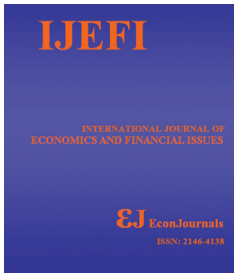

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University Spin-off for Economic Development in Malaysian Universities

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ABSTRACT

The role of universities has been noticed in the last two decades in immediate economic context. Traditionally, universities have emphasized on teaching, research for development, creation and transfer the knowledge. Some universities have taken more active role of starting new businesses and some still are not successfully developed and fulfill their role and demands, because of different factors. In order to develop new entrepreneurial skills and capabilities they need to adopt and learn advanced technologies and market uncertainties and convert this knowledge as an effective tool in spin-off companies. These spin-off companies able to progress capabilities to capitalize knowledge and collaborative network for economic development. In this paper we review Malaysian trend in this context and role of different universities and identifying the abilities they have had to develop and assess their capabilities with organizations networks for their operations. We also illustrated the universities role in economic development and shed a light on government policies and initiative toward university spin-off companies.

Keywords: University Spin-off, Entrepreneurship, Knowledge, Economic
JEL Classifications: 01

1. INTRODUCTION

The modern universities have evolving link with business sector and becoming a main role in economic development. The traditional universities have lay emphasis on teaching and research for develop their knowledge and growth. Later some universities started businesses and exploit modern technologies and contribute with economic growth and development and a source of technological advances for industries. For new growing technical and scientific content for industrial production requires new sources. Academic entrepreneur is define as a business where researchers, doctors, PhD students in order to commercialize the research results. The entrepreneurial process has been described to comprise all the activities, functions and actions related with the awareness of opportunities and creation of organizations to pursue them (Bygrave and Hofer, 1991). University spin-off company is created to convert technological inventions developed from university research into commercial market to make profits such as Plant Genetic System in 1983 (Gregoriou et al., 2011). The role of entrepreneurs is seen as a significant to spin-off research and in creating new industrial activity based on technological innovations (Wright et al., 2004). The research on spin-off label has increased exponentially but still many studies claimed that this phenomenon is mainly empirically driven and a theoretical in nature (Nicolaou and Birley, 2003; O'Shea et al., 2005).

The involvement of university spin off companies and economic transformations being under way since many years. Prior research has emphasized that the study of university spin-off is imperative for many reasons including creation of specific type of firm for entrepreneurial activity (Murray, 2004), channel for the commercialization of research (Radosevich, 1995; Wright et al., 2004), for relationship between spin-off activities and university mission and also for economic impact of university spin off (Lee and Rhoads, 2004). University spin-off companies are established through many technology transfer mechanisms where the scientific knowledge

is translated into economic growth which also becoming one of the main key input factor to innovate society and industry. As technological advancement becoming crucial that acts as a driving force for economic growth, the issue on how much contribution from research output for economic benefits is heavily debut in recent years. Many success stories about universities are seen as a reference of economic growth e.g., California's Silicon Valley and Boston's Route 128 (Saxenian). On the other hand the latest survey in 2013 showed that the growth rate between university spin-off is small compared with 2000, 2001 and 2002 (GIBNEY, 2013).

Despite different approaches have been identified to improve the firm growth rate and focus the resources, the cash flow and revenue growth is still low (Wright et al., 2007). The parent companies have been providing the support in the shape of resources but these are insufficient for reasonable growth and environment (Zhou et al., 2011). To address these challenges many universities appointed senior researchers to managing universities spin-off companies. However, the university spin-off companies has facing another difficulty to penetrate market to survive and growth due to the lack of firm competitiveness and commercial knowledge (Hayter, 2013). Because most of university spin-off companies are technology-based firm therefore the business life cycle is rather short and technology diffusion leads to the risk being easily imitate by competitors. This is the challenges for spin off companies to stay in market in long term within competitive environment. Some studies on social network particularly on cognitive social categories and on entrepreneurial region are attempted (Hayter, 2013; Urbano and Guerrero, 2013). In focusing to the market attractiveness and monitoring the firm growth of Malaysian university spin-off studies there is a need to create barriers of imitation for sustainable competitive advantage and to develop the value creation model for the sustainability growth.

In this paper, we review Malaysian trend in university spin-off context and elaborate the role of Malaysian universities. Then we link this spin-off with economic development and discuss the government policies and initiative toward university spin-off companies in Malaysia. The Section 2 presents the situation in Malaysia and Section 3 illustrates the challenges behind this phenomena. The last Section 4 shows the Government policies and initiative toward university spin-off companies and Section 5 presents some recommendations and directions for future research.

