# Research on the Impact of Private Equity Investment on the Growth of Innovative SMES

## Based on NEEQ Innovation Layer Data

Yichun Chen

Division of Business and Management, Beijing Normal University-Hong Kong Baptist University United International College, Zhuhai, Guangdong, 519087, China

*Corresponding author. Email: p930024023@mail.uic.edu.cn

**Abstract.** This paper selects 711 listed enterprises in the innovation layer of NEEQ from 2016 to 2020 as research samples to study the impact of PE participation in investment with its participation degree and investment background on enterprise business performance and innovation ability. Through multiple regression analysis, the following conclusions are drawn: PE investment has a significant negative impact on return on assets (ROA) of enterprises at the innovation layer of NEEQ, and has a significant positive effect on TIR of enterprises' technology investment ratio. Compared with private PE, PE with state-owned background has no significant improvement effect on ROA, and PE with state-owned background has no significant impact on the TIR.

**Keywords:** Private equity investment; innovative small and medium-sized enterprises; NEEQ1.

# 1 Introduction

## 1.1 Research background

Since the concept of venture capital was first introduced in China in 1984, with the development of the securities market and the gradually abundant liquidity of the market, various forms of private equity investment activities continue to emerge, and the scale of private equity investment (PE) continues to grow. By the end of 2021, registered private funds managed 19.78 trillion RMB, according to statistics from the China Securities Investment Fund Association. The main targets of PE in China are small and medium-sized enterprises in the growth stage. In recent years, the mainstream direction of investment is mainly concentrated in IT, biotechnology/medical health, semiconductor and electronic equipment, and other fields.

The National SME Share Transfer System, also known as the "New Third Board", is a trading platform for listed non-listed companies to conduct equity financing, transfer, mergers and acquisitions and other activities. Compared with the Shanghai and Shenzhen markets, the listing threshold is lower. In recent years, under the influence of

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institutional structure, market demand and other factors, NEEQ has witnessed the increase of active delisting companies, the decrease of financing amount and the inactivity of transactions. The fundamental reason is that the institutional arrangement of market financing and transaction is difficult to meet the market demand of the majority of small and medium-sized enterprises, which makes the overall financing efficiency of the market low.

Therefore, with the continuous growth of the size of small and medium-sized enterprises, their financing needs also increase accordingly, and it is urgent for PE to intervene to help enterprises finance and develop.

### 1.2 Research significance

From a theoretical perspective, there are few studies on the impact of PE on the development of NEEQ enterprises, and most of the existing literature is about the relationship between PE and other sectors of the market. This paper can further enrich the research on the innovation layer of NEEQ.

From the practical point of view, studying the impact of PE on the development of NEEQ enterprises can, on the one hand, provide reasonable bases and suggestions for private equity institutions to make investments, optimize investment structure and improve post-investment management level. On the other hand, it can provide some reference and guidance for NEEQ enterprises in terms of whether to accept investment, operation and management decisions, etc.

## 2 Theoretical basis and literature review

### 2.1 Theoretical basis

About theoretical bases, mainly involves the principal-agent theory, signaling theory, surplus management theory, by theory, including PE under principal-agent theory and signaling theory to the influence of enterprise development has positive effect, while in earnings management theory and the theory of PE by name to the influence of enterprise development has a negative effect. From the principal-agent theory, PE effectively alleviates principal-agent problems by setting incentive and constraint mechanisms for enterprise management, thus promoting enterprise performance [1][2]. From the perspective of signal transmission theory, PE improves enterprise value by transmitting positive signals to the market [3]. From the perspective of earnings management theory, PE will carry out earnings management by window-dressing accounting information when it exits or reduces its holdings for the benefit maximization, thus overvaluing the enterprise [4][5]. From the perspective of the per-name theory, PE will whitewash and falsify corporate financial statements in order to enhance its popularity, which is not conducive to the true reflection of corporate value.

