



Research on Investment Bank Reputation and IPO Underpricing

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ABSTRACT.A large number of foreign studies have verified the reputation theory of investment banks. The IPO underwritten by well-known investment banks is lower than that underwritten by ordinary investment banks. Whether this conclusion suitable for developed countries can be suitable for China's securities market is controversial in the theoretical circle. Taking 460 new shares in Shanghai and Shenzhen A-share IPO markets from January 2020 to December 2021 as the research sample. This paper conducts an empirical study on the adaptability of investment bank reputation model in China. The results show that this conclusion does not apply to the low information efficiency of China's investment banks and issuing markets.

Keywords: Investment bank reputation, IPO, underpricing

1 Introduction

Since the 21st century, the reform of China's stock issuance market has been accelerating [1]. In March 2019, Shanghai Stock Exchange officially opened to accept and review the application for listing on the Science and Technology Innovation Board. The Science and Technology Innovation Board adopts the registration audit method, and the main bodies in the market will play an important role in the process of stock issuance. As of March 2022, there are 391 listed companies. The total amount of IPO funds raised was 547.8 billion yuan, and the total market value was 5.16 trillion yuan [2]. The role of the Science and Technology Innovation Board in serving the national innovation driven strategy and the high-quality development of the real economy is gradually emerging. The pilot registration system of the Science and Technology Innovation Board is a milestone in the development of China's stock market. It provides a new way for equity financing of high-tech enterprises, enriches the multi-level structure of China's capital market, and is of great significance to the development of China's financial market. Research at home and abroad shows that IPO discounts are common in all countries. This phenomenon, which violates the classical theory, has attracted the great attention of a group of scholars, and has put forward various theories to explain this phenomenon. Due to the audit conditions of the Science and Technology Innovation Board itself and the characteristics of the

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board, the issuer is still faced with potential losses caused by excessive IPO underpricing, so the rationality of IPO pricing still exists in the Science and Technology Innovation Board. In China's stock market, there is a widespread phenomenon that the IPO price is significantly higher than the IPO price. Investors can obtain higher returns after subscribing for new shares, which has become a typical feature of IPO. Although IPO issuance at a low price will bring profit opportunities to investors, the issuance of new shares at a low price will lead to some adverse consequences, such as market imbalance and ineffective market resource allocation. Therefore, it is of great significance to analyse the factors affecting IPO pricing of listed companies and find solutions. Based on the actual situation of China's stock market, we will establish a multiple linear regression model for empirical analysis after screening the independent variable indicators in the existing research to explore the correlation between investment bank reputation and underpricing to verify the applicability of the investment bank reputation model in China.

2 Literature Review

2.1 Foreign Literature Review

Foreign studies show that investment banks play an important role in the IPO market. As an intermediary, investment banks can verify the quality of newly issued shares, which can solve the "lemon problem" in the IPO market to some extent (Akerlof, 1970). The reputation of an investment bank comes from its services to listed companies and investors. Carter and Manaster (1990) established a quantitative model of the relationship between investment bank reputation and IPO underpricing based on the "winner's curse" hypothesis [3]. He believed that the investment bank purposefully caused IPO underpricing, which could attract many investors to subscribe for new shares, thus ensuring smooth issuance. As the core participant of IPO pricing, investment banks play an important role in the process of IPO as "certification intermediaries" and "information production". It is generally believed that the higher the reputation of investment banks, the lower the degree of underpricing of the issuer's shares they underwrite. Carter and Manaster (1990) defined the reputation of investment banks as the ability to reduce the dispersion of investors' judgment on the value of the company. A reputable investment bank can help improve the consistency of investors' judgment on the value of the issuing company. It can reduce the risk of the issuing company and increase the issuing price. Specifically, investment bank reputation can reduce the issue discount when issuing new shares. Many empirical studies such as Balvers et al. (1988), Carter and Manaster (1990), Michaely and Shaw (1994) have provided evidence for it. In addition to the role of authentication, the reputation of investment banks also means that they can provide supervision services to issuing companies, that is, they can use their professional capabilities to help listed companies improve corporate governance and evaluate managers, and thus reduce the agency costs of enterprises. Hanson and Torregrosa (1992) examined the underwriting fees of investment banks in equity refinancing and found that in addition to selling shares, investment banks can also obtain premiums due to their contributions to

corporate governance. Carter et al. (1998) examined the relationship between the long-term stock returns of IPO companies and the reputation of investment banks. Consistent with expectations, they found that the long-term return of IPO projects underwritten by reputable investment banks was better than that of other companies. Jain and Kini (1999) studied the operating performance of the IPO companies in the three years after their issuance from 1976 to 1990, and found that there was indeed a significant positive correlation between investment bank reputation and operating performance indicators, which they believed was the result of the role of investment bank supervision [4]. Shleifer (1998) pointed out that in the process of marketization, market players may pursue malignant efficiency at the expense of quality [5], as the core of the intermediary agency in the issuance market. In order to pursue short-term income or market share, investment banks may cooperate with companies that do not meet listing conditions to cheat investors when planning the issuance plan, resulting in a decline in social welfare and deviation from the fundamental goal of optimizing resource allocation.

