

Original Paper

Does Information Asymmetry Influence Hi-tech Entrepreneurial Financing?

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Abstract

Exploring the effective ways of start-up financing is an important and practical issue to technological innovation and economic development. This paper aims to investigate the impacts of information asymmetry on the high-tech start-up financing preference, and whether an entrepreneur's internationality features moderate the main effects. A sample of 500 high-tech start-ups and new ventures was collected at Shenzhen, China. Regression models are designated for testing both the main effects predicted in research hypotheses and the predicted moderating role of an entrepreneur's internationality features.

Our test results lead to 3 findings: firstly, in the high-tech industries, the information asymmetry mitigated by disclosing intellectual properties can significantly increase the start-up preference for external financing. This finding can be explained by the reduction of agency costs of debts. Secondly, the lessened information asymmetry can shorten the life cycle of start-up financing under the pecking order hypothesis. Lastly, the liability of foreignness is observed to have a significant positive moderating role on the main effects under the investigation. It can be concluded that the information asymmetry and the liability of foreignness are crucial factors influencing start-up financing decisions.

This conclusion implies that reducing the information asymmetry by adequately disclosing technological strength and tacit knowledge can benefit the entrepreneurial financing for the high-tech start-ups and new ventures at the early stages, as well as provide an effective shortcut to the start-up financing cycle. Furthermore, the introduction of overseas technologies, funds, knowledge, experiences, and entrepreneurship into the high-tech start-ups does not create the liability of foreignness, and on the contrary, it is an "asset" that can help improve entrepreneurial financing decisions.

Keywords

information asymmetry, financing preference, start-up, pecking order hypothesis, liability of foreignness

1. Introduction

While the large-size multinational companies have long caught the limelight of academic research in the fields of international business and globalization, the small and medium hi-tech startups and new ventures have become a critical part of the growth engine in most economies of the world (Ng & Kee, 2017). With the boost of new and high technologies emerging in the IT-led economic development, the small and micro firms are becoming an increasingly important player in the arena of innovation and economic development. Many of the hi-tech small and micro firms have fast responses to the newest technological innovations and evolutions. Especially in the case of the small and micro startups and new ventures, they are usually a combination of entrepreneurship and technological leadership. They extend the frontiers of both business and technical boundaries using their unique features.

However, vigorous small and micro hi-tech startups and new ventures have financial constraints in their inception, survival, and growth. Early-stage funding is a critical issue for most of them. Hanson (1983) points out that lack of adequate entrepreneurial financing sources is the major obstacle to the survival and growth of startup businesses. In practice, the hi-tech startup's urgent demand for entrepreneurial financing stands out in the way of early-stage survival and growth. The key source of the financing difficulties confronting the startups and new ventures is the information asymmetry between the financiers and the firms who need to obtain entrepreneurial financing. Entrepreneurial finance is a distinctive aspect of corporate finance, notably concerning informational asymmetries.

Great pressure and obstacles are reported in a vast body of entrepreneurial financing research on the emerging market such as China, especially for those small and micro hi-tech startups, they are rarely considered by the funding and financing sources in the external capital markets. As the most important innovation center of the Great Bay Area (GBA) in southern China, Shenzhen is a pioneering city in China, offering researchers a rich data source of natural experiments in entrepreneurial financing and hi- and new-tech new venturing. The industrial development policies of both the Central government and local governments have clearly articulated their support for innovation and entrepreneurship which play vital roles in sparking the developments of economy, science, and technology. Namely, the Fintech-based financial industry and innovation-led technical breakthroughs are the keynotes in the blueprint for future reforms. The implementation of these innovation and entrepreneurship encouraging policies has created a good chance for combining academic research with practical applications and explorations.

As it happens elsewhere in the world, hi-tech startups and new ventures are always confronted with various difficulties in sourcing their entrepreneurial finance. Exploring the effective ways of startup

financing is an important and practical issue to technological innovation and economic development. This study aims to investigate the relationships between the information asymmetry and the hi-tech startup financing preference, then further depict the moderating role of the liability of foreignness on the main effects.

This study makes several marginal contributions to the existing entrepreneurial financing literature with its findings regarding hi-tech startup financing. First, two proxies to depict the reduction of information asymmetry are proposed and testified: technological uncertainty and firm-specific tacit knowledge. Second, this study reveals the fact that the startup entrepreneurial financing preferences are associated with the lessening of the information asymmetry problem. Third, this study identifies for the hi-tech startups the shortened financing cycle under the pecking order hypothesis. Lastly, the moderating role of the foreignness features is observed and this implies that foreignness may be an “asset” instead of a liability.

Besides this introduction, the paper is organized as follows: the second section includes literature review and development of research hypotheses; the third section presents the methodologies adopted in this study; it is followed by the section of empirical results and analyses, and the last section summarizes the conclusions, limitations, and implications of this research work.