### 2.2 Literature review

As for the impact of PE on the growth of enterprises, Wang Rong (2012) studied the impact of PE on technology-based SMEs from the perspectives of capital institutions and corporate governance, and the results showed that PE could better promote the development of technology-based SMEs [6]. Zhao Feng (2013) compared the enterprises with PE investment and found that the enterprises with PE investment had better growth [7]. Hu Yaqin (2017) investigated the impact of PE on the development of gem enterprises, and the results show that PE can actively promote enterprise performance [8]. Xu Jun (2019) investigated the impact of PE on NEEQ enterprises, and the results showed that PE could achieve the growth of SMEs through positive influence on enterprise scale, profitability level and income quality, and the longer the listing life of NEEQ enterprises, the more significant the impact of PE [9]. Yu Meifei and Chen Jing (2019) investigated the impact of PE on SMEs listed on Shenzhen Stock Exchange, and the results showed that PE participation in investment could better promote enterprise growth, and the deeper PE participation, the more significant the impact [10].

While studying the impact of PE on the growth of enterprises, scholars at home and abroad also consider the different impact of different PE participation degree and characteristic background. Smolarski and Kut (2011) found that the increase of PE co-investment to a certain extent can promote corporate performance, but the excessive amount of PE co-investment can lead to a decentralized ownership structure, which is not conducive to the growth of enterprises [11]. Lin Lu Tang and Tan Yi (2015) found that PE joint investment can increase the possibility of successful withdrawal or reduction of PE holdings, but does not affect the growth of enterprises [12]. Tang Yunshu and Tan Yi (2008) found a positive correlation between PE shareholding ratio and enterprise growth by investigating enterprises on the Gem in Hong Kong [13]. Calantone and Zhao (2001) found a negative correlation between PE shareholding ratio and enterprise growth by comparing Chinese, American and Korean joint ventures [14]. The third is the influence of PE characteristic background on the growth of enterprises. Zhu Hongwei and Chen Cheng (2014) found that PE with state-owned background can positively affect the growth of enterprises by positively affecting corporate governance [15]. Li Jiujin et al. (2015) found that PE with state-owned background can significantly improve the value of the invested enterprises [16]. Xu Ziyao et al. (2015) found that compared with state-owned PE, non-state-owned PE can effectively promote the use of free cash flow, achieve rational allocation and use of investment, and thus promote the better growth of enterprises [17].

### 2.3 Summary

In general, most scholars believe that PE can growth play a positive role to the enterprise, but about PE participation, the characteristics of the PE background for the influence of the enterprise has not yet been determined, and the most mature is the main board, the gem listed companies as the research object, NEEQ listed on the growth of small and medium-sized enterprise perspective to examine the research to the enterprise growth is less PE. Based on this, this paper focuses on the impact of PE on the performance and innovation of enterprises listed on NEEQ.

# 3 Theoretical mechanism analysis of the impact of private equity investment on NEEQ enterprises

## 3.1 Development process and current situation of private equity and NEEQ

The development process of Private equity investment in China is mainly divided into three stages. The first stage is the embryonic stage (1992-1998). The first wave of investment started to emerge, and some overseas funds entered the Chinese market for investment. The second stage is the initial stage (1999-2008), in which the market gradually becomes active and the number of active institutions increases significantly. The third stage is the development period (2009-present), in which the survival of the fittest in the market accelerates and a new round of “ranking competition” of institutions is born.

Therefore, after the initial exploration and rapid development stage, China’s private equity industry towards standardized development. The development of private equity investment is highly related to macroeconomic situation and policy environment. From 2011 to 2021, the investment amount increased from 256. 191 billion RMB to 1,422.870 billion RMB, with an annualized growth rate of 18.7%. The number of investment cases increased from 2,200 to 12,327, with an annualized growth rate of 18. 8%. In terms of investment industry distribution, the top investment sectors are mainly IT, biotechnology/healthcare, semiconductor and electronic equipment, Internet, and machinery manufacturing, which have concentrated 70% of the investment scale. In terms of the distribution of investment regions, the top regions are Beijing (291.72 billion RMB), Shanghai (2,802.29 billion RMB), Shenzhen (143.942 billion RMB), Jiangsu (186.136 billion RMB), Zhejiang (95.022 billion RMB), Guangdong (excluding Shenzhen) (118.769 billion RMB). Most of the investment is concentrated in Beijing, Shanghai, Guangzhou, Shenzhen and Jiangsu and Zhejiang regions. In terms of investment withdrawal, there were 4,532 withdrawal cases of equity market investment in 2021, up 18.0% year on year. The continuous promotion of registration system reform and the opening of the Beijing Stock Exchange are the main reasons for the increase in the number of withdrawal cases of China’s equity investment market.

