



Research Article

Financing Preference among Technology Startups (TSs) in Malaysia

Jamal Nassar¹

¹ INCEIF, Kuala Lumpur, Malaysia

* Correspondence: zulkarnain@inceif.org

Received: 24 March 2022; Accepted: 18 June 2023; Available online: 21 June 2023

Abstract: As the maverick of the new economy TSs are making economic waves across industries. However at their early stages TSs are fragile and vulnerable. Startups struggle with many issues starting from business planning, capacity building and management, but financing is key to their survival and growth. Governments play pivotal role in financing TSs at their early stages and so do venture capital. This study measures financing and its' correlation to culture, innovation, government financing and private investments (venture capital and angel investors). It also examines if Islamic Finance play any role in financing TSs. Findings show that innovation and government financing are significant in later stage financing and results indicate that venture capitalists and investors are more likely to finance female technopreneurs than their male counterpart. Despite high awareness levels among technopreneurs findings indicate that Islamic Finance is highly insignificant among TSs. This study is an important contribution in the startup and entrepreneurship space as it identify financing determinants for TSs in the Malaysian startup ecosystem. Further studies are recommended in the area of securitization of assets and intellectual property to enable to TSs to financing their venture via Sukuk or other forms of Islamic securities.

Keywords: Technology startups; Entrepreneurship; Venture capital; Financing

1. Introduction

Small and Medium Enterprises (SMEs) assume a major role in economic development, they drive economic growth, employment, innovation in technology and prosperity of any nation, particularly developing nations (Ricketts, 2009). In Malaysia, SMEs make up about 95 percent of total firms, in Europe 99 percent and in the United States about 98 percent (Eniola & Entebang, 2015; Rahman, Yaacob, & Radzi, 2016). In 2014, Malaysian SMEs contributed 35.9 percent to GDP, and in the following year, they generated 33.1 percent of GDP. SMEs contributed 57.5 percent of total employment during 2015. Going forward, SMEs are expected to contribute as much as 41 percent to the national GDP by 2020, and they are also expected to generate 62 percent of total employment (SME Corp. Malaysia). Between 1996 and 2015, the Malaysian economy (GDP) grew at an average rate of 5.37 percent (World Bank, 2016)¹. Small and medium enterprises served as the main economic growth vehicle for local economy and will most likely continue to play a pivotal role in shaping the future economy. SMEs role in the future economy will be highly influenced by digital and technological advancement, which are expected to fuel economic growth.

¹ www.data.worldback.com - time and date of access 16:23 13/11/2016

It is theoretically established and empirically proven that economic growth and development are increasingly dependent on new technology and innovation (Coccia, 2014; Croitoru, 2012; Doh & Kim, 2014; Śledzik, 2013; Wonglimpiyarat, 2011; Wu & Huarng, 2014). Starting a small business depends on entrepreneurial talent that is able to identify business opportunities and use its skills to mobilize resources. Going forward, entrepreneurs are expected to rely heavily on technology no matter what sector they venture into. Technology entrepreneurship (Technopreneurship) encompasses opportunity identification, R&D, innovation management, new business models and technology. TSs² are highly competitive, innovative, create value through new products or services and have the capacity to lead the way to commercialization (Levi Jaksic, Marinkovic, & Rakicevic, 2014).

Startups are driving economic advancement in many economies (Manigart & Struyf, 1997) and they contribute significantly to job creation, without startups, there would be no net job growth (Kane, 2010). Additionally, startups that innovate effectively and efficiently are able to generate tremendous value and deliver substantial returns to their shareholders and stakeholders.

2. Finance “Life Cycle Theory”

The life cycle theory suggests that capital structure is highly dependent on the life stage of the firm. This theory, first developed by c, explains the development of the firm through its consumption and saving behaviour. Jeng and Wells (2000) concur with Penrose (1952), further asserting that life cycle theory is advanced in rationalizing the life cycle financial development of the firm in relation to its capital structure. The theory proposes that at the early stages of growth, companies rely heavily on internal funds, and they grow. Firms are then able to acquire external funds, which is made possible due to the availability of information to external parties. The theory further suggests that companies in their later stages of growth are less likely to seek debt, and more likely to exploit retained earnings. We believe that this theory may explain the behaviour of TSs, especially at the early stage.

Studies on financing TSs (Aggarwal & Goodell, 2014; Bachher & Guild, 1996; A. N. Berger & Udell, 1998; Cole, Cumming, & Li, 2016; Jeng & Wells, 2000; Manigart & Struyf, 1997) provide evidence to explain financing and capital structure for TSs. These studies highlight the key role of venture capital money at the early stage of the firm life cycle, as explained by Penrose's (1952) life cycle theory.

3. Literature Review

Organizations like Cradle Fund and Malaysia Venture Capital Management Berhad (MAVCAP) came into existence to respond to the need for funding entrepreneurial ventures. MAVCAP is a government initiative established in 2001 under the Ministry of Finance (MOF). MAVCAP is the first specialized venture capital (VC) fund to invest in startups in the ICT sector. MAVCAP and Cradle funds are most popular among local entrepreneurs seeking public funding. Cradle has two popular funding schemes for TSs: CIP150 and CIP 500. CIP catalyst and U-CIP catalyst are pre-seed funds with a maximum value of RM150,000. CIP500 is the second financing scheme, also known as Malaysia's first commercialization fund for TSs. It allocates a maximum fund of RM500,000 to successful applicants. For applicants to apply for CIP150, they have to have at least a prototype in place with a well-drafted business plan, whereas applying for CIP500 requires startup applicants to be a registered entity with existing operations and some kind of revenue, as this fund serves commercialization and expansion.

