

Study on the impact of registration system on GEM enterprise valuation

Lu Youju

*School of Economics and Management, Guangxi Normal University, Guilin, 541006, China
luyouju1226@163.com*

Abstract: *The landing of registration system in GEM is an important measure of China's securities market reform. Using this exogenous event, the daily price-earnings ratio of 50 GEM, Small and medium-sized composite index and Shanghai Composite Index from January 1, 2019 to December 31, 2021 as samples, the differential differential model is used to test the impact of registration system on GEM valuation. The research results show that: After the implementation of GEM registration system, the GEM enterprise valuation index has further improved. This indicates that the registration system may bring the disadvantage of valuation premium. Based on this, in order to enable China's capital market to operate sustainably and stably, this paper puts forward the following suggestions: First, improve the information disclosure supervision system and enhance the awareness of the responsibility of information disclosure subjects; Second, strengthen the investor protection mechanism and enhance the risk prevention ability; Third, promote the comprehensive construction of the registration system and increase the supply of GEM companies.*

Keywords: *registration system; GEM; Corporate valuation*

1. Introduction

With the continuous deepening of capital market reform and the continuous development of China's stock market, Shenzhen Stock Exchange launched the GEM in 2009. However, due to the problems in the approval system, such as easy to breed power rent-seeking, deviation in the accuracy of material review, low efficiency of issuance and review, and constraints on the optimal allocation of stock market resources, the IPO bubble of GEM was spawned and intensified (Chen Jianli, 2015)^[1]. Therefore, in order to promote the steady and healthy development of China's capital market, China introduced the stock issuance registration system: In July 2019, the science and Technology Board was officially established in Shanghai Stock Exchange, and the registration system was piloted; In August 2020, the GEM board implemented the registration system reform; In November 2021, the Beijing Stock Exchange officially established and put the registration system into full operation, and China's market mechanism has gradually improved. The full implementation of the stock issuance registration system reform can optimize resource allocation by using market tools, improve investment and financing efficiency, reduce capital cost, promote innovative enterprises to achieve high-quality development through the capital market, and ultimately achieve the purpose of promoting the real economy by using financial capital (Zhang Xiaoyan, 2023)^[2]. Most of the GEM enterprises are in emerging industries and high-tech fields, and the market has high growth expectations for these companies, which are expected to achieve high profit growth in the future. However, the information disclosure of these companies is often insufficient and transparent, making it difficult for investors to accurately assess their true value, resulting in generally high valuations. In addition, investors' expectations for GEM companies are too high, leading to valuations being pushed up. Investors chase companies with high valuations and hope to earn high returns by investing in the short term, thus pushing up the overall corporate valuation level. The valuation of enterprises plays an important role in the activities of the financial market, which has a significant impact on investment decisions, financing decisions, acquisitions and mergers, market evaluation and guidance, etc. Therefore, does the reform of the registration system affect the valuation of GEM enterprises? Will it further deepen the phenomenon of premium valuation of GEM enterprises? These are further analyzed and tested.

This paper takes the GEM to implement the registration system reform policy as an opportunity to study its impact on enterprise valuation. Because the GEM companies in China have the dual characteristics of "growth" and "innovation". The enterprises listed on the GEM have outstanding main

business, moderate scale, broad product market space, high market recognition, and great potential for sustained growth. Therefore, the implementation of the registration system policy not only promotes the listing efficiency of GEM, but also strengthens the requirements for corporate information disclosure and accelerates the survival of the fittest, thus generating valuation premium for leading enterprises or some industries (Wang Yueya, 2020)^[3]. However, it is difficult to measure the impact of the registration system on GEM in a specific way. Therefore, this paper makes registration as an exogenous event, from the perspective of the valuation changes of GEM listed companies, conducts a comparative analysis of the valuation of GEM listed companies before and after the registration system, and uses the differential method to test its impact on GEM enterprise valuation, which not only meets the requirements of quasi-natural experiment, but also has certain theoretical and practical significance.