In terms of the development of NEEQ, the pilot project was started in Zhongguancun, Beijing in 2006, the national share-conversion companies were officially inaugurated in 2013, and the layered system reform was started in 2016, which was divided into the basic layer and the innovation layer. In 2019, the comprehensive reform was started to deepen, and the selected layer was established on the basis of the innovation layer, and the Beijing Stock Exchange was established in 2021. From the perspective of the development scale, since the expansion of NEEQ in 2013, by the end of 2020, the total number of listed companies has reached 8,187, including 41 listed companies of the selected layer, 1,138 listed companies of the innovation layer and 7,008 listed companies of the basic layer. The listed companies have raised tens of thousands of financing times with a total amount of about 530 billion RMB. In terms of industry categories, major manufacturing enterprises account for nearly half, followed by information transmission, software and information technology service enterprises. It can be found that high-end manufacturing, information technology and other industries are important directions for the future development of China's industries. In terms of regional distribution, listed enterprises are mostly concentrated in Beijing, Shanghai, Guangzhou, Shenzhen and Jiangsu and Zhejiang regions, and it is expected that the development focus will still be concentrated in these regions in the future.

### 3.2 Theoretical mechanism analysis of the impact of private equity investment on NEEQ enterprises

**Positive impact analysis.**

First, we will alleviate information asymmetry and principal-agent problems. Considering the company's management and the information asymmetry between the investors and the interests of the different orientation makes certain principal-agent problems, to some extent, and PE intervention can reduce the conflicts of interest between management and investors, strengthen supervision over enterprises and effective restraint of company management, so as to promote enterprise to achieve better development.

The second is to transmit positive signals to promote enterprise value recognition. China's capital market information disclosure is still not sufficient, especially for SMEs located in NEEQ. Most of them are not strong enough in profitability, and some of them lack accuracy and integrity in accounting information disclosure, and major issues are not clear. The problem of information asymmetry is serious and enterprise value is difficult to be recognized. Through professional project screening and financial analysis, PE can discover high-quality enterprises in NEEQ and follow up investment, which is equivalent to providing enterprises with a "certification role" that can rapidly develop and maintain sustainable operation. If the PE involved in the investment is more famous or has a state-owned background, the certification may be stronger, and more conducive to the increase of enterprise value.

Third, reduce financing costs to promote enterprise innovation. Small and medium-sized enterprises are always facing the problem of financing difficulty in the growth period, especially small and medium-sized high-tech enterprises. From the perspective of the direct financing of small and medium-sized high-tech enterprises such as market value, profitability index could not reach the requirements of main board listing, most can only choose listed on NEEQ, and NEEQ because setting a higher threshold for investors, the capital scale and investment experience have certain requirements, lead to lack of market liquidity, low volume. Therefore, even if enterprises choose to list on NEEQ, it is actually difficult to solve the financing problem. From the perspective of indirect financing, SMEs in NEEQ are difficult to obtain loans from banks and other financial institutions due to their small scale, poor profitability and inadequate risk resistance. In addition, some enterprises have financial irregularities and incomplete information disclosure. Therefore, under the circumstance that both direct and indirect financing are limited, most enterprises can only rely on internal financing and self-financing to support their own development.

Compared with banks and other financial institutions, PE companies have a more aggressive risk appetite and are more willing to provide funds to small and medium-sized enterprises. Therefore, for PE, SMEs are important investment targets, and enterprise listing is the main exit channel. For enterprises, if they choose to obtain debt financing such as loans from banks, they will have to bear the pressure of repayment of principal and interest at the end of the period, which is a test for their profitability and cash flow. However, if equity financing is obtained from PE, it does not need to bear repayment pressure, which in fact reduces the financing cost. In addition, equity financing is long-term capital support, which is more conducive to enterprises' rational use of funds and making correct business decisions. For small and medium-sized high-tech enterprises, they can invest the obtained funds in research and development to improve their core competitiveness and achieve long-term sustainable development. Therefore, PE is also an important financing channel for small and medium-sized enterprises.