TSs that have grown beyond pre-seed and early stage commercialization, or that simply require larger amounts to scale or kick off their startups, may apply to MDEC or MTDC (Malaysia Technology Development Corporation). Under MDEC, grants available to TSs range from production funds, such as the MAC3 production fund of RM1 million and product development and commercialization fund (PCF) of RM750,000. Alternatively, MTDC offers the following funds: a Commercialization of Research and Development Fund (CRDF1) of RM500,000, a Technology Acquisition Fund (TAF) of RM2 million, CRDF3 of RM5 million,

² Technology Startup

Business Startup Funds (BSF) of RM5 million, a Business Growth Fund (BGF) of RM1 million, and a Business Expansion Fund (BEF) of RM15 million (MaGIC, 2016). The requirements and criteria vary for each fund.

In terms of joint private and public sector investment programs, MAVCAP and Cradle as the government major startup financing and funding vehicles are joining hands with private funds in a move to adopt best practices in financing startups (Mason & Smith, 2016; Mugione & Farinelli 2012). MAVCAP currently leads four major funds in partnerships with the private sector, local partners and international VCs such as AXIATA Digital Innovation Fund, EMC Strait Fund, GOBI Fund III, and 500 Durians, which is the local investment arm of 500 startups (MAVCAP, 2015). Cradle Fund Snd. Bhd., on the other hand, is an agency under the MOF, a non-profit organization with a mandate to stimulate and nurture the development of Malaysian entrepreneurship in ICT, bio-technology and life sciences, material sciences and high growth technology industries. Its mandate is also to support ideas for an innovative knowledge-based society and economy (Fund Cradle, 2015). In a similar move, during 2016, Cradle Fund established co-investment programs with regional and international venture funds such as IMJ Investment Partners, Golden Gates Ventures, FatFish, Startup Nation and others. Cradle Fund announced on October 2016 that it would start an equity investment program DEQ800, with an investment range between USD 70,000 and 150,000 (Fund Cradle, 2016). The purpose of DEQ800 is to dissuade early startups from government grants and be more competitive moving towards equity funding.

One way to stimulate venture capital activities and private investments is to offer favourable tax incentives to both. Tax incentives are known to be an effective entrepreneurship policy measure (Cumming & Johan, 2014). Cradle Fund introduced its own Angel Tax Incentive scheme (Fund Cradle, 2015), which entitles angel investors to up to RM500,000 tax deduction when they invest in qualified technology-based startups in Malaysia. This law was launched in collaboration with the Malaysian Angel Investor Network (MBAN) in April 2013. However, progress is slow and this incentive is not as attractive as anticipated. This might be due to the lack of awareness and marketing for this scheme among the intended target audience.

4. Summary and Conclusion

Descriptive statistical was used to screen and analyse the data, and regression analysis was conducted thereafter. When conducting logistic regression and due to the nature of categorical variables the study has, normality, linearity, and homogeneity tests were not applicable as recommended by Field (2009). Unlike ordinary regression tests, which assumes the dependent variable has a linear relationship with the independent variable, logistic regression does not assume a linear relationship between these two variables. The methodology section is composed of two sub sections, one for interview survey and the other is for questionnaire survey.

4.1 Questionnaire Survey

One of the challenges in quantitative studies is obtaining a representative sample size. If observations collected are not enough, certain statistical test may not produce reliable results. Hair, et al. (2010) suggest there should be between fifteen and twenty observations for each independent variable for the sample to be representative. Applying Hair's approach to this study (five variables) provides over 100 respondents (i.e. $5 * 20$). The study obtained a total of 121 responses, which is deemed adequate for statistical analysis (Guadagnoli & Velicer, 1988; Hair et al., 2010).

The sample selection for the survey questionnaire consisted mainly of Malaysian TSs that are registered as Malaysian majority businesses and run by Malaysian entrepreneurs. Entrepreneur groups were identified according to the availability of information within the startup ecosystem in Malaysia. MaGIC, a national one-stop centre for startups, has the largest database of TSs in Malaysia, followed by TPM and Cradle Fund. TeAM, as a young association that was registered in 2014, had a small number of registered technopreneurs, but nonetheless extended their support and were highly cooperative. After conducting initial investigations and market research of the local entrepreneurship ecosystem, we approached MaGIC, Cradle Fund and TPM to facilitate questionnaire dispatch to entrepreneurs in their databases. At a later point, TeAM was approached to solicit further questionnaire responses.

Our sample consisted mainly of respondents registered with Cradle Fund, MaGIC and TeAM which had a balanced ethnic distribution in their databases (Juri, 1999; Nawi, 2015; Noor & Leong, 2013). It is worth

mentioning that some TSs were listed with Cradle, MaGIC and TeAM, which reduced the study's reach and overall sample.

It is worth noting that at each phase, follow-up was conducted on weekly basis. Rounds of emails were sent to follow-up. At different stages, especially the final phase, interview respondents were contacted to seek their cooperation in disseminating the online questionnaire to any relevant TSs that matched our study's criteria. Due to the convenience and efficiency of online questionnaires, many startups complained about receiving too many surveys. Responses were slow and hard to obtain, table 1 display estimates verses actual responses.

Table 1. Response Rate

Questionnaire respondents			
Target	(Estimated)	250	%100
Magic (estimated tss in database)		220	
Cradle fund (estimated tss in database)		30	
Tpm (estimated tss in database)		200	
Team (estimated tss in database)		40	
Total		490	
Actual			
Online responses		154	62%
Manually filled responses		25	10%
Total responses (72 percent of target)		179	72%
Total missing values & non-usable questionnaires		58	23%
Total usable responses (48% of target)		121	48%

Table 2. Questionnaire Response Period

Online Questionnaire Response Rate			
	Phase I	Phase II	Phase III
Date Sent	28-Jul-16	29-Aug	24-Sep-16
Total Cumulative Responses	18	52	121
Rate	7%	21%	48%

Table 4.3 lists responses in terms of phases, percentages and numbers. Percentages recorded below are for the defined 250 target TSs

Compared to similar studies, this response rate is slightly below average³ (Nawi, 2015; Şahin & Asunakutlu, 2014). However, Sax, Gilmartin and Bryant (2003) found that online questionnaire surveys produce lower response rates compared to hard copy questionnaires. Nulty (2008) produced results that indicate that on average, online surveys produce 23 percent fewer responses than paper-based surveys. According to the same study, online questionnaires are expected to achieve responses rate of around 30 percent. McPeake, Bateson, and O'Neill (2013) support both of the above findings.