2. Literature Review and Research Hypotheses

2.1 Information Asymmetry: A Key Source of Startup Financing Problems

Many entrepreneurial financing problems and challenges for startups are originated from the information asymmetry and agency costs. Jensen and Meckling (1976) recognize the existence of the agency problem and identify two kinds of agency costs, i.e., agency costs of equity resulting from the conflicts between management and owners, and agency costs of debt resulting from the conflicts between owners and creditors. Regarding the agency issue and information asymmetry problem existing in the initial startup funding, Nofsinger and Wang (2011) examine what matters in funding the startups, products, technology, or entrepreneurial experience, and they find out that tacit knowledge that is often highly context-dependent and personal is more important compared to the explicit knowledge that is codified such as found in documents. Tacit knowledge refers to what is hard to communicate and deeply rooted in individual action, commitment, and involvement (Nonaka, 1994). Leonard and Sensiper (1998) and Li and Gao (2003) recognize that tacit knowledge is considered the most valuable source of knowledge in the organization, and it is associated directly with innovations and sustained competitiveness.

Nofsinger and Wang (2011), following on their analysis of tacit knowledge, argue that most new startups in their early stages have strong preferences for external financing though they also need these financing sources in later stages. Haines et al. (1989) also argue that the management traits, the managerial strength and income potentials are important in influencing the bank decision of granting

loans to the startups.

Wu et al. (2008) clarify two major lending techniques in China, one being transactional lending based on quantitative data such as the asset-guaranteed or financial statement, and the other, relationship lending that refers to the lending based on the qualitative information usually acquired through interpersonal contacts and communication.

The larger information asymmetry leads to higher agency costs of debts and equity, which influences the entrepreneurial preference for financing resources, in terms of selection between internal and external sources, and the total amounts expected to acquire. On the other way around, the voluntary disclosure of technological competitiveness and tacit knowledge advantages is conjectured to lessen the information asymmetry thus reducing the agency costs of debts, especially the external financing sources. Therefore, I propose the following two research hypotheses:

H1a: The more information disclosure regarding the intellectual properties, the larger amount of funding the startup entrepreneur requests from external sources.

H1b: The more information disclosure regarding the firm-specific tacit knowledge, the larger amount of funding the startup entrepreneur requests from the external sources.

2.2 Pecking Order Hypotheses (POH) and Entrepreneurial Financing Preferences

The pecking order theory arises from information asymmetry. Myers and Majluf (1984) argue that owing to the information asymmetries between the firm and potential investors, managers have more inside information than investors and act in favor of old shareholders. The pecking order theory suggests that a firm usually has a specific preference order for its capital structure decisions, i.e., the firm will prefer retained earnings to debt, short-term over long-term debt, and debt over equity. Thus, the pecking order theory fits well in the explanation of the startup's financing preference in that it assumes that there is no target capital structure which is very common in startups and new ventures. The firms choose entrepreneurial financing sources according to the following preference order: internal finance, debt, and equity.

Wu et al. (2008) and Robb and Robinson (2014) also document some evidence on the pecking order hypothesis on the firm's financing structure and techniques. According to their findings, Chinese startups mainly use their wealth and family financial sources to fund their business at the inception and surviving stages, while they tend to seek external funds, especially the intermediated finance such as bank loans when they enter the growth period.

Other research results show strong consistency with the pecking order theory. Chua et al. (2011) find a positive association between family involvement and new venture debt financing. Åstebro and Bernhardt (2003) conclude that the startups having a bank loan are significantly less likely to survive than those having a non-bank loan. Honjo and Nagaoka (2003) conclude that the startups with the financial support of venture capitals and the technological support from universities are more likely to go public earlier than other counterparts. Daskalakis et al. (2013) argue that startup entrepreneurs are

reluctant to use new external equity financing because they rely heavily on their family or personal funds and dislike the dilution of equity via raising new equity sources, on the other, the startup entrepreneurs prefer to borrow from external sources, especially the long-term debt financing.

Furthermore, the pecking order theory implies that there are stages of entrepreneurial financing for the startups. Chemmanur and Chen (2006) model the dynamic interactions over the time between the startup entrepreneur and external financiers for arriving at private firm financing contracts. Caselli (2010) describes a life cycle perspective into the analysis of the entrepreneurial project, which implies that there are different building steps even in the early stage of startups. Markova and Petkovska-Mircevska (2009) divide the entire startup life cycle into four critical stages, i.e., seed stage, startup stage, early stage, and later stage. To facilitate our empirical tests on the financing cycle under the pecking order hypothesis in the hi-tech startups and new ventures, the study concentrates on the entrepreneur's preferences for the staged external financing and the equity-based financing scheme. Thus, the following research hypotheses are proposed for empirical tests:

H2a: The more information disclosure regarding the intellectual properties, the more likely it is for the startup entrepreneur to adopt a staged external financing plan.