The fourth is to provide post-investment management services to promote enterprise value. After participating in the investment, PE will provide enterprises with post-investment management services. Generally speaking, there are three objectives: first, to control risks, second, to provide value-added services, and third, to do a good job in exit management. To be specific, risk control mainly lies in monitoring financial, legal and key departments of the company, such as signing agreements to constrain behaviors before investment, checking financial statements regularly or directly appointing financial directors, and focusing on monitoring financial, storage and procurement departments. In addition to risk monitoring, PE will also provide various value-added services for the investee, such as docking resources. PE's industrial and social resources are potential partners for the investee, who have opportunities to develop into upstream and downstream customers. Since PE has a deep understanding of the enterprise's strategic planning, advantages and disadvantages, development bottlenecks and key projects during the preliminary due diligence, it can help enterprises better coordinate and integrate resources. In addition, PE can also provide human resources, bring in talented personnel with professional backgrounds and rich experience, provide suggestions for enterprises' business decisions, optimize strategies, help standardize corporate governance, and constantly improve corporate governance. Finally, as a professional investment expert, PE institutions are familiar with various forms of exit, such as IPO, merger and acquisition, backdoor listing, asset injection and so on. PE will provide various guidance for enterprises to go public, standardize management of enterprises according to listing standards, and promote the enterprise value improvement.

**Negative impact analysis.**

First, it requires enterprises to carry out earnings management, which is not conducive to the sustainable operation of enterprises. As the overall valuation of IPO in China is high, PE companies often require earnings management in order to maximize their investment returns and obtain financing with a high valuation. For SMEs located in NEEQ, the financial system is not standardized, and the lack of an internal audit system also leads to more common earnings management. PE, as the shareholder participating in the investment, has a certain degree of understanding of the existence of earnings management in the enterprise and has realized the high valuation of the enterprise. Therefore, PE institutions tend to exit early after the IPO success to obtain high returns. Even some PE companies themselves are short-term surprise investment enterprises, to help the invested enterprises to carry out earnings management, improve the profit index for capital appreciation, in order to obtain high issue prices and excess profits. These PE are often eager to pursue performance to obtain exit earnings and market reputation, so once the listing lock-up period expires, they will quickly reduce their holdings to cash out of the market. It is also an important reason for the performance of some enterprises after IPO changes. Such behavior is not only not conducive to the sustainable operation of enterprises, but also will damage the interests of small and medium investors.

Second, the small start-up PE scale is small, lack of talent, lack of experience. As a professional investment team, PE employees need a comprehensive knowledge system, including macroeconomic analysis, industry research, financial analysis, etc., and even industrial working experience, because it is difficult to fully understand an industry only by relying on standard industry research. Due to the short development history of private equity in China, the industry related training is not perfect, and the outstanding talents with professional investment analysis ability and industrial experience are still insufficient. And, just as funds and projects will be concentrated in the head of PE, excellent practitioners will also be concentrated in the head, resulting in small and medium-sized, start-up PE development difficulties. Due to the small capital scale, lack of talent, lack of investment experience, etc., small start-up PE may have a limited or even negative effect on the improvement of enterprise value.

Third, there are many risks in the betting agreement. PE investment also tends to sign a betting agreement with the enterprise. For the financing party, that is, the invested enterprise, the matching agreement can easily obtain financing and solve the problem of capital shortage. If the matching conditions are met according to the agreement, the cost of capital is relatively low. However, there are also potential risks in betting agreements that should not be ignored. First, set unrealistic performance targets. PE to reduce risk and profit may be set a too high profit target, was cast enterprise blindly optimistic, ignore the performance requirement and the actual operation situation of the gap, when the deal is about to expire, eager to expand, to give up before the steady operation strategy, it amplifies the immature business model and the development strategy of the error, is not conducive to the continuing operations of the enterprise. Second, window-dressing and counterfeiting. In order to obtain high valuation financing or to meet the profit requirements of the gambling agreement, some enterprise managers will even whitewash and falsify the financial statements, which will lay hidden dangers in the future. Third, neglect control. As an investor, PE often arranges senior executives to the management of the company to interfere in the daily operation and management of the company and affect the independence of the control right of the company. Investors and investee enterprises on the business strategy of different opinions will be contradictory, hindering the development of the company. In addition, there are situations in which the actual controller of the company is given control of the company when the performance of the betting agreement is not up to the standard, resulting in the company changing hands.

# 4 Empirical analysis of the impact of private equity investment on NEEQ enterprises

## 4.1 Research design

**Research hypothesis.**
Does PE participate in the relationship between investment and the development of NEEQ enterprises?
What is the relationship between state-owned PE and NEEQ enterprises?