Moreover, TSs in Malaysia, especially those operating based on an internet business model, belong to a new category of companies and are quite limited in number. They are highly dependent on infrastructure and internet speed, both of which are undergoing significant upgrades. Overall, the researcher was highly satisfied

³ Average response rate on paper-based surveys ranges between 50-70%

with the response rate achieved in this study. According to Guadagnoli & Velicer, (1988) and Hair et al., (2010) our response rate (n=121) is valid and acceptable. The sample was tested for both non-response and self-section bias, result indicate sample is representative and statistical tests does not shows any level of significance.

5. Results and Analysis

This questionnaire is adopted from Nawi (2015), Wahab and Buyong (2008) and Oppenheim (1992). Nawi (2015) and Wahab and Buyong (2008) measured SME financing in Malaysia, whereas Oppenheim (1992) focused on the design of the questionnaire measurements. Descriptive statistics is displayed followed by statistical analysis (Chi Square tests) for both early stage and later stage financing. Additionally, comparisons were carried out for continuous variables using t-tests for Government Interventions (GI) and Innovation Technology (IT) as both were continuous variables which were analysed using independent t-test.

5.1 Descriptive Statistics

A list of questions along with the corresponding variables are displayed in Table 3. All five questions were multiple choice questions, meaning that respondents can select more than one answer for a given question. Questions were coded from F1 to F5.

Table 3. Financing Questions

No.	Question
1	How did you finance your business at first?
2	How did you finance your business at a later stage?
3	What is your preferred mode of business financing?
4	What are your top three challenges to financing your startup?
5	When you make a financing decision, which of the following factors do you consider?

1) How did you finance your business at first?

By practice and convention, at the very early stages, entrepreneurs usually finance their startups through two main financing sources: internal financing (own money, friends and family) or external sources (loans, venture capital, investors, grants, others). Frequency analysis results are shown in Table 4 for early stage financing for TSs. Responses are recorded as a number (N) and as a percentage, additionally as a multiple choice question percent of cases indicate the numbers of responses as a second option. Percent of cases is a strong indicator of the most common means of financing, whereas percent indicate the most popular as a first choice. For example those who raised funds from their own money accounted for 47%, whereas those who raised funds by other means of financing but also used own money account for 78.3%.

Table 4. Early Stage Financing

Early Stage Financing				
		Responses		Percent of Cases
		N	Percent	
Raising Capital ⁴	Own Money	94	47.2%	78.3%
	Friends & Family	33	16.6%	27.5%
	Loan	9	4.5%	7.5%
	Asset Financing	2	1.0%	1.7%
	Venture Capital	20	10.1%	16.7%
	Individual Investor	26	13.1%	21.7%
	Grant	13	6.5%	10.8%
	Other	2	1.0%	1.7%
Total		199*	100.0%	165.8%

*Multiple answers question, $N \geq 121$

A substantial percentage (63.8%) of technopreneurs financed their startups at the early stage with internal sources, through their own money and through friends and family or a combination of other internal sources. There are indicators of low engagement of private investors and venture capital involvement at the early stage. Commercial loans, on the other hand, represent 4.5% of startups, while asset-based financing represents a mere 1%. Lack of engagement of venture capital and angel investors speaks strongly of the risky nature of TSs at the early stage, while the 4.5% commercial loans and the very small percentage of asset financing may signal the absence of Islamic financing options either due to unpopularity or due to lack of knowledge. In both cases this should raise the attention of IFIs practitioners.

2) How did you finance your business at a later stage?

According to lifecycle theory (Jeng & Wells, 2000; Penrose, 1952), as a business grows and matures in its lifecycle, sources of finance change. The data for questions F1 and F2 indicate that the same theory is applicable in our sample. Whereas startups are mostly self-funded at the first stage, once they achieve some level of traction, revenue and some level of growth they are more likely to be financed by retained earnings, venture capital and private investors. Table 5 shows the frequencies and percentages of TS financing sources at a later stage.

⁴ Finance questions are mostly multiple choice questions, previous studies employ same type of questions (Abdesamed & Wahab, 2015; Nawi, 2015). Therefore, total answers may exceed total number of participants.

Table 5. Early Stage Financing

Later Stage Financing				
		Responses		Percent of Cases
		N	Percent	
Financing at a later stage	Retained Earnings	47	25.1%	40.9%
	Friends & Family	9	4.8%	7.8%
	Loan	10	5.3%	8.7%
	Asset Financing	3	1.6%	2.6%
	Venture Capital	50	26.7%	43.5%
	Investor	39	20.9%	33.9%
	Grant	27	14.4%	23.5%
	Others	2	1.1%	1.7%
Total		187*	100.0%	162.6%

*Multiple answers question, $N \geq 121$

The majority of startups received funds from venture capital firms, individual investors and grants: this group made up a total of 62% of the sample. This is a strong signal that venture capital activities in Malaysia is at healthy levels whereas 26.7% their first source of financing at the later stage was venture capital, however the total number of TSs that raised money from venture capital were 43.5% which is the highest alternative source of financing for TSs.

Meanwhile, 25.1% of respondents financed their startups with retained earnings, and smaller percentages of 4.8% and 5.3% financed their startups using funds from friends and family and loans. Meanwhile, 1.6% opted for asset financing and another 1.1% used other types of financing. These findings are consistent with other non-technology entrepreneurial ventures, as entrepreneurs with high self-efficacy, determination and vision support their ventures with their own money, saving and any capital amounts they are able to raise from their immediate social circles (Myers & Majluf, 1984; Salamzadeh & Kesim, 2015). Findings are also consistent with life cycle theory (Sefiani, 2013), which asserts that as businesses gain commercial traction, they raise funds, establish operational business models and are able to secure diversified funds. These funds range from venture capital to private and angel investments (Freear et al., 2002; Ismail et al., 2011). The same financing trends very much apply to startups that display technological innovation (Bachher & Guild, 1996). These findings are consistent with current and previous financing trends locally and internationally Bertoni et al., (2011), Sergey, Alexandr & Sergey (2015) and Wonglimpiyarat, (2016) among others.

