

## TECHNOLOGY BASED FIRM'S FINANCING: AN OPERATIONAL MODEL FOR MALAYSIA

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### ABSTRACT

*Venture capital (VC) as a method of funding technology based firms (TBFs) is a concept which emerged from the United States of America since over 30 years and has spread tremendously across the world. This concept has gained considerable awareness in Malaysia since the early 1990's when government established the first venture capital company to promote and accelerate the development of the venture capital concept and also encourage the commercialization of technology based products through the management of the technology transfer funds. Due to the difficulty technology based firms owners go through in the process of growing their innovations particularly during the initial phase of growth of their businesses their is need to encourage financial managers to take up equity stakes and help nurture technology based firms to maturity. As a result of the perception in some quarters that their is a dearth of investments in the Malaysian VC industry which they opined has contributed to the slow pace of growth recorded in the industry despite huge government financial support. This study adopts a grounded theory approach (within-method triangulation) to collect data from 34 respondents in the industry. The model proposed in this study will benefit stakeholders to evaluate technology based firms.*

**Keywords:** Technology Based Firms, Venture Capital, Investment Decision, Model, Malaysia.

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### BACKGROUND OF THE STUDY

Technology based firms are those companies in which their sales revenue is generated through the use of at least 51 percent of technology based operations e.g. aerospace, internet, electronics, mechanical, automobile, clean energy, bio-medical, communications, telephone, fax companies to mention a few (Yip et al., 2009; Ajagbe et al., 2012a). Meaning that, the main trust of their operations depends mainly on the adoption of high technology. There are more possibilities that they will engage in international markets than non high growth small and medium sized firms (BIS. 2010), and they have above-average levels of productivity growth (Mason et al., 2009), strong levels of innovation (Coad, 2009; Mason et al., 2009), strong levels of export-orientation and a high level of internalisation (Mason and Brown, 2010). Many authors agree that technology based (Rothwell and Zegveld, 1982) small firms play an important role in innovating and the technology businesses generate high value-added products that have rippling or spill-over effects on other organizations. Thiruchelvan et al. (2010) pointed out the challenges of access to finance, ability to cope with government regulations and non availability of adequate professional management expertise as a few of the challenges bedevilling technology small firms all over the world. Although in Malaysia it was found that the problem hindering the commercialization of more technology products is a result of inadequate sophistication of deals for venture capital firms to invest in. This assertion is contrary to empirical findings from across the world by several previous researchers in the developed world. In a knowledge-driven economy such as Malaysia, economic growth is increasingly dependent upon innovation whereby access to finance is seen as a major challenge that may impede this process (Bygrave and Timmons, 1992; Wonglimpiyarat, 2007). However, Venture Capital (VC) has been recognized as being among the most vital technology financing mechanisms assisting research and development activities, from encouragement of rudimentary scientific research to technology development and commercialization (Mason and Harrison, 2008; Mason and Pierrakis, 2011). They play a key role in the emergence of new sectors by creating and supporting innovative firms which later dominate these sectors. While the government of Malaysia have since 1990 recognized that venture capital investments accelerates the growth of firms, enabling them to transform ideas quickly into marketable products and become industry leaders through first-mover advantages (Ajagbe et al., 2012a; Mason and Pierrakis, 2011). In view of these and the desire to achieve this ambition have established certain innovation and venture capital promoting agencies in the country, among which are; the Malaysian venture capital berhad (MAVCAP), Malaysian technology development corporation (MTDC), Modal Perdana, Cradle Fund, Biotech Corporation to mention just a few. This is in recognition of the fact that the importance of equity financing in gingering local economic growth of a nation cannot be underestimated.

The emphasis of government-backed venture capital companies in Malaysia is on early stage or start up technology firms because they find it almost impossible to raise adequate financing from banks and other conventional financing institutions. They also invest in a few later stage companies both locally and internationally.

