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# **Examining IPO Success in the Emerging Growth Enterprise Market of China**

Hai Long\* and Zhaoyong Zhang\*\*

*Adopting a sample of the initial 243 IPOs from the emerging Growth Enterprise Market of China (GEMC) over the 2009 to 2011 period, this study develops a regression model to investigate the relationships between these factors and suggests that the firm's net profit and its growth rate substantively determine the IPO volume. In addition, this study adopts probit models to test the influence of the four factors on IPO likelihood, and shows that: 1) fundraising amount, as one of the most significant IPO determinants, is positively associated with IPO probability on the new listing market; 2) the net profit, as a fundamental IPO determinant, is positively associated with IPO probability, but also with other indicators, which demonstrates the fact that the GEMC is a profit-preferring listing venue; 3) the net assets determine IPO probability but not IPO volume on the market.*

**JEL Codes:** G15, G24

## **1. Introduction**

Initial public offerings (IPOs) for venture capital (VC) investors are an optimal exit choice, with high returns from their investment portfolios (Black and Gilson 1998). Although IPOs have been extensively discussed based on a variety of listing markets, very little literature sheds any light on IPOs in the emerging Growth Enterprise Market of China (GEMC). The GEMC, launched in 2009, is designed for entrepreneurial companies, mostly supported by VC in China. This study bridges this gap to help investors successfully exit via IPOs in the GEMC.

The purpose of this study is to investigate the financial determinants of listing requirements and examine their impact on IPO probability in the GEMC, because the Chinese IPO examination mechanism is affected by administrative factors (Long and Zhang, 2014). According to the official document, 'Provisional Administration Regulations for Initial Public Offerings' (PARIPO), there are stringent listing requirements with regard to these financial determinants, which are expected to affect IPO probability significantly. This study adopts a regression model based on Campbell (2000) to investigate the relationships between these factors, and borrows a probit model from Pagano et al. (1998) to test how these financial factors determine IPO likelihood. Both studies exclude the fundraising amount variable from their models. This study fills this gap, working to detect to what extent this variable determines an IPO likelihood.

### **1.1 Background**

One important step in the process of going public is to choose an appropriate listing venue based on three factors: the issuer's current performance (Blowers et al. 1999), its growth prospects (Fischer 2000), and its potential for returns (Pagano et al. 2002). These factors

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vary across listing markets around the world. Apart from the above-mentioned issuer-specific factors, these listing markets differ in exchange-specific aspects: listing benefits and costs, disclosure standards, securities laws, and the development level of the financial market (Ritter 1987; Foerster and Karolyi 1998; Coffee 2002).

Each market has its own exclusive criteria to attract and measure listing applications. The majority of developed markets have a wide range of entry criteria to test issuers' quality, which means sophisticated IPO markets have a sound IPO assessment system to thoroughly gauge issuers' qualifications. As China's securities market is a developing financial market, the GEMC, a product of China's financial reforms, consequently differs from the developed IPO markets in respect of its listing rules. Listing standards vary, and the determinants affecting listing decisions are also different across the listing markets. As such, the difference in the listing requirements within the GEMC generates different IPO variables, which in turn determine IPO probability differently. Additionally, Doidge et al. (2004) suggest listing standards have a more significant and profound impact on smaller firms relative to medium and large firms. As a consequence, fulfilling listing requirements is vital for an IPO across exchanges, but these existing overseas-market-based studies are unlikely to address the Chinese IPO issues. My study is expected to bridge this gap to help investors successfully exit via an IPO in the GEMC.

### 1.2 Research Questions

This study investigates the financial variables of listing standards in the emerging IPO market of the GEMC. Although there are many uncertain variables impacting IPO assessment, this study will focus on the four listing–requirement–specific determinants used to assess issuers: fundraising amount, net profit, potential growth rate, and net assets, along with two endogenous variables: investor sentiment, and dividend return rate. The primary objective of this study is to examine how, and to what extent, these factors contribute to IPO probability in the GEMC.

Two questions arise: 1) What are the relations between these listing determinants? and 2) How do they impact on IPO probability? Similar questions have been studied though, these existing studies were conducted in overseas financial markets, particularly, in US stock markets (e.g. Gottschalg et al., 2004; Kyriakos and Ueda, 2010; Abdou and Varela, 2009; Barry et al., 1990; Manigart et al., 2002; Nahata R., 2008). By contrast, studies concentrating on the Chinese securities market are very rare. In addition, these findings based on the US market are unlikely to tackle the Chinese market's issues. Thus, these two questions have not been answered based on the Chinese stock market, particularly, the GEMC.

The GEMC has totally different listing rules from other share markets. As the GEMC is tailored for entrepreneurial companies' IPOs and facilitates venture capital to exit from these firms, it prefers start-up companies with high profitability and potential growth for the future rather than looking at the current size of a firm (according to Pagano et al. 1998, this refers to the most recent book value of a firm's total assets). As Doidge et al. (2004) suggested, listing rules and market performance may produce a more significant and profound impact on smaller issuers than on larger and seasoned firms, mainly due to more striking information asymmetry between the larger and smaller firms. In the light of this analysis, this study anticipates that listing requirements have more significant impacts on the IPO performance of the smaller firms that characterise the GEMC. This emerging

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market has received little academic attention so far, but it offers abundant and unique research resources for researchers to study and explore.

### 1.3 Research Structure

The remaining components of this thesis are organized as follows:

Section 2 (Literature Review) discusses some relevant studies. Section 3 (Analytical Framework) presents a theoretical framework for investigating how the financial determinants of listing requirements influence IPO probability in the GEMC. Section 4 (Data and Analysis) analyse the data and empirically tests the relations between the determinants through a developed model, and then examines their contributions to IPO probability. Section 5 (Results and Implications) discusses the findings and their implications. Section 6 (Conclusions & Limitations) summarizes this study and gives its research limitations.

## 2. Literature Review

Listing requirements have been studied extensively (Harris 2006; Jenkinson and Ljungqvist 2001; Doidge et al. 2004; Lambert et al. 2007). The earliest literature is by Smith (1936). The author documents that the listing requirements in US stock exchanges, prior to the Securities Exchange Act of 1934, were decided by each exchange on its own initiative and authority. In Europe, the UK adopted the same practice, while the continental European countries such as France and Germany had listing requirements that were formulated by their national legislative departments. At that time, there was no consensus in listing standards, until the Securities Exchange Act of 1934 launched. Whereas, Michie (1986) traces the earliest listing standards back to the NYSE's standards in 1914. The NYSE then recruited only large firms, to increase trading volume, and adopted this screening method to enhance its leading position in the largest capitalisation issues.