The contributions of this paper are mainly concentrated in three aspects: First, deepen the understanding of the reform of registration system on the valuation behavior of enterprises, and reveal its mechanism. The registration system reform can significantly optimize the market's price discovery function, reduce the IPO underpricing rate (Wang Zining and Wang Yuetang, 2023)^[4] and improve the quality of information disclosure of IPO companies (Zhou Yousu and Yang Zhaoxin, 2015)^[5], which has been unanimously recognized by scholars. However, there are few researches on the impact of registration system on enterprise valuation. Therefore, this paper discusses the impact of registration system reform on enterprise valuation by constructing a model, trying to reveal the mechanism of registration system on enterprise valuation, and show the microeconomic consequences of registration system reform. Second, expand the research boundaries of the factors affecting enterprise valuation. Most of the existing researches on enterprise valuation focus on macro policy factors and institutional changes, and there is a lack of starting from the reform of registration system. The full implementation of the registration system is a practical action to unswervingly follow the road of modern capital market with Chinese characteristics. Starting from the micro stock market, the discussion on the impact of environmental changes brought by the reform on enterprise valuation is helpful to provide useful enlightenment for the research on investor behavior, financial market efficiency, corporate governance and market supervision. Thirdly, we use the differential method to investigate the changes of the registration system reform on the GEM enterprise valuation. The existing literature is mainly studied through time series or cross-sectional data. This paper adopts the differential method to investigate the changes of registration system reform on enterprise valuation, avoiding the endogenous problem and the "one-size-fits-all" approach, and can better reveal the impact of the deepening of registration system reform on enterprise valuation.

2. Theoretical analysis and research hypothesis

The impact of the full implementation of the registration system on enterprise valuation is mainly reflected in the following aspects:

First, the impact on the valuation needs of listed companies. The registration system requires enterprises to disclose information before listing, including financial reports, business situation, risk tips, etc., which increases the valuation demand of the estimated market value and the valuation demand involved in information disclosure (Fu Xiangfei et al., 2022)^[6], which helps investors to have a more comprehensive understanding of the situation of enterprises, improve investment confidence in GEM enterprises, and thus increase their valuation.

Second, it makes the market play a greater role in resource allocation and increases the importance of valuation (Hao Yuanyuan, 2020)^[7]. The registration system eliminates the lock-up period of stock issuance, increases the trading flexibility of the secondary market, further promotes investor participation and trading activity, and also improves the liquidity of GEM enterprises, thus helping to raise their valuations.

Third, promote the relationship between price, value and supply and demand into a normal track, and promote the formation of value investment concept and medium - and long-term investment concept (Zhang Bei, 2021)^[8]. The registration system reform encourages investors to invest in medium - and long-term value rather than short-term trading, which means that investors pay more attention to the fundamentals and long-term development potential of enterprises rather than short-term profit fluctuations, and this shift may lead to the stabilization of the P/E ratio of enterprises and more reasonable valuations.

Fourth, it has an impact on the application process and scope of valuation methods (Gao Xinrui,

2019)^[9]. Under different IPO systems, factors affecting enterprise valuation have different characteristics in terms of importance. The implementation of the registration system makes the market more important for risk pricing, and investors will pay more attention to the company's profitability, growth and risk situation, and take more different situations into consideration in the valuation model.

Fifth, the issuance pricing should be more rational to reduce the wild fluctuations of valuation or stock price without reason (Wu Xihao and Zhang Chi, 2024)^[10]. The implementation of the registration system improves the pricing efficiency of the market, which can play a positive guiding role in the overall valuation of enterprises. The overall trend of liquidity premium will decrease, resulting in the acceleration of A-share expansion, constantly lowering the overall valuation, and eventually the average valuation level of the international market will be consistent (Wan Naijia, 2021)^[11].

Sixth, reduce the value of the company's "shell resources" (Shi Haotian et al., 2021)^[12]. In the stock market as a whole, with the advancement of the registration system reform, the value of "shell resources" of listed companies in the stock market will show a downward trend. This means that the companies that previously relied on "shell resources" to obtain the listing qualification will face greater market competition pressure. From the perspective of individual stocks, with the normalization of delisting, small-market listed companies will gradually lose the special value brought by shell resources. This will not only prompt these companies to pay more attention to their own business and profitability, but also increase the market's attention to the company's quality and investment value.

Based on the above analysis, this paper puts forward research hypothesis H1: The landing of registration system on GEM will increase the valuation of GEM enterprises.