The investment decision of venture capital firms is a very significant features that must be taken into consideration in order to understand the process they undergo in determining a few of the high technology firms they choose for funding. Investment

however, can be defined as the sacrifice of a present, certain benefit in the expectation of a future uncertain gain (Jung et al., 2011; Batjargal, 2007). From this it can be seen that the two factors influencing the investment appraisal most are the probability of the project's actual outcome being different from its predicted outcome (risk), and the potential returns of the project. Venture capitalists face myriads of challenges when evaluating potential investments, unlike investors in quoted securities where the theory of Efficient Market Hypothesis applies (Cooper, 2008). VCs will rarely have any historic data on dividends levels and share price movements to help them in their assessments. They do not often invest in quoted securities, except in cases where the management of a quoted company want to buy back the company's shares so that the organization may revert back to private status.

The capital investment process involves venture capitalists nurturing entrepreneurial company management through company formation, defining and protecting key technology, fostering operational growth, adding value through human capital, providing access to contacts and networks, growing the company through knowledge networks (Jung et al., 2011; Ajagbe et al., 2012b) and positioning the company for exit (Batjargal, 2007). The most important challenge venture capital investors encounter as regards the assessment of firms, are the determination of evaluation criteria and their proper integration in an overall, evaluation model which would allow for the rational and automatic selection of viable firms (Kirihata, 2010). Siskos and Zopounidis (1987) identified some distinct categories of empirical studies on such problems based on research carried out by renowned and earlier authors such as (Wells, 1974; Poindexter, 1976; Macmillan et al., 1985; Tybejee and Bruno, 1984; Fried and Hisrich, 1994; Zutshi, 1999; Bachher et al., 1999; Smith, et al., 2010; Ajagbe et al., 2012a; 2012b). However not minding the above, there have been a problem of how venture capital firms in Malaysia should properly evaluate TBFs they invest in. This is because of they belief in many quarters that equity investors are not willing to finance TBFs and also some belief it is a result of the high risk nature of the sector and non qualification of many TBFs to access the available investible funds in the country. The purpose of this research is to develop an operational financing model for venture capitalists in Malaysia to evaluate technology based firms they invest in.

**RESEARCH METHODOLOGY**

This research gathered data through the grounded theory approach to data gathering (qualitative) with a semi-structured form of interview using a well designed interview schedule, observational notes and document review (Strauss and Corbin, 1998; Glaser and Strauss, 1967). Data was collected from 34 participants involving the observation of 14 information communication and technology (ICT) technopreneur pitch their innovation to 10 venture capital and business angel firms, interview of 9 technology based firms (TBFs) and 1 large government supported venture capital firm (GVCF) in Johor Bahru and Kuala Lumpur, Malaysia.

The purpose of any qualitative research is to observe the research topic from the perspective of the interviewee, and to realize how and why it comes up to have this point of view (Cassell and Simon, 2004; Chin et al., 2012). In this study multiple sources of data or triangulation was used which include document investigation, participant observation, and interviews (Denzin, 1998; Creswell, 2012) to ensure credibility and trustworthiness of the findings. The researcher chose to make use of content analysis used for qualitative data analysis (Stemler, 2001; Yin, 1994; Weber, 1990; Ary et al., 2009; Creswell, 2012) so as to bring out the emerging and recurring themes from the real data as presented by the respondents. The researcher in this study followed the three essential levels of qualitative data analysis as proposed by (Miles and Huberman, 1984), such as; (1) the identification of recurring patterns of themes and topics from the raw data. (11) The grouping of the recurring themes and topics from the set of the analysed interviews, personal notes, and observational notes. (111) the categorization of themes and topics into a few tentative major headings for the purpose of data reduction. Further identification and regrouping of themes were carried out from the verbatim transcribed data by the researcher until meaningful and a manageable classification was established. Table 1 shows the emerging themes, sub-themes and attributes that originated from the raw data after coding. The table presented is just a summary of the whole coded data since all the transcribed data could not be used for this study, the researcher chose to bring out the most important and relevant part of the chunk of data for this particular article.