Harris (2006) states that the principal function of listing requirements is to facilitate securities trading through verifying and monitoring the minimum listing quality of issuers, a practice which thereby delivers market participants a signal that listed firms are higher quality relative to non-listed companies. In the light of this theory, Jenkinson and Ljungqvist (2001) found that exchanges were adept at balancing their listing standards and the pursuit of profit. Some stock exchanges viewed listings as a significant source of revenue, hence these exchanges lowered their listing standards or set up new listing platforms for small- and high-growth firms, in an effort to encourage them to go public and obtain more income. The authors highlight that the lower entry criteria enabled more firms to be eligible for listing there, which in turn helped to increase the exchanges' revenues. On the other hand, the relaxed listing rules could damage the exchanges' reputations eventually. Thus, Doidge et al. (2004) discuss the idea that the strict listing regulations in a stock exchange significantly affect its cost of capital and the valuation of potential IPO firms. This viewpoint is also confirmed by the later studies by Hail and Leuz (2006), and Lambert et al. (2007).

On the other hand, other studies document that strict listing regulations are unlikely to help the exchanges to choose higher-quality issuers or promote their post-issue performance (Baumol and Malkiel 1993). Consequently, Macey and O'Hara (2002) argue that exchanges should constantly adjust and upgrade their listing rules to match the new demands of a capital market, since listing standards appear not to retain their initial

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purpose, due to the fact that the exchanges' fundamental role has changed. They advise that exchanges should shift their focus from certain quantitative elements to qualitative ones, such as board structure, business plans, accounting practices and corporate governance. They encourage adopting some qualitative listing standards instead of quantitative ones, but this does not mean quantitative criteria should be abandoned. On the other hand, Cheng et al. (2006) do not agree with this viewpoint. Using a dataset of 386 IPO cases on the Hong Kong Stock Exchange (HKSE) over the period from 1986 to 1998, the authors investigate whether changes in listing rules contribute to an issuer's performance. They suggest there is no significant change in stock price performance after amending the regulations; consequently, the new stringent listing rules are unlikely to be effective when it comes to screening IPO applicants in search of higher quality. They further conclude that the rule changes have partly promoted a reform scheme, introducing an alternative market with lower listing requirements to attract more firms from China to launch their IPOs on Hong Kong's stock markets.

In terms of firm-specific characteristics in listing requirements, a successful IPO application is mainly determined by the following types of active variable: business age, firm size, profitability, leverage level, intangible assets, innovation capacity, return rate etc (Pagano et al.1998; Blowers et al.1999; Fischer 2000; Babich and Sobel 2004). In particular, according to existing literature on the determinants of IPOs, the most important factors that determine the success of an IPO are: the firm's size, its recent performance and its hold on market sentiment (Pagano et al. 1998; Blowers et al. 1999). Here, the firm's size is a proxy for its previous sales income, and the recent performance is a proxy for the firm's recent profit and its growth rate. Market sentiment refers to the firm's expected ability to generate pay-offs.

Pagano et al. (2002) suggest that a firm's higher current return rate and its future expectations of a return on assets may contribute to enhanced capital. Further, Babich and Sobel (2004) suggest current assets are also a significant determinant of going public. They also discuss the idea that the IPO volume is determined by the firm's previous revenue, profits, and market sentiment. In addition, Firth (1998) shows that the profit forecast is the most significant valuation parameter for issuing candidates. Keasey and McGuinness (1991) agree with that opinion, and summarise that issuing candidates' profit records in IPO prospectuses are more reliable for prediction of their future earnings than other statistical models. Consistent with findings from Pagano et al. (1998), Fischer (2000) also proposes that growth potential is an influential factor in IPO likelihood.

These firm characteristics are strongly correlated with the survival rate of IPOs on an exchange, or alternatively, with their post-issue performance (Espenlaub et al. 2012). Hensler et al. (1997) analyse this correlation and report that characteristics like firm size and age, as well as ownership structure, may positively and substantially impact on the IPO survival rate. In line with those findings, Jain and Kini (1999) test the survival time of post-IPOs, and show that this is positively affected by firm size, pre-IPO operating performance, and the underwriters' reputation. Stock exchanges require sufficiently long-lived, well-performing or credible listings to maintain their reputations (Espenlaub et al. 2012). As a consequence, exchanges use firm characteristics to measure the likely survival rate of listing candidates, in order to choose sustainable projects or to select which firms should go public.

Therefore, previous studies on listing requirements are overwhelmingly based on

developed stock markets. Those on the Chinese market are still few and far between.

### 3. Analytical Framework

#### 3.1 Model Development

This section presents a preliminary probit model and some variables. This probit model is based on that of Pagano et al. (1998), which has been widely developed to address IPO-related questions (Fischer, 2000; Corwin and Harris, 2001; Mayhew and Mihov, 2004). Some of the existing studies model the IPO as a financing mechanism for a firm finance. Pagano et al. (1998) test the determinants of IPO volume and find that the variables of firm size, capital expenditure, and growth rate are the important factors to determine the IPO volume. Lowry (2003) examines three potential factors explaining the variables of IPO volume, including capital demand, investor sentiment and information asymmetry.

Although a successful IPO is potentially influenced by various uncertain factors under different circumstances, it is unlikely and unnecessary to consider all of them in a single analytical frame (Pagano et al. 1998). The consideration of the variables is based not only on previous literature, but also the listing rules of the GEMC. Listing standards on the secondary market mostly concentrate on disclosure of financial information, and require periodical audited financial statements to meet ongoing listing requirements (Giudici and Roosenboom, 2002). Studies show different exchanges have their distinguishing natures and unique market positioning for IPO firms (Foerster and Karolyi, 1998; Doidge et al., 2009). Thus, listing standards vary, and variables that affect listing decision are various across listing markets. As such, the difference of listing regulations in the GEMC generates different IPO variables, which determine IPO probability differently.

According to 'Provisional Administration Regulations for Initial Public Offerings', this policy stipulates IPO criteria in seventeen significant aspects, the provision 10 of this policy explicitly stipulates the four financial listing requirements: the fundraising amount (FA), the net profit (NP), its growth rate (GR), and the net assets (NA), which are the principal factors influencing IPO decision in the GEMC. Incorporating these selected variables into its probit model, this study has devised a specific model, as follows

$$Pr(IPO=1) = f(FA, NP, GR, NA) \quad (1)$$

where,  $Pr(.)$  is the cumulative ratio of a standard normal distribution that an IPO application is going to be approved; IPO tends to 1 if the IPO company goes public successfully, otherwise, it is zero. *FA* is the acronym for fundraising amount; *NP* is the acronym for net profit; *GR* is the acronym for the growth rate of net profit; *NA* is the acronym of net assets.

