Faculty of Economics and Business

Intellectual Capital and Efficiency Performance of Malaysian Islamic and Conventional Banking Sector

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Intellectual Capital and Efficiency Performance of Malaysian Islamic and Conventional Banking Sector

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DECLARATION

I Abdul Alim b. Dee (16020009, Faculty of Economics and Business) hereby declare that the work entitled "Intellectual Capital and Efficiency Performance of Malaysian Islamic and Conventional Banking Sector" is my original work. It is original and is the result of my work, unless otherwise indicated or acknowledged as referenced work. The thesis has not been accepted for any degree and is not concurrently submitted in candidature of any other degree.

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ABSTRACT

The services sector especially on banking industry had played a vital roles for development that contribute most towards Gross Domestic Product rather relatively to other sectors. Nonetheless, perspective in intellectual capital were essential and highly recommended especially in developing countries such as Malaysia. Therefore, the general objective of study is to investigate the relationship between Value Added Intellectual Capital (VAIC) and technical efficiency performance of Malaysian Islamic and conventional banking sector. The scenarios lead to the specific objectives namely to investigate on major components of intellectual capital namely human capital efficiency, structural capital efficiency, and capital employed efficiency with the technical efficiency performance for Islamic and conventional banks in Malaysia over the period of 2007 to 2016. Another specific objectives is to examine the sources of intellectual capital as well as to assess the nexus between intellectual capital and efficiency performance of Malaysian banks. The results of the study shows that human capital efficiency and capital employed efficiency are positive relationship with significant efficiency. However, there was negative relationship on structural capital efficiency with technical efficiency performance. The results suggested that Malaysian bank should enhance the ability of human capital and capital employed to sustain the efficiency performance of the banks.

Keywords: Intellectual capital, technical efficiency, Islamic bank, conventional bank

Modal Intelek dan Tahap Kecekapan Perbankan Islam dan Konvensional di Malaysia

ABSTRAK

Sektor Perkhidmatan merupakan salah satu sektor yang mempunyai peranan paling penting bagi pembangunan sesebuah negara kerana mampu menyumbangkan kadar Keluaran Dalam Negara Kasar terutamanya dalam sektor perbankan berbanding dengan sektor ekonomi yang lain. Walau bagaimanapun, persepsi mengenai modal intelek juga turut mempengaruhi dan amat penting khususnya kepada negara-negara membangun seperti Malaysia. Oleh itu, objektif kajian ini adalah untuk mengkaji tentang Penambahan Nilai Intelek Modal (VAIC) dan menganalisa tahap kecekapan prestasi sektor perbankan Islam dan konvensional di Malaysia. Senario ini menyebabkan kajian ini untuk mengkaji komponen-komponen utama dalam modal intelek yang terdiri daripada kecekapan modal insan, kecekapan modal struktur, dan kecekapan modal kerja dengan tahap prestasi kecekapan teknikal bagi perbankan Islam dan konvensional di Malaysia untuk tempoh kajian dari tahun 2007 hingga 2016. Selain daripada itu, di antara objektif lain adalah untuk mengenalpasti sumber-sumber modal intelek serta menguji perhubungan di antara modal intelek dan tahap prestasi kecekapan bagi sektor perbankan di Malaysia. Keputusan kajian telah menunjukkan bahawa tahap kecekapan modal insan dan kecekapan modal kerja mempunyai perhubungan yang positif dengan tahap prestasi kecekapan teknikal dengan meunjukkan keberkesanan yang agak ketara. Namun begitu, kajian mendapati perhubungan yang negatif di antara kecekapan modal struktur dengan prestasi tahap kecekapan teknikal. Justeru itu, kajian ini mencadangkan bahawa kesemua bank yang beroperasi di Malaysia seharusnya meningkatkan tahap kecekapan dalam modal insan dan modal kerja secara berterusan bagi memastikan tahap prestasi kecekapan tersebut dapat dikekalkan.

Kata kunci: *Modal intelek, kecekapan teknikal, perbankan Islam dan konvensional*

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ATO	Asset Turnover
AE	Allocative Efficiency
BCC	Banker, Charnes and Cooper
BNM	Bank Negara Malaysia
CCR	Charnes, Cooper and Rhodes
CEE	Capital Employed Efficiency
CRS	Constant Return to Scale
DEA	Data Envelopment Analysis
DMU	Decision Making Unit
EPS	Earnings per Share
GDP	Gross Domestic Product
HCE	Human Capital Efficiency
LEV	Leverage
OECD	Organization Economic and Co-operation Development
PTE	Pure Technical Efficiency
ROA	Return on Asset
ROE	Return on Equity
SCE	Structural Capital Efficiency
SE	Scale Efficiency
TE	Technical Efficiency
VA	Value Added
VAIC	Value Added Intellectual Coefficient
VRS	Variable Return to Scale

CHAPTER 1

INTRODUCTION

1.1 Research Background

Advancements in information or knowledge economy have created a great impacts that reflected an increasing level of awareness and responsiveness on the important of intellectual capital nationwide (Guthrie, 2001). However, the futures benefit would only be loss, if there is any existent of feeling ignorance and underestimation on advantages of intellectual capital (Roslender & Fincham, 2004). Indeed, the evolution on the phases of socio-economy have proven based on the hierarchies among the production factors which were typically vary with one another.

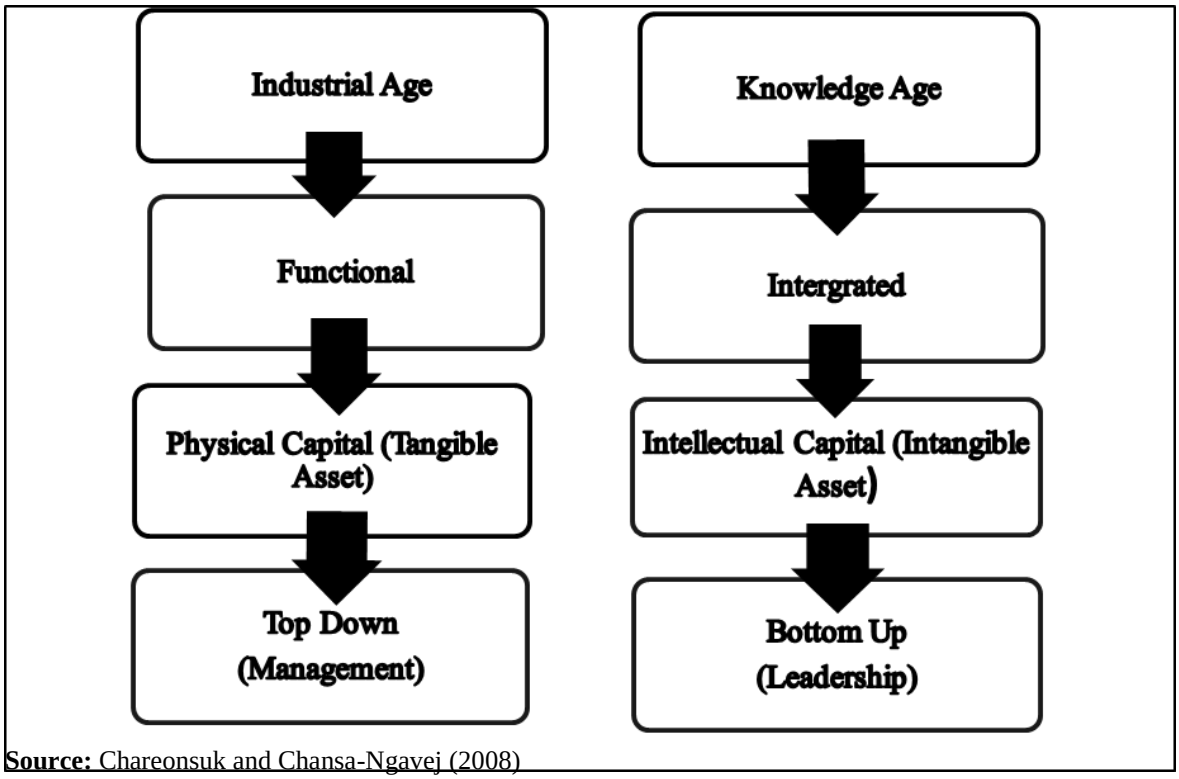
A decade later, when the industrial revolution was took place and the creation of wealth was generated through a combination of capital, raw material and work. In late 1980s until present, the information society started to develop and the world witnessing transformations of the advancement in Information and Communication Technology (ICT) that merely changed the mechanism to create wealth which were derived from labour, capital, natural resources, and entrepreneurship. The transformation attached with knowledge, information technology and intellectual capital have shown an extremely pivotal to produce wealth (Fruin, 1997; Bradley, 1997a; Edvinsson, 2000; Viedma Marti, 2000). Steward (1997), positively believed that the traditional economy of capitals such as machinery, land and labour wete substituted with the current knowledge-based paradigm, and old characters became irrelevant in guaranteed the production of wealth (Machlup, 1962; Bell, 1973; Parker, 1973; Porat, 1977; Beniger, 1986; Drucker, 1993; Richta, 1997; Stahle & Hong, 2002; Chen et al., 2005). Additionally, Drucker (1993) claimed that the knowledge was

consider as nature of resources alongside with the traditional production factors. Knowledge represented more meaningful nature of resources today (Bontis, 2001 & Pulic, 2004) while the traditional factors of production served as secondary (Kozak, 2011). According to Houghton and Sheehan (2000), the knowledge economy has emerged due to massive utilization of knowledge intensity that is developed from high-pressure impact from the globalization of economic affairs.

The Organization for Economic Co-operation and Development (OECD) in 1996, defined the knowledge economy as the amount of usage of knowledge and information that brings the best in the production and distribution of goods. The movement were started in the beginning of 1990s; ever since, intellectual capital has been recognized as the most powerful and competitive weapon in market (Wang & Chang, 2005). Furthermore, knowledge also enable to foster the wealth of nations, the growth of industries as well as the values of individual (O'Donnell et al., 2006). While, these values usually provided an important roles as compared to physical or tangible assets (Bontis, 2004; Madhooshi & Asgharnejadamiri, 2009). On this vein, most developing countries started to transform their economic systems based on knowledge economy since knowledge act as an engine to develop the economic growth (Setayesh & Mostafa, 2009; Sengge, 2010).

The revolution of knowledge in economy have highlighted on the significant roles played by the intellectual capital which has created high impact towards the economic growth (Stahle, 2008) and viewed as a major national investment in order to provide long support towards the national economic performance (Bismuth & Tojo, 2008). However, additional effort were essential in order to increase the level of intellectual capital which proposed as major factors that believed to foster the national economic growth (Stahle & Bounfour, 2008). The illustration under Figure 1.1 depicts on transformation from the industrial age

into knowledge age that portrays the process of transformation from traditional economy towards the current knowledge economy where the old practices have changed into new directions.



Source: Chareonsuk and Chansa-Ngavej (2008)

Figure 1.1: Shift from Industrial Age to Knowledge Age

A transformation from the traditional economy or industrial age to knowledge-based economy, according to Chareonsuk and Chansa-Ngavej (2008) that projected on movement of industrial age into knowledge age that proven to have direct impact especially among the entrepreneurs and industries. Furthermore, the transfromation from traditional economy into the industrial revolution has clearly demonstrated on optimization of tangible assets during production process while delivered an important roles in terms of firms' productivity; during the transition into present knowledge-based economy, the efficient used of intellectual capital or intangible assets has started to gain a significant roles towards a firm's

performance. Litschka et al., (2006) highlighted that the significant changed from the previous traditional work environment to the current knowledge-based economy which were induced on the growth of knowledge and skilled through the productivity elements which highly essential in the new economy.

From business perspectives, the importance of intellectual capital was precedence and have caused drastic switched from the traditional labour to knowledge labour (Lipunga, 2014) in order to compete with the incumbents and newcomers (Naquiyuddin, 1992) thus have proposed knowledge economy needed on the utilization of intellectual capital. Basically, these resources were called 'intellectual' simply due to the sources which underlied on human mind (Janosevic et al., 2013). Likewise, intellectual resources not only in the form of "intangible goods" such as know-how, licenses, patents, franchises, trademarks, software and methods, but also included the invisible competencies or better known as competitive advantage which consequently lead to the similar values that created by those tangible assets (Mavridis, 2004).

A stream of studies projected on intellectual capital which consider most critical asset in firm's production; thus, these special factors has to be manage efficiently and effectively for the successful of firm's performance (Edvinsson & Malone, 1997; Cabrita & Vaz, 2006; Zhang et al., 2006; Chan, 2007; Ting & Lean, 2009; Amiri et al., 2010; Shaari et al., 2010; Ramezan, 2011). Theoretically, firms' has expended it capital in early 1929 and proved the ratios of intangible assets against tangible assets were at 3:7 (Brennan & Connell, 2000). Meanwhile, for market valuation that conducted during 1990s have shown that the expected market cost for tangible assets to be at only 10% to 15%, while the remaining 85% were owned by the intangible assets (Monavarian et al., 2006; Ghelichi, 2009).Following the fact, Bassi and Van Burren (1999) highlighted intangible assets were represented two thirds of

corporated value, while Osborne (1998) indicated that 80% of an organization's value were reflected from intangibles. Generally, the terms of 'intellectual capital' also interchangeable used such as intangible assets (Itami, 1989; Brooking, 1996; Mouritsen et al., 2001), intangible values (Pulic, 2001; Lonnqvist, 2004), knowledge assets (Bontis, 1999; Edvinsson & Malone, 1997; Burgman et al., 2005; Edvinsson & Sullivan, 2006) and intellectual property (Steward, 1997). Brooking (1996) added, intellectual capital basically comes from a combination of intangible assets, although there were no general uniform definition for intellectual capital (Kozak, 2011). In fact, the intangible refer to untouchable but desirable (Bontis, 2003; Kristandall & Bontis, 2007; Curado et al., 2011).

The terms of intellectual capital were first coined by Jon Kenneth Galbraith (1969) that believed intellectual capital was something higher than mind that involved mental activity (Chang & Hsieh, 2011; Khalique, Shaari & Isa, 2011), whereas the concepts of intellectual capital were first appeared in a book published since 1836 by the economist called Nassau William Senior (Marr, 2007). The development of intellectual capital can be trace backed to the earliest studies such as those by Brooking (1996); Edvinsson (1997); Roos et al., (1997); Steward (1997) and Bontis (1998), whereby, all mentioned studies has classified intellectual capital based on three major components namely human capital, customer capital and structural capital.

Human capital refers to the package of innovation, knowledge, experience and learning capability, while structural capital represent the knowledge within organization that can be collected, organized, tested and integrated. Last but not least, customer capital refers to relationships between the customers and suppliers with respect to the satisfaction and loyalty. Past studies such as Steward (1997); Huang and Liu (2005); Cabrita, Vaz and Landeiro (2006) and Khodavankar (2009) claimed the intellectual capital would enriched

the competitive advantage that can drive towards the firms' efficiency and also performance. Nevertheless, one should treated this with caution as competitive advantage only can be realize once there is a stock of knowledge in the form of organizational techniques, professional skills, customer relationship, experiences (Edvinsson & Malone, 1997; Wang & Chang, 2005) and firms' profitability (Hazlina & Zubaidah, 2008).

On this note, Andrissen et al., (2000) and Tayles et al., (2002) shown to be critical to realize the current competitive advantage prior to utilize the optimization of intellectual capital. On top of this scenario, intellectual capital should always be main agenda among the researchers and practitioners in the quest of the firms' efficiency performance while getting ready to face the fierce competition in market (Campisi & Costa, 2008; Nazari & Herremans, 2009; Bagherzadeh et al., 2010). In light of the competitiveness, intellectual capital also reflected on value-added resources for business production towards the innovation (Pulic, 2000; Ramboll Group, 2007; Baecker & Philipp, 2008), business valued and business performance (Hosnavi & Ramezan, 2010). However, to facilitate on highest added value, firms must be able to manage their intangible assets more efficiently (Afrazeh & Sedigheh, 2007; Khodavandkar & Khodavankar, 2009; Ramezan, 2011).