**Table 1: Emerging themes, sub-themes and attributes from the raw data**

Categories	Sub-categories	Attributes
Investment decision	I: Selection process	A: Collect business proposals, pre-screen proposals, invite TBF to pitch, investment decision, structure deal, pump in money, monitor use of capital.  B: Proposal submitted, Review proposal, Conduct business due diligence, Forward to short listing committee, Forward to investment committee, If approved, legal due diligence, Commence financing.
	II: Significant considerations	Market size, Attraction to global market, Financial budget, Marketing plans/strategies, IP protection, Proposed revenue plan, Anticipated customer base, Quality of team members, Scalability of the product, market potential, market needs, well prepared business proposal, Prototype readiness, Raw material sustainability, Threats of obsolescence, Market share, customer value chain, how long to recoup investment, potential exit strategy, product quality and sustainability, business model, marketing strategy/model, funding requirement/utilization, pitching skills, knowledge of technology, business acumen of entrepreneur, passion and drive of inventor, profit potential, product applicability/ workability, potential value to customers, target market anticipated,

		stage of growth, Cost of manpower, cost projection, suppliers projection, Return on investment, Potential for growth, Customers persuasion skills, Ability to influence other people, How catchy is your hook?, Basic value proposition, Market segmentation, competitors Entry barriers, Unique selling propositions, Technology expertise and domain knowledge, Alliance and strategic partnerships, Promoters, Board of Directors, Top management (VPs), Market opportunity/potential, Technology sustainability, Downside risk, Strong technology innovation, High commercial viability, Traction/track record, Proven offering, Geographical location, Leverage buyouts, Low volatility, Consolidation or syndication of investments, Venture backed or not, Government grant as seed fund, Structure of the company, Financial capability of the team members, Loan amount and repayment period, Availability of collateral security, Healthy balance sheet with surplus assets position, Background information.
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**SUMMARY OF INTERVIEW ANALAYSIS AND FINDINGS**