3. Empirical research design

3.1. Sample selection and data source

Since the GEM will implement the registration system from August 24, 2020, this paper sets the data from August 24, 2020 to December 31, 2021 as the sample period after implementation, and the data from January 1, 2019 to August 23, 2020 as the sample period before implementation. According to the previous literature, this paper refers to the practices of Wang Zilin (2021) and Chen Bimei (2021), takes the GEM 50 index and the small and medium-sized board composite index rolling P/E as the research object, and takes the Shanghai Composite index that has not implemented the registration system as the virtual processing group.

The GEM 50 Index: includes 50 representative companies on the GEM market and is used to reflect the overall performance of the GEM market.

Small and medium-sized Composite Index: represents the overall performance of a package of stocks in the small and medium-sized board market, reflecting the performance of small and medium-sized enterprises in China's securities market, usually including GEM enterprises, and these enterprises may be more susceptible to macroeconomic policies, changes in the capital market and other factors.

Sse Index: It consists of a certain number of A-share company stocks selected by the Shanghai Stock Exchange and is used to reflect the performance of the overall stock market of the Shanghai Stock Exchange.

The data used in this article comes from the flush iFinD database. STATA17.0 is used to complete all data processing operations in this paper.

3.2. Model setting

In order to test the impact of the registration system on the valuation of GEM enterprises, this paper takes the GEM 50 affected by the registration system as the representative of science and technology innovation enterprises, which is also the experimental group of this paper, and the small and medium-sized composite index and Shanghai Stock Exchange Index which have not implemented the registration system as the control group. The differential difference model is used to conduct empirical research, so as to minimize the endogeneity problems caused by sample selection bias.

$$PE = \beta_0 + \beta_1 Treat_i + \beta_2 Post_t + \beta_3 Treat_i \times Post_t + \epsilon_{i,t} \quad (1)$$

In formula (1), $i=1,2,\dots$ Representing different plates, $t=1,2,\dots$ For different times; $Treat_i$ for the group dummy variable, if i can be affected by the registration system, the value is 1, for the experimental group, otherwise the value is 0, for the control group; $Post_t$ is the time dummy variable, if after the GEM registration system pilot, the value is 1, otherwise the value is 0; $\epsilon_{i,t}$ Represents the random error term $\beta_0, \beta_1, \beta_2, \beta_3$ and represents the regression coefficient. β_3 Regression coefficient is the main research object and focus of this paper, indicating that the reform of registration system can significantly improve the valuation of enterprises. $\beta_3 > 0$ The dependent variable of the model, PE, is the rolling price-earnings ratio of the index, and the independent variable of the model $Treat_i \times Post_t$ is the dummy variable of whether the company is affected by the registration system reform. If the experimental group is affected by the registration system reform, the value is 1; otherwise, the value is 0.

4. Empirical analysis

4.1. Descriptive statistics

Table 1 reports the descriptive statistics of the main variables in this paper. As can be seen from Table 1, during the sample period, the PE average of GEM 50 index is 54.23, PE average of Small and medium composite index is 27.38, PE average of Shanghai Composite Index is 12.82. At the same time, compared with the price-to-book ratio PB, the PB index of GEM 50 is also higher than that of small and medium composite index and Shanghai Composite Index. We can see that no matter PE or PB, The average value of GEM 50PE is significantly higher than that of other sectors, indicating that enterprises listed on GEM are subject to premium market valuation due to high growth.

Table 1: Descriptive statistics

Stats	GEM50 PE	GEM50 PB	Small and Medium Composite PE	Small and Medium Composite PB	Shanghai Index PE	Shanghai Index PB
Max	71.44	11.64	33.34	3.580	15.18	1.600
Min	33.96	4.060	20.66	2.110	10.58	1.200
Mean	54.23	7.613	27.38	2.990	12.82	1.429
p50	55.91	8.165	27.20	3.050	12.51	1.460
SD	9.336	2.172	2.355	0.372	1.066	0.0939
N	730	730	730	730	730	730

4.2. Parallel trend test

The application of the differential model has special requirements for the sample data, that is, the trend of the two groups of data before the policy intervention should not be significantly different. The P/E ratio of the GEM will change only after the registration system is implemented. To verify this, this paper uses parallel trend test and takes the GEM registration system policy as the research object. The registration system policy was implemented on August 24, 2020. According to the DID parallel trend test method of Dong Yina (2022)^[13], we make the daily rolling P/E statistics of the GEM 50 and the Small and Medium composite index from January 1, 2019 to December 31, 2021 into a line chart (Figure 1). As shown in Figure 1, before the implementation of the registration system on GEM, the development trend of the treatment group and the control group was basically the same. After the policy intervention, the growth trend of GEM 50 was more obvious and the fluctuation was obvious, indicating that the registration system significantly increased the valuation of GEM, while the comprehensive change range of the small and medium-sized composite index was small. Therefore, the data in this paper satisfy the hypothesis of parallel trend, and the model can be estimated by using the different method.