#### 3.2 Variable Relations

Profitability is a critical factor influencing IPO approval. Babich and Sobel (2004) argue that the IPO volume is determined by the firm's previous revenue and profits, and by market sentiment. Albornoz and Pope (2004) investigate the relationship between profitability and the likelihood of going public, and document that firms with low profitability have a low probability of going public, due to the fact that they are unlikely to generate sufficient internal capital to pay back their investors. In addition, the expected earnings growth of IPO firms is positively related to their stock valuations (Cragg and Malkiel 1982; Zarowin

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1990). The dividend returns after listing are positively related to issuers' profitability (Clarkson et al. 1992; Jain and Kini 1994; Firth 1998).

Therefore, IPO applicants in a rapid growth phase manage to expand their business through this means of financing. They are expected to keep this potential growth, with high profitability, over the next couple of years. Presumably, they have the capacity to pay out their investors at a certain annual dividend rate (DR) within an expected number of years (t), provided they have an approved IPO application. This study suggests that FA is a function of NP, GR, DR, and t, which is defined as:

$$E(FA) = f(NP, GR, DR, t) \quad (2)$$

As the Chinese IPO examination system is administrated by the government (Long and Zhang, 2014), the GEMC as a regulator and gatekeeper sticks to this principle to assess IPO quality and make its ultimate IPO decision. Campbell (2000) suggests that *the market price of any financial asset is just the sum of its possible future payoffs, and the capital raised through IPO as part of financial assets is expected to be paid off by the issuers in the future*. As such, the issuers must have the potential to produce sufficient cash flow for the pay-offs due in future. Underwriters and stock exchanges have a duty to verify that the IPO prices are able to reflect all relevant inside information about the issuers' past and future pay-offs (Ibbotson and Ritter 1995). The exchange anticipates that the issuing firms annually allocate a proportion of dividend from their net profits to repay their shareholders in an expected investment horizon. In light of this analysis, equation 2 can be defined further as below:

$$\sum_{n=1}^t postNP_n * DR = FA \quad (3)$$

where,  $postNP_n$  means the future annual net profit in year  $t$ ;  $FA$  means IPO fundraising amount;  $DR$  means an expected annual dividend rate in year  $t$  after IPOs.

This equation demonstrates that a high current return rate and future returns expectations may contribute to the fundraising amount, and large firms typically pay out a significant percentage of their earnings in the form of cash dividends. This equation also shows that the total net profit that applicants will have earned by the year  $t$  equals their fundraising amount, which means the applicants will have an expected cash flow to support the considerable returns to their investors.

Furthermore, like the Singapore Stock Exchange that requires the statements of a profit forecast and dividends in an IPO prospectus (Firth, 1998), the Chinese stock exchange requires that issuers report their net profits over the past two years as well as future dividend plans, in their IPO prospectus. Based on the mean net profit ( $pre\overline{NP}_2$ ) in the past two years before an IPO, the total expected net profit to be earned by the firm within the expected years  $t$  can be expressed as below:

$$\begin{aligned} \sum_{n=1}^t postNP_n &= pre\overline{NP}_2 * (1 + EGR)^t \\ pre\overline{NP}_2 &= \frac{preNP_1 + preNP_2}{2} \end{aligned} \quad (4)$$

Here,  $pre\overline{NP}_2$  means the average net profit of a firm in the last two years before the IPO;

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*EGR* means the expected growth rate of net profit of a firm in year  $t$ ;  $t$  means the investment horizon for a firm;  $preNP_1$  stands for the net profit of a firm in the past year before IPO;  $preNP_2$  stands for the net profit of a firm in the second year before IPO.

Substituting equation 4 into equation 3, an updated equation is below

$$FA = pre\overline{NP}_2 * (1 + EGR)^t * DR \quad (5)$$

According to the relations between these determinants, equation 5 indicates that the entire dividend rate in an equity market influences the investor sentiment of the market (Baker and Wurgler, 2006; Kumar and Lee, 2006). Both investor sentiment and returns may contribute to the IPO volume (Lowry, 2003). All these variables are related to net profit and its growth, because the increment on these variables derives from the profitability (Basky and De Long, 1993).

In light of the above discussions, it is fairly clear that the net profit and its expected growth rate play a significant role for a successful IPO application. This shows the reason why the two indicators are strictly required in the PARIPO to measure a company's profitability; this also partly demonstrates the GEMC is a profit-preferred market.

### 3.3 The Testable Model

Based on the above discussion, equation 1 can be developed further into a testable model as below:

$$P(IPO = 1) = \eta_0 + \eta_1 FA + \eta_2 NA + \eta_3 NP + \eta_4 GR \quad (6)$$

where  $P$  stands for the probability of IPO success determined by the mentioned variables;  $\eta_0$  is an intercept;  $\eta_n$  is the coefficient of the variables.

According to general probit model  $P = E[F(Y) = 1] = \frac{1}{1+e^{-Y}}$  ( $0 \leq P \leq 1$ ), where  $Y = \eta_0 + \eta_1 [pre\overline{NP}_2 * (1 + EGR)^t * DR] + \eta_2 NA$ , the researcher has

$$P = E\{F(Y) = 1\} = \frac{1}{1 + e^{-\{\eta_0 + \eta_1 [pre\overline{NP}_2 * (1 + EGR)^t * DR] + \eta_2 NA\}}} \quad (7)$$

As variable  $P$  is a two-valued variable, the IPO approval probabilities approach 1 and IPO failure probabilities approach 0.

$$P = \begin{cases} 1 & \text{for approved IPOs} \\ 0 & \text{for failed IPOs} \end{cases}$$

As such, the probit model for approved firms is

$$P_a = E\{F(Y) = 1|Y\} = \frac{1}{1 + e^{-\{\eta_0 + \eta_1 [pre\overline{NP}_2 * (1 + EGR)^t * DR] + \eta_2 NA\}}} \quad (8)$$

and for failed firms is

$$P_f = E\{F(Y) = 0|Y\} = \frac{1}{1 + e^{-\{\eta_0 + \eta_1 [pre\overline{NP}_2 * (1 + EGR)^t * DR] + \eta_2 NA\}}} \quad (9)$$



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where  $P_a$  denotes the IPO probability of the firms from the approved sample group;  $P_f$  denotes the IPO probability of the firms from the rejected sample group.