3) What is your preferred mode of business financing?

This questions attempts to measure the financing preferences of TSs. The question attempts to reveal whether technopreneurs have different behaviours from other entrepreneurs in terms of financing. Table 6 presents the financing preferences among TSs.

Table 6. Early Stage Financing

Preferred Financing Mode				
		Responses		Percent of Cases
		N	Percent	
Preferred Mode of Financing	Asset Financing	11	4.8%	9.2%
	Bank loan	20	8.7%	16.7%
	Bootstrapping	36	15.6%	30.0%
	Crowd-funding	31	13.4%	25.8%
	Invoice Financing	15	6.5%	12.5%
	Islamic Finance	15	6.5%	12.5%
	Selling Equity	27	11.7%	22.5%
	Venture Capital	69	29.9%	57.5%
	Other	7	3.0%	5.8%
Total		231*	100.0%	192.5%

*Multiple answers question, N ≥ 121

The first financing preference among TSs seems to be venture capital, with 29.9% and 57.5% as cumulative percent of all TSs who have other financing preference along with venture capital. This is a strong indication that venture capital contribute positively to the growth and wellbeing of startups. In addition to funding, TSs find multiple benefits from venture capital such as mentoring, advisory and access to markets that they receive without additional cost.

The second preference is bootstrapping, accounting for 30% of total cases. Bootstrapping is based on sustaining the business without consuming any external financing (Alvarez & Busenitz, 2001), which is a common practice among startups at the early stage. This speaks strongly of the mind set of technology entrepreneurs, as they practice bootstrapping, they become more self-dependent, increase their resilience and eventually become sustainable.

The third financing preference was crowd-funding, which was the first choice for 13.4% and the second choice for as many as 25.8% of cases. This denotes the increasing popularity and demand for crowd-funding where TSs are able to raise funds from individuals mostly with lower cost of equity and capital.

Other preferences were equity financing at 11.7%, bank loans at 8.7%, invoice financing and Islamic financing, both at 6.5%, and asset financing, at 4.8%, all as percentages of responses. These options along with Islamic financing apparently do not have much preference among TSs, which is due to TSs lack of knowledge of IF or due to perceived benefits and cost efficiency reasons.

TSs often raise their seed capital through venture capital, and in return venture capital firms often regard high TSs as potentially lucrative investments, with equal risk and reward ratios (Afful-Dadzie, Oplatková, & Nabareseh, 2015; Audretsch & Lehman, 2004; Grilli & Murtinu, 2014; Lerner, 1994). Investors, on the other hand, pursue such opportunities in fields where they have extensive knowledge and experience, and contribute

to the growth and success of the startup through mentorship and coaching (Hermann, Gauthier, Holtzschke, Bermann, & Marmer, 2015). The present findings indicate a trend for venture capital financing, and more interestingly, reveal that both bootstrapping and crowd-funding are significant financing preferences for TSs. Bootstrapping puts the startup in survival mode, decreasing expenses and increasing productivity and efficiency (Hermann et al., 2015; Salamzadeh & Kesim, 2015), while crowd-funding decreases the dependency on government funding, venture capital and private investment, while increasing financing outlook and decreasing financing costs (Maier, 2016). Both of these sources are recent financing trends among global startups (Eniola & Entebang, 2015).

4) What are your top three challenges in financing your startup?

This question aimed to identify top challenges for TSs. Identifying these challenges is critical for future research to be able to contribute to finding solutions, thereby increasing the future success rate of TSs. The top three challenges, in order, were financing on time, access to venture capital and access to grants. Cumulatively they accounted for 46.7%, 0.3% and 39.2% of the percentage of cases. These percentages indicate that not many TSs find it a challenge to be funded by venture capital, while most TSs find it challenging to be financed on time and to receive government grants. These findings express frustration of many TSs as they seek government grants and are not able to secure any due to their competitive and limited nature.

Meanwhile, 12.9% representing a cumulative 29.2% percent of cases reported loan approval to be their highest challenge, followed by 12.5% a cumulative 28.3% that reported access to investors to be among their top challenges. These numbers suggest that private and angel investors lack active participation in the funding space, while banks remain risk averse towards TSs. Only 1.1% representing a cumulative 2.5% percent of cases reported no difficulty in financing. Table 7 presents a list of challenges and responses in terms of numbers, percentages and percentage of cases.

Table 7. Financing Challenges

Financing Challenges				
		Responses		Percent of Cases
		N	Percent	
Top Three Financing Challenges	Loan approval	35	12.9%	29.2%
	Finance not adequate	40	14.7%	33.3%
	Financing on time	56	20.6%	46.7%
	Access to investors	34	12.5%	28.3%
	Access to VC	52	19.1%	0.3%
	Access to grants	47	17.3%	39.2%
	Others	5	1.8%	4.2%
	No Difficulty	3	1.1%	2.5%
Total		272	100.0%	226.7%

Overall, results indicate that there is an equity financing gap for TSs among this sample population. This suggests that there is un-met demand for venture capital, especially in early stage financing forming a significant financing gap that found in later stage financing (Deffains-Crapsky & Sudolska, 2014; Eniola & Entebang, 2015). These findings are exciting and significant contribution of this study.