**Variable description.**
As for the explained variables, this paper selects return on assets (ROA) and the ratio of technical personnel (TIR) as indicators to measure the operating level and innovation ability of enterprises respectively. As for explanatory variables, this paper selects whether PE participates in investment (PE1) and whether PE has a state-owned capital background (PE2). If PE participates in investment, PE1 is 1; otherwise, it is 0. If PE is state-owned, PE2 is 1; otherwise, it is 0. As for the control variables, this paper selected enterprise SIZE (SIZE), ownership concentration (TOP10), asset operation efficiency (ATR), enterprise debt level (LEV), enterprise competitiveness (GPR) and other indicators.

## 4.2 Model building

In order to verify the impact of PE's participation in investment on the development of NEEQ enterprises, this paper constructed the model as follows:

ROA = beta. 0+ beta. 1PE1 + beta. 2The SIZE + beta. 3Top 10 + beta. 4The ATR + beta. 5LEV + beta. 6GPR + epsilon (1)

ROA = beta. 0+ beta. 1PE2 + beta. 2The SIZE + beta. 3Top 10 + beta. 4The ATR + beta. 5LEV + beta. 6GPR + epsilon (2)

In order to verify the relationship between STATE-OWNED PE and the development of NEEQ enterprises, this paper constructed the model as follows:

TIR = beta. 0+ beta. 1PE + beta. 2The SIZE + beta. 3Top 10 + beta. 4The ATR + beta. 5LEV + beta. 6GPR + epsilon (3)

TIR = beta. 0+ beta. 1PE2 + beta. 2The SIZE + beta. 3Top 10 + beta. 4The ATR + beta. 5LEV + beta. 6GPR + epsilon (4)

## 4.3 Data sources

In this paper, enterprises at the innovation layer of NEEQ from 2016 to 2020 are selected as the objects of investigation. Taking into account the zero R&D cost in agriculture, forestry, animal husbandry and fishery industries, the financial industry with different accounting standards, and the availability of data, 711 enterprises are finally selected, among which 493 are invested by PE. The data is mainly from the wind database, and the processing software is Stata.

**Analysis of empirical results.**

*Descriptive statistics.*

Based on Stata software, descriptive statistical results of sample data are shown in the following table.

**Table 1.** Descriptive statistical results

| Variable | Observations | The mean | The standard deviation | The minimum value | The maximum |
|---|---|---|---|---|---|
| ROA | 3555 | 9. 940 | 10. 71 | 60. 47 | 77. 80 |
| TIR | 3555 | 30. 16 | 21. 81 | 0. 540 | 92. 53 |
| PE1 | 3555 | 0. 693 | 0. 461 | 0 | 1 |
| PE2 | 3555 | 0. 0295 | 0. 169 | 0 | 1 |
| SIZE | 3555 | 8. 249 | 0. 430 | 6. 782 | 11. 09 |
| TEN | 3555 | 87. 47 | 12. 33 | 32. 27 | 100. 0 |
| ATR | 3555 | 0. 993 | 1. 049 | 0. 0385 | 17. 66 |
| LEV | 3555 | 37. 99 | 18. 15 | 0. 140 | 98. 57 |
| GPR | 3555 | 7. 795 | 28. 01 | 779. 8 | 111. 6 |

*Multiple regression analysis.*

As shown in Table 2, models (1) and (2) are given respectively for ROA and TIR cases involved in PE investment be explained variable, the result of the influence on the development of NEEQ enterprise model (3) and (4) are given respectively for ROA and TIR be explained variable cases PE background characteristics on the impact of NEEQ enterprise development results.

According to Model (1) and Model (2), the regression coefficients of PE1 on ROA and TIR are -0.835 and 4. 770, which are significant at the level of 10% and 1%, respectively, indicating that PE investment has a significant negative impact on enterprise ROA, but has a significant positive impact on enterprise TIR. According to Model (3) and Model (4), the regression coefficient of PE2 on ROA is 1.903, indicating that state-owned PE has a positive effect on enterprise ROA compared with private PE, but does not pass the significance test. Similarly, the regression of PE2 to TIR did not pass the significance test. PE state-owned background has no significant effect on the ROA and TIR of NEEQ enterprises.