2.2 Domestic Literature Review

Zeng Hong and Chang Xin (2020) explained the phenomenon of IPO underpricing in China's stock market from the following aspects based on the particularity of the regulatory model of China's stock market and the distribution of investors [6]. First, a tripartite game. In China's stock market, the main participants are stock issuers, underwriters, and investors. Each participant wants to maximize its own interests. Each party formulates its own strategy by observing the actions of the other party. In fact, it is a tripartite game. Therefore, the determination of IPO price is also the result of the tripartite game. Second, administrative pricing. The history of China's stock market is relatively short, and retail investors account for a large proportion in the composition of investors. In order to prevent large risks, the securities regulatory department has a wider range of supervision than western securities markets, and many of the work that can be market-oriented is not market-oriented. For example, the administrative pricing of IPO issuance has two restrictions on the P/E ratio of IPO issuance: one is that the P/E ratio of IPO issuance does not exceed 23 times; Second, it should not exceed the average P/E ratio of the same industry. Third, IPO preference and liquidity premium. Preference refers to the degree of preference of decision-makers for a commodity (or a combination of commodities). In China's securities market, individual investors account for a large proportion. At the initial stage of IPO, there was a high degree of market attention, a large number of participants, good liquidity, full elasticity of stock prices, and many short-term opportunities, all of which led to investors' strong preference for new shares. Domestic scholars have different conclusions on the relationship between investment bank reputation and IPO underpricing. Guo Hong and Zhao Zhenyu (2006) found that the reputation mechanism of investment banks does not exist in China's stock issuance market through empirical research on the correlation between the degree of IPO underpricing and the reputation of underwriters [7]. Different from the above views, Xu Haoping and Luo Wei (2007) not only considered market share like other scholars when

measuring the reputation of investment banks, but also included the practice quality into the evaluation index of investment bank reputation [8]. The empirical results show that the impact of investment bank reputation on IPO discount is not significant when measuring investment bank reputation by market share or practice quality alone. However, if we consider the interaction of the two on this basis, we can find that there is a significant negative correlation between IPO discount and investment bank reputation, that is, investment banks with high market share and good practice quality can significantly reduce the IPO discount level of issuers. Xu Rong et al. (2013) supported this view from different perspectives [9].

3 Empirical Model

3.1 Sample Selection

This paper chooses the IPO of listed companies in China's Shanghai and Shenzhen Stock Exchanges from Jan. 2020 to Dec. 2021 as the research sample. On this basis, the samples are screened as follows: the samples are screened as follows: ST companies are excluded; exclude financial companies. In the sample, as the financial category is quite different from other enterprises in terms of capital structure, capital source, profit model, etc., it is excluded to maintain the consistency with the research on IPO underpricing at home and abroad. In addition, some shares issued by means of share exchange and merger are not consistent with the purpose of this study, and they are also eliminated, leaving a valid sample of 460 new shares. In order to reduce the influence of extreme values, all continuous variables are answered at the upper and lower 1% levels. All data in this paper are from Guotai'an database. The metrological analysis software used is SPSS22.0 and Eviews 5.0.

3.2 Statistical Variables

Explained variable: IPO underpricing rate. The explanatory variable in this paper is IPO underpricing rate, specifically defined as (closing price on the first day - issue price)/issue price. Explanatory variable: underwriter reputation. As China's securities market has a short history of development, and the format of IPO issuance announcement is different from that of American IPO tombstone announcement, no academic group and research institution in China can provide a ranking system for investment bank reputation like American CM, and there are various difficulties in the application of JM method. The domestic relevant research basically measures the reputation of investment banks according to the market share of underwriting business of investment banks according to MW method. This paper also uses this method to measure the reputation of investment banks by calculating their market shares of underwriting business in the sample interval. $RP=0.5 * \text{market share calculated by underwriting times}+0.5 * \text{Market share calculated by underwriting amount}$.