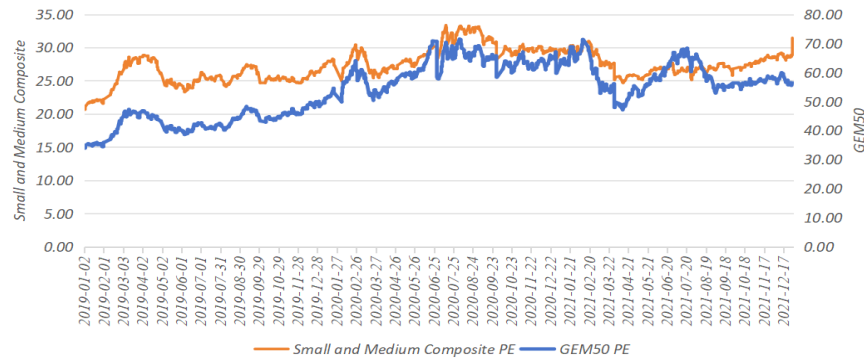


Figure 1: Test of PE parallel trend of GEM 50 and Small and medium Composite index

4.3. Analysis of empirical results

Table 2 presents the results of the overall impact of the registration system on GEM enterprise valuation. Before the implementation of the registration system, the average P/E ratio (PE) of the small and medium composite Index was 26.708 and that of the GEM 50 was 49.429, with a difference of 22.721 between the two. After the implementation of the registration system, the average P/E of the Small and Medium Composite Index rose slightly to 28.194, while the GEM's valuation increased significantly, with the average P/E increasing to 60.006. This resulted in an increase in the valuation gap between the two from the original 22.721 to 31.812. DID regression results showed that its P value was less than 0.01, indicating that the effect of registration system was significant. The coefficient is positive 9.091, indicating that the implementation of the registration system has improved the valuation of GEM enterprises, and the hypothesis H1 is verified. The robustness of the conclusions can be drawn by placebo test.

Table 2: DID regression results of GEM 50 and Small and Medium Composite index PE

Outcome var.	PE	S. Err.	t	P>t
Before				
Control	26.708			
Treated	49.429			
Diff (T-C)	22.721	0.402	56.52	0.000***
After				
Control	28.194			
Treated	60.006			
Diff (T-C)	31.812	0.441	72.07	0.000***
Diff-in-Diff	9.091	0.596	15.23	0.000***
R-square: 0.86				

4.4. Robustness test

In order to ensure the reliability of the research conclusions, this paper conducts robustness tests from two aspects: placebo test and sensitive test.

4.4.1. Placebo test

In order to verify that the empirical conclusion of this paper is caused by the registration system rather than other unobserved factors that change over time, this paper conducts placebo test by finding a new group of virtual experimental groups that are not affected by the registration system. Specifically, the Shanghai Composite Index that is not affected by the registration system is used as the virtual experimental group, and the small and medium composite index of the original control group is combined with the same method to re-estimate equation (1), and compare whether the result is valid. If the conclusion of this paper is mainly caused by the registration system, then the regression coefficient of the virtual variable Shanghai Composite index obtained by the above method should not be significant, or the positive and negative shape of the regression coefficient is opposite, indicating that the virtual experiment is not valid, and the experimental results of the original experimental group and the original control group are stable. If the regression coefficient is significant, β_3 Then it means that the change of GEM 50 valuation has no direct strong correlation with the implementation of the

registration system, and the results of DID obtained before are unstable, that is, the hypothesis is not valid.

The specific results are shown in Table 3. We can see that the coefficient of the interaction term $Treat_i \times Post_t$ is not significant, being $\beta_3 0.224$, greater than 0.05, which passes the placebo test and supports the research conclusion of this paper, that is, the increase in the valuation of GEM enterprises is not caused by the differences in basic characteristics among enterprises, but is indeed the impact of the implementation of the registration system on the valuation.

