single shareholding structure, and the founders have strong business capabilities in the industry, but the experience of corporate

governance is not sufficient. PE can help enterprises improve corporate governance, improve the shareholding structure, assist in standardizing the company's financial management and other systems, improve the structure of directors and supervisors, provide legal, financial and tax advice for enterprises, and promote enterprise development. In addition, private equity investment can promote entrepreneurship, because entrepreneurial private equity firms can leverage their long-term expertise, management experience and business models to help companies regulate their legal affairs and improve their financial problems. Only by standardizing legal affairs and financial issues at the beginning can the standardization be constantly improved, it is beneficial to the further introduction of talents and funds, and in the long run, it is conducive for enterprise to go public.

5. Empirical Study of the Impact of Private Equity Investment on the Business Performance of GEM Listed Companies

5.1. Variable selection

In order to accurately analyze the impact of PE on the business performance of GEM listed companies in recent years, 107 companies listed on the GEM are used as research samples, and 107 annual cross-sectional data of 2017 are used for OLS regression and robustness test to obtain the qualitative impact of PE on GEM listed companies.

When selecting variables, the net profit rate of the GEM listed companies is taken as the explanatory variable, which represents the operating performance of the listed company. Whether the GEM listed company has the support of PE is taken as an explanatory variable, if the enterprise has PE, then $PE=1$; if not, $PE=0$.

The definition of whether GEM listed companies have PE support is as follows: First of all, the definition of PE in this paper is broad. PE makes equity investment in unlisted companies through various stages of startup, growth, expansion, and maturity through private equity. Second, as long as one of the top ten shareholders of a listed company is a PE institution, it is determined that the listed company has PE participation in the shareholding, otherwise there is no PE participation in the shareholding. In addition, the PE studied in this paper must invest in the company before the IPO. Third, the PE and GEM listed companies studied in this paper are non-related parties.

5.2. Data description

The relevant data in this paper is mainly from the Resset Database, Choice financial terminal and the Zero2IPO Research Center, and the PE-related explanatory variables are obtained by reviewing the periodic reports of listed enterprises. To ensure the reliability and measurability of the data, the following GEM listed enterprises were excluded from the research sample: enterprises with incomplete data, enterprises with negative net profit, enterprises with negative owner equity and financial enterprises. After careful screening, 107 qualified GEM enterprises were obtained, and the number of listed companies with PE were 88, which was accounting for 82% of the total; the number of listed companies without PE were 19, which was accounting for 18% of the total.

5.3. Descriptive statistics

Table 1 shows the descriptive statistics of the GEM listed companies, it can be seen that the average net profit rate of 107 GEM listed companies is 17.82%.

According to Table 2, the average net profit rate of sample companies with PE was 18.73%, and the average net profit rate of sample companies without PE was 13.64%. Through descriptive statistical comparison of the two tables, it is found that the average net profit rate of listed companies with PE participation is higher than that of listed companies without PE. Compared with the listed companies without PE, the listed companies with PE also perform better in return on net assets (ROE) and total return on assets (ROA). It indicates that listed companies with PE perform better.

Table 1 2017 GEM listed company variable descriptive statistics.

Variable	Total sample			
	Mean	Sd.	Min	Max
net	0.1782	0.0957	0.0402	0.5415
ROA	0.0882	0.0301	0.0366	0.2067
ROE	0.1574	0.0646	0.0676	0.6042
PE	0.8224	0.3839	0	1
scale	11.0268	7.4363	3.4089	51.1181
year	15.2991	5.4793	6	32
top10	0.7287	0.0602	0.4350	0.8662
lev	0.2281	0.1197	0.0420	0.6176
tato	0.7226	0.2561	0.2413	1.8318
rst	4.8836	5.8666	0.8379	47.7484
Observations	107			

Table 2 2017 GEM listed company sample variable descriptive statistics.

Variable	Listed companies with PE				Listed companies without PE			
	Mean	Sb.	Min	Max	Mean	Sb.	Min	Max
net	0.1873	0.0907	0.0843	0.5415	0.1364	0.1088	0.0402	0.4257
ROA	0.0904	0.0286	0.0366	0.2067	0.0778	0.0352	0.0381	0.1954
ROE	0.1599	0.0661	0.0676	0.6042	0.1462	0.0574	0.0883	0.3212
PE	1	0	1	1	0	0	0	0
scale	10.9168	7.5333	3.5891	51.1181	11.5361	7.1425	3.4088	30.2291
year	15.1591	5.4137	6	32	15.9473	5.8829	8	32
lev	0.2176	0.1117	0.0420	0.5155	0.2769	0.1450	0.0476	0.6175
tato	0.6846	0.2139	0.2413	1.2355	0.8986	0.3545	0.3885	1.8318
rst	4.2986	4.1511	0.8379	29.0555	7.5927	10.4868	1.9940	47.7483
Observations	88				19			