3.3 Statistical Analysis

Foreign research shows that investment banks with high reputation will choose high-quality companies to issue in order to improve and maintain a good reputation. For issuers with good quality, the underwriting and issuance entrusted by investment banks with good reputation conveys the information of high-quality companies, which helps to reduce the uncertainty in advance caused by information asymmetry, reduce the degree of IPO underpricing and reduce the issuance cost. But for such an emerging and transitional stock market as China, can the reputation of investment banks also reduce IPO underpricing? Therefore, based on the above literature, the following two assumptions are proposed: (1) investment banks with high reputation tend to choose high-quality stock issuance; (2) The underpricing of new shares is negatively related to the reputation of investment banks.

The single factor model is used to test the two inferences, and then the multiple regression model is used to retest inference 2. According to assumption 1, there are:

$$\text{RSD} = \alpha_0 + \alpha_1 \text{REP} + \varepsilon \quad (1)$$

$$\text{UPR} = \alpha_0 + \alpha_1 \text{REP} + \varepsilon \quad (2)$$

$$\text{UPR} = \alpha_0 + \alpha_1 \text{PRO} + \alpha_2 \text{RSD} + \alpha_3 \text{REP} + \alpha_4 \text{LOT} + \alpha_5 \text{MAR} + \alpha_6 \text{PE} + \varepsilon \quad (3)$$

RSD: standard deviation of return rate after IPO. In the model, the standard deviation of daily rate of return within one month from the second day to the 31st day of IPO is expressed as logarithm, representing the prior uncertainty of the issuing company. REP: underwriter variable. A dummy variable, when its value is 1, indicates that

underwritten by underwriters other than the top ten underwriters. UPR: First day yield of listed companies, i.e., underpricing rate of new shares. In the study, there are generally two kinds of calculation of underpricing rate, namely:

$$\text{UPR} = \frac{P_1}{P_0} - 1 \quad (4)$$

$$\text{UPR} = \frac{P_1}{P_0} - \frac{I_1}{I_0} \quad (5)$$

P_1 is the closing price on the first day of listing, P_0 is the issue price, and I_1 is the market closing index of the stock exchange on the first day of listing. I_0 is the market closing index of the stock exchange on the day before the listing of the stock. As there are empirical models, the first method is adopted in the empirical study. LOTS: Winning lot rate, indicating the winning lot rate of the stock. MAR: Market index refers to the market situation of Shenzhen Stock Exchange or Shanghai Stock Exchange when the new shares are issued, which is expressed by logarithm of the average value of the market index one month (within 20 trading days) before the issuance. PE: P/E ratio. ε : Random term. PRO represents the size of the issue. The larger the standard deviation is, the more uncertain the IPO market value is. LOTS represent the winning lot rate, which is used to reflect the basic situation of the supply

and demand sides of the new share issuance. It is generally believed that the stronger the IPO demand is, the lower the winning rate will be, and the IPO will be under-priced. The higher the degree. MAR indicates that the market index reflects the overall level of the market when the new shares are listed. The issue price of new shares is related to the overall market level at the time of issue.

3.4 Main Results

The results of multiple regression show that, among the explanatory variables, the issuance scale and the average market index (logarithm) have passed the significance test at 0.01 level, and the coefficient sign is consistent. The standard deviation of daily rate of return representing prior uncertainty passed the significance test of 0.1 level, and the direction is negative. Other investment bank reputation variables, lottery winning rate and P/E ratio have not passed the significance test. The R2 coefficient of the equation is 0.3748, and the adjusted R2 is 0.3614, which indicates that the regression equation has a good fit and the independent variable can better explain the initial yield of the issuance, but it also indicates that there are some other factors not included. The value of F statistic is 25.0141, and the equation passed the 0.01 level test, indicating that the overall linear fitting of the equation is excellent. The D-W test shows that the equation has definite autocorrelation, but considering the empirical use of cross-sectional multiple regression, the autocorrelation effect can be ignored. The regression results show that the issue size is significantly negatively related to the underpricing of new shares, which is almost consistent with all research results. There is a significant positive correlation between market index and underpricing, which is consistent with the theoretical analysis above. This shows that the first day yield is higher when the market situation is good. The standard deviation of the rate of return of the issuing company is negatively correlated with the underpricing at the level of 0.1, which is not significant and inconsistent with the theoretical analysis. The empirical results of multiple regression equation are shown in Table 1.

Table 1. Empirical results of multiple regression equation (table credit: original)

Item	Regression coefficient	Standard deviation	T statistics	P value
Constant	-15.1426	3.1485	-4.7756***	0.0001
PRO	-0.5624	0.0671	-10.9521***	0
RSD	-5.1989	3.1417	-2.2844*	0.0846
REP	0.08952	0.0747	1.1469	0.2456
LOTS	0.02391	0.1158	0.2252	0.8585
PE	0.0023	0.0075	0.0454	0.9526
MAR	2.9137	0.4562	6.2263***	0
R2		0.3748		

Adjusted R2		0.3614		
D-W test		1.4208		
F value		25.0141		
P value		0		

Note: * indicates significant at 0.1 level; ** indicates significant at 0.05 level; *** indicates significant at 0.01 level.