Therefore, the testable model can examine the probabilities of the IPO firms, based on the performance of these factors. Theoretically, a firm's IPO fundraising amount is mainly determined by its net profit and potential growth rate. A firm with a high net profit and growth rate is expected to raise more money through its IPO. Further, a firm's dividend rates contribute to its fundraising amount as well. The probit model shows that firms with a large fundraising amount have high IPO probability, because these firms have high net profit and growth potential.

### 4. Data & Empirical Analysis

#### 4.1 Data

According to the listing procedures of China's stock market (see the institutional context in Chapter 3), IPO firms have to apply to the CSRC for permission to launch an IPO, and they have to detail their IPO-specific information in their IPO prospectus. The CSRC publishes these documents on its official website [www.csrc.com](http://www.csrc.com) for public investors' reference. The data used for this study was collected from these IPO prospectuses of listing applicants. From September 2009 to December 2011, the CSRC reviewed 243 IPO applications, of which 205 were approved and 37 were rejected. The researcher obtained data about 233 IPO cases from 2009 to 2011 for this study. The data collected includes firms' industry distribution; net profits ( $NP_1$ ,  $NP_2$ ) and incomes ( $IN_1$ ,  $IN_2$ ) in the past two years before IPO; the dividend rate over the past two years; net assets (NA) in the past year; the issued share amount. IPO price, and fundraising amount (FA).

#### 4.2 Regression Model Test

Base on the former analysis, the IPO principal factors have been identified, so the first research question has been addressed. This section concentrates on addressing the second research question, namely, what are the relationships between these listing determinants?

Prior to empirically investigating the associations using linear regression model, it is necessary to examine the developed model 5 is feasible and reasonable based on the collected sample data.

Theoretically, we know that

$$PE = \frac{Price}{EPS}, EPS = \frac{pre\overline{NP}}{SAI} \quad (10)$$

$$PE = \frac{Price * SAI}{pre\overline{NP}} = \frac{FA}{pre\overline{NP}} \quad (11)$$

So the equations can be defined as

$$PE * pre\overline{NP} = Price * SAI = FA \quad (12)$$

By Combining equation 5 with equation 12, it is developed further as

$$FA = PE * pre\overline{NP} = pre\overline{NP} (1 + EGR)^t * DR \quad (13)$$

A new equation is finally received

$$PE = (1 + EGR)^t * DR \quad (14)$$

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The next step is empirically to demonstrate  $PE = (1 + EGR)^t * DR$  based on the collected data. As a result, the proposed model  $FA = pre\overline{NP} (1 + EGR)^t * DR$  is feasible and sensible to account for the relations between these principal factors, provided the collected data support equation 14. The flow is

- i. working out the values of both dividend rate and investment sentiment. The below table outlines the results according to the equations

$$t = \frac{\ln\left(\frac{FA}{DR * pre\overline{NP}_2}\right)}{\ln(1+EGR)} \text{ and } DR = \frac{D_3 + D_2 + D_1}{NP_3 + NP_2 + NP_1} * 100\%.$$

The results are presented in Table 1.

**Table 1**  
**Descriptives of Values on Return Rate and Investment Sentiment by Industries**

Industries <sup>a</sup>	DR	Inv. Horizons (t)	Functions
AM <sup>b</sup>	0.18	15.34	$FA = pre\overline{NP}_2 * (1 + EGR)^{15.34} * 18\%$
BI <sup>c</sup>	0.31	11.12	$FA = pre\overline{NP}_2 * (1 + EGR)^{11.12} * 31\%$
EF <sup>d</sup>	0.08	14.45	$FA = pre\overline{NP}_2 * (1 + EGR)^{14.45} * 8\%$
IT <sup>e</sup>	0.10	19.36	$FA = pre\overline{NP}_2 * (1 + EGR)^{19.36} * 10\%$
MA <sup>f</sup>	0.05	20.62	$FA = pre\overline{NP}_2 * (1 + EGR)^{20.62} * 5\%$
MS <sup>g</sup>	0.19	15.62	$FA = pre\overline{NP}_2 * (1 + EGR)^{15.62} * 19\%$
NM <sup>h</sup>	0.08	17.28	$FA = pre\overline{NP}_2 * (1 + EGR)^{17.28} * 8\%$
TM <sup>i</sup>	0.13	15.61	$FA = pre\overline{NP}_2 * (1 + EGR)^{15.61} * 13\%$
Average	0.20	19.78	$FA = pre\overline{NP}_2 * (1 + EGR)^{19.78} * 20\%$

a. The industries with under 5 IPO firms are excluded, b. Advanced Manufacture, c. Biomedicine, d. Environmentally Friendly, e. Information Technology, f. Modern Agriculture, g. Modern Service, h. New Material, i. Traditional Manufacture.

As the table indicates, dividend rates vary across industries (Lintner 1956), and the majority of return rates are over 10%, which is the minimum rate required by the GEMC. As an emerging and promising industry in China, the BI sector has the highest return rate, which is in line with the finding of Ang and Boyer (2009), who show that the new industries provide investors with significant returns over five years. In addition, the sectors with high returns are generally manufacture-related industries, while the agriculture-based sector MA has the least returns, due to the fact that China's economy is in transition to industrialisation. As the functions demonstrate, the higher current return rates and future return expectations may contribute to a larger amount of capital, which is consistent with the findings of Pagano et al. (2002).

These functions also support Lowry (2003)'s viewpoint that investor sentiment may contribute to IPO volume. As the IPO market swings between bullish and bearish markets, investment sentiment consequently fluctuates, following its market cycle. Theoretically, the investment horizon will be greater in a bullish market, due to the reason that the high volume is associated with the market peak (Loughran 1994). Otherwise it will be smaller. Because of the limited dataset, this study is not able to compare these figures for investment sentiment in these two different market situations (It should be assumed that the dataset environment was a bearish market, because this sample range is from September of 2009 to December of 2010, i.e. after the Global Financial Crisis of 2008).

It is therefore believed that the investment horizon and returns can be used as proxies for investor sentiment (Baker and Wurgler 2006; Brown and Cliff 2004), and contribute to IPO volume (Lowry 2003).

- ii. Then, the values of both  $(1 + EGR)^t * DR$  and PE based on the data are

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determined, and the results are reported in Table 2.