As for the phenomenon that PE investment has a negative effect on the ROA of NEEQ enterprises, this paper believes that it should be considered from the following perspectives:

(1) In more mature market sectors, such as China's main board, small and medium board and growth enterprise board, due to the difficulty of listing and high threshold, the overall quality of the company is relatively good, and most of the participating PE investors are large scale and well-known large PE. In contrast, the listing threshold of NEEQ is relatively low, the company's own profitability is poor, and the PE companies investing in NEEQ rarely appear in the list such as The Annual Ranking of China's Equity Investment Institutions. Therefore, different types of PE may have different financial strengths and management levels, and the situation of NEEQ and other plates cannot be generalized.

(2) According to the provisions of China's accounting standards, the capitalized part of the treatment of R&D expenses shall be amortized in the following years, and the expensed part shall be included in the current profit and loss, which will affect the enterprise's net profit and lead to the reduction of net profit. Especially for small and medium-sized high-tech enterprises in the growth stage, compared with mature enterprises, the early R&D investment of small and medium-sized enterprises will significantly increase the cost of enterprises. For example, there are a large number of biopharmaceutical enterprises in the sample, and it takes pharmaceutical enterprises 15 years on average to develop new drugs. The R&D transformation efficiency of SMEs is relatively low, and R&D investment may lag behind to some extent even if it has a positive impact on enterprise performance.

In the case that PE state-funded background has no significant impact on NEEQ enterprises, state-owned PE may not play the certification role as assumed, but bring disadvantages such as low efficiency and insufficient innovation vitality, while private PE may be more aggressive in research and development. The regression results also showed that, compared with private PE, the regression coefficient of state-owned PE on enterprise ROA was positive, and the regression coefficient on TIR was negative. However, the regression could only be carried out in the sample with PE investment, and the sample size was not large enough, leading to insignificant results. In addition, the ownership structure of PE in this paper does not distinguish whether PE is state-owned shareholding, state-owned capital holding or wholly state-owned, etc. These kinds of control strengths are different. In the ownership structure of enterprises, there is no distinction between non-PE shareholders and state-owned backgrounds. These may have a certain impact on the regression results, which is also one of the limitations of this study and needs to be further studied.

**Table 2.** Analysis of the impact of PE participation in investment and PE background on the development of NEEQ enterprises

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| PE1 | 0. 835<br>* | 4. 770<br>* * * | | |
| | (0. 479) | (0. 771) | | |
| PE2 | | | 1. 903 | 7. 496 |

| | | | | |
|---|---|---|---|---|
| | | | (1. 306) | (6. 108) |
| SIZE | 1. 172 ** | 10. 35 *** | 1. 154 ** | 10. 07 *** |
| | (0. 525) | (1. 015) | (0. 525) | (1. 017) |
| TEN | 0. 103 *** | 0. 0964 *** | 0. 104 *** | 0. 0964 *** |
| | (0. 0159) | (0. 0312) | (0. 0159) | (0. 0313) |
| ATR | 2. 285 *** | 0. 972 *** | 2. 270 *** | 1. 049 *** |
| | (0. 190) | (0. 373) | (0. 191) | (0. 375) |
| LEV | 0. 103 *** | 0. 127 *** | 0. 102 *** | 0. 139 *** |
| | (0. 0109) | (0. 0216) | (0. 0109) | (0. 0216) |
| GPR | 0. 177 *** | 0. 0144 | 0. 177 *** | 0. 0127 |
| | (0. 00516) | (0. 0129) | (0. 00516) | (0. 0130) |

# 5 Conclusion

## 5.1 Research conclusions

In this paper, 711 listed enterprises on the innovation layer of NEEQ from 2016 to 2020 are selected as research samples to study the influence of PE participation in investment and its participation degree and investment background on enterprise business performance and innovation ability. Through multiple regression analysis, the following conclusions are drawn: PE investment has a significant negative impact on ROA of enterprises at the innovation layer of NEEQ, and has a significant positive effect on TIR of enterprises' technology investment ratio. Compared with private PE, PE with state-owned background has no significant improvement effect on ROA, and PE with state-owned background has no significant impact on the TIR.