A substantial percentage of respondents claim that accessing banking loans is a significant challenge, which may be explained by the fact that most startups do not own any assets (Deffains-Crapsky & Sudolska, 2014) which banks normally require as collateral. Although access to grants constitutes a 39.2% as a cumulative percentage of startups as a challenge, it was found that government funding enhances the probability of follow-up financing by venture capital (Tobergte & Curtis, 2013). These results for later stage financing indicate that government funding is a significant predictor of venture capital and private investments. Although the present findings are consistent with previous studies, access to finance in multiple channels remains a challenge for Malaysian startups. This may denote the early development stage for TSs in Malaysian, particularly in the internet and ICT sectors.

5) What are your financing decision factors?

Business performance was the top answer with 22.7% as cumulative 60.3% of cases. TSs rated business performance as the most important decision factor in financing: this is consistent with Nawi (2015), who suggests that SMEs have similar criteria as financing decisions as TSs. Meanwhile, 15.6 % a cumulative 41.3% of cases rate network to be the most critical financing factor. Results are consistent with previous studies that highlight the role networking for entrepreneurs and early stage business (Bøllingtoft, 2012; Kobza & Mutlucan, 2016; Roman, Congregado, & Millan, 2013).

Table 8. Financing Decision Factors

Financing Challenges				
		Responses		Percent of Cases
		N	Percent	
Top Three Financing Challenges	Loan approval	35	12.9%	29.2%
	Finance not adequate	40	14.7%	33.3%
	Financing on time	56	20.6%	46.7%
	Access to investors	34	12.5%	28.3%
	Access to VC	52	19.1%	0.3%
	Access to grants	47	17.3%	39.2%
	Others	5	1.8%	4.2%
	No Difficulty	3	1.1%	2.5%
Total		272	100.0%	226.7%

Displays decision factors in terms of percentage and percentage of cases

Among respondents 14% a cumulative 37.2% rate venture capital as the most important financing decision factor. Other important factors were interest rate at 29.8% cumulative, individual investors at 27.3% cumulative, attitude to debt at 18.2% cumulative and grants at 14.9% cumulative of cases. These number indicate the wide range of significant factors for different respondents, the difference in decision criteria could be due to ethnic culture practices, where Malaysian Chinese entrepreneurs utilize a strong network to finance their business (Shim & Shin, 2016) whereas Bumiputra entrepreneur remain in favour of government grants (Zainol & Daud, 2011). Whereas attitude to debt among Muslim Bumiputra entrepreneurs, may be a strong decision factor to avoid interest on their financing.

Religious beliefs came at 5% cumulative and way of life at 7.4%, while financial trends came at 19.8% cumulative of all cases. This indicates that TSs are more pragmatic in their approach to financing and

may be less sentimental about religious beliefs and way of life, while they observe and consider financial trends.

Overall, business performance, network and venture capital are the highest financing criteria among the startups surveyed. Business performance and network have both been found to be significant factors in financing determinants among Malaysian SMEs (Nawi, 2015). Business performance is a common factor among SMEs and startups in different environments; however, networks are more prevalent in collective cultures and are a significant source of social capital (Yoon et al., 2015). Interest rates are a common decision factor for SMEs and startups alike (Doh & Kim, 2014; OECD, 2004). Religion, ways of life and cultural norms seem to be insignificant for TSs, in contrast to the findings of previous studies (Coccia, 2014; Hofstede, 1981; Woodside et al., 2014). This might be due to the nature of the TSs' environment, their diverse nature and open culture, which minimizes cultural sensitivities (Burke, 2015). It is also clear that religious considerations are not substantial or significant. Attitude to debt seems to be a factor for only a small minority that is concerned with debt as a major decision factor.

6) Islamic Finance (IF)

The final part of the questionnaire measured technopreneurs' perception and awareness of Islamic Finance (IF), to what extent they use IF products and services, whether they recommend IF and to what extent they would want to learn about IF. Questions are designed to measure TSs awareness of IF, their financial consideration, their current usage of IF products and services, to what extent they would recommend IF to other TSs and finally to what extent they would want to learn about IF. Questions 1 to 5 are coded as follows; IF1, IF2, IF3, IF4 and IF5.

Table 9, presents the five questions that attempted to measure the above metrics. Responses were based on a Likert scale with the following criteria: (1) not at all; (2) to a little extent; (3) to a moderate extent; (4) to some extent; (5) to a high extent.

Table 9. Islamic Finance Questions

No.	Islamic Finance
1	To what extent are you aware of Islamic Finance?
2	To what extent would you consider Islamic Finance?
3	To what extent do you use Islamic Finance?
4	To what extent would you recommend Islamic Finance products?
5	To what extent you want to learn about Islamic Finance?

The following Table 10 presents descriptive statistics for IF questions 1 to 5 along with mean, median, standard deviation and variance, data indicate no missing values.

Table 10. Islamic Finance Questions

		Statistics				
		IF1	IF2	IF3	IF4	IF5
N	Valid	121	121	121	121	121
	Missing	0	0	0	0	0
Mean		2.5372	2.2149	3.3884	3.1818	3.5702
Median		2.0000	2.0000	3.0000	3.0000	4.0000
Mode		1.00	1.00	3.00	3.00	5.00
Std. Deviation		1.36040	1.27937	1.30622	1.27148	1.35908
Variance		1.851	1.637	1.706	1.617	1.847

Table 11 provide answers to research questions listed previously in table 5.7, table include the questions, answers (1-5), frequency, percentage and cumulative percentage.

Answers for the first question reveal that 51.2% of startups rated their awareness of IF not at all or to a little extent, which indicates very low level of awareness of IF among TSs. Meanwhile, 9.9% claimed to be aware of IF to a large extent, 17.4% rated their awareness to some extent and 17.4% rated to a moderate extent respectively. Answers indicate the most startup lack awareness of IF products and service, which could be due to the fact that they are more engaged with active with venture capital firms that provide attractive financial and non-financial benefits verses alternative financing like IF. Other possible reasons among technical entrepreneurs is their lack of knowledge of financing in general and this is where they need the guidance and support of government agencies.