Table 3: DID regression results of Shanghai Composite Index and Small and medium-sized Composite index PE

Outcome var.	PE	S. Err.	t	P>t
Before				
Control	26.708			
Treated	12.240			
Diff (T-C)	-14.468	0.120	-120.59	0.000***
After				
Control	28.194			
Treated	13.510			
Diff (T-C)	-14.684	0.132	111.47	0.000***
Diff-in-Diff	-0.217	0.178	1.22	0.224
R-square: 0.95				

4.4.2. Test for sensitivity

In order to ensure the robustness of the conclusions, this paper further replaces the main variable PE with PB. According to Figure 2, in the period before the implementation of the GEM registration system, the PB of the small and medium composite index and the GEM 50 showed similar trends. However, with the passage of time, the trend of GEM 50 began to rise, while the small and medium composite index remained relatively stable during the same period. Figure 2 shows that this sensitivity test passes the parallel trend test.

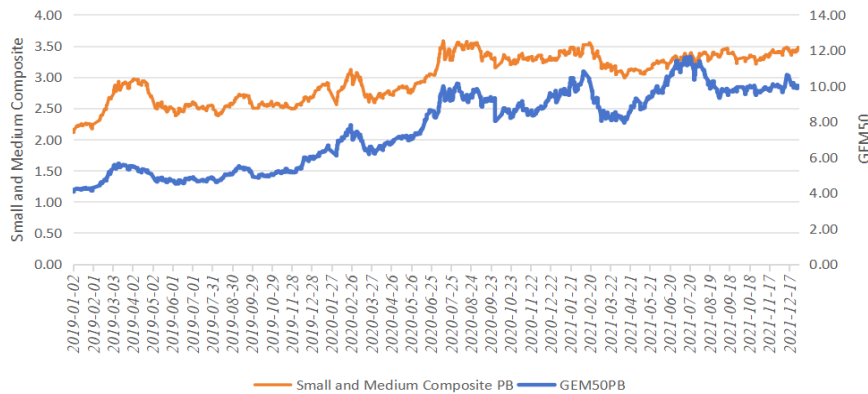


Figure 2: PB parallel trend test of 50, Medium and small composite index of GEM

According to Table 4 below, before the implementation of the registration system, the average PB of GEM 50 was 5.993, and the average PB of small and medium-sized composite index was 2.727 in the same period, with a difference of 3.265. After the implementation of the registration system, the average PB of GEM 50 rose to 9.567, and the average PB of small and mediumsized composite index became 3.306, with a difference of 6.260. The gap between the two is further widened, which indicates that the registration system has further improved the valuation of GEM 50, enabling it to enjoy a positive valuation premium.

To ensure the validity of the study's conclusions, we need to eliminate the effect of certain features of the firm itself on the results. In order to prove that the increase in enterprise valuation is indeed affected by the registration system, we also need to conduct a placebo test to verify the significance of the DID model results between GEM 50 and PB of the Small and medium composite Index. In this experiment, the Shanghai Composite Index was selected as the virtual experimental group. The specific results are shown in Table 5. The coefficient of the new policy implementation variable is -0.443, which is not significant, passing the placebo test and further verifying the main conclusion of this study:

the implementation of the registration system can significantly improve the valuation of enterprises on the Growth Enterprise Market.

Table 4: DID regression results of GEM 50 and small and medium composite index PB

Outcome var.	PB	S. Err.	t	P>t
Before				
Control	2.727			
Treated	5.993			
Diff (T-C)	3.265	0.63	51.45	0.000***
After				
Control	3.306			
Treated	9.567			
Diff (T-C)	6.260	0.070	89.83	0.000***
Diff-in-Diff	2.995	0.094	31.77	0.000***
R-square: 0.90				

Table 5: DID regression results of PB of Shanghai Composite Index and Small and medium-sized Composite index

Outcome var.	PB	S. Err.	t	P>t
Before				
Control	2.727			
Treated	1.367			
Diff (T-C)	-1.360	0.012	-111.04	0.000***
After				
Control	3.306			
Treated	1.503			
Diff (T-C)	-1.803	0.013	134.08	0.000***
Diff-in-Diff	-0.443	0.018	24.36	0.000***
R-square: 0.96				