2. UNIVERSITIES SITUATION IN MALAYSIA

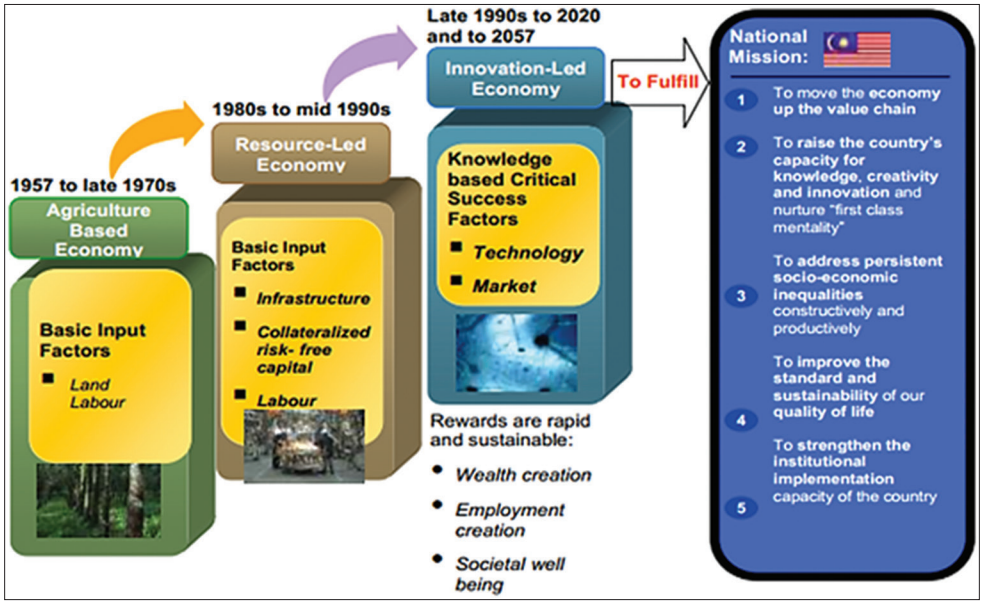
The Ministry of Higher Education (MOHE) presented the report on research commercialization achievements by Malaysian universities and highlighted the 16 public universities in Malaysia had commercialize out of 313 universities. The achievement of private universities were worst compared to public universities. Research commercialization is on high priority and consider as a major concern to establish cooperation between industry and academia since 2010 in Malaysia. In the era of 1950-1970, the Malaysian innovation model was based on agriculture based economy. After that time the new time was shifted into innovation led economy and surrounded by knowledge based models: market and technology. The innovation led model involved in scanning environment where the input captured market needs and considered as source of innovation. The market demand concepts exploit the short-term opportunities to generate wealth via value creation (Rasli et al., 2014). The firms adopted the technology driven model for global market. The innovation model endorsing the universities commercialization through spin-off companies and focused on innovation by technology model. Through this model the governments provide funding as incentives to researchers and creating technology based spin-off companies. The Figure 1 shows the innovation model.

Malaysia has experiencing 7% annual growth of gross domestic product. However in 1990's Asian crisis the Malaysia growth rate decreased into 4.8% and in 2011 that is increased into 5.1%. The Malaysian leading export is technology based in Asia and it is domestic local value added out of total value. Malaysia is entering to innovation-led growth but no improvement in research performance. According to World Bank 2012 report the Malaysia is on 48th position out of 146 countries and relatively low in knowledge based economy index (Jomo, 2013). In Malaysia, four Research Universities are Universiti Teknologi Malaysia (UTM), Universiti Sains Malaysia (USM), Universiti Malaya (UM) and Universiti Putra Malaysia (UPM) have generated profits of RM 3.6 billion through research and development (R&D) activities between 2007 and 2013. That amount is including RM 1.25 billion from commercialization and RM 1.25 billion of R&D commercialization activities. Until 2012, there were about 1,650 Intellectual Property (IP) had created research income worth RM 48.7 mil through IP rights and licensing with spin-off companies. Universities are expected to create 80 spin-off companies per year by 2020.

3. CHALLENGES OF RESEARCH COMMERCIALIZATION

Recently, Malaysian public universities have faced several issues and challenges in research commercialization. It was reported that university research has less commercial value and not suitable for industry needs. One of the reason is Small Medium Enterprise dominate almost 60% of local market by focusing on ready product for labeling and branding. This approach affected innovation industry as the firm are not relying on high technology products produced by university (Nazir and Shah, 2014; Sobry, 2014). The university spin-off contribution in economic development has been debated due to static growth rate. Even though the survival rate of universities spin-off is still high (Lawton Smith and Ho, 2006; Markman et al., 2008). The 80% their firm businesses have been established since 5 years ago but still less effective compared to U.S counterparts in economic growth (Clayman and Holbrook, 2003). The latest survey of Praxis Unico Spinout UK showed in their annual report 2013, that growth rate of university spin-off is small compared to 2000, 2001 and 2002. However the most of companies have failed to show the little sign of growth (GIBNEY, 2013). Another challenge is lack of management team, universities have appointed senior researchers to lead and manage the university spin-off challenges in companies. Regardless of acquiring high technical knowledge and experience in special areas, the university spin-off companies have difficulties to penetrate market for survive and economic growth

Figure 1: The innovation led model



and lack of firm competitiveness. Further the management team has not sufficient commercial knowledge to understand external environment. Because of this the strategic resources had effected and the research innovation becoming less competitive and directly impact on the growth of university spin-off companies (Bathelt et al., 2010). The similar issue has been stresses out by local researchers in public universities in Malaysia. Most of the universities have been created the spin-offs on early stages of development and that time the technology still unproven and need further investment to launch any product in market (Thursby et al., 2001). Another problem occurred when the technology of research products owned by university spin-offs are too broad in scope of application and easily imitate by competitors. It makes a difficulty for university spin-off to stay competitive market and effect on growth.