**Table 2**  
**Descriptives of Values on  $(1 + EGR)^t * DR$  and PE by Industries**

Sectors		Statistic	
		$(1 + EGR)^t * DR$	PE
AM	Mean	15.82	13.61
	Median	14.79	12.99
	Minimum	4.82	4.069
	Maximum	35.37	27.31
BI	Mean	20.91	17.03
	Median	18.88	15.25
	Minimum	7.21	6.56
	Maximum	42.78	31.12
EF	Mean	20.08	18.40
	Median	22.69	17.67
	Minimum	11.31	10.10
	Maximum	39.74	29.80
IT	Mean	14.15	13.15
	Median	15.14	13.51
	Minimum	9.37	6.77
	Maximum	20.15	18.24
MA	Mean	18.17	15.24
	Median	16.11	13.89
	Minimum	13.36	11.98
	Maximum	28.98	21.44
MS	Mean	18.96	15.88
	Median	19.35	16.41
	Minimum	8.97	7.45
	Maximum	33.74	25.59
NM	Mean	15.52	14.93
	Median	16.96	14.17
	Minimum	9.6	8.29
	Maximum	34.32	27.06
TM	Mean	16.22	13.65
	Median	13.91	12.08
	Minimum	9.69	.181
	Maximum	40.09	31.33

Apparently,  $(1 + EGR)^t * DR$  is approximately equal to PE in each industry.  $(1 + EGR)^t * DR$  is greater than the PE, because these IPO applicants are more likely to demonstrate to the exchange their profitability and return performances, and they deliberately allocate their high dividend returns within the most recent past year. Nevertheless, it seems reasonable to assume that the equation  $PE = (1 + EGR)^t * DR$  is well-founded, and gives support to the proposed model  $FA = pre\overline{NP} (1 + EGR)^t * DR$ .

4.3 Probit Model Test

In this section, a probit model is introduced to cope with the third research question, i.e. how do these factors determine IPO probability? The data from both approved and failed IPO samples is used to detect the probability difference between the two sorts of samples. Presumably, the approved firms should have higher approval rates than the failed firms.

According to the analytical framework, the two probit models for approved and failed respectively are as below:

$$\begin{aligned}
 P_i^a &= E\{F(Y_i) = 1 | Y_i\} = \frac{1}{1 + e^{-Y_i}} \\
 P_i^f &= E\{F(Y_i) = 0 | Y_i\} = \frac{1}{1 + e^{-Y_i}} \\
 Y_i &= h_0 + h_1FA_i + h_2NA_i
 \end{aligned}
 \tag{15}$$

Prior to working out the P value, the prerequisite is to know each value of the coefficient  $\eta$ , which can be achieved via software. As the  $P_i^a$  equals 1 for the approved samples, and the  $P_i^f$  is 0 for the rejected samples. When each value of independent variable (FA, NA) is given from the collected database, the estimated parameters of the variables are subsequently received as Table 3.

Table 3 Parameter Estimates

Parameter	Estimate	Std. Error	Z	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
PROBIT <sup>a</sup> FA	4.732	.665	7.111	.000	3.428	6.036
NA	0.013	.177	-.074	.041	-.360	.334
Intercept	-1.065	.270	-3.952	.000	-1.335	-.796

a. PROBIT model: PROBIT(p) = Intercept + BX

so,

$$Y_i = -1.065 + 4.732FA_i + 0.013NA_i
 \tag{16}$$

The following step is to work out the P value. Back to the probit model  $P_i = F(Y_i = h_0 + h_1FA_i + h_2NA_i) = \frac{1}{1 + e^{-Y_i}}$ , the P value for each sample firm is computable by entering the Y values individually into the probit model. Table 4 presents some characteristics of the two sorts of probit value. Obviously, the approved group has significant IPO likelihood, at 0.851 on average, while the failed group has a much lower rate, at 0.419.

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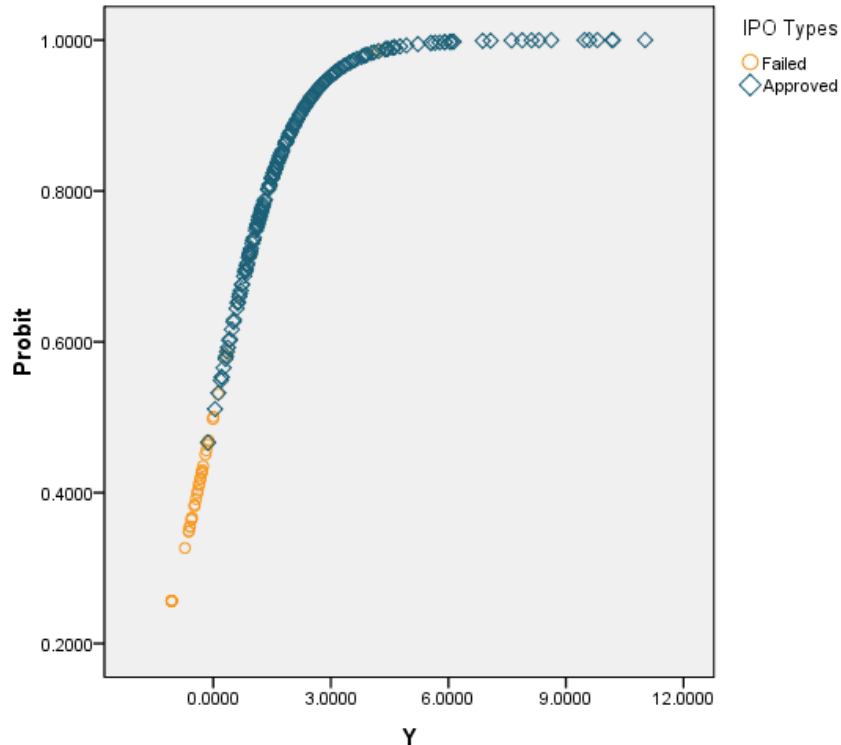
**Table 4 Descriptives of Probit Values**

IPO Types			Statistic
Probit	Failed	Mean	.419
		Median	.410
		Mode	.256 <sup>a</sup>
		Std. Deviation	.132
		Minimum	.256
		Maximum	.651 <sup>*</sup>
		Approved	Mean
Median	.882		
Mode	.467		
Std. Deviation	.130		
Minimum	.511		
Maximum	1.000		

\* As literature shown, there are many factors affecting IPO decision, so some sampling firms with high probability in this study are rejected due to other reasons rather than accounting performance.