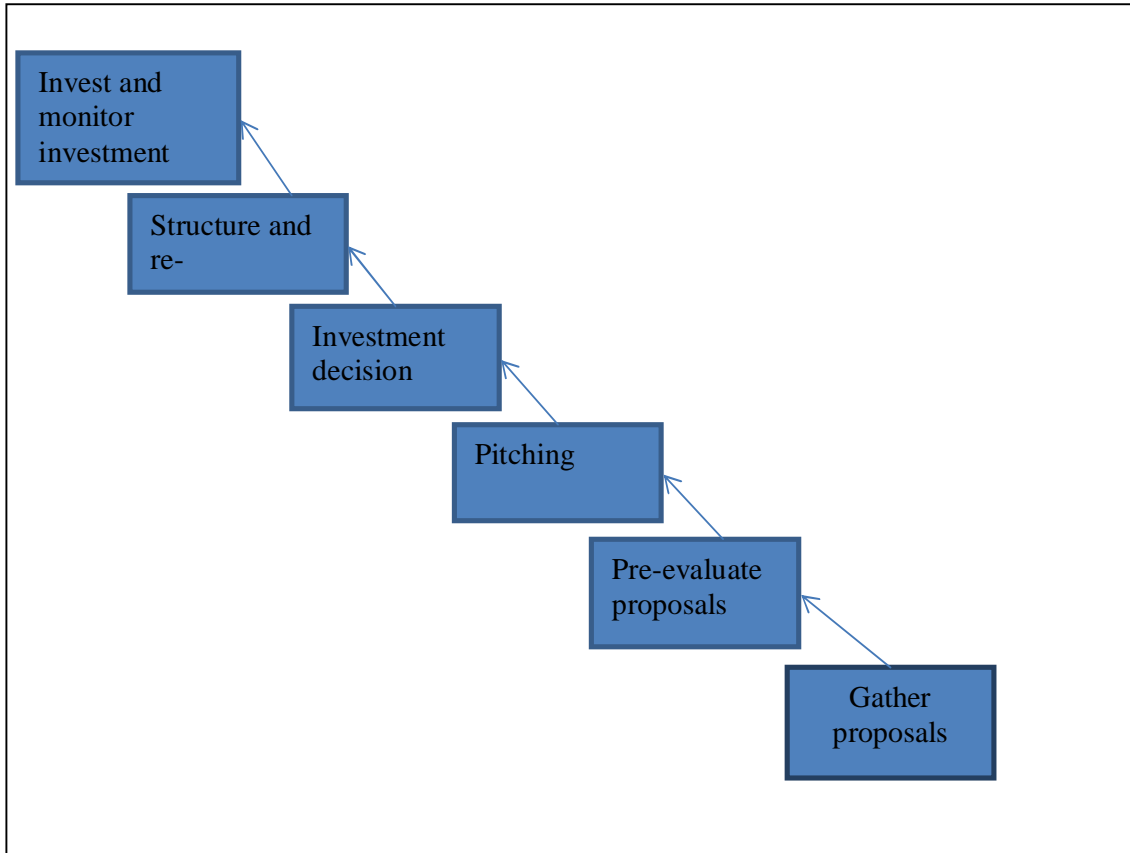
**INVESTMENT DECISION PROCESS**

The purpose of this question is to understand the experience of technology entrepreneurs during the venture capital investment screening process. As we know that in the developed countries of Europe and America where the art of technology business financing has reached an advanced stage, different factors are put into considerations before financial institutions would decide to invest in a technology. But for the developing countries in Asia such as Malaysia, the researcher seeks to find out if same criteria are adopted during the VC selection process. Participants were asked questions about their experience during the VC selection process and the responses are transcribed verbatim from the tape recorder. Several responses were elicited from the participants of the interview and although some of the responses are almost the same because technology entrepreneurs go through selection processes from same venture financing agencies in the country, the researchers have selected the responses that are important and well detailed for the analysis of this study, hence the first respondent relayed his experience that *“the idea of the project must be high enough for global market, the potential size of the market must be huge enough, potential ability to be attracted to external investors must be high enough, although we have not asked for any funding from venture capital firms yet, we are still going through the initial firm formation and being groomed by government venture capital firms to reach that stage, however “ for you to secure funding you must go through this processes with the VC firms; Collect business proposals, pre-screen proposals, invite TBF to pitch, investment decision, structure deal, pump in money, monitor use of capital (TBF ZX). Another respondent who has gone through similar venture capital screening processes posited that “we were mandated to come out with a budget, marketing plans, marketing strategies, proposed revenue plans, anticipated customer base, competitor threats, marketing size of products, all these things were considered by the venture capital firm during the selection process. Although being a government venture capital firm, they were lenient in area of team members because they understand that we are all novice entrepreneurs and Malaysian government is doing it’s best to encourage people like us, what they really focused on in our technology is the scalability of our innovation” (TBF NH). Furthermore from the submission of this participant, it would be realized that “Prior to getting funding from the venture capital firm, it took four years of preparation and when we were eventually invited for the screening exercise, we discovered that 300 young technopreneurs were assembled by MTDC for screening and after going through different modalities 20 of us were selected and further made to pass through another round of training courses and workshop on business management technique, technology management, how to write a winnable proposal, how to pitch your innovation to funding agencies, how to pitch your innovation and convince licensing panel from established firms to license your innovation, convincing the panel of venture capitalists for external funding, how to plan to market your technology, all these processes were yardstick used to select a few of us funded” (CEO CT). Looking at the modus operandi of MTDC you would realize that this is exactly the way other government motivated venture capital firms in the country operate, agencies such as MAVCAP, Modal Perdana, Cradle investment fund, Biotechnology Corporation and just to mention a few. Further submission of a conventional technology entrepreneur reported that some of the significant factors that influenced his company been selected for financing during the venture capital evaluation process are “viability of technology, market potential, technology expertise of inventor, return on investment, technical expertise and deep knowledge of the technology, capability of team members, sustainability of innovation, access to source of raw material, benefit to society, profit potential are some of those things considered as significant in my proposal during screening. MTDC staff is not involved in my business, they give you money and set a milestone for you to achieve, they are not actively involved; they are just a monitoring agency” (CEO ZW). In order to corroborate the opinion of technology entrepreneurs interviewed, the researcher further seek to hear from the representative of the largest venture capital firm in the country who have actually participated in screening and funding many TBFs and by virtue of his position as a senior investment manager, he is well qualified to speak. However, he posited that in Malaysia *“on how we screen potential investee firms we fund, ehhe internally we practice a number of policies for us to go through the deals as in the business model, we look at the promoters sometimes, we look at the product, that is the technology, the market size whether it is scalable, consider whether we want to put our money into it the company, there is a long processes internally, there are many huddles you have to go through at the end of the day a deal has to be approved by the investment committee of 7 individuals and each individual is given a vote and any deal that fail to obtain at least 6 votes to 7 votes will not be qualified for an investment, infact you must go through these processes before you secure any fund if you are lucky: Proposal submitted, Review proposal, Conduct business due diligence, Forward to short listing committee, Forward to investment committee, If approved, legal due diligence, Commence financing” (Sen. Invtm. Mgr. VCF). The essence of the question asked the senior investment manager of a huge venture capital firm is to corroborate the opinion of the technology entrepreneurs and see if they share similar experience, this also is required to ensure trustworthiness and credibility of findings. Hence from the experience of the TBFs and the VCF interviewed, the triangulated themes in Table 1 above shows that the way and manner TBFs**