As an extensive studies emphasized on firm resources to increase the firm performance but it leaves a gap into the critical look in firms and value added as a new lens in firm growth studies. The Malaysian patent record is weak compared with international comparison as a second country of the Association of Southeast Asian Nation (ASEAN). The most patent granted in Malaysia have been to foreigners and on the other hand, Malaysia is most patented technology class is active solid state devices like transistors and diodes. According to MyIPO the share of patent has gone to locals about 8% of the total in 2009. With the exception of individually owned patent UPM, Malaysian Palm Oil Board (MPOB) Harn Marketing is granted five or more patent between 2003 and 2007. However, research output and commercialization of universities have not lived up to expectations. Despite the income generated from research commercialization, the numbers are still small in comparison from the total of R&D activities. About less 2% out of 27,449 research output within 15 public universities has been commercializes within 5-10 years. Major contribution of the income generation comes from Research Universities which UTM positioned the highest in ranking with 239 commercialized products, followed by UPM (85), USM (58) and UM has 39 products since 2000 (Zaidan, 2014).

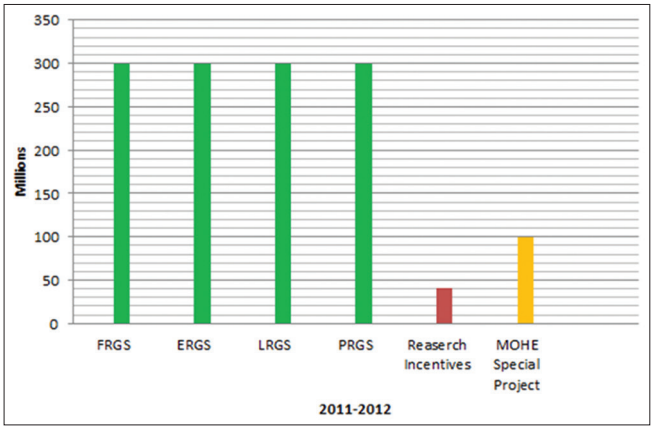
4. GOVERNMENT POLICIES AND INITIATIVE TOWARD UNIVERSITY SPIN-OFF COMPANIES

There is a need to promote and support universities in the context of spin-off companies and the Government and Higher commission of Malaysia take some quick initiatives. Recently they have some policies to established private universities and consultancy centers and emphasizing research. The Government spends RM 191.5 billion announced in 2010 for economy-based innovation in terms of established the research management centers. Some other financial programs have been started such as Cradle Investment, Demonstrate Application Grant, Malaysian R&D grant scheme, etc. Innovation is significant driver of value creation in social welfare and economic growth. The current post-recession economic development is better compared to late 1990s but growth is very slow after Asian financial crisis. The innovation and enhancing the contribution of universities and public research organizations are significant for social and economic development for sustainable growth. The Figure 2, graph shows the MOHE investment in R&D schemes.

5. RECOMMENDATIONS FOR FUTURE RESEARCH

The financial awards are not enough for universities motivations there is a need to make functional these regional economies (Ahmed and Jamshaid, 2014). Government should reduce funding from state budget and provide to universities. Another source is to promote entrepreneurship and taking an ownership stake from IP developed by university staff. The idea generated through scientific or engineering laboratories or from information and communication technology. Universities have to develop new capabilities to enhance the success rate for launching technology-based startups. In addition, transforming knowledge into wealth generating businesses and take serious actions for many dimensions. The organizations have

Figure 2: Government investment on R&D schemes (MOHE)



to develop their infrastructure such as specialized organizational technology units, invention disclosure policies, applied research funds, and announced some incentives for faculty to engage for technology and research. The specialized up to date laboratories and faculty hiring policies should be clear and transparent. The another important factor is to capture value from research products and effectively transfer that knowledge to firms such as IP management policies, ability to assess the technology value, market value and competitive licensing strategies. The networking capabilities are also an important for linking its startup firms with government agencies and with other firms. The networking capabilities should have international scope in terms of market. Through these networking universities, make advantageous relationship to support the interactive activities needed to succeed. The university entrepreneurships in possession of technical expertise should cultivate partnership with entities that have commercialization knowledge.

6. CONCLUSION

The paper is short concise review on Malaysian trend and role of universities in terms of development and identifying capabilities and network operations. Through literature review, it is clear that universities role in economic development is significant and for this progress, there are many factors such as government policies and initiative toward university spin-off companies, networking capabilities, management capabilities and organizational infrastructure. Malaysian private universities need to promote and support from Government and other public universities in the context of spin-off companies. The Government and Higher Commission of Malaysia will have some clear policies and initiatives.

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