H2b: The more information disclosure regarding the firm-specific tacit knowledge, the more likely it is for the startup entrepreneur to adopt a staged external financing plan.

H2c: The more information disclosure regarding the intellectual properties, the more likely it is for the startup entrepreneur to seek the external, especially the equity-based external sources.

H2d: The more information disclosure regarding the firm-specific tacit knowledge, the more likely it is for the startup entrepreneur to seek the external, especially the equity-based external sources.

2.3 Liability of Foreignness

The liability of foreignness refers to the costs that foreign firms incur or the benefits that are available to domestic firms but not to foreign firms (Rugman & Verbeke, 2007). Guar et al. (2011) argues that there are two sources of liability of foreignness-environmentally derived liability of foreignness and firm-based liability of foreignness. Mo and Kurt (2018) investigate the relationship between the liability of foreignness and the openness of the entrepreneur's social network and conclude that the increasing cost of entering a foreign market due to the closed network worsens the liability of foreignness.

Some research papers focus on the foreignness liability issue confronting firms in China. Ng and Curran (2017) study the liability of foreignness confronting the foreign companies operating in China, and they find out that the most persistent problems include the use of the local employees and developing relationships with both national and local governments. Most Chinese international business scholars tend to highlight the positive role of foreignness liability in terms of returnees or returnee entrepreneurs. Qin et al. (2017) document that returnee entrepreneurs with innovative technology and foreign financial support are slower than their homegrown counterparts in entering

their home country to start their new ventures, and they explain that the liability of both newness and foreignness plays a crucial role in slowing down the returnee's speed of entrepreneurial entry. Bai et al. (2017) investigate the impact of returnee entrepreneurs' international experience and knowledge on the initial and early international expansion of the returnee entrepreneurial firm and argue that the returnee's international experience nurtures knowledge about international markets and in turn produces a positive effect on the level of internationalization.

To accommodate the theme of hi-tech startup financing, this study considers returnee entrepreneurship an appropriate proxy for us to investigate the moderating role of foreignness liability on the main effects. In practice, returnee entrepreneurs represent the various entrepreneurial inputs flowing back to China, including new products, new technologies, innovations, advanced managerial experience, financial and human resources. Therefore, I propose the following research hypothesis.

H3: Returnee entrepreneurship, a proxy for the liability of foreignness, significantly moderates the main effect between the information asymmetry reduction via disclosure and the entrepreneur's financing preference for external sources (including the requested amount, the staged plan, and equity-based financing).

2.4 Literature Gap and Conceptual Framework Adopted in this Study

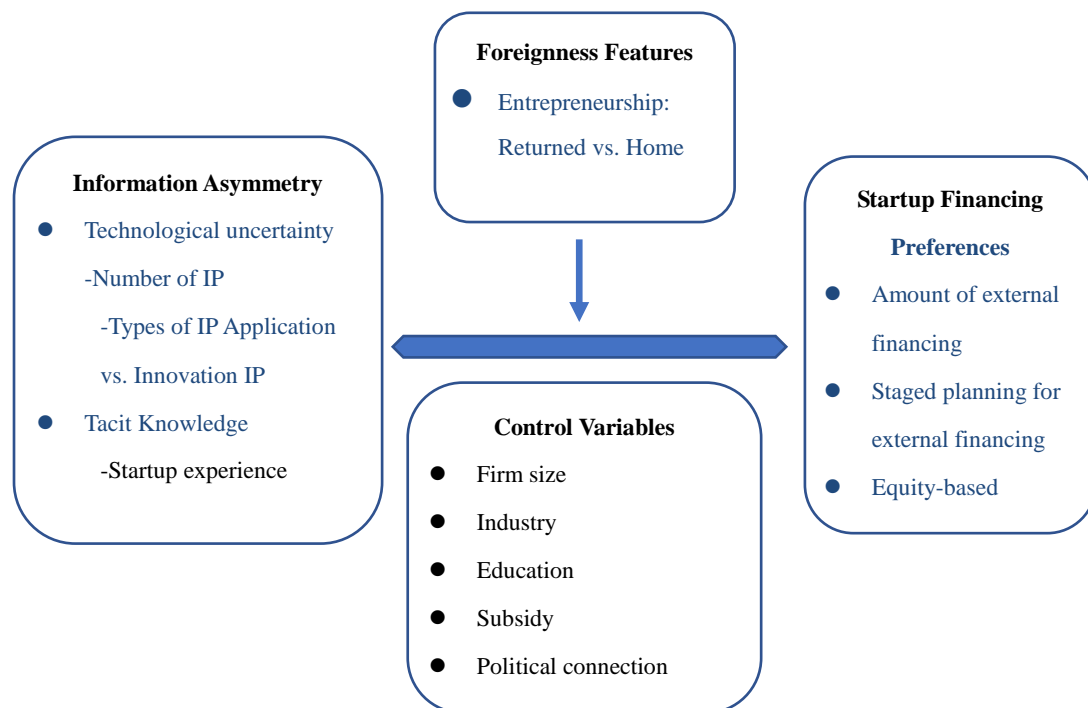


Figure 1. Conceptual Framework in this Study

Though there is a vast body of existing literature dedicated to entrepreneurship research and a large number of studies on entrepreneurial financing, there are some gaps to fill up in these academic fields. First, the entrepreneurial financing issue for hi-tech startups has seldom been visited. Second, the association between the pecking order hypothesis and the information asymmetry has not yet been tested empirically. Third, the liability of foreignness has not been introduced into the existing entrepreneurial financing literature.