1.2 Intellectual Capital and Bank Performance

Research conducted in previous literatures which related to the intellectual inclined to focus on knowledge-intensive industries such as information technology (Wang & Chang, 2005; Chang, 2007), manufacturing (Tseng & James Goo, 2005), biotechnology (Hermans & Kauranen, 2005), biotechnology (Hermans & Kauvernen, 2005), electronic industry; (Wang, Ghosh & Mondal, 2009; Janosevic & Vladmir, 2014), pharmaceutical industry (Ghosh & Mondal, 2009; Abdul, Jawad & Bontis, 2010) and hospitality (Laing, Dunn & Lucas, 2010;

Aisyegil & Topsakal, 2015). Interestingly, the study of intellectual capital in services sector has drawn attention and progressively gained interest, specifically for banking and financial services sector (Murthy & Mouritsen, 2011). In the case of the banking and finance industry, researchers had started to study the banking sector since the industry were acted as the front liner for many other industries that aimed to become more innovatives through their operation supported with the technology (Norhanim & Sabarudin, 2012; Suhaimi, Nee & Ibrahim, 2012; Sledzik, 2013; Shamsudin & Yian, 2013; Sampath & Gamini, 2013).

The highlighted on intellectual capital also to ensure the enhancement of employees' skills and knowledge to be utilize effectively rather than heavily depend on the investments in traditional factors of production like plant and machinery. Apart from that, as banking industry merely involved in exercises and established on the intellectual capital, ever since its components in intellectual capital become crucial in order to identify their basic roles as well as its implication towards the advancement of banking industry (Belkaoui, 2002; Goh, 2005; Najibullah, 2005; Saengchan, 2008). In fact, these sector was relatively more competitive within the market whereas influenced from globalize environment that forced the industry to be reshaped into the knowledge-intensive industry. Within knowledge age, value creation was generated once the firms have managed the intangible assets efficiently rather than gaining similar values that created from physical assets. Hence, considered to be the main part of economic source that potentially affectting development and successful of futures performance.

An early research conducted by Pulic (2004), based on the Australian banking industry reveal the importance of intellectual capital that relationship between intellectual capital and successful corporate performance found to be positively strong. This is supported by several studies done according to a numerous empirical evidences that there is a strong and positive

relationship between intellectual capital and firms' performance (Bontis, 1998; Bontis, Keow & Richardson, 2000). Nevertheless, since the nature of business for banking industry that related to intellectual capital were invisible and intangible thus, to measure the value of knowledge using traditional accounting approaches obviously might be difficult (Chen, 2005; Mondal & Ghosh, 2012). However, Handy (1989) stressed on the existing accounting literatures underlies on the importance in measuring the intellectual capital however Gan and Salleh (2008) argued that, traditional approaches in measured the firm's performance by using the traditional accounting principles would reflected on the possible outcomes which probably inaccurate.

In knowledge economy, it seem to be difficult to create values when only to refer on the descriptions or discovered on related information that prescribed about intellectual capital regardless on techniques or changed from the conventional accounting system. However, any issues reported on the intellectual capital would finally generated positive impact when putting efforts in identifying on firm's performance whether the way of conducted were indirectly, productively or efficiently. Notwithstanding, the uncertainty of futures economy still naturally profitable throughout any possible outcomes in any investments subject to intellectual capital. Canibano et al., (2000) highlighted that any costs correlated to the changes in the accounting system via rational approach measurements will eventually supply added value to the firm's performance. Thus, the other authors also have suggested on the enhancement of financial reports, especially those that are disclosing any relevant information related to the intellectual capital accordingly in order to produce better measurements as well as the findings (Canibano et al., 2000).

Study in intellectual capital and financial performance also has prove on strong connection between these two variables (Mavridis, 2004; Kamath, 2007 & Poh, 2014). For instance on

recent study conducted by Isanzu (2016) recommend the Conventional banks have to make the right decisions when investing in the respective components of intellectual capital. This statement was supported by Riahi-Belkaoui (2003) who found similar evidence that there were positivel relationship between intellectual capital and financial performance. In terms of the organizations' market value, the Skandia Navigator Value Scheme concept (Edvinsson, 1997; Edvinsson & Malone, 1997) advocates on market value were generated from two types of the capital namely financial capital and intellectual capital. The former was further divided into monetary capital and physical capital meanwhile the latter can be classified into human capital and structural capital.

Goldfinger (1997) highlighted that the sources of value and wealth were mainly derived from efficient management of intellectual capital. OECD, (2008) had confirmed through the research and development, patents, human capital and software investment of intellectual capital contributed to highest average of profits. Berzkalne and Zelgalve (2014) found that increase the utilization of intellectual capital will influence positively on company's values. On this note, Chen, Cheng and Yuchang (2005) reviewed an evidence that the investors encouragely to place more value on intellectual capital in return for higher profitability. Hence, will improved the companies' efficiency in both current and the following years. Meanwhile, Ahuja and Ahuja (2012) stated the efficient utilization of intellectual capital is essential for the successful in the banking industry as a whole and sustaining the competitive advantage especially through the delivery of high quality services such as investments related to intellectual capital which includes human resources, brand building, systems and process.

Additionally, study done by Chen, Cheng and Hwang (2005) postulated that intellectual capital acted as the corporate strategic asset which were not only to focus on enhancing the

financial performance but also to increase sustainable competitive advantage. In view of the Malaysian banking industry, several studies have reported the evidences that there was positive impact on intellectual capital within the Malaysian firms' performance; however, the efficiency in the intellectual capital within banking industry was still consider to be lacking and continuously being discussing among the scholars. The issue of intellectual capital expressed on what consist in the intellectual capital and arguement about the intellectual capital from different aspect of characterization, acknowledgment, measurement and reporting (Goh & Lim, 2004; Sofian et al., 2004; Yau et al., 2009; Ousama & Fatima, 2012).

Numerous scholars has also outlines regarding the subject of interest in intellectual capital and firm's performance (Bontis et al., 2000; Wan Fadzilah et al., 2004; Gan & Zakiah, 2008; Norman et al., 2009; Siti Hajar et al., 2012; Khalique & Md Isa, 2014) were also dicussese in the context of the impact viewed from market value's perception (Ousama et al., 2011b) and some were listed on the usefullness of intellectual capital information (Gan, 2001; Ousama et al., 2011a). Such as the empirical evidences from Bontis et al., (2000) postulated to investigate on the relationship between intellectual capital and financial performance thus shown on the findings that significantly and positive relationship between the structural capital and business performance, especially for both the services and non-services sector, while for human capital efficiency were only significant and positively related within the services sector only but proved without any impact towards the non-services sector.

Another empirical evidences on the intellectual capital within the Malaysia firms were done by Goh (2005) who had focused on the Conventional banks in Malaysia. The study had revealed on huge emphasize of human capital that needed in order to contribute more value added towards the firm's performance. Additionally, the foreign banks were the most

efficient banks than domestically, thus investment in human capital will in return provide highest revenues as compared to investments in structural and physical capital (Muhammad & Ismail, 2009). On top of market values, Nik Maheran et al., (2009) highlighted on positive significance of capital employed which also known as combination of physical assets and financial asset compared to the structural capital and human capital among Malaysian bank.

1.3 Background of Malaysian Banking Sector

In general, the banking institutions has provide direct impact that were closely related with the development of country economy.Since, the performance in banking sector potentially created on the huge impact towards the stability of future growth for national economic (Zaidi, 2005). Shumpeter (1912) claimed, the importance of banking system due to increase on the level of growth rates that reflected the Gross National Income which had fostered the positive growth that affected on the real identification and funding towards in a ways of innovative and productives of product investment. Bank Negara Malaysia (BNM, 2017) had announced on the banking sector that involved both in the Islamic and Conventional banks revealed on a pre-tax profits totalled of RM36.2 billion which were recorded as slightly higher compared to previous year which only accounted at RM32.2 billion in 2016

Thus, the successful of banking sectors were reflected from the increased financing for automotive and previous improved of efficiency which continued support to achieve on highest productivity. However, in term of the pre-tax profits of per employees, it proved an increased of 12.5% or accounted at RM305, 165 on per employee. Despite, higher staff cost in 2017 which was at 11.4% as compared in 2016 which accounted at 6% since the banking sector sought to retain and hire-highest skilled of talent of being more competitive in labour market. As recorded, Malaysian banks basically spend on huge amount of expenses to

improve the productivity among the employees to enhance jobs-skilled and emphasized the knowledge as to produce the very best talented in human capital for the industry and to face any challenges due to the change in operation side or from strong competiton coming from high pressured in technology. However, to overcome those challenges, the launched of implementation called Financial Sector Masterplan (2001-2010) and Financial Sector Blueprint (2011-2020) which have placed the Malaysian banking sectors in more prominence and strongly competitives that merely supported on the development of national economic.

As respond, Malaysian banking sector were turned out to be more resilient and became stronger among the players impact from the financial institutions played clean and healthy competitions thus have potentially contributed towards the improvement of banking system more efficiently. Many country included Malaysia were accepted on the facts that banking industry recognized as one of the main knowledge-intensive sector that could potentially improved the skilled-based and relationship-rich industry. These reasons were facilitated the Malaysian banking sector presently at the prime's position in becoming more innovatively and relying on new technology which improved worker's skilled as well as knowledge instead of investment from the old production factors such as plant and machinery. In relation to the Malaysian economy, according to Ismail and Rahim (2009) revealed the merger policy implemented by the government through the supported from the economic planning on the Financial Master Plan from 2001 to 2010. It is significant for Malaysian economy since the merger policy has brings more advantages especially to Malaysian banking sector.

Authors were also spotted on the several benefits such as the respective banks will obtained more excess on the capitals either physically or intangibles in nature because after the

merger, obviously the capital and intellectual were combined and resulted an excess in capitals. Nevertheless, the merger among the small bank will mitigated the major economic problems such as financial crisis (Ismail & Rahim, 2009). This was proved by the authors that technical efficiency performed much better after the merger as well as the productivity performance of Malaysian banks. Beside, there were positively feedback given by the Malaysian banks on the program offered by the BNM as such 2000, Pacific Bank mergerd with Phileo Allied Bank to form Maybank Berhad, Bank Bumiputera Commerce Berhad and Southern Bank Berhad merged and establish CIMB Bank Berhad in 2006, Arab Malaysian Finance Berhad and MBF Finance Berhad merged to form Ambank Berhad in 2002.

In 2001, both Hong Leong Bank Berhad and Public Bank Berhad established as anchor banks after Hong Leong Bank Berhad merged with Eon Bank Berhad in 2012 while Public Bank merged with Hock Hua Bank respectively. After all, Affin Bank Berhad was formed after the merging with BSN Commercial Bank Berhad (BNM, 2011). Nonetheless, according to the Association of Banks in Malaysia in 2008, Malaysian banking sector will remain strong and well capitalised despite the turmoil in the global financial markets. However, the study within banking sector subjected to the financial performances were necessarily encourage in order for the banks to track backed on their previous performances that would assist in identifying the appropriate sections that need to be improved. In parallel to the Islamic banking industry, the strong existence of the Conventional banking sector in Malaysia had played an important roles for development of Malaysian economic that more developed and very well-established rather than Islamic banks.

Basically, all the Islamic banks were offered on the services and products while acted as the financial intermediary aligned with the principles of the Islamic laws.The Islamic banks that operated were similar to Conventional banks including offered on the various products and

services.whereby most of the products were physically tangibles while services were intangibles in nature because the customer obviously were unable to touch or observe on the services that was served unless the services offered were directly exposed to them. According to Ahmed (2011b), these have created big implication and more challenging especially in conduct a research that requires prototype for market-testing in determining the actual cost of the services and for measuring the bank's achievement. Hence, this is the main challenges faced by the Islamic bank part of being young in industry. In order to Islamic bank to compete with the well-established Conventioal banking system, Islamic bank required a competent human intellectual capital (Staff) to ensure the fullest delivery of services to the end users.

Shariah compliance is at the core of products and services offered by Islamic banks and this of course need a careful Shariah monitoring of the delivery structure and system (Structural IC) so that the quality of the services remain within the limits of Shariah-Law. Hence, Islamic bank sector, product innovation required all three sources of intellectual capital. As such, Conventional bank were relatively long history and wider experiences open the path for more avenues for investments and much more developed technology, and other similar advantages. The principles of Islamic and Conventional bank were totally different as Conventional bank operated on the basis of pre-fixed interest rates, whilst for Islamic banking were be based on sharing of profit and loss. Thus, both industries were lie based on two different paradigms where the interest served as foundation of Conventional banks, while the Islamic banks worked in a completely different directions.

Furthermore, Islamic banking does not create value without real assets, making Islamic banks more resilient to any of potential financial crisis. Additionally, the major factors behind the achievement of Islamic banking were all of its products and services are backed

by real assets which is not the case for Conventional bank where the securitization of assets is vague (Alzalabani & Nair, 2012). Figure 1.2 shown on the expected growth rate for Malaysia's financial markets to move towards the Vision 2020 whereby expected growth will be drawn based on BNM blueprint from the year 2010 until 2020. The Islamic banking sector also expected to grow further well in the future and could drive confidently for the developments of country's economy, but the government need to monitor so as the economic will benefits to all, especially for Islamic finance structures.

The financing movement was expected to happen depend on the growth rate of Malaysia's financial markets towards the Vision of 2020. The government have recommended and highlighted on the use of the blueprint by suggesting the worked to be based on nine major areas which were supported by 69 proposals and more than 200 initiatives. Under this blueprint, two subjects are an exact match with the objectives of this study which are that Malaysia is positively building its Islamic finance sector towards internationalization as well as developing talented people in the Islamic banking sector to meet demands. The blueprint visualized that the financial system will continuously grow at an annual rate of 8% to 11%, representing six times the GDP in 2020. On top of that, a majority of the contributions to the increase in GDP is from the financial sector which is expected to grow from 8.6% of nominal GDP in 2010 to 10% to 12% before 2020 (BNM, 2010).

The excellent returns and achievements by the Malaysian banking sector prove that Malaysia currently on the right tracked. This is alongside with evidences of positive returns from the overall Malaysian banking sector while Islamic bonds are projected to reach 55% of the debts and securities market. The projected growth rate for Malaysia's financial market in 2020 highlights that Islamic banking is expected to increase up to 40% in order to face the challenges of 2020 (BNM Financial Sector Blueprint, 2011-2020). The former Governor of

BNM had announced that through the analysis were shown positively and highlighted that Malaysia is confident in meeting the target of 40% against the overall total finance in year 2020. As a result, the Malaysian Islamic banking model has been recognized as perfect model among all the Muslim countries worldwide and served as primary examples and sources of motivation (Mokhtar et al., 2008).

He added that, the potential growth is further supported by the government's policy through the Islamic Financial Services Act 2013 which has already paved ways for development in Islamic banking which were based on its' variances within the Conventional products and allowed on the funded to be mobilized either used deposited or invested accounts. Therefore, it were provided the credit for industry as opposed to the additional options of became more innovatives to provide other solutions for the consumers. Additionally, the Islamic banking sector's achievement were furthered indicated by its quadrupled digits of growth from 7.1% in 2010 to 28% in 2016 (BNM, 2017). This proved that Islamic banking was started to be widely accepted by public as the sector's market shares had unexpectedly risen from 3.37% in 1998 to 22.8% in year 2007 which were equal to USD65.6 billion in terms of total assets (BNM, 2008). Based on the statistical analysis on previous performance among the Islamic banking sector which had exposed once in every of five years' period, the Malaysian Islamic banking sector were expected to growth further as compared to the overall performance of Malaysian banking industry.