## 5.2 Policy Suggestions

**For PE institutions and industries.**

Optimize the investment structure to better serve small and medium-sized high-tech enterprises. China's equity investment is facing two major difficulties, one is the lack of high-quality targets, the other is the lack of exit channels. Now, the comprehensive deepening of the reform of NEEQ has provided PE with new opportunities. The enterprises that can be selected to the selected layer are basically small and medium-sized high-tech enterprises with strong profitability or innovation ability. If the target company is selected and listed for one year, it can apply for listing on the board, which is equivalent to more than one exit channel for PE. Future PE can be layout in NEEQ all levels, including the base layer, innovation, and select the layer, is both beneficial to optimizing the investment structure of PE internal, but also to provide targeted to different levels of enterprise investment and financing service, more important is can excavate potential opportunities, hatching high-tech enterprises and main board listed company in the future.

Improve post-investment management and provide long-term capital support. At present, the domestic economy is facing transformation and the development of various industries is gradually mature. Among the four links of "raising, investment, management and withdrawal", there are three dilemmas: "raising is difficult", "investing is difficult" and "withdrawing is difficult", so post-investment management has become an important part of the competition between PE institutions. High-quality post-investment management can improve the strength of PE institutions and build brand advantages, which can not only improve the fundraising ability and project acquisition ability of PE, but also enhance the value of the invested enterprises, improve the exit situation of PE, and improve the overall income. Do a good job in post-investment management, build a post-investment team, define strategies, strengthen the daily supervision and management of enterprises, such as paying attention to the financial statements of enterprises, and providing various value-added services for enterprises, including but not limited to introducing excellent enterprise management talents and providing listing guidance. In addition, PE should not only pay attention to the growth of enterprises, but also pay attention to profitability, improve the core competitiveness of enterprises. To do a good job in long-term post-investment management, not to cater to the market, chasing short-term performance to manipulate the enterprise, to avoid the phenomenon of "name by name".

Vigorously supporting the development of private PE companies. PE in China can be divided into four categories according to the investment background: private, state-owned, foreign and joint venture. From the perspective of investment types, the state-owned investment committee represented by Shenzhen Venture Capital Co, Ltd. cooperated with local government guiding funds to invest in government-supported enterprises. The M&A group represented by Hony and Hopu mainly helps large enterprises to carry out industrial integration, while the foreign venture capital group represented by Sequoia and Jingwei focuses on an early investment in technological innovation. In the stage of sorting out the data, it is found that there is almost no foreign-funded and joint-venture PE in the research sample of this paper, and there are also few large state-owned PE. Therefore, most of the support for China's small and medium-sized enterprises in the growth stage is domestic private PE. According to the regression analysis of state-owned PE in this paper, state-owned PE cannot significantly improve the operating performance and innovation ability of NEEQ enterprises. It can be seen that there is no significant difference between private PE and state-owned PE in serving SMEs located in NEEQ. Therefore, in order to serve SMEs well and meet their financing needs, the development of private PE needs should be strongly supported at the moment of the comprehensive deepening of the reform of NEEQ.

Strengthen supervision and improve information disclosure mechanism. In the process of registration and filing, PE companies engaged in lending or indirectly engaged in lending activities, which do not conform to the nature of the investment, shall not be put on record. For a private fund manager, it is not allowed to register if the ownership structure and actual controller are not specified, and the manager is urged to actively fulfill relevant obligations and responsibilities. We will accelerate legislation related to private equity funds, combine supervision with self-discipline, improve the information disclosure mechanism, and promote the healthy and orderly development of the private equity investment industry.

**Enterprises at the innovation level of NEEQ.**

Enterprises at the innovation level of NEEQ should speed up the transformation of research and development achievements and build the core competitiveness. In this paper, the regression analysis results show that the PE investment and joint investment on NEEQ layer of enterprise technology innovation ratio of TIR has a significant positive effect, can provide enterprises with research and development, improve the enterprise research and development strength, promotes the transformation of scientific and technological achievements of the enterprise, form the competitive advantage, promote the sustainable development of small and medium-sized high-tech enterprises. More importantly, enterprises should improve the efficiency of transformation of R&D achievements, accelerate the formation of patented technologies and intellectual property rights, and gradually turn them into main business income and net profit. After all, the fundamental purpose of enterprise operation is to maximize profits. As mentioned above, PE participation in investment has a significant negative effect on the short-term return on assets (ROA). However, this paper does not advocate enterprises should not introduce PE investment for profit, but should divide it into short-term and long-term perspective. It is possible that the short-term goal of some innovative enterprises and PE companies in the sample is to expand research and development so as to be selected into the selected layer smoothly, but in the long run, they still need to find a stable profit model and build the core competitiveness of the enterprise, which is the fundamental of sustainable operation.