5.4. Regression analysis and econometric model

To verify the results of the analysis, the following regression models were set based on the selected variables, explanatory variables, and control variables selected above:

$$net_i = \alpha PE_i + \beta_1 \ln scale_i + \beta_2 \ln year_i + \beta_3 top10_i + \beta_4 lev_i + \beta_5 tato_i + \beta_6 rst_i + \varepsilon_i \quad (1)$$

In the model above, net is the net profit rate of the listed company, which represents the operating performance of the company. PE represents whether the listed company has the dummy variable of private equity investment. If so, PE=1; otherwise, PE=0. Scale is the total assets of the listed company, indicating the scale of company; year is the establishment period of the company, indicating growth stage of the company. Top10 is the total shareholding ratio of the top ten shareholders, indicating the degree of equity concentration of the listed company; lev is the asset-liability rate of the listed company, and represents the solvency of the company; tato is the total asset turnover rate, and rst is the inventory turnover rate, which represents operating capacity of the company; i represents different GEM listed companies, α and β_i represent coefficients to be estimated, and ε represents random disturbance terms.

107 annual cross-sectional data of 2017 are used for OLS regression in this paper, and the regression results are shown in the following Table 3:

According to the regression results, at a 5% confidence level, the net profit rate (net) as the explanatory variable is positively correlated with PE. The coefficient of PE is 0.0632, indicating that the existence of PE has increased the net profit rate of GEM listed companies by 0.0632

percentage points. The addition of PE has indeed played a positive role in the business performance of the GEM listed companies, this is because PE institutions not only bring the required funds for enterprises, but also provide comprehensive value-added services by improving the corporate governance structure, establishing incentive mechanisms, expanding potential business, improving management teams and so on. This is consistent with the results of the analysis.

Table 3 Impact on the business performance (net profit rate) of GEM listed companies: OLS+ robust standard error in large sample.

Variable	Coefficient	Sb.	P
PE	0.0632**	0.0194	0.006
lnscale	0.0127*	0.0142	0.026
lnyear	0.0113*	0.0172	0.046
top10	0.293**	0.0999	0.004
lev	-0.293***	0.0691	0.000
tato	-0.182***	0.0320	0.000
rst	-0.0000209	0.00146	0.389
_cons	0.113	0.118	0.340
N	107		
Adjusted R ²	0.518		

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

5.5. Robustness test

In order to further verify the robustness of the regression results, the return on net assets (ROE) and total return on assets (ROA) of GEM listed companies were used as explained variables in this paper, and sensitivity analysis was conducted through the method of "OLS + stable standard error". The regression model is as follows:

$$ROA_i = \alpha PE_i + \beta_1 \ln scale_i + \beta_2 \ln year_i + \beta_3 top10_i + \beta_4 lev_i + \beta_5 tato_i + \beta_6 rst_i + \varepsilon_i \quad (2)$$

$$ROE_i = \alpha PE_i + \beta_1 \ln scale_i + \beta_2 \ln year_i + \beta_3 top10_i + \beta_4 lev_i + \beta_5 tato_i + \beta_6 rst_i + \varepsilon_i \quad (3)$$

Table 4 Impact on the business performance (ROA, ROE) of GEM listed companies: OLS+ robust standard error in large sample.

Variable	Original model	Sensitivity analysis	
	Explained variable	Explained variable	Explained variable
	net	ROA	ROE
PE	0.0632**	0.0291*	0.0326***
lnscale	0.0127*	0.0090	0.024*
lnyear	0.0113*	0.0039*	0.0017
top10	0.293**	0.125***	0.229**
lev	-0.293***	-0.105***	-0.0479*
tato	-0.182***	0.030**	0.077***
rst	-0.00209	-0.0010	-0.002
_cons	0.113	-0.0240	-0.107
N	107	107	107
Adjusted R ²	0.518	0.278	0.153

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

According to Table 4, the participation of PE increased the total return on assets (ROA) of GEM listed companies by 0.0291 percentage points, and increased the return on equity (ROE) by 0.0326

percentage points. The empirical results show that the participation of PE has a positive impact on the total return on assets (ROA) and return on equity (ROE) of GEM listed. In other words, PE has indeed improved the operating performance of GEM listed companies to a certain extent. This is consistent with the empirical results of the model (1).

In addition, all the non-virtual continuous variables in the sample data were processed with Winsorize of 1% and 99%, and the model (1) was regressed again. According to the results in table 5, there was no difference in the main research conclusions.

Table 5 Impact of PE on the performance (net interest rate) of the GEM listed companies (robustness test).

Variable	Coefficient	Sb.	P
PE	0.0213**	0.0185	0.004
lnscale	0.0268	0.0141	0.061
lnyear	-0.0027	0.0168	0.874
top10	0.314**	0.0844	0.007
lev	-0.295***	0.0710	0.000
tato	-0.1831***	0.0315	0.000
rst	-0.0019	0.0012	0.095
_cons	0.109	0.122	0.374
N	85		

Table 5 Impact of PE on the performance (net interest rate) of the GEM listed companies (robustness test) (Continued).