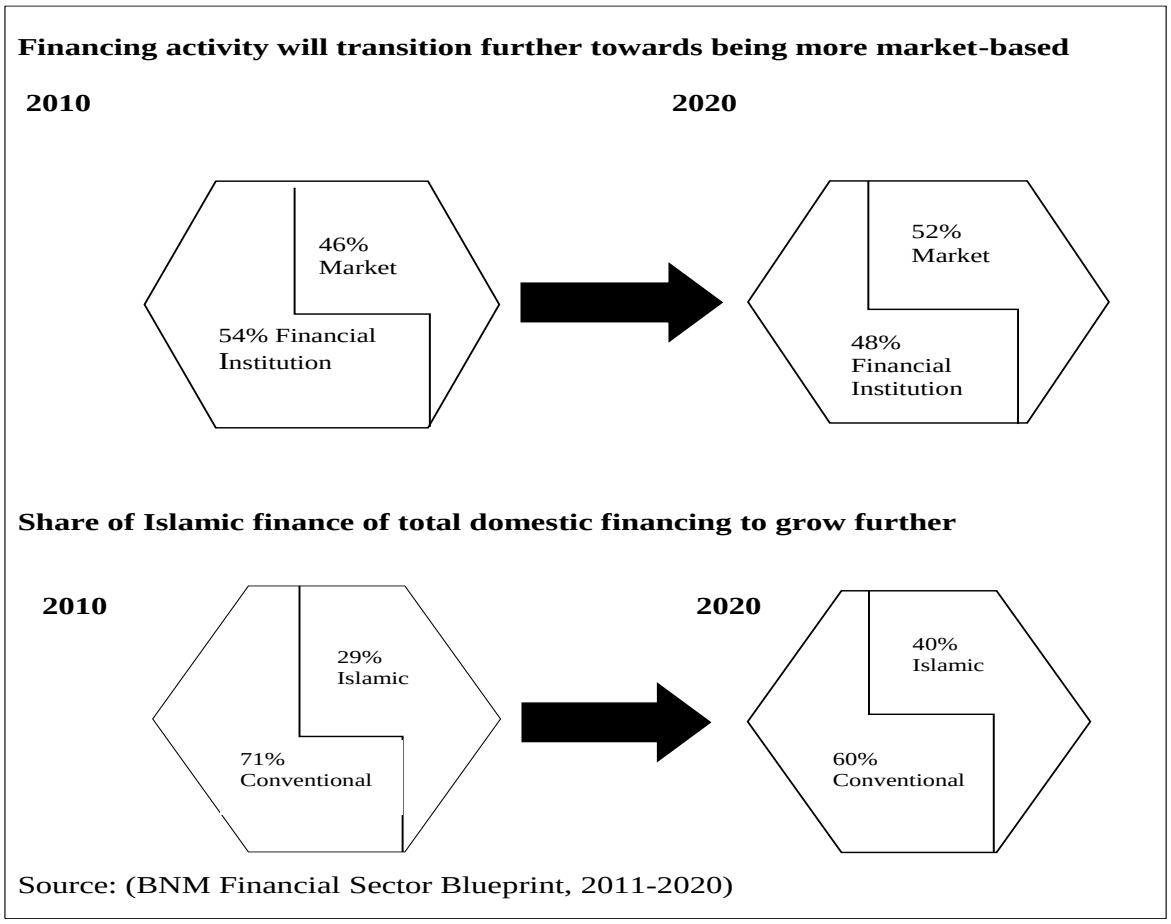


Figure 1.2: Projected Growth Rate of Malaysia's Financial Market in 2020

The average growth rate for Islamic banking were almost 19% per annum, while the overall banking industry were only grew approximately at 11% per annum. This was open an extra opportunity for Malaysia to hire more talented employees. The world crisis which were happened many years backed were demonstrated that Malaysia was one of the countries that have least affected. The main reasons were identified beyond the achievement was Malaysia stands as the hub for Islamic financial market claimed by economist. Moreover, BNM had proved that the banking sector experience significant growth for the past two decades due to their innovative ways of created business for the industry to earn highest profit alongside with the continuously and persistent their market share. BNM, (2015) reported that goods and services offered by the Islamic banking industry were not exclusively for only Muslim

people. Interestingly, highest number of Islamic financial institutions recorded an estimation for more than 50% of non-Muslim customers.

In conjunction with the public's acceptance as well as the growth of the liberalization and globalization environment have created the chances for Malaysian banking industry, mainly for Islamic banking to expand on their trading and investment network with the other part of Malaysian financial institutions. Thus, the sustainable valued that contributed towards the competitiveness were encourage the other financial institutions in achieved a strong financial positions such as through their financial backgrounds and experiences which in turn, for the best interest of the Islamic banking sector. Therefore, the challenge in Islamic finance would be encounter if intellectual capital treated as the main resources that guaranteed for the long survivability within the global market. Intellectual capital should be one of the main potential sources that inspired behind of every successful and main agenda not only for Malaysia but also the worldwide.

In the past, the investments of financial capital or tangible assets were practices widely used and considered as main resources for the enterprise in determine the maximization in gained the profits. However, this particular assets became notorious and slowly change as the revolution towards the knowledge economy started to replace the tangible assets with intangible assets. Since then, intellectual capital has been recognize and turn out as the main assets that to be used to improve the performance of businesses, alongside with the traditional factors of production. Tangible assets have clearly defined according to the fundamental of accounting; however, today revealed in every successful of the organization were heavily depends on the management's ability in managing their intangible assets or intellectual capital effectively and efficiently.

Table 1.1: List of Domestic and Foreign Malaysian Islamic and Conventional Bank (2016)

No	*Name of Islamic Bank*	*Domestic/Foreign*	*Total Asset (RM)*
1	Affin Islamic Bank Bhd	Domestic	5,286,233
2	Alliance Islamic Bank Bhd	Domestic	9,799,260
3	Amislamic Bank Bhd	Domestic	38,303,410
4	Bank Islam Malaysia Bhd	Domestic	55,683,301
5	Bank Muamalat Malaysia Bhd	Domestic	22,649,767
6	Hong Leong Islamic Bank Bhd	Domestic	16,938,841
7	Maybank Islamic Bhd	Domestic	181,794,557
8	CIMB Islamic Bank Bhd	Domestic	66,646,856
9	Public Islamic Bank Bhd	Domestic	49,663,526
10	RHB Islamic Bank Bhd	Domestic	48,116,641
11	Al-Rajhi Banking & Invesment Bhd	Foreign	8,401,131
12	Asian Finance Bank Bhd	Foreign	2,456,042,837
13	HSBC Amanah Malaysia Bhd	Foreign	16,301,084
14	Kuwait Finance House Bhd	Foreign	16,499,353
15	OCBC Al-Amin Bank Bhd	Foreign	15,254,630
16	Standard Chartered As-Saadiq Bhd	Foreign	9,168,579
17	Affin Bank Bhd	Domestic	48,075,735
18	Alliance Bank Malaysia Bhd	Domestic	46,351,846
19	Ambank (M) Bhd	Domestic	86,608,395
20	BNP Paribas Malaysia Bhd	Foreign	4,168,400
21	Bangkok Bank Bhd	Foreign	4,238,235
22	Bank of America Malaysia Bhd	Foreign	2,951,635
23	Bank of China Bhd	Foreign	9,208,091
24	Mtsubishi UFG Bhd	Foreign	29,438,183
25	CIMB Bank Bhd	Domestic	30,078,9042
26	China Construction Bank Bhd	Foreign	N/A
27	Citibank Bhd Bhd	Foreign	4,352,916
28	Deutsche Bank Bhd	Foreign	11,888,390
29	HSBC Bank Malaysia Bhd	Foreign	72,934,712
30	Hong Leong Bank Bhd	Domestic	162,238,461
31	India International Bank Bhd	Foreign	474,872
32	Industrial and Commercial Bank of China	Foreign	4,063,685
33	J.P Morgan Chase Bank Bhd	Foreign	10,026,400
34	Malayan Banking Bhd	Domestic	496,062,610
35	Mizuho Bank Bhd	Foreign	5,821,870
36	National Bank of Abu Dhabi Bhd	Foreign	897,926
37	OCBC Bank Malaysia Bhd	Foreign	81,981,799
38	Public Bank Bhd	Domestic	303,809,743
39	RHB Bank Bhd	Domestic	191,716,120
40	Standard Chartered Bank Malaysia Bhd	Foreign	44,243,896
41	Sumitomo Mitsui Banking Corporation	Foreign	12,244,737
42	The Bank of Nova Scotia Bhd	Foreign	4,656,370
43	United Overseas Bank Bhd	Foreign	100,415,676

1.4 Problem Statement

Investments in financial capital or tangible assets widely been used and considered the main resources for the enterprises in determined the profitability. However, these particular assets were became notorious and slowly changed since the revolution in the knowledge economy have started to replaced tangible assets with the intangible assets as for main alternatives investment strategy. Ever since, the mechanism of intellectual capital were acknowledged and treated as the most important asset to improve in every successful of many businesses, thus converted the investment strategy from tangible into intangible. Again, there has been dramatic achievement for many sectors previously that revealed extraordinarily especially for knowledge-based intensive sector in established the return and positively increase the company values.

Beyond expectation, the competition environmental and globalization were considered as a business challenged and need tto ransform towards the knowledge based intensive across numerous industry included banking sector performance which possibly levered to facilitate the business financial system. Moreover, the acceptance in knowledge economy have created great influence to the most of the industries thus have induced the banking sector to be capitalize on their organization resources that derived from intellectual capital. In respond to increase of capital market. It also created high demand for new talented of skills in assitss any transcation system alongside with the advancement of technology that turned intellectual capital to be the most pivotal elements in driven the investment strategies within the banking sector.

Nevertheless, the edgy of competitive challenges have encourage the existed interaction that were likely most to be based on the technology. Thus, affectted the banking sector and

customers turned out to be more flexible, intellectual capital and business performance in the way of interaction, partly due to new technology ond high level of education with greater performance. Consequently, there is a need for the banks to identify a dynamic interaction between the structural capital and relational capital in order for the banks to achieve the efficiency performance as this treated an investment goal for the sector.

In addition, Penrose (1950), postulated the competitive advantage does not to be based on a different mixtures of production and market to be achieved only but it should be merely viewed from other distinction with different types of organization resources in the industry ever since the resources cannot simply being transfered, mimicked or replaced. Certainly, it became an integral part for the organization took more serious attention on resources from internal instead the external of the organization in order to stabile the resources. In fact, Malaysia have started to taken an initiatives to move forwards by promoted the importance of the knowledge through launched of missions crafted as for ensure the growth of knowledge-based society since after the implementation of Master Plan in 2002.

This plan has outlined numerous strategies to accelerate the transformed Malaysia into knowledge-based economy and for achievement the sustainability of economic growth where the utilization of knowledge weree brought attention that captivated on main roles within the society (Economic Planning Unit, 2001). However, the aspirations only can be achieved together with the support from the effective management that could drive the increase in productivity and innovation to tangibles and intangibles resources throughout supervision of physical and intellectual capital. The evolution of knowledge economy-oriented society demonstrated that highest returns only if the utilization of their intellectual capital efficiently, thus signify the substantial interest toward the investments in intangible assets.

In viewed within the Islamic and Conventional banking in Malaysia, highlighted by the former Governor of BNM, Muhammad Bin Ibrahim during the launching of Asian Banking School's of Cambridge Summer School Programme in April 2017, which critically announced for the challenges faced by the future banking system is on the human capital investment, either in term of its quantity within the domestic market or the level of quality that would be produced. In addition to the existing model on human capital investment, it must be modernize to suit for the industry in developed the very best talented while reinvented on the model for the market players to meet their demand especially in Islamic banking sector.

In terms of average amount spending on the annual training, Malaysian banking sector so far have recorded the average expenditure only at 3% level which revealed below the employees' payroll or slightly lower from the global benchmark guideline. According to international standard requirement, it must be an equally or above 4% to 4.5%. Obviously, it concerned for the Malaysian banking sector, especially Islamic banking in achieving their agenda of becoming prominence international hub within Islamic finance in Asian region. In relation with the knowledge economy, partially was established on human capital, thus been considered as the main sources of intellectual capital that served as primary asset in planning the growth of the industry. BNM, (2015) reported, during the conference among the Islamic countries, former governor of BNM was described the Islamic bank presently at its prime level based on their contribution towards the add value for the industry included the attractive financing offered to the most businesses and public sectors.

He added, the development in Islamic banking were heavily depended on the industry resourcefulness which initiated for motivation in building and maintaining the ways of innovativeness, competitiveness as well as the comprehensiveness. The governor once

stressed, the growth of Malaysian Islamic banking sector throughout the achievement of every successesful, yet there were still a plenty of worked need to be done and focused in order to posite not only within domestically growth but also in expanded globally. Additionally, this pushed also from previous implemented of the 10th Malaysian Plans (2010-2015) that specifed on the main area mainly for human capital development that were pivotal in securitized the futures industry especially for the Islamic and Conventional banking. Realistically, the government have taken on the initiatives in order to ascertain the availability of demand especially for talented human capital and the needed of the industry towards the transformation on the country to be most developed in Islamic and Conventional financial markets.

In conjunction, the 11th Malaysian Plan (2016 -2020) whereas the listed planning was to assure on national objectives in achieved to become successful whereby transformed accordingly based on the policies. Constantly, the country must warrant and deliberated on the availability of human capital within the market however unlike the 10th Malaysian Plan (2010-2015), the current Malaysian plan tended to have higher tendency in focused those people earned high income level included with an inclusive environmental of economic conditions. Furthermore, in lines with the objectives for these current study, these planning were relatively debated on the subject of intellectual capital merely involved the human capital as one of the six thrust elements crafted by the government in extended on the development of human capital which promises to have a stable futures performance.

On this note, Malaysian banking system currently has practices on the dual banking system which involved both Conventional and Islamic banking that provided on certain relationship that were treated as an extra credit to the whole nation of economic performamce. The current study also to investigate the level of efficiency between the Islamic and Conventional

banking sector as responded to BNM declaration in 2001, denoted the Islamic bank's system were relatively insignificant than Conventional although, successful in Islamic banking were still progressively expanded at better rates compared to Conventional counterpart throughout the years. Indeed, the Islamic banks demonstrated on good performance and being inspired however, Islamic banking sectors needed to put more efforts in improved their level of efficiency (BNM, 2001) and able to polish their human capital so as to compete effectively and stand through its owned roots. Although, BNM were noticed that Islamic banking sector experienced on a reduction of market share with decline of the annual growth rate from double digits in 2011 at 24.2% and drastically dropped at 8.2% in 2016. However it has clearly portray on the Islamic banking industry obviously required attentively and ensured the abilities in explored on the new opportunities to identify the market p;ayers within the same industry for them to stay for the long-term survivability and continued their positive growth.

1.5 Research Objectives

The general objective of this study is to investigate the relationship between the Value Added Intellectual Coefficient (VAIC) and technical efficiency performance of Malaysian banking sector. The specific objectives are listed in detail as below:

Objective 1 To investigate the components in intellectual capital namely human capital efficiency (HCE), structural capital efficiency (SCE), and capital employed efficiency (CEE) of Malaysian Islamic and Conventional banks.

Objective 2 To examine efficiency performance of Islamic and Conventional banks.

Objective 3 To assess the nexus between VAIC and technical efficiency of Malaysian Islamic and Conventional banks.

1.6 Research Hypothesis

The basic hypotheses of this study are crafted according to the basic conceptual of intellectual capital that classified into capital employed efficiency (physical and financial capital within the firms), human capital efficiency which refers to employee knowledge, skills and experiences and the structural capital efficiency comprises of the relationships between suppliers, customer loyalty and social networking. Therefore, the study's hypothesis is constructed to test the relationship between intellectual capital which is based on the combination of three main components namely human capital efficiency, structural capital efficiency and capital employed efficiency and the technical efficiency performance of Malaysian bank. The hypotheses developed were described in detail below.

1.6.1 Value-Added Intellectual Capital (VAIC)

Some researchers tended to treat the sub-components of VAIC as completely independent constructs, thereby will cause the losing on the significance of the whole VAIC. Therefore, in order to fully understand how VAIC develops and drives the performance, it may be helpful to look at an organization's overall VAIC's profile and also focus independently on its individual parts. Accordingly, it is expected that the higher the firm's aggregate stock of VAIC, the more successful the firm will be and the greater its competitive advantage is. In other words, the higher the VAIC is, the greater the technical efficiency performance will be. Hence, the first hypothesis to be tested as below:

H1: There is a positive relationship between VAIC and technical efficiency performance of Malaysian of Malaysian banks.