To bridge the foregoing literature gaps, this study develops a conceptual framework for the further investigations of the rationale for the entrepreneurial financing preferences in the hi-tech startups, based on the theoretical explanations of information asymmetry, the financing cycle under the pecking order hypothesis, and the potential impact of the foreignness liability. This framework is illustrated in Figure 1.

3. Research Methodology

3.1 Data Collection

Following the national encouragement policies for innovations and entrepreneurship, both the local and central governments in China have established innovation and entrepreneurship-oriented competitions to sort out the best and vigorous hi-tech startups and new ventures in China. In the city of Shenzhen in 2018 alone, there were more than 4700 hi-and new-tech startup teams and new ventures enrolled in the innovation and entrepreneurship-oriented business competition (so-called *Shuangchuangsai*, the Innovation and Entrepreneurship Competition of Shenzhen). The winners would represent the province in the National Competition of Innovations and Entrepreneurship in China. The startup and new venture participants are generally motivated to extend their reputation to obtain external recognition and financial support.

A sample of 500 new ventures aged from 0 to 7 years old are collected on the Innovation and Entrepreneurship Competition of Shenzhen site to test our research hypotheses under the framework and individual interviews are to be conducted for further evidence of our findings and conclusions in this study.

3.2 Research Variables and Measurements

The research variables investigated in this study fall into four categories. Firstly, the dependent variables include the entrepreneur's selection between external and internal financing sources, the pecking order hypothesis, and the external financing sources requested. Secondly, two explanatory variables are selected to act as proxies for the two key dimensions of the information asymmetry, i.e., the technological uncertainty and managerial tacit knowledge, which are identified and measured by the content disclosure in the startup business plans. The third category includes the variables capturing the foreignness features of the startups and new ventures, and they are hypothesized to play the moderating role on the main effects between the dependent variables and explanatory variables. Lastly,

I follow the existing startup and entrepreneurial financing literature to select the control variables crucial to our regression tests.

Dependent Variables

The dependent variables are related to the startup financing preference, including four variables for the entrepreneur's preference for external financing sources, the staged external financing plan, the involvement of equity transferring, and the dollar value of the expected external financing. These four dependent variables are denoted by FINPRF, STAGEDFIN, EQUITYFIN, and LGFIN\$ respectively.

Explanatory and Moderating Variables

We use two sets of explanatory variables as proxies for the lessening of the information asymmetry: one is related to the technological uncertainty, and the other is relevant to the firm-specific knowledge. The first set includes the information disclosure regarding the two types of intellectual properties, and the number of the officially approved and authorized intellectual properties, denoted by IPTYPE and IPNO respectively. For the second set, I choose the number of years for which the key startup team members have worked for the new venture and this variable is denoted by TACITYEAR.

Control Variables

The first control variable in this study is firm size. Colombo and Grilli (2005) investigate the correlation between the external financing and the firm size of the Italian hi-tech startups and they find that those young startups with bank debt financing are not larger than those established only through the entrepreneur's wealth, but the external private equity financing has a significant positive impact on the firm size of startups. Firm scale always plays an important role in the financial decisions made by both financiers and recipients of financial sources. Size can be a signal for firm credibility in debt covenants and provides collateral for executing financing contracts. Most prior studies indicate that larger size and complete asset portfolio of a new venture are more likely to attract external financing sources. Recognizing this major finding, I control the size of the startup entrepreneurial team in this investigation on entrepreneurial financing.

The education level of the entrepreneurs is a critical factor. Gebru (2009) finds out that the less educated micro and small enterprise owners are more likely to use their household net worth to finance their startups and new ventures, while the more educated people have more tendency to acquire and receive the external funds.

We also control the industry factor. All the hi-tech startups in this study are classified into 6 groups of hi-tech industries regulated by the government. They fall into one of the following 6 industrial categories: Electronic Information, Internet and Mobile Internet, Bio-tech, AI & Robotics, New Energies, and Environmental Protection Technologies, New Materials.