**Comprehensively deepen the reform of NEEQ.**

To do a good job in the reform of the significance of publicity. Since 2018, the market sentiment of NEEQ has not been high. Due to the increase of deep-adjustment delisting companies and the decrease of the number of newly listed companies, the market is facing an embarrassing situation with sluggish trading and insufficient liquidity. In order to support the development of small and medium-sized enterprises and the private economy, deepening reform has been launched in an all-round way. In order to change the public's inherent impression, we should do a good job of publicity, comprehensively introduce the five reform directions, strengthen information disclosure, improve the exit mechanism, let qualified investors widely participate in the investment, so as to make the securities market truly recognized.

To realize NEEQ and PE industry development to promote each other, both to steadily push forward NEEQ to deepen reform, strengthen the status of the multi-level capital market system in China, and to actively promote the development of the private equity industry, optimize the internal structure of investment, increase investment in NEEQ in each level, improve the investment layout.

## References


1. Lu Hujun. Research on reverse agency in private equity Fund governance [J]. Modern Management Science, 2007(12):3.
2. Wang Guangkai, ZHANG Tao, Hong Min. Research on the promotion effect of private equity investment on enterprise growth [J]. Modern Management Science, 2017 (7): 18 to 20.
3. Chemmanur T., Loutskina E., Tian X. Corporate venture capital, value creation, and innovation[J]. Social Science Electronic Publishing, 2011, 27(8): page. 2434-2473.
4. Darrough M., Rangan S. Do Insiders Manipulate Earnings When They Sell Their Shares in an Initial Public Offering? [J]. Journal of Accounting Research, 2005, 43 (1): 1-33.
5. Qin Luohan, Zheng Jianming. PE shares and earnings management behavior before and after IPO -- from gem listed companies Economic and management research,2016,37(03):137-144.
6. Wang Rong. Research on the effect of private equity financing for technology-based SMEs [D]. Tianjin University of Technology,2012.
7. Zhao F. Research on the impact of private equity fund participation on enterprise growth [D]. Jinan University,2013.
8. Hu Y Q. Empirical analysis of the impact of private equity fund participation on the performance of gem enterprises [J]. Financial via Economy, 2017 (22): 94-96.
9. Xu J. The impact of private equity investment funds on the growth of SMEs: Based on the data of NEW Third Board enterprises from 2011 to 2016 [J]. Journal of Beijing technology and business university (social science edition),2019,34(03):74-83.
10. Yu Meifei, Chen Jing. Research on the impact of venture capital on enterprise growth: Based on the nature of enterprise ownership and Northern Finance,2019(12):26-36.
11. Smolarski, Kut C. The Impact of Venture Capital Financing Method on SME Performance and Internationalization[J]. International Entrepreneurship and Management, 2011:39-55.
12. Tang L L, Tan Y. Research on joint investment performance of Chinese venture capital institutions -- an empirical study from China's IPO market [J]. Journal of Fudan University (natural science),2015,54(03):336-342.
13. Tang Yunshu, Tan Yi. Venture capital, IPO timing and business performance: Empirical evidence from Hong Kong ge[J]. Systems Engineering-Theory & Practice,2008(07):17-26.
14. Calantone R. J., Zhao Y. S. Does venture capital novation? [M]. Entrepreneurial inputs and outcomes: New studies of entrepreneurship in the United States. Emerald Group Publishing Limited, 2001:1-44.
15. Zhu H W, Chen C. Private equity investment and corporate governance: An empirical study based on gem listed companies [J]. Journal of Guangdong University of Finance and Economics, 2014,29(01):62-72+80.
16. Li Jiujin, Wang Fusheng, Xu Chang. The impact of private equity investment characteristics on the value of investee enterprises: Based on the empirical data of IPO enterprises from 2008 to 2012 [J]. Nankai management review,2015,18(05):151-160.
17. Xu Ziyao, ZHENG Fang, XING Jie. The Impact of private equity investment on overinvestment behavior of listed companies: Based on innovation Journal of financial economics, 2015, 30(03):73-82.

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