Existing literatures have proposed that VAIC comprised of human capital, structural capital and relational capital. In Murthy and Mouritsen (2011), advised that is necessarily to

measure the contribution of each resources, particularly for the financial services industry which is relatively being less explored and sub-components of VAIC were being measured separately in order to examine on which characters of main components that contributed the most towards the technical efficiency performance among Islamic and Conventional banks in Malaysia.

1.6.2 Human Capital Efficiency.

Human capital efficiency particularly focus on individuals or employees in organizations including their implicit knowledge. Meanwhile, knowledge or skill basically cannot be gauged or calculated, but these characters are inside each and every individual who worked within the organizations. In expressing the knowledge among all members, it is necessarily for the employees to utilize their human capital in delivering their daily tasks or operations at work. Lynn (1998) explained on the characteristics of human capital which is comprises of raw expertise, skills, and intelligence of individuals that acting inside the organization. Nevertheless, the human capital of individuals does not consider belong to the company (Bollen et al., 2005). Colombo and Grilli (2005) suggested that firms with greater human capital (higher educational or skills) are likely to have a better performance as long as it is continuously being developed. A company's staff can improve their job performance and ultimately, their firm's performance (Hsu, 2007).

Human capital theories (Becker, 1964; Schultz, 1961) viewed that an increase in workers' skills, knowledge and abilities are most likely transform as an increasing in the performance. Likewise, Dakhli and De'Clercq (2004) suggested that the firm's stock of human capital influences profitability. Empirical evidences within the banking sector revealed that investments in human capital will provide a higher return than in physical and structural

capital. A study by Ting and Lean (2009) has confirmed on these findings. Kamath (2007) analysed the value-based performance of the Indian banking sector and finding revealed that foreign banks were the top performers in human capital efficiency.

Mention and Bontis (2013) reported that human capital contributed both directly and indirectly to business performance in the banking sector. Most of all the empirical evidences suggested that human capital efficiency as investment driver that affect on the performance in the financial sector. In the case of human capital and its relationship with the technical efficiency performance, the amount of knowledge among workers in organization is affected that more may enhance their credibility and reputation of Islamic and Conventional banks to compete within the financial sector. The knowledge which is valuable, rare and isolated from imitation is embodied in the human capital of Malaysia banks. Therefore, the hypothesis on human capital is include as below:

H2: There is a positive relationship between human capital efficiency and technical efficiency performance of Malaysian banks.

1.6.3 Structural Capital Efficiency

According to Edvinsson and Malone (1997), the structural capital efficiency is the structure and mechanism that believed would assist in delivering the employees' routines. Structural capital also reviewed as the aim is to "support on the productivity of employees" or "everything were fixed and remain inside the office after working hours". An organization with strong structural capital will have a supportive culture that encourages employees to try and learn on new knowledge (Florin et al., 2003). Besides, De'Brentani and Kleinschmidt (2004) suggested an organization's operational, processes and commitment against the sufficient resources is significantly effect on the performance.

Likewise, Hsu and Wang (2012) claimed structural capital such operations; procedures and knowledge management process contributes towards value creation activities which in turn will have a positive effects on the firms' performance. As for Islamic finance industry which are still at its early stages and less stable in structural capital hence, the expenditures are expected to be slightly higher. This may reflected on the negative relationship within the industry's performance indicator. However, the industry may adopted on different types of structural processes and systems to track their records and transaction, both Conventional and Islamic banks based on their investment in structural capital will be expose from this study based on its relationship with technical efficiencies performance. Therefore, the hypothesis to be tested in terms of structural capital efficiency is as below:

H3: There is a positive relationship between structural capital efficiency and technical efficiency performance of Malaysian bank.

1.6.4 Capital Employed Efficiency

According to the Pulic's model concerned with capital-employed efficiency rather than on relational or customer capital efficiency as the main reason of why relational capital characteristics are considered part of structural capital. On top of that, VAIC basically measures corporate intellectual capital efficiency which is not included in both financial and physical capital as part of the VAIC. In short, the combination of financial and physical assets is hence known as capital employed efficiency is said to contribute to the intellectual capital efficiency. Practically, the banking sector based on the mainstream act of utilizing intellectual capital as done by the majority of studies which investigated bank performance with respect to the role of intellectual capital (Cabrita & Bontis, 2008; Saengchan, 2008) which suggest that the utilisation of physical asset is not focused on the management of human capital and structural capital only (Makki & Lodhi, 2009). Furthermore, as clarified

by Firer and Williams (2003), capital employed refer to physical and financial capital which must be managed and utilised effectively and efficiently. Thus, efficiency evaluated accordingly as proposed by Pulic (2004) can generate resources' ability to the value-added for the company according to empirical evidences which expected to have a positive relationship between capital employed efficiency and corporate performance.

Mavridis (2004) found the significant positive correlation between value added and capital employed efficiency. Kamath (2007) also found that Indian public sector banks are the top performers in capital employed efficiency when compared to their foreign counterparts. In an extended research on the Hong Kong Stock Exchange, Chu et al., (2011) reported that structural capital enhances corporate profitability, but capital employed efficiency is still the major determinant of financial performance. Thus, the hypothesis proposed is crafted to examine the relationship between capital-employed efficiency and technical efficiency performance as stated below:

H4: There is a positive relationship between capital employed efficiency and technical efficiency performance of Malaysian bank

1.7 Significance of Research

A recent studies on Islamic banking sector was conducted by Malik, Malik and Mustafa (2011) had highlighted on the lacked of expertise in Islamic finance. Expertise basically refer to the talents who are experts in Islamic finance principles and knowledge as an extra advantages that must be possessed by those who work in Islamic banking institutions. In short, it means that is skills and expertise are among the main components of intellectual capital. Studies in this area are particularly important in the context of rapidly emerging viewed from the other academicians and practitioners in related to the issues of intellectual

capital in knowledge economy paradigm. Hence, the study was probably contributed towards the growing of interest in intellectual capital reporting.

Moreover, also beneficial to the country as provided clear pictures on the level of intellectual capital and technical efficiency among the Malaysian Islamic and Conventional banks in respect of characteristics either for domestically or foreign-controlled Islamic banks as well as the level of technical efficiency performance of both Islamic and Conventional banks. This were due to the existences of the knowledge-based economy particularly an important for the finance industry, considering the sector's dire need for intellectual personnel and the utilization of knowledge with the objectives of increasing efficiency performance. In conjunction, with the knowledge economy alongside with the liberalization, the ability of the Malaysian Islamic banking industry in compete and minimize cost is consider crucial and pertinent.

Therefore, the findings of the study will be able to give an overall pictures on the importance of intellectual capital towards the efficiency level of the Malaysian Islamic banking sector, besides providing a comparison with Conventional banks. Eventually, Islamic banks will be able to compare their own efficiency with the others Islamic banks and subsequently, against Conventional banking institutions. The study practically significance to the country as a whole and specifically within the banking sector. One of the reasons due to the Malaysia as developing country and its economic growth were generally influence by the performance of the banking sector. Furthermore, the performance of other businesses within a country's economy was also depends upon the services provided by the bank (Mondal & Ghosh, 2012), the findings of the study would especially assist the management of the respective banks in determining their position regarding their investments and utilization of intellectual capital.

1.8 Scope of Research

The study will covered all of the licensed Islamic banks in Malaysia which has been further categorize as either domesticly or foreign-controlled Islamic banks. In summary, Malaysia currently has a total of 10 domestic Islamic banks and total number of 6 foreign Islamic banks (BNM, 2017). The domestic Islamic banks namely are Bank Islam Malaysia Berhad, Affin Islamic Bank Berhad, Alliance Islamic Bank Berhad, AmIslamic Bank Berhad, Bank Muamalat Malaysia Berhad, CIMB Islamic Bank Berhad and RHB Islamic Bank Berhad. On the other hand, the remaining was the foreign Islamic banks namely are Al-Rajhi banking and Investment Corp Malaysia Berhad, Asian Finance Bank Berhad, HSBC Amanah Malaysia, Kuwait Finance House (Malaysia) Berhad, OCBC Al-Amin Bank Berhad and Standard Chartered Saadiq Malaysia Berhad.

Notwithstanding, the Asian Finance Bank Berhad had merged with MBSB bank on 6th November 2017, thus the research will cover and maintain the original banks' names and ownership. In contrast, the study on Conventional banks can be used as for the comparison on the efficiency against Islamic banks with respect for the improvement purposes. Hence, the data that will be obtained and taken from the annual reports of year 2007 until 2016 for the present 16 Islamic bank and another 27 of Conventional banks that actively operating in Malaysia; out of the 27 banks, 19 are classify as the foreign-controlled Conventional banks while the remaining 8 Conventional banks are domestically-controlled institutions. The study's period spans from 2007 until 2016 or specifically within 10 years period.

The 10 years period are considered as the most recent available data, and most of the Islamic banks in Malaysia excluding Bank Islam and Bank Muamalat were given the full-fledged Islamic bank status from the year 2005 onwards by BNM. The study is based on the

secondary data which will collect from 160 financial statements (observations) of Islamic bank and 270 financial statement of Conventional bank in Malaysia. Furthermore, any missing data on selected variables or major irregularities such as mergers and acquisitions in this period is excluded from the study. The data collected will be pooled and arranged in a time-series measurement.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

This chapter highlights numerous views from the past studies by firstly describing and discussing on the definitions or concepts of intellectual capital, specifically in terms of the development of intellectual capital from its conception through to the ongoing debate on its ideas and theories. Explanations on the general components that are included under intellectual capital and which have become major assets in providing significant development towards the current era of knowledge economy are also included. Additionally, the chapter will also briefly explain on the empirical evidences within intellectual capital studies, including measurements or approaches taken to calculate intellectual capital. The chapter would assist in gaining a deeper understanding of the research topic as previous empirical studies are beneficial as guidance and direction for this study in order to determine the utilization of intellectual capital, especially within Malaysian Islamic banks. Discussion will also be in close relation to the level of efficiency as well as contributions for better improvement, especially within the banking industry as a whole.

2.2 Development of Intellectual Capital

The knowledge-based economy has induced increasing amounts of interest in intellectual capital. In line with this, big efforts have been done so far in the field as many studies have concentrated on intellectual capital thus resulting in huge amounts of contributions, especially in improving existing ideas regarding intellectual capital such as to the ongoing discussion on the topic's definition. Generally, almost all available citations have agreed on

the terms and basic components of intellectual capital. Likewise, the scenario has given witness to such efforts and interest contributed by researchers and practitioners to the subject of intellectual capital, especially on the basic parts such as its concepts and perceptions on its components. The studies also addressed on how intellectual capital can serve as a better strategy for businesses to compete within the industry, its critical success factors, as well as value-added (Rylander et al., 2000; Bukh, 2003).

Likewise, for the business strategy within several industries, intellectual capital has consistently provide sound investments for businesses which consider as valuable capital in projecting the creation of potential value. Thus, reporting on intellectual capital will continuously develop in term of better approaches or more effective measurements, while the capital will be managed and utilized efficiently as a valuable resource (Wood, 2003; Cabrita & Vaz, 2006). According to the existing literatures, early research done by Brooking (1996); Roos et al., (1997); Bontis (1998) and Stewart (1998) had investigated on the linked between intellectual capital and financial performance; their findings revealed that intangible assets in reality will turn into critical assets within enterprises that could generate significant roles that are beneficial both to the enterprise and the country's economy as a whole. The previous chapter has reviewed on current studies with respect to several improvements made to intellectual capital in terms of reporting, especially when used to demonstrate different ideas whereby the definition of such intangibles basically appear in accounting terms based on the balance sheet.

However, intellectual capital is frequently used in the areas of human resources (Vickery, 1999). As for notice after many compromise among the researchers in regards to intellectual capital, the term of intellectual capital is accepted to be interchangeable with intangible assets (Itami, 1989; Brooking, 1996; Mouritsen et al., 2001), intangible values (Pulic, 2001;

Lonnqvist, 2004), knowledge asset (Edvinsson & Malone, 1997; Bontis, 1999; Burgman et al., 2005; Edvinsson & Sullivan, 2006) or intellectual property (Steward, 1997). The transition in economic paradigm has given huge impact on several definitions by academicians and researchers worldwide since intangible assets have been identified as the most critical assets used to achieve the firm's performance.

Due to the increase in interest among scholars, definitions of intellectual capital and its components has together expanded and supported by the existing number of techniques and approaches that can be taken to measure intellectual capital within the current knowledge-based economy (Walsh et al., 2008). Throughout the history, the person who is responsible for intellectual capital was Jonn Kenneth Galbraith who defined intellectual capital as something connected with the brain and includes mental activity (Feiwal, 1975; Chang & Hsieh, 2011). In 1991, the founder of works on intellectual capital, Itami clearly described intellectual capital as an intangible asset which consist of combination in the technology, customer information, brand name, reputation and corporate cultures. This asset consequently produces potential value for firms in order for them to enhance their competitive power (Goh, 2005). Meanwhile, explained by Barney (1991), intellectual capital is primary asset for enterprises that produce competitive advantage and maximise on their value added.

As a matter of fact, although there is still no standardized or specific description of intellectual capital, its universal definition has to include the main components of intellectual capital (Chan, 2009; Zeghal & Maaloul, 2010). Acknowledging the fact that there is no general definition of intellectual capital, the rise of speculations accompanying the subject is considered relatively novel since it has only started and begun to develop in the early of 1990s. Despite its infancy, many efforts have been done in order to progressively expand its

definition and the basic main components (Zeghal & Maaloul, 2002). Prior to this study, some issues regarding its definition remain indefinable (Ho & Williams, 2003) while the subject is still continuously being debated including the discussions on numerous ideas that used to describe intellectual capital.

By response, the most common definition of intellectual capital is intellectual material that are typically untouched and affected, serves as the value added within the organization's asset (Andrissen, 2004), and it is related with human resource management (Boudreau & Ramstad, 1997). Since the subject remains indefinable, attention from both academia and scholars have only increased. Although the subject is considerably underdeveloped, but ongoing studies actively explores the idea in order to encourage and motivate other researchers to improve the subject by sharing the outcomes with one another (Kozak, 2011). Nevertheless, intellectual capital in a straightforward definition postulated by Ulrich (1998) was "competence multiplied by commitment". In other words, defined as the level of an employee's knowledge, skills, attributes, and the willingness to work hard.

However, Pulic (2001) extended the definition basically an employees who have the ability to contribute values within an organization's process and bring those values to the market. Additionally, another study revealed that intellectual capital normally transforms knowledge into profits (Sullivan, 2000), a stipulation proven through the progressive growth of national and international economies which in turn, affects the potential value of utilizing intellectual capital (World Bank, 1998; Cabrita & Vaz, 2006). A number of definitions have exposed the development of intellectual capital and identified modern definition describing intellectual capital or the so-called of intangible asset or intangible business factor. In most previous studies, many researchers agree on the precise definition of intellectual capital given by Edvinsson and Sullivan (1996) who labelled intellectual capital as equivalent with the

information that include value. However, this definition has been broaden as to make it more simple to some extent by refer to as combination of knowledge, experience, organizational technology, customer relationship and professional skills to achieve the real competitive edge within the market (Edvinsson & Malone, 1997). Aligning the various ideas regarding its definition, Steward (1997) once declared that intellectual capital is "useful and full with information", whereby information specifically describes the knowledge, information, technologies, skills, expertise, intellectual property, customer loyalty and team management needed to contribute for creating values within organizations.

To conclude, all of the definitions that have been discussed basically used the similar words such as terms of knowledge, employee's experiences and skills, employee's satisfactions and loyalty, customer's satisfactions, firm's reputation, organization's routines, procedures, systems, cultures, and information technology as factors that create value (Brooking, 1996; Edvinsson & Sullivan, 1996; Edvinsson & Malone, 1997; Edvinsson, 1997; OECD, 2000; Kannan & Aulbur, 2004; Yalama & Coskun, 2007; Kamath, 2012). Researchers' developed interest in contributing ideas and discussions to theories of this subject has clearly diversified and expanded its definition, and in the end lead to the classification of intellectual capital. Among all, most studies have through their own definitions verified the basic components of intellectual capital.