Political connection is an important factor impacting entrepreneurial financing in emerging markets. Daskalakis et al. (2013) document the fact that there is an informational gap in grant financing. Thus they suggest that for the government grant financing, startup entrepreneurs should be better informed

and encouraged more to apply for state grants and co-financed programs. Subsidies for startup new ventures are provided by local governments for the policy purposes of encouraging some highly prioritized industries and businesses, and these subsidies are commonly rewarded to the high- and new-tech new ventures. Governments and policymakers offer subsidies to demonstrate for entrepreneurs the guidance or directions for future industrial and business orientations in their macro-economic policies. Moreover, gaining government subsidies can also act as a strong signal for the good firm credibility of business and technology endorsed by official authorities. This “fortune money” in the form of subsidies represents the local government’s encouragement in entrepreneurial financing and is selected as a control variable in this study. Close business and government relationships can reduce transaction costs by lubricating the business processes, and this is more pronounced in emerging economies. Most researchers use political connections to indicate the business and government relationships and their impacts on business activities. Political connections of the startup team, especially those of the key members, may help mitigate the new emerging market entering obstacles incurred due to the foreignness liability.

Table 1. A Summary of Research Variables

Variable	Description	Measurement
<i>Startup Financing Decisions</i>		
LGFIN\$	Dollar value of expected external financing plan(s)	Logarithm of the dollar value of the funds to be financed
STAGEDFIN	Indicating the staged plan of startup financing	No=0; Yes=1
EQUITYFIN	Indicating whether equity is involved	No=0; Yes=1
<i>Information Asymmetry</i>		
IPTYPE	Practical Application IPs or Invention/Innovation IPs	Practical Application=0; Invention/Innovation=1
IPNO	Number of approved IPs	No. of IPs possessed
TACITYEAR	Years since inception	Number of years since inception, with team valued at 0.
<i>Foreignness Features (Moderators)</i>		
RETURNEE	Entrepreneur is returned talent (overseas) or home trained	Home=0; Overseas=1
<i>Control Variables</i>		
SIZE	Number of people in the new venture	No. of people in the startup group
INDUSTRY	Traditional or hi-tech industries	Traditional Industry=0 Hi-tech industry=1
EDUCATION	Highest degree of the key person in the startup	Non-college=1 Undergraduate=2 Postgraduate=3
POLITICS	Is there any political connection on the new venture team? (e.g., ex-politician, CPCC members)	No=0; Yes=1
WEALTH	New ventures from <i>Guangdong</i> and overseas are relatively wealthier than the non- <i>Guangdong</i> non-overseas ones	non- <i>Guangdong</i> non-overseas=0; <i>Guangdong</i> or overseas=1

The last control variable is the wealth of the startup entrepreneurs. As it is studied in Frid et al. (2016), the wealthier entrepreneurs are more likely to obtain larger amounts of external findings while the low-wealth ones are more likely to be rejected by the banks and other external financiers.

In summary, for our study on entrepreneurial financing, I try to control those factors which might influence our results. They are denoted by SIZE, EDUCATION, INDUSTRY, POLITICS, and WEALTH. Table 1 summarizes all the research variables used in this study.

3.3 Regression Models

The models for testing the main effects (i.e., H1s and H2s) are listed as follows:

$$\text{LGFIN\$} = \beta_0 + \beta_1 \text{IPTYPE} + \beta_2 \text{IPTNO} + \beta_3 \text{TACITYEAR} + \beta_k \Sigma \text{Controls} + \varepsilon \quad (\text{Model 1})$$

$$\text{STAGEDFIN} = \beta_0 + \beta_1 \text{IPTYPE} + \beta_2 \text{IPTNO} + \beta_3 \text{TACITYEAR} + \beta_k \Sigma \text{Controls} + \varepsilon \quad (\text{Model 2})$$

$$\text{EQUITYFIN} = \beta_0 + \beta_1 \text{IPTYPE} + \beta_2 \text{IPTNO} + \beta_3 \text{TACITYEAR} + \beta_k \Sigma \text{Controls} + \varepsilon \quad (\text{Model 3})$$

The following models are designated for testing H3.

$$\begin{aligned} \text{LGFIN\$} = & \beta_0 + \beta_1 \text{IPTYPE (IPNO, TACITYEAR)} + \beta_2 \text{RETURNEE} \\ & + \beta_3 \text{CROSSITEM}_i + \beta_k \Sigma \text{Controls} + \varepsilon \end{aligned} \quad (\text{Models 4,5,6})$$

4. Empirical Results and Discussion

4.1 Statistical Descriptions

Table 2. Descriptive Statistics

Variable	N	Min	Max	Mean	St.D.
LNFIN\$	500	5.23	7.90	6.6221	.55893
STAGEDFIN	500	0	1	.56	.499
EQUITYFIN	500	0	1	.62	.488
IPTYPE	500	0	1	.13	.339
IPNO	500	.00	30.00	2.1402	5.05712
TACITYEAR	500	.00	11.00	2.9252	3.46056
RETURNEE	500	0	1	.16	.367
SIZE	500	1	10	4.05	1.410
INDUSTRY	500	1	6	3.18	1.607
EDUCATION	500	0	4	2.15	.845
PCONNECTION	500	0	1	.34	.475
WEALTH	500	0	1	.92	.268
Valid N (likewise)	500				