Diagram 1 demonstrates the distribution pattern of all the probit values. The dark diamonds standing for the probabilities of approved firms dominate the right side of diagram, and the majority of them assemble between likelihood 0.8 and 1. On the other hand, almost all the circles distribute dispersedly on the left side under likelihood 0.5. As the diagram indicates, firms with under 0.5 probit are completely rejected and cannot undertake IPOs.

**Diagram 1 Distribution Pattern of Probit Values**



### 5. Results and Implications

#### 5.1 Findings from the Logarithm Model Analysis

1). The regression model suggests that the NP and GR factors affect the FA substantially relative to investment sentiment and the dividend rate in the GEMC. They fundamentally and essentially determine each IPO indicator and ultimately impact on IPO performance, because all of the NP-related IPO indicators, such as FA, ROE, GR, EPS, investment sentiment, dividend returns, and IPO price, are positively determined by the NP factor.

This finding is consistent with findings in prior studies. For example, Benartzi et al. (1997) argue that dividend growth usually follows a period of profit increase. Similarly, profitability is a reliable indicator reflecting the long-run performance after listing and the potential returns of the issuing firms (Firth 1998; Jain and Kini 1994). Additionally, Ritter (1984) reveals that earnings-specific characteristics are significant determinants in determining the IPO volume of issuing firms.

**Implications:** IPO applicants should concentrate on their profitability, rather than their firm size. This implies that prospective applicants should turn their attention away from rapid business expansion to competitiveness and sustainability. Profit is a basis underlying many financial indicators. For example, the PE as a profit-based indicator is the simplest and most popular approach to measure an IPO firm's valuation. In addition, high profits support technological innovation; high profits can contribute to high dividend allocations to repay investors; high profits ensure IPO firms can compete with their industry peers in the public market. As such, IPO firms should work to enhance their profitability in order to achieve a higher chance of IPO success.

2). The investment sentiment is a factor contributing to IPO volume in the GEMC; the investment horizon varies across industrial sectors depending on market sentiment and the profitability of the issuers.

This finding is in line with the findings in prior literature. Lowry (2003) reveals that the fundraising amount fluctuates remarkably over time, due to market swings between bull and bear markets, and suggests further that investor sentiment is the most important and significant determinant of IPO volume. Loughran (1994) states that the investment horizon will be greater in a bullish market, due to the high volume associated with the market peak, otherwise it will be smaller. IPO volume is not only determined by the firm's previous revenue and profits, but also by market sentiment (Babich and Sobel 2004).

3). The dividend payout is a factor contributing to IPO volume in the GEMC. This finding is supported by others observing overseas markets. For instance, as Pagano et al. (2002) suggested, a higher current return rate and expectations of future returns on assets may contribute to raising a larger amount of capital. Moreover, Jain and Kini (1999) show that firms with good pre-IPO performance and with dividend returns are more likely to survive longer after IPO than others. Long-term dividend returns are a signal of issuers' quality because lower quality firms appear to have worse stock returns (Loughran and Ritter 1995).

Therefore, the dividend rate is a profit-related factor that influences IPO pricing, and investor sentiment is driven by multiple factors underlying IPO volume (Lowry 2003). Both

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have been used to examine the effects of investment sentiment, and substantially determine IPO price and IPO volume (see Brown and Cliff, 2004; Lowry, 2003). They affect each other as well (Baker and Wurgler, 2006).

**Implications:** Dividend policy is constantly stressed by China's exchanges. The authorities not only require that IPO firms should publicly state their dividend policies in their IPO prospectus, but also release a wide range of regulations to increase cash dividend rates. On 30 November 2013, the SCRC released a new regulation called 'No 3 Supervisory Instruction for Listed Firms—Dividend Allocation in Cash', which requires an increase in the annual dividend rate from 10% to at least 20%.

Current dividend policies have stimulated the growth of the payout rate in China's stock market. According to Dow Jones Index data on 31 January 2002, China's dividend rate of 0.75% was dramatically lower than others. After the government's efforts in these years, the data from Shenzhen Stock Exchange (No. 2, 2012) show that this rate rapidly increased by 23.36 % in 2011, and may grow in the future. Although the dividend rate is still lower relative to those available in the developed markets, it is gradually approaching their levels. Therefore, the dividend rate is an important indicator for measuring IPO firms' performance in China's stock market.

### 5.2 Findings from Probit Model Analysis

1). The FA, as one of the most significant IPO determinants, is positively associated with IPO probability in the GEMC. As Levis (1993) suggested, the offering volume is one of the indicators determining issuance uncertainty or otherwise: issuers with large IPO volumes are less likely to be risky than those with a smaller offering size.

This finding is consistent with existing studies based on overseas markets. For example, Jain and Kini (1999) and Boubakri et al. (2005) reveal that IPO probability is positively related to IPO volume. Dunbar (1998) examines the likelihood of offering success for two offering methods (best-efforts and firm-commitment), and finds that the offering size is one of the determinants of a successful offering. Beatty and Ritter (1986) suggest that large offerings generally have less underpricing due to their lower uncertainty.

In addition, other studies explore the same relationship from a delisting perspective, to show that IPO probability is substantially subject to the FA. For example, using a multinomial model, Schultz (1993) examines 797 IPO issuers over the period 1986–1988 and finds that the delisting probability of IPO firms is affected by their offering size. Consistent with this finding, Boubakri et al. (2005) find that the delisting likelihood is associated with the offering size, because the larger IPO firms with larger fundraising amounts are more likely to withstand tough market conditions than those with a smaller IPO size.

**Implications:** The CSRC reports that firms with a large amount of IPO volume are usually leading companies in their industry. The government welcomes this sort of company going public, and growing stronger, because these firms will make more contribution to the national economy in the form of tax payment, employment opportunity, and technological innovation. The CSRC gives priority to IPOs for these firms. In addition, the CSRC believes that this kind of firm will survive longer than the other firms in the financial market, and they may even facilitate the development and stability of the emerging stock market.

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Therefore, to achieve a successful IPO, applicants should sensibly determine their IPO volume based on their past financial performance. They need to demonstrate their capability to yield sufficient net profits to repay their investors. They also need to demonstrate their capability to use this money efficiently for their future business plans.

2). The NP, as a fundamental IPO determinant, is positively associated not only with other indicators (FA, DR ), but also with IPO probability in the GEMC. This finding confirms the proposition that the GEMC is a profit-oriented listing venue.