A study done by Steward (1997) clearly registered the components of intellectual capital through three main categories namely human capital, customer capital and structural capital. Similarly, other studies on intellectual capital have listed out the importance of intellectual capital which focuses on human capital, structural capital and social capital. Furthermore, an additional capital, namely spiritual capital has also been added under the umbrella term of intellectual capital (Ismail, 2005). Intellectual capital when viewed from different aspects

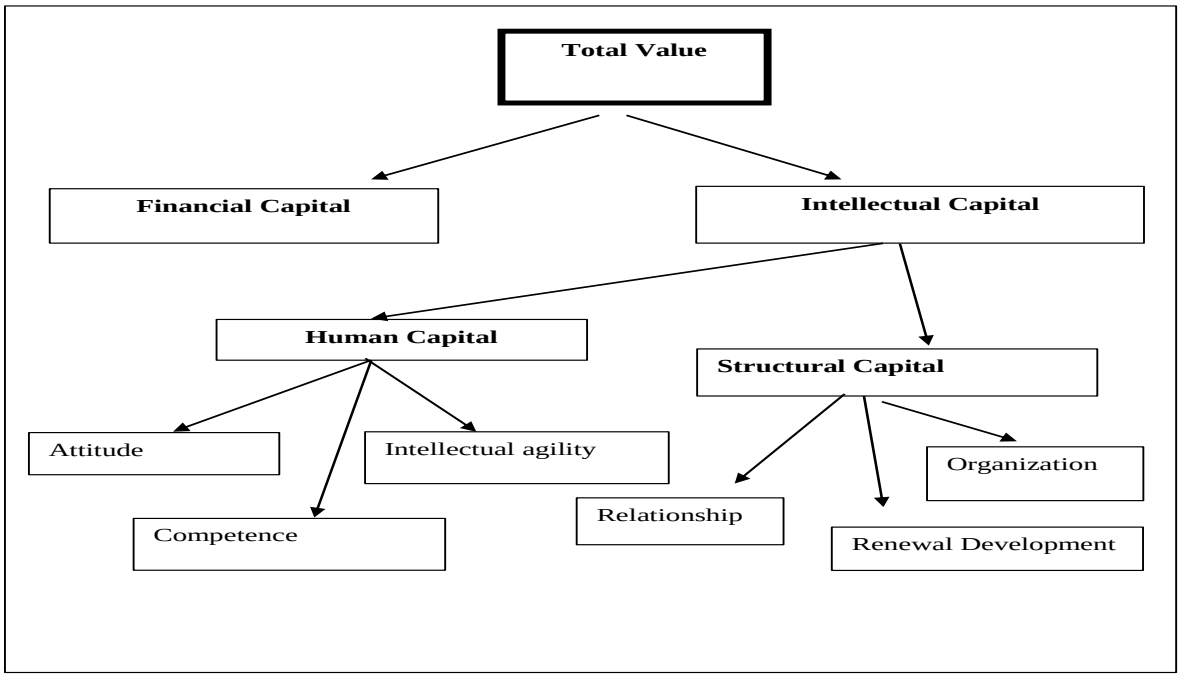
has accordingly resulted in the agreement that it can be further categorised as human capital, organizational capital or structural capital, technological capital, social capital, and business capital or customer capital (Bueno et al., 2006).

2.3 Components of Intellectual Capital

Several definitions based on the existing literatures were clearly stated on the different interpretations and discussions have resulted reflected from varied opinions, theories and ideas in intellectual capital which consequently turned the knowledge into an asset for businesses. Intellectual capital is posed to lead and enhance on the business' competitive advantage and serve the potential for creating value added which in turn determininig the business' successful. The conceptual framework on as references has further classified intellectual capital comprises of human, structural, and relational capital (Zambon, 2003). Figure 2.1 classified intellectual capital into three main categories namely human capital, structural capital (organizational capital) while relational capital (customer capital or social capital) were categorized under the structural capital (Edvinsson & Malone, 1997; Roos, Edvinsson & Dragonetti, 1997; Steward, 1997; Bontis, 1999).

Precisely, the authors have highlighted the intellectual capital components that can be describe under human capital, such competencies (including skill and know-how), attitude (motivation, top management's leadership quality) and intellectual agility (ability of an organization to be quick in terms of intellectual, innovation and entrepreneurship; and the ability to adopt and cross fertilize). Whereas the components categorized under relational and structural capital are such as external structure (compared to relational capital), internal structure (compared to structural capital), and individual competencies (compared to human capital) (Sveiby, 1997). Bueno et al., (2004) and Wu and Tsai (2005) extended the concept

of intellectual capital by introduce another two additional components namely social capital and technological capital. On the same vein, Ismail (2005) extended the idea by presenting an additional component of intellectual capital which is spiritual capital. The additional components were included due to their contributions towards the performance of organizations. Ramezam (2011) who investigated on the components of intellectual capital included sub-components such as human capital, organisational capital or structural capital, social capital, and business process capital or customer capital.



Source: Chareonsuk & Chansa-Ngavej (2008)

Figure 2.1: Classification of Intellectual Capital

Nevertheless, following the previous studies supported with relevant theories which provide numerous classifications of intellectual capital while OECD, (2000) took their own initiative to define intellectual capital as general description of economic values which consist of two major component namely human and structural capital. Existing literatures on intellectual capital have decided on the three major component of intellectual capital namely human

capital, customer (relational) capital and structural capital (Edvinsson & Malone, 1997; Mavridis & Kyrmizoglou, 2005; Wall, 2007; Ruta, 2009; Meditinos et al., 2011).

Beside, majority of researchers and practitioners has accepted on the classification of components under intellectual capital since the earliest studies on intellectual capital which began in the 1980s had highlighted the respective main components of intellectual capital that are human capital, structural capital and relational capital (Edvinsson & Malone, 1997). According to Johnson (1999), intellectual capital is the source of human capital, structural capital and relationship capital. Human capital is usually refer to the ideas through humans' skills, knowledge, teamwork and talent and also known as leadership capital or the ability of problem solving and creativity. Structural capital also termed as innovation capital and includes patents, trademarks, technologies, copyrights, databases, design, and combination of processes involve in a working environment, like workers' procedures and work secrets. Last but not least, relationship capital refer to the sum of relationship with customers, suppliers, shareholders and other groups in the network society.

2.3.1 Human Intellectual Capital

The concept of human capital is identify as people in an organization that take responsibility towards the organization and consider it as crucial or essential asset that needs to be utilized effectively and efficiently for future development. The capital provides similar functions to physical assets; plant and machinery, financial capital, employee's attitudes, and employees' skills and abilities to contribute to an organization's performance or profitability. Whatever expenditures that is included under training, development, health and support will not be treated as expenditures but considered an investment. In contrast, Steward (1997) and Edvinsson and Malone (1997), refer the human capital as combination of employees'

knowledge, qualifications and skills. It have the ability to create value, whereby the value created basically come from the workers or possessed by specific individual within the organization. These individual in turn known as the organization's value added, supported with unique physical characteristics and attitudes.

However, value include in human capital will only have influence on any changes to the environment especially in social interactions, value corrections and organisational obligations. In knowledge economy, most organizations emphasize on employees' knowledge and skills which hence will help grow and develop the firm's performance efficiency (Freeira & Martines, 2011). Likewise, Mohiuddin et al., (2006) described that the characteristics of human capital are basically owned by individual or employee; however, organizations can owned information by structuring on procedures and system formats. As defined by Roos and Roos, (1997) and Zeghal and Maaloul, (2010), human capital is classified as employees' knowledge, experiences, and skills which will be gone when they leave the organization. Since, human capital is concerned on the employees' capabilities such as competencies, commitments, motivations, loyalty, and other similar attributes. In short, studies shown on the significance of human capital and identified it as core to intellectual capital; however, would vanish when employees exit the company (Bontis, 1999; Mohiuddin et al., 2006).

Several studies define human capital as the number of stocks in skills and knowledge that were embodied by employees when delivering performance in producing economic values through education and experience (Sullivan & Sheffrin, 2003; Bozbura, 2004; Aston, 2005 & Appuhami, 2007). Meanwhile, Aston (2005) informed that human capital is consistent with personnel's attributes such as knowledge, skills and expertise. (Appuhami, 2007), and Bozbura (2004) have suggested that human capital should classified as the accumulation of

knowledge acquired by employees during their work tenures such as leadership skills, the ability to take risks while performing on jobs given, and thus, the ability for decision-making and problem-solving (Appuhami, 2007).

Almost all studies have shown that human capital is generally viewed as the development and enhancement of the efficiency of tangible and intangible assets within an organization (Bontis, 1999; Fitz-enz, 2001; Appuhami, 2007). In the context of the financial and banking industry which is consider as knowledge-intensive industry, sustaining the potential in intellectual resources is practiced and applied in order to produce the highest number of talented professionals in the banking industry (Zeti, 2005). Indeed, the financial sector possesses highly qualified, flexible and responsible professional executives with versatile skills. In the globalization and knowledge era, it is proven that high class human capital is a necessity in many jobs' roles, and is not only for magnificence (Nik Muhammad et al., 2007).

2.3.2 Structural Intellectual Capital

Unlike the human capital that are remain within the intellectual mind of employees as they leave workplace, but for the structural capital is not refer to any information that being structured and does not. Thus, it can be explained as something that is created by employees, like system or products that will stay even if those workers leave the organization. Structural capital is also known as organizational capital or intellectual property and is defined as the existing combination of systems, networks, policies, cultures, distribute channels and other "organizational capabilities" that needed to meet market requirements (Kok, 2007). Likewise, structural capital refer to the combination of the tangible part in trademarks, symbols, patents and databases up to its completion into intangible part such as culture, transparency and loyalty among workers. Organizations that practice sustainability towards

structural capital will result in providing supportive environment that permits their workers to take challenges on new things, be able to learn it, and apply it to their work (Bontis et al., 2000).

According to Muhammad et al., (2006), structural capital comprises of structures that allow an organization to utilize its intellectual capital. These structures ranges from tangible items offered by an organization such as patents, copyrights, trademarks, databases, software systems and processes, and intangibles such as corporate cultures, accountability, efficiency and trust among employees (Seetharaman et al., 2004). Ashton (2005) describe structural capital as containing of various types of both internal and external value drivers. The former refers to the organizations that involve processes, routines, databases and organizational structures, while the latter is refer to the relationships with customers, suppliers and alliance partners (Appuhami, 2007). Edvinsson (1997) recommended that, the management in the effort to transform the organization's assets from human capital knowledge into structural capital component have to ensure that value is created in order to maintain sustainability for the long run (Appuhami, 2007). Meanwhile, an organization that applied strong structural capital tended to develop a supportive corporate culture among its employees to try and exercise new things at the workplace (Bontis et al., 2000).

2.3.3 Relational or Customer Intellectual Capital

Relational capital also one of main components in intellectual capital that should be concern in order for the organization to be well-known by the public as this component are linked to the company's close relationship with its customers, suppliers and stakeholders. Prahalad and Ramaswamy (2000) indicated that customers reflected on a firm's performance. Basically, relational capital is also known as social capital and is the capital that exists as

connection or linkages with social and interpersonal factors (Porters, 1998) and between individuals or societies (Kale et al., 2000). According to Chang and Gotcher, (2007), the concept of social capital with the business insight somehow be interchangeably used with relational capital which reflected on the connection between the suppliers and customers. Relational capital refer to any resources that are connected with the external relationships of an organization such as its relationships with customers, suppliers or partners in research and development.

Moreover, this capital comprises both parts of human and structural capital which involved in business relationships such as those with stakeholders who are investors, creditors, and customers as well as suppliers, together with perceptions on the organization's credibility (Belkaoui, 2003) such as through images, commercial power, negotiation capacities, financial entities, and environmental activities. Similarly, Cabrita and Bontis (2008), Longo et al., (2009) and Houmiga et al., (2011), described relational capital to include the relationships with external stakeholders, networks with suppliers, distributors, lobby organizations, partners, customer relations, and images which are viewed from attitudes, preferences, reputation, and brand recognition (Payne et al., 1995; Roos & Roos, 1997; Marr, Schivma & Neely, 2004; Jacobsen et al., 2005;).

2.4 Theoretical Studies

The theory for intellectual capital have emerged in the past dacade with respond to the growing of important in information and knowledge. Although, the theory of intellectual capital still consider as new and research conducted at early formative stages, the theoretical foundation identified to be the anchors of intellectual capital. The alternatives of theoretical approached was used to the present dynamic impact that intellectual capital have on an

organization when it is properly defined. The theoretical foundations has been existed for many years and today, have helped to define human resource development. Although the theory of intellectual capital is appeared in the form of completely comphrensive yet its underlied based on the concept which has shown to be quite simple.

The intellectual captial recognize the wealth of knowledge in individuals and organizations and needed to be connected to one system with another in order to improve the performance. In fact, the limited amount of research and data currently available have suggestted that intellectual capital were greatly contributed to the success of an organization and slowly became a natural extension of organizational development. This has caused the practicioners to be able applied these concept easily and promoted change within an organization assumed the organization were ready to change. Intellectual capital theory were totally contradicted with the definition according to the basic accounting principle since there a different scope of definition which thus created the gaps to the business from seeing, managing or building their knowledge assets. As a result, this situation affectted and hindered the businesses' ability to become competitive which in turned have affectted the economic growth since acknowledgement of knowledge were only significant in gained profits.

In fact, asset should comprise of everything on what the company owned that could transform the raw materials to something more valuables. Raw materials are refer to both tangibles and intangibles based on the nature of the material which is either physically (tangible) or something in the form of knowledge or information (intangible). Prior to the statements, financial accounting were not measured intellectual capital, but the practices is clearly done by the markets. In 1980s, Walter Wriston who was the former chairman for Citicorp noted on bank and other corporations were possessed valuable intellectual capital that accountants (and bank regulators) does not measured. Later, Karl- Erik Sveiby was

began to investigate and produced the first experiments on the nature of intellectual capital in 1989 and proposed that knowledge as kind of asset which can be recognized in three places namely the competencies of a company's people, its internal structures such as patents, models, computers and administrative systems, as well as in its external structures such as brand, reputation, and relationships with customers and suppliers.

Thus, knowledge era signify the intellectual capital and were cited by many which became well-known as involved in human capital, structural or organizational capital, and customer or relationship capital. Indeed, all the companies or organizations were started to possess on three main practised of intellectual capital, especially for human capital which comprises the employee's skills, competency, and ability of individual and group. These skills were ranges from specifically on technical skills until the softer skills like marketing or the ability to work effectively in a team.

In addition, human capital cannot be owned under the legal senses, meaning it does not belong to the organization as does not partially referred to individual's talented but also included the collective skilled and aptitudes of the employees. Structural capital comprise of knowledge assets or company's intellectual property such as patents, copyrights, trademarks, processes, methodologies, models, documents and others knowledge artifacts, computer network and software, administrative systems, and other similar activities. For example, warehouse data considered as a structural capital due to the decision-support were through the software and conducted by the employees whose manage the data. Knowledge management processes can be converted into human capital which are usually available to just a few peoples, and subsequently turned into the structural capital so that becomes shareable. Another components in intellectual capital refer to the customer capital that explained throughout value of relationships with the suppliers, allies, and customers.

Basically, these two common part of customer capital were referred to the brand equity and customer loyalty. The former was actually made the promises of quality or some other attributed for which a customer agreed to pay the premium price, or can also be defined as the values of brand that can be measured based on financial term principles. The latter referred to the customer used a discount cash flow analysis to be measured. Both were frequently used when the companies bought and sold, and every customer capital finnaly would reflected either based on the premium prices or through the sticky buyers and seller relationship.

According to the nature of intellectual capital, the benefits to the organization has clearly support to generate the extraordinary power especially in adding values. Unlike previously, which merely invested based on physical assets thus intellectual capital has directly reduced the organization's expenditures and burden rather than depended on the physical asset. As stated, the famous management for intellectual which known as "Drucker", believe that current knowledge-oriented society had concerned with economic resources rather than from capital, natural resource and workforce knowledge. Aligned with the above statement, the knowledge economy and industrial economy were dominated by economic production factors whereby wealth is generated by a series of physical or tangible assets such as plants, land, workforce, money, equipment and others. Consequently, those factors were combined to produce wealth.