Table 2 presents the descriptive statistics of the research variables used in the empirical tests of this study. At the first sight of the 500 observations, the minimum request for the external financing if any is 5.23, which is translated to the dollar value of RMB170000, and the maximum is 7.90, which is equivalent to the dollar value of RMB80 million. 56 percent of the startups have the staged external financing plan and an even larger percentage, 62 percent, prepare themselves for the equity-based external financing. There is a clear tendency for external, especially the equity-based financing among the hi-tech startups under investigation. For the three proxies for information asymmetry, both IPTYPE and IPNO indicate that most of the intellectual properties are related to applications, which means an obvious lack of original inventions and innovations. And TACTYEAR shows that the entrepreneur's new venture experience which is a proxy for firm-specific tacit knowledge is less than 3 years. Additionally, it can be observed that there are only 16 percent of the startups' key members are returnees.

The statistical descriptions of control variables also present some special features demonstrated by the hi-tech startups. For example, most startup entrepreneurs possess academic degrees above mater. The average number of hi-tech startup team members is 4. 92 percent of the startup teams and new ventures come from the high-wealth areas. And there is a relatively low political connection among the hi-tech startup entrepreneurs under investigation.

4.2 Correlation Analyses

Table 3 provides an overview of the bivariate correlations among the research variables. Based on these analyses, I can draw some preliminary conclusions regarding our research hypotheses.

First, all the three dependent variables LGFIN\$, STAGEDFIN, and EQUITYFIN are significantly correlated to the three proxies for information asymmetry, i.e., IPTYPE, IPNO, and TACITYEAR, which preliminarily supports hypotheses H1s and H2s. However, only one of the dependent variables, STAGEDFIN, is significantly correlated to the expected moderator, RETURNEE which is a proxy for the foreignness liability.

Table 3. Pearson Bivariate Correlatio

	LGFINS	STAGEDFIN	EQUITYFIN	EQU	IPNO	IPTYPE	IPTIME	TACITYR	SIZE	EDUCATION	RETURNEE	POLITICS	TECHLEVEL	LOGVALUE
LGFINS	1													
STAGEDFIN	0.167*	1												
EQUITYFIN	.296***	.463**	1											
EQU	0.144	.227 [†]	.615**	1										
IPNO	.228**	0.139	0.179	0.031	1									
IPTYPE	0.005	0.027	0.103	-0.002	.358***	1								
IPTIME	0.051	-0.104	0.003	0.076	0.027	0.107	1							
TACITYR	0.009	0.068	0.103	0.119	0.1	.199**	0.006	1						
SIZE	0.115	0.094	0.106	0.142	0.136	0.156*	-0.043	.271***	1					
EDUCATION	0.152	-0.053	-0.053	-0.046	0.179*	.241***	0.156	-0.038	0.011	1				
RETURNEE	0.135	0.097	0.021	-0.054	0.177*	0.108	0.168*	-0.049	-0.04	.385***	1			
POLITICS	-0.17	-0.056	-0.114	-0.073	-0.12	-0.09	-0.055	0.072	-0.065	-0.076	0.023	1		
TECHLEVEL	.337***	0.158	0.138	0.101	0.145	.193 [†]	0.147	0.083	0.089	-0.038	-0.02	-0.151	1	
LOGVALUE	.737***	.266***	.338***	0.015	.198**	0.132	0.008	0.035	.198 [†]	0.172*	0.118	0.313	.412***	1

Notes. * significant at 0.10, ** significant at 0.05, and *** significant at 0.01.

4.3 Regression Tests on the Main Effects (H1s and H2s)

Table 4 presents the results of regression models for testing the relationships between the three financing preference variables and the three explanatory variables for the two aspects of information asymmetry. There are significant positive correlations between the requested amount of external financing sources and the content disclosure of the number of intellectual properties and the firm-specific managerial experience with the startups and new ventures. Hypotheses H1a and H1b are supported except for the non-significant positive correlation effect for the variable IPTYPE.