Table 11. Islamic Finance

Questions	Answer	Frequency	Percent	Cumulative Percent
1. To what extent are you aware of Islamic Finance?	1	39	32.2	32.2
	2	23	19	51.2
	3	26	21.5	72.7
	4	21	17.4	90.1
	5	12	9.9	100
2. To what extent would you consider Islamic Finance?	1	54	44.6	44.6
	2	14	11.6	56.2
	3	33	27.3	83.5
	4	13	10.7	94.2
	5	7	5.8	100
3. To what extent do you use Islamic Finance?	1	15	12.4	12.4
	2	12	9.9	22.3
	3	36	29.8	52.1
	4	27	22.3	74.4
	5	31	25.6	100
4. To what extent would you recommend Islamic Finance products?	1	17	14	14
	2	13	10.7	24.8

	3	46	38	62.8
	4	21	17.4	80.2
	5	24	19.8	100
5. To what extent you want to learn about Islamic Finance?	1	15	12.4	12.4
	2	10	8.3	20.7
	3	28	23.1	43.8
	4	27	22.3	66.1
	5	41	33.9	100
	Total	121	100	

As for the second question, majority of respondent groups, making up over 56.2% of the sample, rated their consideration for IF products and services not at all and to a little extent, which indicates a low inclination toward using Islamic Finance products for TSs. Meanwhile, 10.7% of respondents answered to a moderate extent and 5.8% to a large extent, while 27.3% rated their answer as to some extent, which suggests that most startups have no knowledge of IF products therefore they would mostly not consider it. Another reasons for such answers, is that we anticipate that some non-Muslim respondent to link IF to religion and religious beliefs, hence not be inclined to consider IF products.

A total of 77.7% of respondents answered the third questions to a moderate extent and higher, which indicates a high percentage of users of IF products and services among TSs. Only 12.4% reported they did not use IF products and services at all. Although questions may seem to contradict with the previous questions, but we believe a wide range of respondents are current and active customers of IF personal financing product. These respondents seems to lack knowledge of IF products for business, and it may be also that IF institutions do not offer any financing to startups without assets.

The fourth question measures the extent that TSs would recommend IF products to others. A total of 38% of respondents answered to some extent, while 17.4% answered to a moderate extent and 19.8% to a large extent, indicating a moderate to high likelihood of recommending Islamic Finance products and services. However, 14% and 10.7% of respondents answered 1 and 2 respectively, which indicates a low likelihood that they would recommend Islamic Finance products and services.

The Majority of respondents a total of 79.3% indicated that they had a desire to learn about IF products and services. Only 12.2% indicated no desire at all to learn about IF products and services, while 8.2% reported that they were interested to a little extent: overall, these findings indicate considerable interest in IF. A valid explanation could be the hype behind the growth of IF overall in recent years combined with TSs desire to explore additional financing alternatives.

It seems that Islamic Financing is not prevalent among TSs in Malaysia, even though over 34%5 of startups are represented by Bumiputra entrepreneurs, who are predominantly Muslim entrepreneurs. This can be explained by three reasons: first, is that IF is mostly linked to bank financing which is not a preferred source of financing for startups. Second is, small startups are most likely to finance their ventures through internal sources at the early stage and through external sources at the later stage. The third explanation might be that technology

entrepreneurs are not concerned with IF and being Shariah-compliant as long as they receive funding on time to sustain their business.

5.2 Statistical Analysis

To be able to distinguish between TSs financing behaviour at the early stage and their financing behaviour at the later stage, two financing variables were constructed. Variable F1 represents early stage financing and F2 represents later stage financing. Venture capital financing and private investor financing were used to construct the new variable, reason being they both represent private investments and often times TSs are financed by these two verses other methods of financing. Results indicate that at the early stage of financing, no variable was able to predict financing from either venture capital or private investors. Among all the variables tested, none were significant, including age, gender, education, innovation, government and investing own money. Table 12 displays Chi-Square test results for F1. No single variable or a combination of variables were predictors of financing at the early stage. The very nature of TSs environment at the early stage could contribute to these results. TSs are characterized by speed, agility, fierce competition, edge innovation and very high risk (Lee et al., 2016), and this risk is significantly high at the early stage. Moreover, many factors contribute to the higher risk at the early stage including but not limited to, technology, talent, commercialization and business model (Eschenfelder & Holstein, 2017).

Participation for the early stage was limited and fragmented among both genders and ethnic group, hence not significant. TSs are highly risky at their earlier days, and many wind up within the first three years, which mounts to further challenges in raising funds at early stages. To help explain these results, startups spend considerable efforts at the early stage in activities like entrepreneurship research, exploring business opportunities and building economic models (Davidsson, 2015).

Table 12. Early Stage Financing Descriptive Statistics

F1 – Early Stage Financing – Chi-Square (n=121)

Variable	Category	Yes		No		X^2	Odd Ratio	C.I.		P Value
		n	%	n	%			L.B.	U.B.	
Ethnicity	Bumi	35	83.3	7	16.7	1.184	1.695	0.651	4.413	0.277
	Non-Bumi	59	74.7	20	25.3					
Gender	Female	26	72.2	10	27.8	0.883	0.65	0.264	1.603	0.348
	Male	68	80	17	20					
Age	18-30	48	76.2	15	23.8	0.17	0.835	0.353	1.973	0.68
	30+	46	79.3	12	20.7					
Education	Bachelor	54	78.3	15	21.7	0.031	1.08	0.456	2.558	0.861
	Others	40	76.9	12	23.1					
Work Exp.	<3 Years	19	82.6	4	17.4	0.397	1.457	0.45	4.717	0.529
	>3 Years	75	76.5	23	23.5					
Own Money	Yes	21	51.2	20	48.8	25.06	0.101	0.037	0.27	0.001
	No	73	91.3	7	8.7					
Grants Stage1	Yes	84	77.8	21	22.2	0.005	1.05	0.267	4.122	0.944
	No	10	76.9	3	23.1					

Similar comparisons were carried out for continuous variables using t-tests. Government Interventions (GI) and innovation Technology (IT) were both continuous variables. This test attempts to measure the effects of government interventions and innovation for both early stage (F1) and later stage financing (F2). Table 13 display IT and GI effects at the early stage.