Knowledge economy has transformed the business' strategy that change as it is concern with the intangible assets' and value which producing the main cores of competencies within the organizations. Intellectual capital considere as priority factor in producing the wealth as compared to the tangible or physical assets since the intellectual capital generated more return mainly from the investment of human capital, which were th most important

organization asset that barely promise on the maximum profitability. These changes also made the investment of intellectual capital played the important part throughout the business management which involve to focus on other developemtn of investment such as the brands, shareholder relations, fame, and organizational cultures for the sustainable commercial advantage.

2.4.1 Human Capital Theory

The theory of human capital was introduced by Becker in 1964. However, Schultz (1963) was the first one who applied these theory to analyze the significance of human capital towards the economic values. According to Schultz (1963), investment in human capital in knowledge economy has increases the production output; however, human capital has to be managed efficiently in order to contribute to the existing approaches that are relevant in measuring intellectual capital. In addition, employee's knowledge will only be fully utilized by giving them sufficient and continuos training for self-progressive development. In other word, the author suggests that to build a good relationships with the consumers, the workers and managers within an organization must expand the usage of knowledge and skills under human capital in order to gain the highest return. (Schultz, 1963). Becker (1993) defined capital as something that yields the income and other factor of production or output that devoured within a period of time.

In 1964, Becker explained human capital according to his theory human capital is equal to any organization expenditures including education, trainings, benefits and other similar expenditures and it is being well-accepted along with basic principles by many scholars. In contrast, these investments in human capital cannot be separated from employees or from their own knowledge, skills, and abilities. According to the human capital theory, in order

to have employees that are more productive than others, more resources has to be invested into training for these particular employees; however, if the situation is conversed, it were brings the similar value of investment that should be invested on machines (Mueller, 1982). The human capital theory mentioned that investing and providing training for employees to expand their skills and expertise possibly will in turn gainaing profits and positively growth mainly for the organization.

Theory of investment in human capital will also definitely added values and developed strongest competition in next future (Mincer, 1958; Schultz, 1963; Blaug, 1976; Becker, 1993). Basically it is depend on the employees to enhance their capabilities as producers or consumers (Martin, 1981). In addition, giving the tasks to the employee which uses their capability in delivering routine job performance will reflected their wages or salaries and job promotions or types of the job (Hulin & Smith, 1967; Katz, 1978). As such, organization need to develop intellectual capital environment so the transitions of knowledge can take place throughout the organization's structures; thus, if organization refuse to do so, it might consequently loses its important individual as knowledge were improved through year of services. In short, human capital merely increase the value for each of employees which consider as an organization's asset. The knowledge gain by employees will translate into the organization's high performance with the existence of strong competition in the industry must be supported by ownership and utilization of intellectual capital.

2.4.2 Structural Capital Theory

By definition, structural capital can be express as capital that belongs to an organization as a whole and entitled for the legal rights of ownership such as technology, invention, data publications, and process legally patented, copyrighted or protected under such rules and

regulations provid by the law. According Steward (1997), assets under structural capital can be stated as extensive and valuables. In addition, knowledge can be transferred, mimicked and replaced through several types of transmission mediums; thus, the organization of structural capital is required to be managed effectively in order to connect with people and information supported by an efficient framework of communication channels. According to Stewart, structural capital has two purposes name to organize bodies of knowledge that can be transferred in order to preserve the recipes that might otherwise be lost and to connect people to data, experts and expertise including bodies of knowledge on a just-in-time basis. This is due to fact that, knowledge sharing is dependent on various channels of transmission, a proper organizational structure need to be in place.

In relation with structural capital theory, knowledge can be easily transmitted and faster in view of the assistant of communication networks, corporate yellow pages and knowledge data-bases allow the company to put its best people on the front line while still keep their expertise available to the entire organization (Stewart, 1997). Thus, Allee (1997) argued that structural capital is refer to the experiences and information used to communicate and share within organization. In managing and controlling the association between both components of intellectual capital, namely human and structural capital, the management has to ensure and monitor the process involved (Baughn et al., 1997). In addition, structural capital gained significant since it is considered as one of the main components in intellectual capital that could provide the framework and patterns in transmitting knowledge.

Likewise, for the organizations to maximize on their human capital, they have to assess their investment's ability to create the potential skill towards achieving competitive advantage. Hamel (1991) argued that in learning process, the initial alliance structure and governance mechanism will be followed by ongoing "micro-bargains" against knowledge acceptance.

Therefore, the companies' management faced the challenge in constructing a collaborative membrane to maximise the inflow possibly needed from the skills of one's partner in order to minimise the unintended outflows. Knowledge and the sharing of knowledge need to be managed effectively to achive the successful of intellectual capital. Leaders within the system have to be recognize in order to lead the companies and utilize the establishment of intellectual capital as means for enhancing the competitive advantage. The most important is that intellectual capial is creating a structure that not only supports the human capital but also recognizes the overall importance of customer capial.

2.4.3 Customer or Relational Capital Theory

According to Steward (1997), customer capital is consider one of most valuable components for intellectual capital due to the assumption that customers support the company and majorly affected the company's bottom line. Steward (1997) added that customer capital represents the values of franchises which is linked with the employees or organizations anywhere its products is sold. In fact, managing customer capital is often the worst part of organizations. Steward claimed that most businesses don't even recognize their own customers or specifically the end users of their products or services. According to Saint-Onge (1997), customer capital refer to the relationship between the company and its customers.

In general, it is differs from managing employees or business partners. Thus, customers' relationships are valuable to a company's worth. Green (2007) developed some indicators for relational or customer capital which rely on the firm's efficient management in creating relationships with its external stakeholders and organizations. In return, customers and stakeholders should be familiar with the firm's objectives and goals learnt through the

relationship. Thus, to achieve the connection between the customer capital or relational capital and the technical performance whereby the firms should provided an access to its technical, financial, management and other similar business resources.

2.5 Measurement of Intellectual Capital

The issues on measurement has been debated ever since due to the facts that, by measured something that were intangible in nature such as intellectual capital clearly shown to be difficult. Furthermore, previous topics have enlightened on the existence of various generic definitions of intellectual capital, yet none of the definitions signify a genuine definition amongst all. Thus, the current condition has induced progressive studies that investigate the various types of methodologies used to measure intellectual capital in response to the provision of numerous definitions on intellectual capital (Joshi et al., 2011). Meanwhile, the right measurement of components of intellectual capital poses a major challenge for business strategy, and thus requires further investigation and decision. Since there are difficulties in choosing the right measurement (Kim et al., 2009; Nazari & Herremans, 2007) hence investigation on intellectual capital is extremely important in order to evaluate corporate performance and measure their efficiency level accurately for better outcomes and future improvements (Lev et al., 1999). Reliable alternatives that can be used to measure intangibles consider important part to the process and necessary to be determined based on the common framework used in order to explain on each of components in intellectual capital.

Knowledge economy have given rise to conflicts, especially when an enterprise somehow does not provide any information on its human capital according to annual report requirements before being presented to the public. Furthermore, traditional factors of

productions do not include any details on intellectual capital. Indeed, it become necessary to develop the methods based on economic theory of intelligent capital performance and perceptions on corporate performance.Theoretically, measuring intellectual capital consider as something that were relatively conceivable and been proven by previous studies that started to measure intellectual capital based on the accounting and financial metrics. However, current accounting principles that were developed and introduced by Luca Pacioli clearly proved that none of balance sheet items can signify the human capital as an asset even though during era of post-industrial economy where the conventional accounting system have yet not provided any appropriated methods to measure intangible assets.

In contrast, accounting principle only declared based on the financial value of tangible assets. Therefore, one of the challenged in knowledge age were within the definition of intangibles which has become more complicated and contradicting with tangible assets. As the result, numerous internal and external measurements on intangible capital introduced within accounting system in order to avoid any arising conflict. An appropriate measure for intangibles from various approaches with the extension to the classification consider one of the solutions towards the issue (Luthy, 1998 & Williams, 2000). Knowledge age have identified on the differences between the modern approaches versus traditional approaches that been highlighted such as the level of knowledge of employees together with their position and changes in the organization's expenditure that clearly help to distinguish between both approaches in creating a company's values and monitor the organization's operations. However, labour and capital tend to be more powerful to sustain corporate performance (Bornemann, 1999; Pulic, 2000; Firer & Willians, 2003; Mavridis, 2004). After being finalize, researchers have agreed that three main capitals were listed within organization namely financial, physical and intelligent capital (Goh & Lim, 2004).

Table 2.1: Methods of Measurement for Intellectual Capital

Year	*Label*	*Proponent*	*Description*
1950	Tobin's q	Tobin J	Indicated on 'q' refer to the ratio of the stock market on firm's value divided by replacement cost of its assets. Thus, q will either affected or not on the proxy to measure effective intellectual capital performance.
1970	Human Resource Costing and accounting (HRCA)	Flamholtz (1985)	Methods pioneer on work for HR accounting source.
1988	Human Resource Costing& Accounting (HRCA)	Johansson (1996)	Reducing the firm's profit by computing the hidden impact on HR costs by amendment towards P&L. Intellectual capital will be measure by calculating the contribution on human asset held by the company divided by capitalized salary expenditures.
1989	The Invisible Balance Sheet	Sveiby (ed.1989) The 'Konr ad'group	The difference between the stock market value of firm and its net book value explained three interrelated of human, organizational and customer capital. The three categories first published in this book in Swedish turn to become a de facto standard.
1990	HR statement	Ahomen (1998)	The HR profit and loss account divided personnel related costs into three classes for human resource costs namely renewal costs, development costs, and exhaustion costs.
1992	Balance Score Card	Kaplanan and Norton (1992)	The performance on organization in evaluate indicators which cover four main angle on financial, customer, and internal process as well as learning perspective. This method suitable for matching the strategic objectives on the firm.
1994	Skandia Navigator	Edvinsson and Malone (1997)	Intellectual capital will be calculated through analysis which consists of total number 164 metric measurements (91 intellectually based and 73 using traditional metrics). Further, it also covered 5 major components; financial, customer, process, renewal as well as development and human.
1996	Holistic Accounts	Ramboll Group	EFQM Business Excellence mode, describes 9 key areas with indicators; Value and management, Strategic process, Human resource, Structural resource, Consultancy, customer results, Employee results, Society results and financial results.
1997	Economic Value Added (EVA)	Steward (1997)	Calculated by adjusting the firms disclosed profit with charges related to intangibles, Changes in EVA provided an indication of whether firm's intellectual capital productive or not.
1997	Calculate Intangible Value (CIV)	Steward (1997) and Luthy (1998)	Adjustment US tax method for calculating the value of goodwill. The excess return on hard assets will be use this figure as basis determine proportion of return attributable intangible assets.

Table 2.1 continued

1997	Market-to-Book Value	Steward (1997) and Luthy (1998)	Value on intellectual capital will reflect the differences between the firm's stock market value and the company's book value.
1998	Value Added Intellectual Coefficient (VAIC)	Pulic (1998)	The method identify on how much and how efficient the intellectual capital and capital employed in order to create value based on relationship with three major components namely capital employed, human capital and structural capital
1999	Knowledge Capital Earnings	Lev (1999)	Knowledge capital measurement the portion on normalized earnings (3 years' industry average and consensus analyst for future estimated) over above earnings attributable to book assets. Earnings then used to capitalize knowledge capital similar to CIV.
2000	Total Value Creation (TVC)	Anderson And McLean (2000)	A project initiated by the Canadian Institute of Chartered Accountants. TVC requires to apply discounted projected cash-inflows to re-examine the events that affected on planned activities.
2000	The Value Explorer	Andriessen and Tiessen (2000)	Accounting methods proposed by KMPG for calculating and allocating value for 5 major concerns on intangible assets namely asset and endowments, skills and tacit knowledge, collective values and norms, technology and explicit knowledge and last but not least the primary and management process.
2000	Value Creation Index (VCI)	Baum, Ittner, Larcker, Low, Siesfeld and Malone (2000)	Inspire by Wharton Business School and associate with Cap Gemini Ernst & Young Center to Business Innovation and Forbes. It estimates the importance of different non-financial metrics in explaining market value of companies. Pointing on different factors for different industries. The VCI focuses on main factors that markets important rather than on verbally by higher management.
2002	Meritum guidelines	Meritum Guidelines (2002)	An EU-sponsored research project which yielded a framework for management and disclosure of intangibles assets in 3 ways: 1) Define strategic objectives 2) Identify intangibles resources, 3) Take actions to grow intangible resources. Classified intangibles into Human capital, Structural Capital and Relationship Capital.
2003	Danish guidelines	Mouritzen Bukh and al (2003)	Intellectual capital statements consist of: i) Knowledge narrative ii) Set of management challenges iii) Number of initiatives and Relevant indicators
2004	MAGIC	EU research project	Project funded by European Commission. This technique inspires from the Skandia Model that consist of Human capital, Organizational capital, Market capital and Innovation capital.

Numerous methodologies were available clearly reflected the fact various definitions have been pulished and provided by the scholars were being accepted. An examples, the neo-classical assumption which was practiced until the late 1980s on opinion that organizations have to shift their concentration to the competitive edge environment. In accordance to the considerable evidences gained from the previous studies, a total numbered of 28 metrics for measured the intellectual capital have been identified (Sveiby et al., 2012), before that Andrissen (2004) had listed more than 25 methods available to measure intellectual capital. The theory of resources posited that organizations through their management have to accept the fact that competition between enterprises is compulsory in order to gain higher profitability. As the replacement of existing sources in an organization seems like difficult task, organizations must then start to utilize their existing assets in order to attempt formulating their strategic advantage (Llewlyn, 2003; Canibano & Sanchez, 2003).

The level of awareness within organization according to the resource-based perspective that gained attentions. According to Sveiby, the know-how of company briefly explains how knowledge should be manage within non-traditional knowledge organizations (Sullivan, 2000). In 1990s, numerous frameworks have come up with measurements of performance developed with the similar objectives of overcoming the weaknesses and limitations of financial measures (Bourne et al., 2000). Intangible resources (Amir & Lev, 1996) like learning, internal procedures and key customers considered major parts of these models (Simons, 1990). Meanwhile, other approaches such as the Skandia AFS built by various Swedish organization and introduced in 1993 by the Swedish Council of Service Industries were served as the standard proposal for annual reports (Sullivan, 2000). Later, Edvinsson was combined on Sveiby's method with the Balance Score Card of Kaplan and Norton (Sveiby, 2001) created a new method to calculate the intellectual capital.

The method were published in Skandia's first that reported in 1995 title "Visualizing Intellectual Capital in Skandia" (Bollen et al., 2005). Examples of companies which have adopted the simillar model such as Canon, Hewlett-Packard, CIBC and Dow-Chemicals which have done after realized the importance of human capital and leadership development (Roos & Roos, 1997). These factors were recognized to be the factors that empowered an organization's culture and considered to have potential in sustained competitive advantage (Bontis & Fitz-enz, 2002). Thus, the new economy encouraged organizations to employ technological innovations such as internet, telecommunications and computer intensively in order to produce, distribute and sell services alongside their own products. Simultaneously, organizations' structures must reflect the international matrix of e-business network structure. Studies such as Sveiby (1997), Edvinsson and Malone (1997) and Stewart (1997) totally focus on the investments to transform the tangible assets into intangible.

This have turned out and would changed the intangibles into significant value drivers of financial capital. Numerous measurements have been modelled as inspired by various scholars in the field of intellectual capital. However, this fact indicates available methods for measuring intellectual capital from perspective of management science that clearly not been explored yet. Hence, intellectual capital can affected a firm's performance in which intellectual capital has the potential to determine the company's values, profits and wealth.Thus, the new economy encourage organization to employ technology innovation like internet, telecommunication and computer intensively in order to produce, distribute and sold the services alongside with their owned products. Simultaneously, organizations' structures must reflected the international matrix of e-business network structural. Studies such as Sveiby (1997), Edvinsson and Malone (1997) and Stewart (1997) totally focused on the investments to transformed tangible assets into intangible assets.