Table 4. Regression Results for Models 1 through 3

Variables	Model 1 (Linear) <i>DV=LGFIN\$</i>		Model 2 (Logit) <i>DV=STAGEDFIN</i>		Model 3 (Logit) <i>DV=EQUITYFIN</i>	
	B	Sig.	B	Sig.	B	Sig.
IPTYPE	.165	.416	18.952	.998	19.143	.998
IPNO	.033	.009	.010	.744	.012	.708
TACITYEAR	.092	.000	.423	.000	.305	.004
RETURNEE	-.599	.001	.091	.952	-.360	.786
SIZE	-.093	.026	.473	.046	.521	.020
INDUSTRY	.065	.114	.699	.002	.416	.041
EDUCATION	-.213	.016	.107	.582	.161	.689
PCONNECTION	.456	.001	1.091	.095	.694	.268
WEALTH	1.467	.000	2.778	.114	1.954	.143
Constant	5.397	.000	-7.352	.002	-6.104	.002
Model fit summary	R ² =.542		Cox & Snell R ² =.404		Cox & Snell R ² =.404	
	Adjusted R ² =.479		Nagelkerke R ² =.543		Nagelkerke R ² =.543	
	Sig.=.000		Sig.=.000		Sig.=.000	
	n=500		n=500		n=500	

Our findings are consistent with the conclusion in Leonard and Sensiper (1998), Li and Gao (2003), and Nofsinger and Wang (2011), which show that the key external financiers such as banks and institutional investors concentrate their due diligence upon the information asymmetry problems when they deal with the initial startup funding. However, our investigation further differentiates the different dimensions of information asymmetry by using the three operationalized proxies in terms of content disclosure about the intellectual properties.

The exception means the two types of intellectual properties, i.e., application versus invention, are not differentiated in the hi-tech startup financing decisions. This finding leads to our preliminary conclusion that in the entrepreneurial financing decisions, the hi-tech startups tend to pack up their intellectual properties as an entirety in their content disclosure. The external financiers need to be better informed of the details to release their concerns regarding the technological uncertainties.

It is noteworthy that the control variables of SIZE, EDUCATION, PCONNECTION, and WEALTH are significantly correlated to the dollar value requested in the hi-tech startup financing. This finding is consistent with the conclusions in the existing literature (e.g., Haines et al., 1989; Nofsinger & Wang, 2011), which helps to add incremental validity to the empirical test results in this study.

On the other hand, the empirical tests on hypotheses H2s produce the identical results with H1s in terms of TACITYEAR, which means the more experienced startups are more likely to prepare the staged external financing plan, particularly designing the equity-based financing schedule to mitigate the agency problems in the hi-tech startup financing. It can be concluded here that the reporting of the firm-specific managerial experience with startups and new ventures, instead of content disclosure of intellectual properties, is the preferred way of lessening the information asymmetry in startup financing. In other words, reporting the tacit knowledge of the startups and new ventures are positively correlated to the external, especially equity-based financing schedules at the early stages of startups. In this way, the hi-tech startup's financing cycle under the pecking order hypothesis is shortened. These findings and conclusions are unique in this study which initiatively differentiates the two dimensions of information asymmetry as technological uncertainty and tacit knowledge.

An additional finding from the tests on H2s reveals the fact that both the firm size and industry of the hi-tech startups and new ventures are significantly related to the shortening of the financing cycle under the pecking order hypothesis.

4.4 Tests on the Moderating Role of Foreignness (H3s)

Table 5. Regression Results for Moderation on LGFIN\$

Variables	Model 4 (Linear)		Model 5 (Linear)		Model 6 (Linear)	
	DV=LGFIN\$		DV=LGFIN\$		DV=LGFIN\$	
	B	Sig.	B	Sig.	B	Sig.
IPTYPE	.770	.008	-	-	-	-
IPNO	-	-	.008	.642	-	-
TACITYEAR	-	-	-	-	.568	.006
RETURNEE	-.145	.563	-.811	.001	-1.325	.000
CROSSITEMi	-.696	.064	.076	.008	.163	.000
SIZE	-.047	.335	.010	.820	-.124	.007
INDUSTRY	.037	.429	.012	.763	.035	.387
EDUCATION	-.082	.419	.016	.863	-.092	.279
PCONNECTION	.399	.007	.418	.001	.404	.002
WEALTH	.672	.020	.655	.014	.710	.005
Constant	6.067	.000	5.749	.000	6.404	.000
Model fit summary	R ² =.329		R ² =.396		R ² =.350	
	Adjusted R ² =.249		Adjusted R ² =.342		Adjusted R ² =.272	
	Sig.=.000		Sig.=.000		Sig.=.000	
	n=500		n=500		n=500	

As presented in the foregoing empirical results and analyses on H1s and H2s, the expected moderation role of the foreignness liability is significantly pronounced on the main effects between the amount requested for external financing and the proxies for the lessening of information asymmetry. Table 5 presents the further test results regarding this moderation. For all the three interactions between RETURNEE and the information asymmetry proxies, the coefficients are significant, especially for the IPNO and TACITYEAR (both significant at the 0.01 level).

5. Conclusions, Limitations, and Implications

5.1 Conclusions

The technology-led information asymmetry mitigated through the appropriate disclosure of the intellectual properties possessed by the startups can improve the firms' attraction to the external financiers. *The Innovation and Entrepreneurship Competition* organized by the governmental authorities facilitates the communication of the corporate strategies and technological cutting edges of the startups to increase the effectiveness and efficiency of the external financing in the early stages of startups.