5. Conclusions and recommendations

The reform of the registration system is of great significance in promoting the transformation of China's capital market from the examination and approval system to the direction of marketization and rule of law, promoting the healthy development of the capital market, improving the quality of listed companies, and enhancing market vitality. Based on the implementation of the registration system in GEM, this paper makes use of the PE and PB data of 50 index of GEM, Small and medium composite Index and Shanghai Composite Index from 2019 to 2021, and draws the following conclusions by combing relevant literature, analyzing hypotheses and empirical research: After the implementation of the registration system, the rolling price-earnings ratio of 50 of GEM has been significantly improved, that is, the registration system has increased the valuation of GEM enterprises and deepened the valuation premium phenomenon of GEM, and this influence has a certain lasting effect. A series of robustness tests such as placebo test, parallel trend test and sensitivity analysis all support the above conclusions. Based on the above empirical findings, this paper puts forward the following three policy recommendations: First, improve the information disclosure supervision system and improve the responsibility awareness of information disclosure subjects. Strengthen supervision and establish a more stringent information disclosure review mechanism to ensure that GEM enterprises can disclose key information to investors in a timely and accurate manner. Second, strengthen investor protection mechanisms and enhance risk prevention capabilities. Establish a sound investor education system to reduce investment risks and reduce investors' losses by improving investors' risk awareness and investment skills. Finally, promote the comprehensive construction of the registration system and increase the supply of GEM companies. Through the development of more scientific and flexible audit standards, adapt to different types of start-ups, reduce unnecessary audit links and time costs. At the same time, intelligent technology and big data analysis are adopted to improve the efficiency and accuracy of audit, and provide more high-quality startups with listing opportunities.

Acknowledgements

This paper is the research result funded by the graduate research start-up Fund project of the School of Economics and Management of Guangxi Normal University. Project number:JGYJSKY202311.

References

- [1] Chen Jianli(2015). *Approval System and Registration System: Fueling IPO Bubble or Suppressing IPO Bubble? -- Taking GEM as an example*. *Journal of Zhongnan University of Economics and Law*, (04):88-94.
- [2] Zhang Xiaoyan(2023). *The practice of comprehensive registration system reform at home and abroad and its impact on small and medium-sized enterprises*. *People's Forum*,(07):81-85.
- [3] Wang Yueya(2020). *Security enterprises: Strategies for listing under the background of registration system reform*. *China Security*,(11):19-29.
- [4] Wang Zining, Wang Yuetang(2023). *Study on the impact of registration system reform on IPO premium: An Analysis based on Investor irrationality hypothesis*. *Modern Economic Research*, (06): 73-84.
- [5] Zhou Yousu, Yang Zhaoxin(2015). *Reflection and reconstruction of China's stock issue information Disclosure system under the background of registration system reform*. *Reform of Economic System*, (01):146-150.
- [6] Fu Xiangfei, Zhang Kaiyuan, Li Xiang(2022). *The concept of registration system with information disclosure as the core and the function improvement of capital market: Path and mechanism*. *Journal of Finance and Accounting*,(20):8-13.
- [7] Hao Yuanyuan(2020). *Study on the impact of Registration system reform on the price discovery function of stock market: An analysis on Further improving the IPO pricing mechanism*. *Price Theory and Practice*,(08):96-99.
- [8] Zhang Bei(2021). *Interpretation and Reflection on GEM registration system*. *Finance and Accounting Bulletin*,(02):19-23+100.
- [9] Gao Xinrui(2019). *Comparative study on Valuation of innovative Enterprises with different IPO systems*. *Tianjin University of Finance and Economics*.
- [10] Wu Xihao, Zhang Chi(2024). *The impact of registration system reform on capital market pricing efficiency: from the perspective of IPO underpricing rate [J/OL]*. *Nankai Management Review*, (02) : 1-32.
- [11] Wan Naijia(2021). *On Stock Valuation in the era of registration system: A revision based on the classical PEG valuation model*. *Modern Business*,(27):131-133.
- [12] Shi Haotian, Shi Jiaran, Xiao Xiao(2021). *Registration system reform, shell company valuation and earnings management*. *Accounting Research*,(08):54-67.
- [13] Dong Yina(2022). *Study on the impact of registration system on GEM enterprise valuation*. *Zhejiang University*.