are evaluated in Malaysia are somewhat similar to that of other part of the world, the only little difference is in the area of been a bit soft with the potential investee firms since the major aim of Malaysian government is to encourage and groom more technopreneurial firms, and this is further attested by the current report of the Harvard Business School (HBS) that globally, Malaysia government have been reported to be one of the leading governments when it comes to huge investments funneled into small and medium enterprise development.

To cap it all, the model presented in Figure 1 shows an outcome of the coded and triangulated responses from the interview data of TBFs, VCF and from literature review, and this indicates a proposed view of how VCs in Malaysia evaluate TBFs.

**Figure 1: A proposed model for venture capital firms to evaluate TBFs in Malaysia**



**MODEL DESCRIPTION**

**GATHER PROPOSALS FROM POTENTIAL INVESTEE FIRMS**

Malaysian venture capital firms gather investment proposals from potential investee firms across the country through several sources. This is the first among the six proposed investment decision procedures that are adopted by majority of venture capital firms in Malaysia. Findings from our research has shown that majority of venture capital firms in Malaysia are partly supported by the federal government through huge financial backing hence government has a say in the way their activities are carried out in terms of sectors to invest in and geographical spread of investments. However, from the analysis of the interview transcript we found that technology based firms in universities of higher learning (spin-offs) and ICT technopreneurs who are members of Malaysian Association of ICT Entrepreneurs (PIKOM) and Multimedia Development Corporation (MDEC) source information about potential financial investment companies through various sources such as university technology transfer offices (UTTO), newspaper advertisement, television advertisement, internet, industrial association, professional network such as Malaysian venture capital and private equity association (MVCA), business partners. Also venture capital firm’s source informations about potential investee firms through various sources such as; cold calls, professional networks (MVCA), technology entrepreneurial association of Malaysia (TEAM), ex employees, attending exhibitions and pitching events, government innovation promoting agencies and others.