2.6 Empirical Studies of Intellectual Capital

Intellectual capital were shown progressively through a rapid growth (Bontis & Serenko, 2009; Serenko et al., 2010). Study in these area have focused on development of the relationship between performance and efficiencies of intellectual capital regardless of the industry. One of the study conducted by Shiu (2006) provided empirical findings within manufacturing and biotechnology industry (Tseng & Goo, 2005; Hermans & Kauranen, 2005). The study employed the VAIC model in order to explore the correlation between the intellectual capital and corporate performance among the Taiwanese-listed technology companies. The sample data of the study included a total of 80 registered technological companies. The research's outcomes proved a significant and positive association between intellectual capital and firms' profitability in terms of ROA and market values or book value ratio.

Additionally, the study were revealed the findings that highlighted on negative relationship between the intellectual capital and productivity proxied based on asset turnover (ATO). A recent study were done by Chokri et al., (2012) on the non-financial services industry that investigated the impact of intellectual capital on the firms' performance. The study were based on the data from a sample of 25 non-financial companies listed the Stock Exchange of Tunisia for the period of 2009 until 2011. The results have shown that Tunisian-listed firms have relatively high investments in human capital efficiency in order to create their firms' value-added. However, the study's overall empirical finding showed a significantly positively associated between the components in intellectual capital with the firms' performance. Another empirical were conducted by Tan et al., (2007) on the impact of intellectual capital performance consisting human capital efficiency, structural capital efficiency and capital employed efficiency with financial performance measured by ROE,

EPS and ASR. The study employed VAIC model to measure intellectual capital from the sample data obtained from total of 150 companies listed for Singapore Stock Exchange. The overall findings provide more evidences on the fact that intellectual capital were significantly related with the firms' performance as well as futures performance (Tan et al., 2007).

Whereby, Dunn and Lucas (2010) examined the study conducted on the intellectual capital efficiency and financial performance within Australian hotel industry. Sample data were taken from year 2004 until 2007 and measured the intellectual capital used by VAIC model, and results shown that human capital efficiency were the major impact on performance of the Australian hotel industry. Consequently, the study proved the positive influenced of intellectual capital towards the financial performance within Australian hotel. Other studies were conducted within other industry and also revealed the empirical evidences on the positive relationship between the intellectual capital and the firms' performance. Among all, the automobile sector were shown to have no significant association between the intellectual capital and firm performance. Such study was done by Ji-jan et al., (2006) who claimed that no components of intellectual capital provided any significant towards the effect of the financial performance. The study was used the sample of 32 automobile companies that were listed in Shanghai Stock Exchange.

A study on the relationship between intellectual capital and firm performance among the constructions company in Poland based on data collected from 2000 until 2005 and proved all of the components of intellectual capital were significantly positive towards firms' profitability (Buszko & Mroziewski, 2009). The findings were furthered supported by Molodchick and Bykova (2011) whose obtained on the data from the sample of 350 Russian industrial companies from the period of 2005 to 2007 postulated that the components of

intellectual capital clearly have significantly positive relationships with financial performance. Ironically, the investigations based on intellectual capital performance within the Asian region, especially in Malaysia that were still very limited.

Bontis et al., (2000) was one of earliest studies that investigated and explored intellectual capital in Malaysia, although the study was actually extended based on previous studies conducted in Canada. In order to examine the relationship between intellectual capital and business performance, psychometrically-validated questionnaires were applied in order to examine the interrelation between intellectual capital and business performance of the non-services versus services sectors in Malaysia. Surprisingly, the findings were similar to that of other existing literatures from other countries where intellectual capital is considered as the main contributor affecting firm's profitability. With respect to the firms' profitability, the study indicated that relational capital is relatively more significant in influencing profitability, followed by structural capital. On the other hand, development in structural capital showed positive relationship with firm's performance.

Worked done by Hazlina and Zubaidah (2008) that used correlation test to investigate the intellectual capital value of companies listed in Bursa Malaysia within the study period from 2005 until 2006. The authors showed that the relationship between intellectual capital and firm profitability is significantly positive based on analysis on data from companies listed and categorize under Bursa Malaysia's Main Board. In contrast, the results show a negative sign on the relationship between intellectual capital and firms' productivities, and this is supported by the absence of sign to explain the relationship between intellectual capital components and firm's market value based on the firms listed in both the main and second boards of Bursa Malaysia. For current study wihich use the DEA method to measure the process of intellectual capital efficiency which is different from other previous studies in

terms of DEA variables where the VAIC is used as inputs representing intellectual capital. Likewise, empirical studies on the intellectual capital performance of companies listed on the Istanbul Stock Exchange aim to determine the impact of intellectual capital performance on firms' profitability. The study used all banks currently operating in Turkey within the study period of between 1995 until 2004 as samples. To measure intellectual capital, the study employed the VAIC model to analyse the data in order to test the proposed relationship.

The evidences revealed that intellectual capital is significantly related with the efficiency and profitability level of financial services in Turkey. The authors suggested that investors should put high priority on their investments in intellectual capital to positively gain from the efficiency performance within Turkish banking sector compared to investments in physical capital. The authors additionally claimed that the overall outcomes are beneficial for the futures references. Added on the empirical evidences from Turkey, similarly findings obtained through a study conducted on banking organizations listed in China. The study proposed the need to change and improve on its efficiency level of intellectual capital, specifically for capital employed efficiency and structural capital efficiency. The results shown negatively related between the intellectual capital and technical efficiency after analysed data were concluded according to DEA methodology. On the other hand, human capital efficiency were positively related with technical efficiency; however, the relationship between capital employed and human capital towards technical efficiency were statistically significant.

Darmawan and Toro (2012) investigated on impact of intellectual capital within the banking sector in terms of market value and financial performance. The data were taken from the sample of companies from Indonesia Stock Exchange total of 31 financial institutions within

period of study from 2007 until 2010. The objective of the study was to examine the impact of efficiency and financial performance by using multiple regression analysis through the DEA method. Analysis were based on classical assumption to test and regressed the analysis which indicated that there were significantly influence between components of intellectual capital and firm's market value; however, none of the evidences were proved and signify the intellectual capital's relationship with productivity, apart from the capital or physical asset employed which only generate impact towards firm's financial performance.

Another study on the intellectual capital among insurance companies was done by Amir and Abbas (2015). The study had investigated and constructed areas for improvement that are possibly related with intellectual capital among the sample data of license insurance companies. Intangible resources were highlighted as important assets for organisations to compete in the competitive environment, especially when delivering insurance services. In this study, efficiency was measured using the DEA methodology and estimated using the equation regression method in order to justify the efficiency performance. The study's overall revealed on the finding provided another evidences that intellectual capital is positively related to firms' efficiency performance.

Chan (2009) studied the impact of intellectual capital on the organizational performance of companies listed on the Han Seng Index of the Hong Kong Stock Exchange. Similarly, the study adopted the VAIC model to analyse the intellectual capital through a sample data of selected companies in a period of study from 2001 to 2005. The relationships between intellectual capital and selected financial performances of the sample data were regressed respectively. The findings showed no concrete evidence to support the relationship between intellectual capital and four dependent variables acting as financial performance indicators. However, a moderate association was identified between intellectual capital and firms'

profitability. The study also highlighted capital employed were highly utilized by companies compared to intellectual capital in order to enhance the market valuation, productivity and profitability.

In Malaysia, Qian, Yee and Irene (2013) investigated the efficiency of listed software company with the main objective of transforming intellectual capital into corporate values. The study adopted the DEA methodology to analyse the selected sample data. The authors focused on the three main components of intellectual capital and employed the VAIC model by considering the inputs for the DEA method. Tobin Q and ROE were treated as outputs and independent variables. The study findings shown that among the sample data of 25 companies listed under the main board of Bursa Malaysia were shown to be relatively less efficient. Thus, authors had proposed benchmarking to improve the efficiency of intellectual capital management which in return allows for better decision-making by the managers of software companies.

2.7 Empirical Studies on Intellectual Capital and Bank Performance

In the last few decades, a number of empirical studies focus on financial and banking sector have been done in both developed and developing countries such as in Europe, Australia (Pulic & Bornmann, 1997; Cabrita & Vaz, 2006; Yalama & Coslun, 2007; Joshi et al., 2010) and also within the Asian and Middle East regions (Hazlina & Zubaidah, 2008; Ting & Lean, 2009; El-Bannany, 2012; Mondal & Gosh, 2012). Therefore, issue in intellectual capital have drawn concerned from various industries, especially within knowledge-based intensive sectors. The banking and financial services sector particularly have highest tendency of being subjects to the enthusiastic setting of this study. Most of the developed countries have shown that the services industry has donated the highest portion of percentage in terms of

productivity comprising of almost 70% of the value-added towards the OECD, while the remaining 30% in gross value-added come from EU-27's (Eurostat) financial service industry. Moreover, quality services must need to include intangibility, heterogeneity and co-production (Fitzsimmons & Fitzsimmons, 2000).

One of the earliest study done by Bontis et al., (2007) in an attempt to investigate the implication of business image and reputation for loyalty on customers in banking sector, while research conducted by Ordonez (2004) is described on relational capital. Besides, among all of the empirical studies that have been mentioned, most of the research on intellectual capital within the banking sector was so far conducted within European countries. These researches had investigated on the relationship between intellectual capital and banking performance measured by efficiency, value creation, bank market valuation as well as financial performance and profitability. Majority of these studies adopted the VAIC model to measure the performance of the industry.

Based on Joshi, (2010) on the study that examined the intellectual capital performance among Australian banks based on sample data from 2005 until 2007. The objectives of study were investigated the relationship among various components of intellectual capital performance. The study had adopted VAIC approach that developed by Pulic in determined the intellectual capital performance. Findings had resulted that there were significantly relationship with human capital and value added which were created by Australian bank since all the banks have relatively higher the human capital efficiency rather than capital employed efficiency and structural capital. However, the size of the banks in terms of total asset and employee's with shareholders equity has low influence on the efficiency performance among the Australian banks.

In addition, El-Bananny (2008) postulated on the determinant on the intellectual capital performance among the UK banks with the objective of investigate the determinants of intellectual capital performance in the UK over the period of 1999-2005. Throughout the study, multiple regression analysis were used in order to test the relationship between the intellectual capital performances which treated as dependent variable with certain independent variables. The result indicated that the standard variables which is bank profitability and bank risk were extremely important whereby shown that the investment in information technology (IT) system, bank efficiency, barriers to entry and efficiency of investment in intellectual capital variables that are not included in any previous studies demonstrated to have a significant impact on intellectual capital performance. However author added and suggested to require more empirical evidences were needed in order to confirm on the relationship as mentioned.

Meanwhile, the first empirical research on intellectual capital study in India was done by Mondal & Gosh (2012) of intellectual capital and financial performance of Indian banks with the objective of investigated on the relationship between intellectual capital and financial performance of 65 Indian banks for the period of 10 years from 1999-2008. In this study, VAIC method is applied for measuring the value based on the performance of the banks. Apart from that, ROA and ROE were used to measure the profitability and productivity of the Indian banks measured by ATO. Meanwhile, the impact between the corporate performance with intellectual capital and major components were measured by used the multiple regression techniques. The findings have shown that the relationship between the performance of the banks intellectual capital and financial performace indicators namely profitability and productivity. Authors added and suggested that banks' intellectual capital were extremely pivotal for created on the competitive advantages.

On the other hand, only a handful of studies on intellectual capital were conducted in developing countries, especially in the Asian region. Nevertheless, the results shown that most of studies done were based on VAIC model to measure intellectual capital, such as study done by Pulic and Bornrmann (2001) in Austria, Pulic (2002) in Croatia, Mavridis and Kyrmizoglou (2005) in Greece, El-Bannany (2008) in the UK and Joshi et al., (2010) in Australia, whilst studies on intellectual capital also appeared in intercontinental countries such as Mavridis (2004) in Japan, Yalama and Coskun (2007) in Turkey, Cabrita et al., (2007), Trevinyo-Rodriguez and Bontis (2007) in Mexico, Kamath (2007) in India, Cabrita and Bontis (2008) in Portugal, in Jordan (Sharabati et al., 2010) and Goh (2005) and Ting and Lean (2009) in Malaysia.

A reviewed on studies of intellectual capital by top international research institutions and researchers found that 19 studies were conducted in Belgium, while 33 research from Luxembourg specifically represent research conducted on intellectual capital (Mention & Bontis, 2013).There are also studies conducted in Iranian firms to empirically examine the relationship between components of intellectual capital and financial performance using the VAIC model. The results showed that human capital efficiency is considered as the main contributor and has a significant relationship with profitability measured as ROA. However, only human capital was identified to have a positive relationship, whereas the other intellectual capital components had negative relationships with firm performance (Ahangar, 2011).

Meanwhile, study measured efficiency in Pakistan's banking industry proved that the private banking sector shown the best performance as compared to other banks within the nation, especially in terms of efficiency. The research were conducted by Kamath (2007) measured the efficiency performance within Pakistan's banking sector through new innovations of

intellectual capital adopted based on the VAIC model. Other studies such as those conducted on the Italian banking industry had employed VAIC model as measurement of intellectual capital. The study's results showed that intellectual capital is not significant to businesses performance. Moreover, none of the intellectual capital components were found to have strong connection with the business performance (Firer & Williams, 2003).

Karol (2013) investigated intellectual capital performance among Polish bank by measuring level of intangible resources within the sector. The data collected was within the period of 2005 until 2009 and calculated according to the VAIC model in order to measure intellectual capital. The study argued that intellectual capital technically depends heavily on human capital efficiency, thus suggested that investments in human capital will secure the highest value added on the future compared to investments in both structural capital and capital employed efficiency. Another recent empirical study was conducted by Isanzu (2016) on the relationship between the intellectual capital and financial performance of banks in Tanzania. Sample data were collected from 6 banks within the period of study from 2010 until 2013. The findings had shown that intellectual capital has a positive impact on the performance of Tanzanian banks.

On the other hand, Goh (2005) postulated that investments in human capital would ensure profitability of the banking sector according on the findings of the study which measured the effect of intellectual capital on performance of commercial banks in Malaysia. Data were obtained from Malaysian banking institutions for the period between 2001 and 2003. The results have shown that foreign banks are inclined to be as efficient as domestic banks, yet domestic banks appeared to enjoy more on value-added as compared to foreign banks. Nik Maheran et al., (2009) conducted a study on the relationship between intellectual capital efficiency and bank performance using sample data collected on 18 financial companies

listed in Malaysia within the study period of 2002 to 2006. The results showed that intellectual capital relatively influences the market value which was more affected by capital employed (financial or physical capital). The overall results shown that the performance of Malaysian bank were positively related to human capital and structural capital, while capital employed was not connected at all.

Research done by Ting and Lean (2009) based on relationship between intellectual capital and financial performance was adopted the VAIC methodology to measure the intellectual capital and company performance, whereby measured the performance based on the ROA as a dependent variable by using data collected for the period of study from 1999 until 2007. Data were collected from the Malaysian financial sector obtained from annual reports and financial statements. Overall, the study resulted and proved that financial institutions in Malaysia were shown significantly positive relationships between intellectual capital and ROA. Similarly, a study done by Saeed, Shekoofeh and Mahnaz (2012) described the impact of intellectual capital towards financial performance of Iranian companies. The study aimed to investigate on the relationship between intellectual capital and financial performance based on the sample data of Iranian companies listed on the Tehran Stock Exchange for a study period from 2001 to 2010. The results provided an evidences of a significantly positive relationship between intellectual capital and financial performance.

Another study done by Lipunga (2014) examining the relationship between the intellectual capital and financial performance among company in Malawi's banking sector and had adopted VAIC method to measure intellectual capital. The results showed that the utilization of human capital efficiency was relatively higher compared to structural capital efficiency and customer capital efficiency. Other studies had investigated on the impact of intellectual capital efficiency on firms' financial performance such study conducted by Muhammad and

Ismail (2009) which had employed the VAIC model and has found a positive and significant relationship between the financial performance and profitability among Malaysian banking sector. In addition, the authors highlighted that human capital efficiency and structural capital efficiency has not provided any significant relationship with financial performance and profitability compared to capital employed efficiency.