Table 13. T-test for early stage financing (F1)

		mean	SD	P-value
Innovation Technology	Yes	19.511	3.366	.712
	No	19.778	3.093	.700
Government Interventions	Yes	25.450	4.514	.302
	No	24.410	4.854	.325

As for later stage financing, age, gender, innovation technology, government grants at the early stage and investing own money at the early stage were all predictors of financing. Table 14 displays the results for later stage financing (F2).

In later stage financing, it appears that female technopreneurs were more likely to be financed by venture capital firms and private investors, including angel investors. This is due to the perception among investors that female entrepreneurs are less likely to take risk (Berger & Kuckertz, 2016). Age was also a significant factor: technopreneurs aged 30 and above were more likely to be financed than those under 30. Overall, venture capital firms and investors seem to favour older and more experienced entrepreneurs over younger entrepreneurs (Ahmad et al., 2014). Investing one's own money at the early stage was a predicting variable for financing at the later stage. This is explained by the entrepreneurs' self-efficacy, determination and vision to support their business, as venture capital firms and investors show more trust in entrepreneurs with a strong character (Nawi, 2015).

Government financing, on the other hand, was also a significant predictor of financing at the later stage. This may be explained by the fact that recent government financing programs are becoming more competitive and are based on merit. Although limited in number, the rise of startups has led many to seek government funding at both stages, leading to intense competition and limited funding. This has led to improved quality of funded startups. Such improvement in quality is reflected by further financing rounds by venture capital and private investors.

Table 14. Later Stage Financing Descriptive Statistics

F2 – Later Stage Financing – Chi-Square (n=121)

Variable	Category	Yes		No		X ²	Odd Ratio	C.I.		P Value
		n	%	n	%			L.B.	U.B.	
Ethnicity	Bumi	21	50	21	50	0.216	1.194	0.564	2.528	0.642
	Non-Bumi	36	45.6	43	54.4					
Gender	F	21	61.1	12	38.9	4.033	2.245	1.011	4.982	0.045
	M	35	41.2	50	58.8					
Age	18-30	23	36.5	40	63.5	5.926	0.406	0.195	0.844	0.015
	30+	34	58.6	24	41.4					
Education	Bachelor	35	50.7	34	49.3	0.843	1.404	0.68	2.898	0.359
	Others	22	42.3	30	57.7					
Work Exp	<3 Years	7	30.4	16	69.6	3.168	0.42	0.159	1.111	0.075
	>3 Years	50	51	48	49					
Own Money1	Yes	34	72.3	13	27.7	19.628	2.586	1.031	6.488	0.036
	No	23	31.1	51	68.9					
Grants Stage2	Yes	20	74.1	7	25.9	10.114	4.402	1.694	11.348	0.001
	No	37	47.1	57	52.9					

Furthermore, due to lack of collateral and information asymmetry, entrepreneurs face inherent challenges in attracting external capital (Deffains-Crapsky & Sudolska, 2014), whereas at the later stage, startups have developed an operational business model and achieved some form of traction in the form of revenue or significant potential revenue. In this case, venture capital and private investors would be more convinced to participate in financing opportunities that have certain financial expectations (Jahanmir, 2016).

IT in general is a sensitive criterion for venture capital firms and investors overall. The level of innovation plays a significant role in financing, as improving the level of technological innovation can increase survival rate and help startups to expand and grow (Rahman et al., 2016).

Table 15. T-test for later stage financing (F2)

F2 Later Stage Financing (n=121)

		mean	SD	P-value
Innovation Technology	Yes	18.632	3.574	.003
	No	20.406	2.799	.003
Government Interventions	Yes	25.491	4.896	.534
	No	24.969	4.328	.537

Most forms of government support programs, on the other hand, are dependent on the development stage of the country (Thai & Turkina, 2014): government interventions have been found to be more effective in

developing countries, which lack human resources, infrastructure and quality of governance, among other entrepreneurship constituents.

6. Conclusion

The insights of this study make a significant contribution to the literature in the area of financing innovation and technology; however, the challenge lies in producing an inclusive and exhaustive policy framework to address the gap in financing. This challenge is mainly due to the nature of the study and the wide spectrum of elements included. Nevertheless, the study is able to conceptualize a well-rounded policy framework.

Previous studies in the field of financing and entrepreneurship (Ahmad et al., 2014; Apetrei et al., 2015; Harms, Luck, Kraus, & Walsh, 2014; Kohar et al., 2012; Nawi, 2015; Oppenheim, 1992) were based on interviews with entrepreneurs as the central target respondents. Very few studies have included government financing agencies (Hamidon, 2008) to establish linkages and relevance.

7. Policy Implication

The study concludes with recommendations.