**PRE-EVALUATE PROPOSALS RECEIVED**

When venture capital firms in Malaysia receive enough applications from interested technology based firms from various sources, the applications are further scrutinized and processed. Selected firms are mostly invited based on recommendation from prospective sponsoring agencies such as UTTO, MTDC, TEAM, MVCA, MAVCAP, MDEC/PIKOM and other business matching agencies in the country. Government supported venture capital firms before selecting early staged firms they fund

firstly, identify potential technology based firms that need funding, they follow up by identifying what is needed to train those entrepreneurs for them to be qualified for funding by organizing different workshops, seminars, exhibitions, pitching programs on how to build up their technology and write business proposal that meet up the requirement of potential financial institutions. A few of the TBFs who pass through this pre-evaluation or screening process will be presented for pitching to venture capital or business angel firms for further consideration. Findings from this study is similar to that of previous research which agreed that the second stage is very important because of the huge numbers of business proposals, which far more out-weigh the funding capacity, size of the staff and portfolio of venture capital firms (Jung et al., 2011; Ajagbe et al., 2012b), hence the need to screen and limit the selected numbers of deals and consequently invest in only a fraction of the deals which come to their attention.

#### **ARRANGE PITCHING EVENT**

Venture capital firms in Malaysia after training intensively potential investee firm's managers in the act of basic management skills, writing business proposals and presentation skills. They move to the next stage by organizing events that bring the potential financial agencies (venture capital firms and business angels) both from local and overseas for potential investee firms to pitch their innovation for funding. In carrying out an effective pitching, a few important criteria need to be taken into consideration by the presenter (technopreneurs) such as; the Hook (SRI., 2012), which involves beginning with a statement that is compelling enough to arouse the interest of the potential investor into listening to your presentation and further get them convinced and understand the nitty gritty of the content of your business proposal. The ability to succeed through this stage enables the VCs consider inviting the TBF to his office for detailed discussion and probably due diligence will follow. It is expected that the skills and knowledge acquired from this several workshops will come to fur and help the new venture managers do a good pitching to potential financiers and get a good deal struck.

#### **TAKE FINAL INVESTMENT DECISION**

Having witnessed presentations from potential investee firms that were pre-qualified and selected for the final pitching to venture capital firms. The next thing to do is go ahead and do due diligence study of the selected firms after been satisfied with the pitching and the content of the business plan. It was discovered that public supported venture capital firms are somewhat lenient in scrutinizing firms they invest in as their main objectives is to groom future technology based firms to be able to apply for external equity capital and stand alone as independent companies hence, helping to grow the economy of the country, although this is much at the very early phase of life of the growth firms. But for independent venture capital and business angels as observed during the pitching of the ICT technopreneurs in Malaysia, the selection process is almost the same but for the fact that they make independent investment decisions because the capital under management is owned by shareholders and this needs to be strictly and properly managed because of accountability issues. However, this was reflected in their usual strict manner of evaluating firms they fund. However, whether for public supported or private venture capital firms, final investment decisions are made when they panel are totally convinced of the future prospect of the innovation and the company. From analysis of the researcher's interview transcript and empirical literature (Wells, 1974; Poindexter, 1976; Macmillan et al, 1985; Fried and Hisrich, 1994; Ajagbe et al., 2012b), consistency was found that as a result of the inadequacy of track records by many of the potential investee firms result in the lenient manner public supported VCFs evaluate firms and help fund them so as to build up initial traction for future consideration by independent equity investors. However, venture capital firms usually consider anticipated risk and expected rate of return coupled with the quality of team members, market size and a few other criteria when selecting firms they fund.