Our empirical results support our research hypotheses on the relationship between the lessening of information asymmetry and the hi-tech startup financing preferences, especially those for the staged and equity-based external financing. I also document the evidence for the shortened financing cycle for the hi-tech startups under the pecking order hypothesis. This is largely consistent with the reality of hi-tech entrepreneurship. The startups at the inception stage, i.e., less than 1 year old, mainly rely on the founder's wealth and family/partner financial support, seek less amount and simpler ways of external funds compared with the startup at the survival stage, i.e., more than 1-year-old. At the survival or growth stage, the startups who usually have some existing external financing sources, tend to seek a larger amount of external funds and more sophisticated financing alternatives.

This study draws three conclusions: firstly, in the hi-tech industries, the information asymmetry mitigated by the content disclosure regarding the intellectual properties and the management-specific tacit knowledge can significantly increase the startup preference for the external financing due to the reduction of agency costs of debts; secondly, the lessened information asymmetry can shorten the life cycle of startup financing under the pecking order hypothesis, and lastly, the liability of foreignness is observed to have a significant positive moderating role on the main effects under the investigation. In summary, it can be concluded that the information asymmetry and the liability of foreignness are crucial factors impacting the startup financing decisions.

5.2 Limitations

This paper focuses on the hi-tech startups and new ventures attempting to achieve certain goals through attending the Global Innovation and Entrepreneurship Competition of Shenzhen, they might not possibly represent the true preference pattern of the hi-tech startups and new ventures. At least most

micro and small firms of this type are not exposed to this specific business competition and they do have different preferences for startup financing.

The data collection is based on the manual reading and coding of the business plans presented by the hi-tech startups and new ventures. If some artificial intelligent way of data mining could be used given the uniform business plan presentation formats, then the results covering the entire hi-tech startup population would bring up more convincing power to this research report.

5.3 Implications

This study contributes to the existing entrepreneurial financing literature with certain unique academic implications. First, it inspires to explore more social-psychological aspects of the startup financing preferences; second, it suggests utilizing more research methods, e.g., questionnaire surveys and in-depth interviews, and last, it implies that more theoretical perspectives should be introduced into the investigation of the rationale for the startup financing preferences.

There are some practical implications as well. The conclusions of this study imply that reducing the information asymmetry by adequately disclosing technological strength and tacit knowledge can benefit the entrepreneurial financing for the hi-tech startups and new ventures at the early stages, as well as provide an effective shortcut to the startup financing cycle. Additionally, the introduction of overseas technologies, funds, knowledge, experiences, and entrepreneurship into the hi-tech startups does not create the liability of foreignness, and on the contrary, it is an “asset” that can help improve the entrepreneurial financing decisions. Furthermore, different groups of stakeholders might infer some implications from the conclusions of this study: for the hi-tech startup and new venture entrepreneurs, they are inspired to plan for the staged external entrepreneurial financing, especially the equity-based financing, at the earlier stages; for the financiers, they might learn how to identify and match the appropriate financing needs of various types of hi-tech startups and new ventures; for the policymakers and government monetary agencies, they need to provide guidance and supervision on the innovation-capital matching effectiveness, and to better the financial and capital market environment for startup financing for innovations and entrepreneurship.

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Appendix: Excerpt of Questionnaire Items Adopted in this Study

1. Industry :
 - 1) Electronics and Information_____
 - 2) Internet_____
 - 3) Bio-tech_____
 - 4) Advanced Manufacturing (Robotics)_____
 - 5) Neo-energies/Eco-tech_____
 - 6) New Materials_____
2. Time of founding : _____ Year _____ Month
3. Team size: _____ people;
 Ave age: _____ years old
 Female: _____ people , _____ %
4. Key founder educational level : Bachelor or eow_____ Master_____ Doctorate_____
5. Has the founder acted as before (multiple choices allowed) ? PCCC_ PR_ SOE Mgt_
6. Does the founder family own a business ? Yes_____ No_____
7. Your initial funds are from (multiples choices allowed) :
 - 1) household savings
 - 2) loans from relatives and friends
 - 3) investment from relatives and friends
 - 4) investor or investing institutions
 - 5) bank loans
 - 6) others
8. Currently, do you have a stepped financing plan for different venturing stages? No__ Yes__
9. Does your financing plan concern transferring your shares ? No____ Yes____ (____%)
10. What is the total amount of required funding? _____(in RMB10000's)
-
24. Have you studied overseas ? No_____ Yes_____(_____ years)
25. Have you worked overseas ? No_____ Yes_____(_____ years)

26. Have you applied for IP overseas? No _____ Yes _____ (_____ items)
27. Have you received funds overseas? No _____ Yes _____
28. Have you received tech support overseas? No _____ Yes _____
29. Number of Ips: _____ invention patents
 _____ practical new model patents
-