References

- Braun, V. and, & Clarke, V. (2006). " Using thematic analysis in psychology. " *Qualitative research in psychology*, 3(2), 77–101.
- Brewer, J., & Hunte, A. (2006). *Foundations of Multimethod Research. Synthesizing Styles*. Sage.
- Chapra, M. U. (2008). Ibn Khaldun's theory of development: Does it help explain the low performance of the present-day Muslim world? *Journal of Socio-Economics*, 37(2), 836 – 863. <http://doi.org/10.1016/j.socec.2006.12.051>
- Coccia, M. (2014). Socio-cultural origins of the patterns of technological innovation: What is the likely interaction among religious culture, religious plurality and innovation?? Towards a theory of socio-cultural drivers of the patterns of technological innovation. *Technology in Society*, 36(1), 13 – 25. <http://doi.org/10.1016/j.techsoc.2013.11.002>
- Corbin, J. M., & Strauss, A. (1990). Grounded theory research: Procedures, canons, and evaluative criteria. *Qualitative Sociology*, 13(1), 3–21. <http://doi.org/10.1007/BF00988593>
- Creswell, J. W. (2007). *Qualitative inquiry and research design: choosing among five approaches*. Thousand Oaks, London: Sage.
- Croitoru, A. (2012). Schumpeter, J.A., 1934 (2008), *The Theory of Economic Development: An Inquiry into Profit, Capital, Credit, Interest and the Business Cycle*, translated from The German by Redvers Opie News Brunswick (U.S.A) and London (U.K.): Transaction Publishers. A re. *Journal of Comparative Research in Anthropology and Sociology*, 3(2), 137–148. <http://doi.org/10.2307/1812657>
- Cumming, D. J., & Johan, S. A. (2014). The Role of Government and Alternative Policy Options. <http://doi.org/http://dx.doi.org/10.1016/B978-0-12-409537-3.00009-8>
- Denzin, N. K. (1978). *Sociological methods: A sourcebook*. McGraw-Hill Companies.
- Denzin, N. K., & Lincoln, Y. S. (1998). "The Landscape of Qualitative Research: Theories and Issues." Sage Publications, 84–87.
- Doh, S., & Kim, B. (2014). Government support for SME innovations in the regional industries: The case of government financial support program in South Korea. *Research Policy*, 43(9), 1557 – 1569. <http://doi.org/10.1016/j.respol.2014.05.001>
- Eniola, A. A., & Entebang, H. (2015). SME Firm Performance-Financial Innovation and Challenges. *Procedia - Social and Behavioral Sciences*, 195(August 2016), 334–342. <http://doi.org/10.1016/j.sbspro.2015.06.361>
- Fund Cradle. (2015). Cradle Fund Snd. Bhd. Retrieved from <http://www.cradle.com.my/>
- Hamidon, S. (2008). The Development of Malay Entrepreneurship in Malaysia. *Asian Journal of Technology Innovation*, 16, 101–116. <http://doi.org/10.1080/19761597.2008.9668649>
- Kane, T. (2010). The importance of startups in job creation and job destruction. *Kauffman Foundation Research Series: Firm Formation and Economic Growth*, (July), 12. <http://doi.org/10.2139/ssrn.1646934>
- Karatas, S. C. "Economic theory of Ibn Khaldun and rise and fall of nations.," 2Bid 281 (2006).

- Levi Jaksic, M., Marinkovic, S., & Rakicevic, J. (2014). Sustainable Technology Entrepreneurship and Development – the Case of Serbia. *Management - Journal for Theory and Practice of Management*, 19(70), 65–73. <http://doi.org/10.7595/management.fon.2014.0004>
- MaGIC. (2016). Malaysia Global Innovation & Creativity Center. Retrieved from <http://impact.mymagic.my/>
- Manigart, S., & Struyf, C. (1997). Financing high technology startups in Belgium: An explorative study. *Small Business Economics*, 9(2), 125–135. <http://doi.org/10.1023/A:1007967722346>
- Mason, C. (2016). Promoting High-Growth Entrepreneurship in Peripheral Regions: a Critique of Government Sponsored Venture Capital Funds. *Welsh Economic Review*, 24, 36–41.
- MAVCAP. (2015). Malaysia Venture Capital Management Berhad. Retrieved from <http://www.mavcap.com/>
- Miles, M.B. and Huberman, A. M. (1994). *Qualitative data analysis: a sourcebook of new methods*. Thousand Oaks, CA: Sage Publications.
- Mugione, F., & Farinelli, F. (2012). ENTREPRENEURSHIP POLICY FRAMEWORK AND IMPLEMENTATION GUIDANCE. United Nations Conference on Trade and Development. <http://doi.org/10.4135/9781446269381.n2>
- Nawi, H. (2015). Determinants of capital structure in small and medium sized enterprises in Malaysia, (May).
- Rahman, N. A., Yaacob, Z., & Radzi, R. M. (2016). An Overview of Technological Innovation on SME Survival: A Conceptual Paper. *Procedia -Social and Behavioral Sciences*, 224(6), 508 – 515. <http://doi.org/10.1016/j.sbspro.2016.05.427>
- Ricketts, M. (2009). Theories of Entrepreneurship: Historical Development and Critical Assessment. *The Oxford Handbook of Entrepreneurship*, (July 2016), 1 – 30. <http://doi.org/10.1093/oxfordhb/9780199546992.003.0002>
- Rubin, H. J., & Rubin, I. S. (2011). *Qualitative interviewing: The art of hearing data*. Sage Publications.
- Şahin, T. K., & Asunakutlu, T. (2014). Entrepreneurship in a Cultural Context: A Research on Turks in Bulgaria. *Procedia - Social and Behavioral Sciences*, 150, 851–861. <http://doi.org/10.1016/j.sbspro.2014.09.094>
- Sax, L., Gilmartin, S., & Bryant A. N. (2003). Assessing Response Rates and Nonresponse Bias in Web and Paper Surveys Author (s): Linda J . Sax , Shannon K . Gilmartin and Alyssa N . Bryant Published by : Springer Stable URL : <http://www.jstor.org/stable/40197313> AND PAPER SURVEYS, 44(4), 409–432.
- Śledzik, K. (2013). Schumpeter's view on innovation and entrepreneurship. *Management Trends in Theory and Practice*, (ed.). University of Zilina & Institute of Management, 89–95.
- Veal, A. J. (2005). *Business Research Methods: A Managerial Approach*. Pearson Education Australia/Addison Wesley.
- Wonglimpiyarat, J. (2011). Government programmes in financing innovations: Comparative innovation system cases of Malaysia and Thailand. *Technology in Society*, 33(1 – 2), 156 – 164. <http://doi.org/10.1016/j.techsoc.2011.03.009>
- Wu, C.-W., & Huarng, K.-H. (2014). Global entrepreneurship and innovation in management. *Journal of Business Research*, 68(4), 743–747. <http://doi.org/10.1016/j.jbusres.2014.11.022>