4 Countermeasures and Suggestions

4.1 Improve Issuance System

In recent years, China's IPO system has undergone a series of market-oriented reforms, including the implementation of the sponsor system, the reform of the Development and Examination Commission, and the implementation of the inquiry system. While some achievements have been made, there are still many imperfections, which restrict the autonomy of investment banks to a certain extent. Therefore, deepening the market-oriented reform of the IPO system, restoring the functions and positioning of investment banks as financial intermediaries, and promoting investment banks to form the interest and incentive to establish long-term exchanges and games with investors are the basic work to strengthen the reputation mechanism of China's investment banks and promote the formation of the relationship between the reputation of investment banks and IPO underpricing. The registration system of compliance audit has a better effect than the approval system of substantive audit, which not only greatly reduces the workload of the regulatory authority, but also reduces the personal discretion space as much as possible. The recommendation responsibility should be borne by the recommendation institution as the intermediary of the securities market. If the recommendation representative violates the regulations or the issuing enterprise recommended by it violates the regulations, the responsibility of the recommendation institution shall be investigated, not the personal responsibility of the recommendation representative. To implement the responsibility of the recommendation mechanism, whether it is administrative punishment or civil and criminal punishment imposed by the regulatory authority, the responsibility should be implemented, which requires the corresponding cooperation of securities regulation and the reform of China's securities legal system [10].

4.2 Strengthen Market Supervision

The supervision and restriction of the regulatory authority on the behaviours of investment banks is an important external pressure mechanism to regulate the behaviours of investment banks and prevent investment banks from breaking the rules and dishonesty [11]. On the one hand, effective supervision can increase the cost of investment banks' violations. On the other hand, effective supervision is also the institutional guarantee to make up for market failures and maintain effective

competition. Therefore, effective supervision of investment banks is an important condition for regulating investment bank behaviour and promoting the formation of investment bank reputation mechanism. Clarify the power division, reduce the dependence and association of securities regulatory authorities on other departments, and reduce the impact of other departments on securities regulatory authorities. To maintain the independence of supervision, we should also clarify the relationship between regulators and the supervised. The mutual penetration of interests between regulators and the supervised will inevitably affect the independence of regulators. In the current securities issuance market of China, an important manifestation of the ambiguous interest relationship between regulators and the regulated is that the officials of the regulatory agencies are often appointed to the regulated agencies. The supervisor's appointment to the supervised department blurs the boundary between the supervisor and the supervised, resulting in the regulatory policy tilting to investment banks at the expense of investors. Therefore, it is necessary to eliminate the phenomenon that the officials of the regulatory agencies serve in the regulated institutions [12].

4.3 Optimize Reputation Evaluation System

The fairness and scientificity of the underwriter reputation evaluation system is an important basis for the integrity construction of the entire securities underwriting market. The ranking of underwriters' reputation in China is far from perfect. Therefore, based on fully drawing on the mature reputation rating experience of foreign countries, China should actively carry out research and establish a relatively complete, scientific, and fair reputation rating system and ranking rules for underwriters in China. The credit reporting system is an institutional arrangement that transmits and diffuses the information of the defaulting party in the industry. Its role is to reduce the reputation capital of the violators and promote the participants with potential violation motives to self-constrain. The accumulation of reputation capital is based on the past behavior records of participants. As a supervisor, we should establish a sound credit reporting system. On the one hand, we should improve the credit rating methods and methods of investment banks, and regularly publish the rating results. On the other hand, it is necessary to exert indirect influence on the operation of investment banks with poor reputation from the system, such as extending the time of issuance review, adopting stricter review standards, etc., to affect the future continuous transactions of the target investment banks. The establishment and improvement of investment bank credit reporting system is also an important way to improve the punishment of securities supervision on investment bank reputation.

5 Conclusions

In China's current securities market, there is no difference between the enterprises underwritten by investment banks, and investment banks with high reputation do not

choose high-quality issuers. The correlation between IPO underpricing and investment bank reputation is not significant, and there is also no correlation between IPO underpricing and low-risk issuing enterprises. This shows that the investment bank reputation theory is not established in China. IPO underpricing has no relationship with issuer quality. It is more affected by many factors, such as enterprise size, market environment and the degree of new share pricing control. The market-oriented reform of China's issuance system still needs to be further deepened.

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