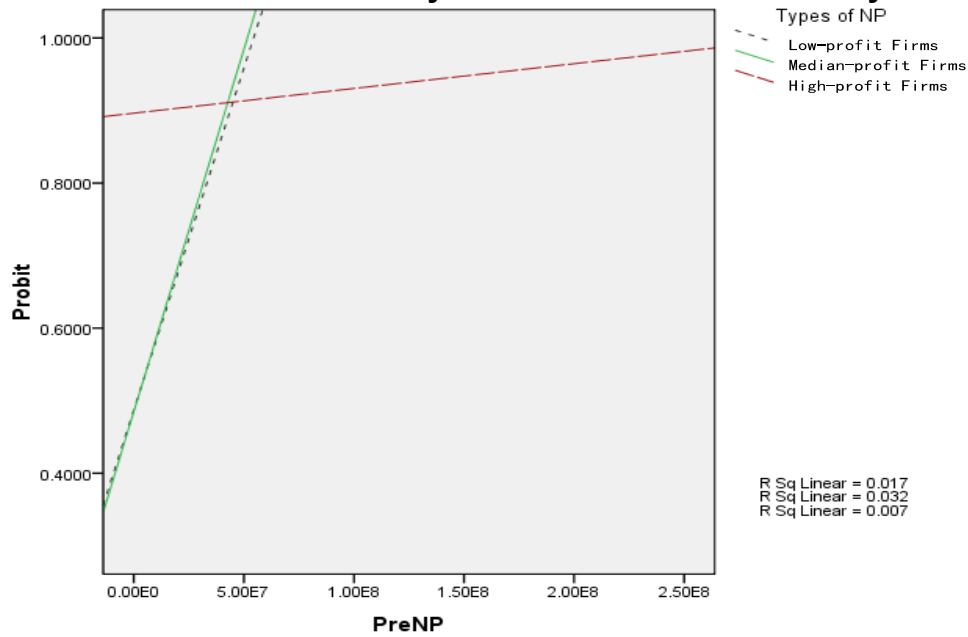
This finding is supported by prior literature. For instance, Alborno and Pope (2004) reveal that firms with low profitability have a low probability of going public, due to the fact that they are unlikely to generate sufficient internal capital to repay their investors. Gao et al. (2012) show that profitability is a determinant of IPO probability for small firms. Fischer (2000) suggests that profitability, including net profit and its growth rate, may affect IPO likelihood in many different ways. As such, profitable firms are more prone to be listed (Shen and Wei 2007), because high profitability is a credible signal for IPO companies, and can overcome the risk of rejection (Diamond, 1991).

Peristiani and Hong (2004) show that a gradual deterioration in pre-IPO profitability leads to a corresponding acceleration in the post-IPO failure rate. The middle curve in the chart represents the experience of the average-profit companies. The top and bottom curves present the survival of issuers ranked at the 95th and 5th percentiles of profitability. The considerable disparity in performance between the high-profit and low-profit groups (about 13 percentage points after seven years) indicates that pre-IPO profitability is, by itself, a very strong indicator of the ability of firms to operate successfully after the offering (Peristiani and Hong 2004). Therefore, pre-issue profitability is a significant predictor of an issuer's survival potential in the aftermarket.

As Diagram 2 illustrates, a growing pre-IPO probability may contribute to a corresponding growth in IPO probability. The horizontal dotted-line in the diagram stands for the experience of the high-profit issuers. The top vertical solid-line presents the relationship between median-profit and IPO probability. The vertical dotted-line outlines the situation of the low-profit firms. The considerable disparity in performance between the high-profit and low-profit groups indicates that pre-IPO profitability is a pretty substantial indicator of IPO likelihood among pre-listing firms. Therefore, pre-issue profitability performance is not only a significant predictor of an issuer's survival potential in the aftermarket, but also a substantial indicator of IPO likelihood

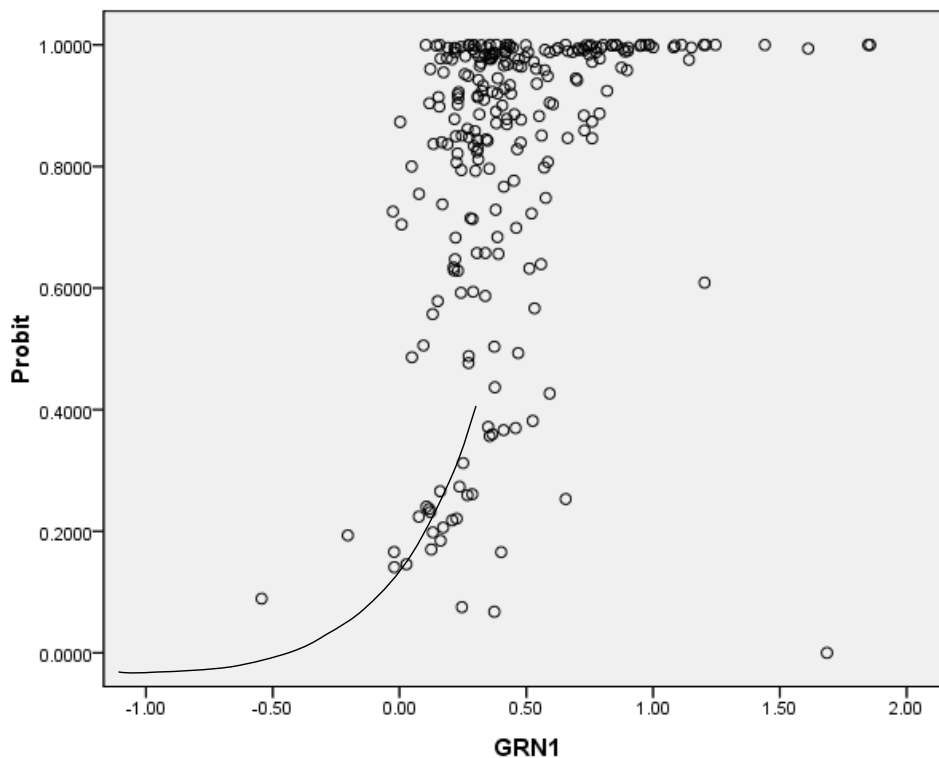


**Diagram 2**  
**IPO Likelihoods of Pre-IPO Firms by Level of Pre-IPO Profitability in the GEMC**



In addition, Jong et al. (2012) document that profitability is one of the determinants of the IPO decision, a factor that is positively associated with IPO probability. Consistent with this finding, this study reveals a similar finding on the relationship between profit growth and IPO probability (see Diagram 3).