#### **STRUCTURING AND REMODIFICATION OF THE DEAL**

Many times when venture capital firms have taken their final decision to invest in a technology based firms as a result of their conviction about the prospect of the product innovation, there might still be need to discuss a few issues pertaining to the deal which will only be finally consummated if those conditions are agreed upon which may include product re-modification, intellectual property rights, hiring competent chief executive officer, management of the company and how cash is to be released depending on the attainment of set milestone for the case of public supported venture capital firms. These suggestions are necessitated because most times team members of VC firms are comprised of experts on various fields who also have indepth knowledge of the technology and potential market needs of the products. These suggested concerns are further discussed and consensus reached and the final structuring of the deal is concluded. For the case of Malaysia where majority of the venture capital firms are public supported and the fact that they have a key influence on decisions of firms they fund, such issues as deal structuring will be determined partly taking into considerations government rules and regulations.

#### **INVEST AND MONITOR INVESTMENT**

The general belief is that venture capital firms take a board seat on the management of the firms they invest in, but in Malaysia it is not usually so. This is because when capital is released to investee firms, public supported venture capital firms due to the fact that they do not have enough human capital that is, professional venture capitalists to represent them on boards of several funded technology based firms, this is mostly the case at the very early stage of TBFs. But at the later stage venture capital firms whether public supported or independents take equity positions on the management board of firms they invest in. As soon as cash is infused into these companies the role of the venture capital becomes that of partners as acknowledged by (Fried and Hisrich, 1994) that the decision to invest is a very difficult one with serious selection risk, and emphasized that once that decision is made the investment becomes illiquid, and its success is highly dependent on a small group of managers or entrepreneurs. The new task could be through well structured management board participation or through an informal influence in market, supplier and creditors' networks. The level of engagement in the management of the funded company may vary from one venture capitalist to another. Finally, and most importantly, venture capitalists typically want to cash-out their gains five to ten years after their investments. What is prevalent at this point is the setting up of measures to guard the nascent investment,



providing management consultation to the inexperienced management team, and, finally, helping coordinate the merger, acquisition, or public offering which would create a public market for the investment.

### IMPLICATIONS OF THE RESEARCH

The purpose of this research is to propose an operational model for venture capital firms in Malaysia to select technology based firms they invest in. This research study makes use of the theoretical model of venture capital evaluation criteria as proposed by Tybjee and Bruno (1984) and modified by Fried and Hisrich (1994). While this model has previously been used to study the evaluation criteria venture capitalists use to screen technology based firms in other part of the world especially in the west and only in Singapore (Zutshi et al., 1999) for Asia no such model has been proposed for Malaysia. The outcome of this study will contribute immensely to the body of theoretical knowledge on venture capital in Malaysia by expanding on the themes in the model. This research is one of the few studies that have investigated on the detail relationship between the characteristics of the elements in the conceptual framework and how the impact on funding of technology based firms in Malaysia. The nature of research on venture capital financing as an area of study is such in a manner that findings that would be provided shall add abundant value through their applicability in an organizational setting. The characteristics of the themes found in this study and how they interact will be useful for both new venture owners and financing professionals if they are properly harnessed. Several technology based firms have not been able to access the much desired financing and could not be commercialized because they do not understand what it takes to approach venture capital firms for financing and also VCs have not been able to commercialize more tech firms as a result that TBF owners could not convince them of the need to invest in such high risk ventures. The limitation of this study is that the findings may not be representative of what exist in other type of industries. Moreso the data used in this study may not allow generalization to be drawn relative to how venture capital firms' help to nurture technology based firms but will help future quantitative researchers understand some of the emerging themes that are inherent in this subject. All the emerging attributes (Table 1) from the raw data cannot be presented in this study because of the voluminous nature of the data and the page limitation for this paper. The Figure 1 as presented in this research shows the proposed model for this study which is an outcome of the detailed findings as reported from the previous literature review, document analysis, interviewed participants and observed participants. Also to come out with this model the researchers also adopted intuition in crafting this financing model considering emerging items from Table 1 and detail attributes that emerged from the verbatim interview transcription. However, it is worthy to note that the testing of this model is beyond the scope of this research.

**Note:** This article should be cited as **Ajagbe et al.**

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