Variable	Coefficient	Sb.	P
Adjusted R ²	0.537		

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Based on regression results after processing Winsorize, that the results of the model are robust, and PE does play an active role in the business performance of GEM listed companies. Combining the above normative qualitative empirical analysis, we have come to the conclusion that PE plays a positive role in the business performance of GEM listed companies.

6. Analysis Conclusions and Policy Suggestions

6.1. Analysis conclusions

In recent years, China's PE market has developed rapidly. The rapid development of PE plays an important role in improving China's capital market, promoting the optimal allocation of Chinese social resources, and stimulating social vitality, corporate vitality, especially the vitality of SMEs. In this context, this paper conducted an empirical study on 107 companies listed on GEM in 2017, and deeply analyzed the impact of PE on the operating performance of GEM listed companies. Normative qualitative research and empirical quantitative research are comprehensively applied to analyze and find that PE plays a positive role in the operation performance of GEM listed companies obviously. PE not only brings the required capital to the enterprise, but also has a very huge added value.

6.2. Policy suggestions

6.2.1. Policy suggestions at the government level

On the one hand, whether the government can create a good market environment and formulate reasonable and standardized policies is the key to the development of the PE industry. The government should provide a better market environment and policy environment, ensure the legal compliance of the investment process, ensure that enterprises expand financing channels and

promote industrial upgrading through policy support. On the other hand, the government should ensure the healthy development of the PE market environment through reasonable legislation and supervision, fully protect the legitimate rights, interests of investors and invested enterprises, guide and exert the positive impact of PE on the economy and society effectively.

6.2.2. Policy suggestions at the private equity institution level

Compared with foreign developed countries, the development of Chinese private equity investment institutions is not mature. Domestic institutions should summarize the successful experience of absorbing foreign PE institutions' investment operations, introduce foreign talents, strengthen their own construction, and improve the level of capital operation. At the same time, the state-backed PE institutions should continue to play its leading role, improve professional competence and expand reputation and influence of them. Besides, investment institutions should focus on catering to the policy orientation of the state and the government, and investing in industries encouraged by national industrial policies actively. PE institutions must abide by relevant state regulations on investment and other aspects, and all their businesses should be based on legal compliance.

6.2.3. Policy suggestions at the enterprise level

Business managers need to understand the government's determination to develop a multi-level capital market. If the enterprise wants to achieve good long-term development, they depend on external capital to a large extent. When enterprises are determined to raise funds through private equity, they should give priority to private equity investment institutions with good background and rich experience, reduce their own costs of choice and improve efficiency of development. Financial enterprises should not only make full use of private equity funds, but also actively carry out the transformation and improvement of themselves, explore the resource allocation of investment institutions continuously, and learn from the professional knowledge of PE institutions to comprehensively improve their own strength and improve business performance effectively.

References

- [1] Chesini, Giusy, Giaretta. (2013) What is the impact of private equity investments on economic performance and on the growth of enterprises in the local economy? *Rivista Bancaria-Minerva Bancaria*, 3, 7-36.
- [2] Scellato,G Ughetto,E. (2013) Real effects of private equity investments: Evidence from European buyouts. *Journal of Business Research*, 2, 2642-2649.
- [3] Zhao Wenshu. (2016) Empirical Study on the Correlation between Private Equity Investment and the Value of Listed Companies on the GEM. Capital University of Economics and Trade.
- [4] Wang Liangliang. (2018) Research on the Impact of Private Equity Investment on Business Performance. Beijing Jiaotong University.
- [5] Rosa,R.S. , Velayuthen, G. &Walter. (2003) The share market performance of Australian Venture capital backed and non-venture capital backed IPOs. *Pacific-Basin Finance*, 1, 197-218.
- [6] Zhao yan, Lu ying. (2009) The relationship between venture capital and the operating performance of listed companies—Taking China's SME board listed companies as a sample.*Scientific and Technological Progress and Countermeasures*, 23, 108-111.
- [7] Duan Xinsheng, Lan Yuying. (2011) Empirical Analysis of the Market Effect of Private Equity Investment—Based on the Data of SME Board Listed Companies. *Finance and Accounting Monthly*, 36, 31-34.
- [8] Wang C K, Wang K, Lu Q. (2003) Effects of venture capitalists' participation in listed companies. *Journal of Banking & Finance*, 10, 2015-2034.

[9] Caselli S, Garcia-Appendini E, Ippolito F. (2013) Contracts and returns in private equity investments. *Journal of Financial Intermediation*, 2, 201-217.

[10] Ma Xiang. (2013) Private Equity Investment Characteristics, IPO Underpricing and Business Performance-Empirical Study Based on China's Growth Enterprise Market. *Accounting and Finance*, 03, 14-21.