**Diagram 3**  
**Relationship between Pre-IPO GR and IPO Probability in the GEMC**



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**Implications:** As mentioned earlier, the GEMC is a profit-preferring listing market. Through these profit-driven IPO firms, the CSRC attempts to show the high quality of the listing market to investors and prospective IPO applicants. The profit-driven firms have longer survival prospects and better performances after their IPOs than other listed firms in China's stock market. In addition, the CSRC believes that the profit factor is the more reliable factor for evaluation of new IPOs, because net profit substantially affects IPO size and other IPO indicators, and consequently increases IPO success. Data show that the more profitable, higher-dividend payout IPO firms are in China's stock market, although some studies may not support this finding.

Looking at the problems associated with unsuccessful IPO applications in the GEMC, this study finds that approximately half of the failed firms were rejected due to their profit issues. As a consequence, IPO applicants should carefully manage their net profits and profit-based factors in the three years immediately before their IPOs.

3). The net assets determine IPO probability but not IPO volume on the GEMC. Consistently, Babich and Sobel (2004) regard current assets as a significant determinant of going public, because expenditure on research and development may result in a large proportion of intangible assets, which will yield greater profit. According to Fischer's model (2000), the logical model for assets affecting listing decisions is: an increase in capital expenditure leads to growth in sales and intangible assets, and then results in profit growth, which consequently contributes to the likelihood of going public. Once an IPO is successful, ample capital is raised and is available for the next round of growth.

Jong et al (2012) explore the relation between pre-IPO capital expenditures on fixed assets and IPO probabilities, and suggest that the asset growth is also a listing determinant, which is positively associated with IPO probability. Furthermore, Jain et al. (2009) argue that IPO firms are substantially prone to spend part of the raised capital on their technological innovations and marketing strategies, and on catering for rapidly growing demand.

Similarly, this study investigates the association between pre-IPO net assets and listing probabilities, and finds that the net assets are positively related to the probability. This means the net-asset-related factors determine the IPO probability, which is consistent with Jong et al (2012).

**Implications:** Net assets are an important indicator that the CSRC constantly concentrates on to measure a firm's growth potential. According to the most recent data from the 40 IPO firms listing between 8 January and 11 February 2014, the average value of their net assets per share was RMB¥ 5.20. This high requirement has driven China's IPO firms to improve their net assets performance. As Table 5 shows, China's listed firms experienced gradual seven-fold growth in net assets during the period 2005–2011.

**Table 5**  
**Total Amount of Chinese Listed Firms' Net Assets (2005–2011)**

	2005	2006	2007	2008	2009	2010	2011
Net Assets (¥Billion)	2281.5	3,665.1	6,791	7,724	9,278.8	12,301	15,037

Source: CSRC official website.

In addition, the CSRC highlights on its website that return on equity (ROE) is a core indicator reflecting the profitability and management capability of an IPO firm. This is different from overseas markets that consider returns on assets (ROA) to be a factor contributing to the IPO decision (Pagano et al. 2002). The CSRC have conducted a set of reforms regarding the net assets of IPO applicants. According to the two schemes released on 28<sup>th</sup> June 2012, listed firms will be given a delisting warning if their net assets are consecutively negative for three years; IPO applicants on the other hand are advised that they must meet the listing requirements on net assets, and must show a good performance in net assets to increase their IPO probability.

To sum up, the financial determinants proposed in this study, drawn from the listing requirements, are the principal factors that positively affect IPO probability in the GEMC. The fundraising amount has the most direct impact on listing likelihood, but profitability is the fundamental and essential determinant, because it determines directly and indirectly all of the other IPO indicators. Net assets have an effect on IPO likelihood, but have no impact on the fundraising amount. In terms of the two introduced variables (DR and t), both exert impact on the fundraising amount, and contribute to IPO probability.

## 6. Conclusions and Limitations

The GEMC, being an emerging alternative listing venue, is designed for fast-growing and profitable entrepreneurial firms that intend to go public. To achieve a successful IPO in the market, these firms do not simply need to meet the listing requirements, they need to present their past financial performance and future financial plans. To do so, they must convince the exchange that an IPO is important to their business plan. In addition, the majority of these firms are invested in by venture capitalists and other institutional investors. This study attempts to give an insight into the listing requirements and to investigate the IPO examination mechanism in the GEMC, in an effort to facilitate these earlier institutional investors exiting from their investee firms through an IPO.

The most striking findings are:

1. The GEMC, like the primary market in China, is also a manufacturing-oriented market.
2. The proposed four elements are the key IPO determinants in the GEMC, so the issuer's performance on these four fronts is critical to its IPO assessment.
3. The FA, as one of the most significant IPO determinants, is positively associated with IPO probability.
4. Net profit and its growth potential are major determinants of IPO probability. The NP factor fundamentally and essentially determines each IPO indicator and ultimately impacts on IPO performance. The NP factor makes the greatest contribution to the FA. In addition, ROE, GR, PR, PE, EPS, NS, Dividend, and IPO price, are NP-related IPO indicators, which are positively determined by NP.
5. The return rate makes a fairly limited contribution to the FA; on the other hand, the

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NA factor has no impact on the FA, but it still contributes to listing likelihood at least equally among the four determinants.

To sum up, the factors proposed in this study are the key factors affecting IPO success. While net profit and its growth rate may contribute to IPO volume, net assets may not. All the factors contribute to IPO probability. Thus, IPO firms and their investors should carefully manage their performance according to these key determinants, which are capable of enhancing their chances of IPO success. The existing investors may completely exit and maximise their returns through a successful IPO, under the circumstances discussed above.

Despite having made these major findings above, there are two major research limitations in this thesis.

First of all, this study investigates only some quantitative variables set up in the listing requirements of the GEMC, particularly financial factors. However, qualitative determinants have been excluded from the study due to limited access to this sort of data, which do have impact on IPO success, because China's IPO examination system is affected by some administrative factors (Long and Zhang 2014). As such, further work to address this limitation would entail taking the most important qualitative determinants into account as dummy variables.

Secondly, although the analytical framework developed in this study has been significantly tested, some models are not suitable to test similar questions from other markets, which have different listing rules and context-specific factors. As Kumar et al. (1998) suggested, theories or frameworks established in a particular context may not be applicable when being considered under different circumstances. To cope with this issue, the researcher expects that future research will be able to improve the framework and models, based on various stock markets.

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