First study in intellectual capital which evaluated on the banking performance and employed VAIC model was conducted by Pulic and Bornemann (1997) with objective of investigated the relationhip between intellectual capital and financial performance within 24 largest Austrian banks. The data were collected within the period of study from 1993 to 1995 (Pulic & Bornemann, 1999). The study was an extension of investigation on Croatian bank based on data collected from the year 1996 until 2000 (Pulic, 2001). Both studies showed significant differences between the two countries' banking sectors based on their ranking towards the level of efficiency and performance based on the traditional accounting measurements. Similarly, study that applied the same methods was conducted by Mavridis (2004) on the performance of 141 groups listed in Japanese banks within a study period of 2000 until 2001. The study claimed that there is no significant relationship between intellectual capital and the performance of different groups in Japanese banks. Only physical capital creates a positive relationship between intellectual capital and bank performance.

Study done by Yalama and Coskun (2007) had focused on the effect of intellectual capital performance on Turkish banks' profitability. The study analysed on the data that collected within the period of study from 1995 to 2004. As the result, study were concluded that any investments in intellectual capital were technically more pivotal than investments in tangible capital within the banking sector in Turkey. Among others, Cabritta and Vaz (2006) whose studies between the intellectual capital and value creations from the sample evidence of

Portugese banking sector. Under this worked, the objective was to consolidate on the existed literatures which demonstrated the intellectual capital were positively and significacantly associated with the organizational performance. The findings of studies were proved that intellectual capital was substantively and significantly related to organizational performance. The study also had issued and suggested as for the future research perhaps to extend with several directiosn on any other industries from other countries and offered the future study to use on different alternatives of approaches applied indicated to obtain the different findings.

The study which were conducted in Thailand had adopted the VAIC model and showed a significantly strong relationship between firms' intellectual capital and investment capital gained on shares. On the other hand, the study's finding also have provided an evidences indicate on negatively related between the capital gain on shares and corporate financial performance. A study conducted by Li and Guo (2005) postulated throughout the theories of resource-based enterprise indicated that human capital has offered strong and positively significant relationship with the firm performance. This is further supported by Liu (2009) whose study on intellectual capital and performance of China's commercial listed banks in 2008 show that human capital coefficient and structural capital coefficient have the positive relationship with profitability of companies in China's commercial banking sector.

Furthermore, study done by Abdul Salam et al., (2011) which measured the intellectual capital performance of Kuwaiti banks using a sample of 8 Kuwaiti commercial and non-commercial banks for the study period from 1996 until 2006 shown consistent resulted with previous studies whereby both commercial and non-commercial Kuwaiti banks have relatively higher utilization of human capital efficiency in order to increase the bank's

performance as compared to the other components of intellectual capital which refered to the physical and structural capital. Apart on quantitative research, other recent studies had also based on the qualitative in natures such as done by Murthy and Mouritsen (2011) on the relationship between the intellectual capital and financial performance by employ based on the case study approach. The findings highlighted the relationship between intellectual capital and financial capital were consider to be complicated to explain in detail as they were in balance and not instrumental to each others. Furthermore, Chen et al., (2014) whose study based on the interview session with some analysts and the bank managers in UK have concluded that, the intellectual capital were the most "appropriate combination and the interaction process for financial intermediation, information intermediation and the risk involved in management of the banks.

2.8 The Gap in Literatures

Empirical literatures reviewed under this chapter reflected on general stated that intellectual capital disclosure and measurement had continued been discussed since past two decades. In contrast, studies concerned with conventional financial institutions proved mixtured of evidences in related to the intellectual capital. Therefore, it is important for futures study conducted on the linkages between intellectual capital and banks' performance, especially for Islamic finance in order to develop and promote Islamic banking in globally. In addition, although the study on the Intellectual capital on a firm performance was researched over the last decade or so, the empirical evidence on its actual contribution to the dynamics of the value creation process remained scarce in certain sectors such as Islamic banking and finance also in emerging (developing) economy including Malaysia. Majority indicated relationship between intellectual capital and business performance study on the Islamic finance institution are based in the developing countries.

CHAPTER 3

METHODOLOGY

3.1 Introduction

The previous chapters highlighted on the significance of intellectual capital that attracted a number of scholars to investigate the values created by investing in the intellectual capital and generated towards competitive advantage for further improvements in efficiency levels, especially within the enterprises (Kavida & Sivakoumar, 2009). In response, it also foster the business performance in becoming more dynamic and committed in facing the fierce competitiveness in the same industry within current globalized environment. Thus, fully concentration is essential for the growth of intellectual capital in order for enterprises to recognize their own potential assets which in nature are considered intangible and to be able to control their assets used to compete within business insight (Cater & Cater, 2009).

The quantitative method applied these study has enable the scholars to explore the components of intellectual capital and relationships with technical efficiency performance among the Malaysian banking sector. The quantitative method also help researchers to compare between Islamic banks with Conventional banks. Scholars divide research into three different types, namely explanatory, descriptive and exploratory subject to the nature of information required by the researcher (Tull, 1990; Yin, 2009; Saunders, 2011). It is appropriate to use an exploratory study when the situation at hand is not well-known and when the literature does not offer much evidence on the subject matter (Sekaran & Bougie, 2010). Furthermore, Sekaran and Bougie (2010) described that an exploratory study is required in order to establish a viable theoretical framework on an existing phenomenon. In addition, this section will provide details on the research methodology, data collection,

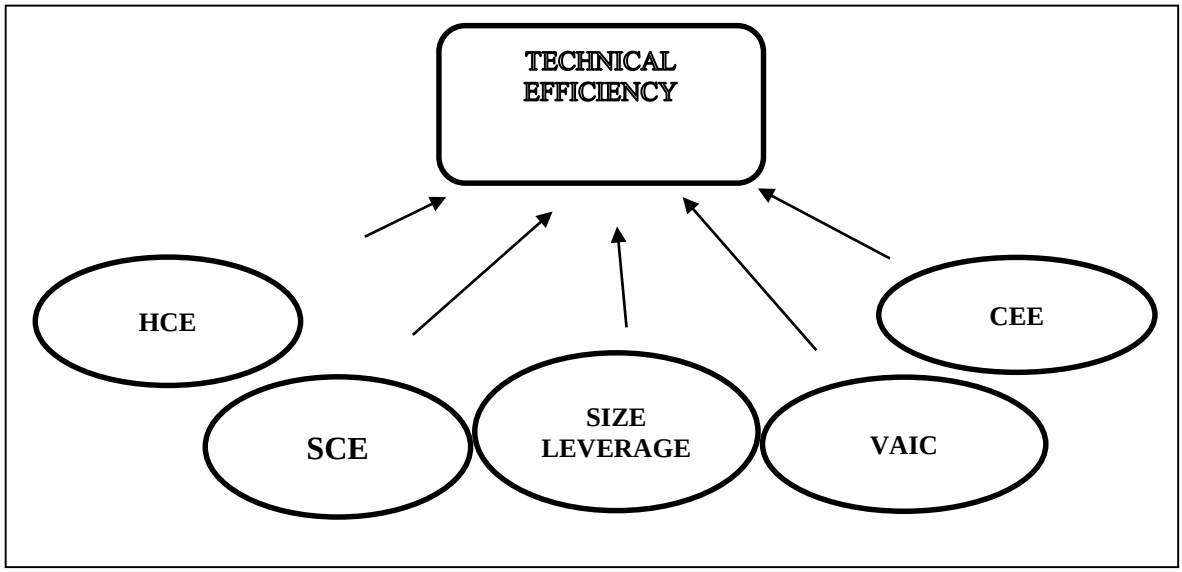
alternatives to the measurement of intellectual capital, analysis on technical efficiency under the DEA based on the input and output indexes as well as analysis of data in order to investigate the relationship between intellectual capital and efficiency among Malaysian bank. Basically, the selection of research methodology is extremely vital for each and every research conducted in order to accurately analyze on available data to contribute to useful findings and additional empirical evidence towards existing literature in related fields and achieve the objectives set in a particular study.

The study conducted to investigate the significant relationships between selected independent variable and dependent variables of the sample data taken within a certain period. Whereas, the research design was applied to assist in achieving the objectives of this study which are statements that briefly describe how the research's variables could be narrated with one another. According to Creswell (2008), a relationship study is appropriate to be used to investigate the significance of relationships with respect to the objectives of the study; thus, this research which is concerned with investigating the efficiency of Malaysian bank and its relationship with the main sources of intellectual capital is considered to be on the right path.

3.2 Conceptual Framework

The model for the study is presented based on reviews of existing literature which focus on intellectual capital efficiency within Malaysian banking sector. The framework for this study is as per illustrated in Figure 3.1. The research model was developed according to existing literature and relevant theories. In Chapter One, highlighted on the main purpose for the study is to investigate the relationship between VAIC and Technical Efficiency performance among Islamic and Conventional banks in Malaysia. The research framework was refer to

subject of interest that is intellectual capital efficiency which were treated as independent variable and expected to potentially contributes towards any signal of significant relationship or effect with technical efficiency performance.



Note: HCE -Human Capital Efficiency; SCE - Structural Capital Efficiency; CEE –Capital Employed Efficiency, Lev-Leverage, Size- bank Size.

Figure 3.1: Conceptual Framework

According to the resource-based theory, the firms which efficiently utilize their intellectual capital resources were able to enhance their economic performance that gained competitive advantage. Since the overall intellectual capital efficiency contain of three components, therefore focused on each of the components' efficiency that may have relationship with technical efficiency and in turned, influences the economic performance. Hence, the intellectual capital efficiency were treated as an independent variable that consists of VAIC, human capital efficiency, structural capital efficiency and capital employed efficiency. In addition, according to the agency theory, the firm's performance was probably affected by internal factors such as firm's size and firm leverage. Thus, the research framework also include the effect of firm-related variables namely size and leverage as control variables.

3.3 Sample Data

The sample include all of the Malaysian Islamic and Conventional banks that are currently registered with a full license and listed under BNM. There is only 16 Islamic and 27 Conventional banks operated in Malaysia as of 2017. Those banks are listed in Table 1.1. The data is obtained fom Malaysian Islamic and Conventional bank which is divided into domestic- and foreign- controlled institutions. Originally for Conventional banks, there are total number of 28 banks however based on Firer and Williams (2003) and Shin (2006), Bank's with some data are missing (unavaibility of annual report in consequence of merger and acquisition or newly established) will be excluded such as banks of China Construction is start and commenced their business operations only in 2016. In addition, banks with the negative human capital and structural capital value were excluded from the sample.

Then, a selected of 10-year period from the financial year ended 2007 to financial year ended 2016 as for the study period. These years were chosen because considered as sufficient number of years basically the ranges from 5 to 10 years were provided a reasonable duration for the collection of intellectual capital data. This period is assumed to be long enough to handle the short-term irregularities and provide the reliable estimation for banks' efficiency. It is also considered as the most recent available of the bank's data that were obtained from annual reports of all banks. Specifically, the data collected were based on the annual audited statements of financial position (i.e., balance sheet), comprehensive income (i.e., income statement), and notes to the accounts. The financial statements for each banks were obtained from websites and bankscopes data.

Further, the additional information on the data published in the annual report were also collected. These were basically for the external used only; however, it certainly served the

purpose of standard justifications if there were any confused over the validity of data in investigated the Malaysian Islamic and Conventional banks' of intellectual capital and technical efficiency performance. The reason for used annual reports of each financial institution were considerable supported within accounting disclosure literatures of analysis of reported using the annual reports. For instance Campbell (2000) suggested that annual reports were the most widely used distributed of all an organization's publicly produced documented and managed had completly editorial controlled of the discretionary and disclosure of information in these documents.

3.4 Methodology

Research methodology is extremely important part to the field of each studies. The current study, that emphasize on the methods mainly in measuring the intellectual capital and its major components always available with the multi of choices on measurement however the relevance of measure must be taken into consideration before applying in analyzing and facilitating to the research's finding. Therefore, the first part of these section, will further describs on the proxies used to measure the dependent variables, independent variables and control variables whereby, the multiple regression equation will be revealed on the last part of this section.

In efficiency, Peter Drucker has refer it to the sum of all things that have been done properly. However, the Audit Committee of Auditing Organization had explained the efficiency is a ratios resulting from the company operations (outputs) through the resources consumed (inputs). Efficiency in operations is recognized as the supply of the maximum efficiency (outputs) with the minimum consumption of resources (inputs) through an optimized techniques. Basically, efficiency do provides the ratios of several inputs and outputs (Katz,

1978). It is reflected on the differences between the potential and the actual efficiency, and shows how much the organization can generate if it is performs optimally. However, the actual efficiency is identified based on the ratios of actual input levels whereby the actual efficiency normally much smaller than the potential efficiency.

Neverthelss, Pires described on the efficiency that basically concerned on how well the organization can used its resources in order to produce the best performance at the point of time. In other words, efficiency represented the resources to be used or all of the total costs that involved until the worked is done. It also can be expressed as to what extent the resources and facilities is utilized at the maximum level. These current study were about to investigate on the Islamic and Conventional bank's performance as measured by efficiency based on the technical efficiency performance obtained from the DEA. In viewed of the performance in banking sector, it can be interpreted by the signal of success for each of the banks as well as in industry as whole in determined their level of efficiency accordingly. In the past, studied have used a variety of techniques and data sample used throughout applicable methods to measure efficiency. It is accepted that the different approached of measured could possibly generated different findings, even used the similar data sample.

Banks could sustained their efficiency level when conducted on the banking operations, although the competition were existed between the banks even from the outside of the industry (Wheelock, 1993). In fact, in 1980s the banks that experience on the higher costs of operations and production tend to have a higher chances of failures (Berger & Humphrey, 1992) whereas, the banks within the industry with a lower technical efficiency performance consequently will face a greater chances of getting failures (Wheelock & Wilson, 1995).The analysis used DEA methodology, basically offered comprehensive directions either in way of input-oriented or output-oriented directions. The former were refer to the objective of

proportionally decreased the input amount with the output amount held to constant at the present level; and the latter is concerned on proportionally decreasing output utilization with the input amounts held constant at the present level. As the study objectives is to investigate the utilization of intellectual capital and its' main components towards technical efficiency among the Malaysian banks thus, the input oriented model was been selected.

Several studies on the efficiency of the Malaysian Islamic and Conventional banking sector have been conducted by using the DEA method such as that by Leitner et al., (2005) who illustrated the usefulness of the DEA in estimating and standardizing intellectual capital efficiency in a broaden way. With the reason, these study will first to investigate the utilization of VAIC and its' components among the Malaysian Islamic and Conventional banks and to evaluate the technical efficiency among the Malaysian banks while for the last part of the study will perfoming the regression analysis in order to examine the nexus between the intellectual captal and technical efficiency performance of the Islamic and Conventional Banks in Malaysia.l

3.4.1 Measurement of Independent Variables

Previous studies such done by Bontis (1998), Chen et al., (2005), Tayles et al., (2007) and Stahle et al., (2011) acknowledged on the importance of intellectual capital which have been previously accepted by many other scholars. Likewise, Chen et al., (2005) and Tan et al., (2007) postulated on the measurement of intellectual capital were still at the early stages of development even there were several methods for measured the intellectual capital yet must took into the account that measured the value of intangible assets may not be accurately throughout any absoluted ways. However, it is an excellent reference for benchmarking as a measured of the potential business evolution of a company over time (Lev, 2003). Many of

the existing methods are difficult to apply, some of it may required too much information or perhaps not clearly being described, while other are not in numerical order which eventually only as providing a references to managers for decision-making. In general, the actual and accurate techniques that can be used to determine intellectual capital are based on underlying theories for intellectual capital. Among all, VAIC model found to be relevant and most convenient approaches in measuring intellectual capital while commonly used on most practice method (Joshi et al., 2010; Zeghal & Maaloul, 2010; Chu et al., 2011; Maditinos et al., 2011; Pal & Soriya, 2012).

Existing studies were practically adopted on VAIC model to measure on the firm's' intellectual capital performance. VAIC was referred to the measurement on creation value per money of unit that invested in each sources. The higher VAIC for the firm, the more value added is created by the firm's overall sources (Pulic, 2004). Most international studies use the model presented in VAIC which predominantly focused on the studies within the banking and finance sectors. The scenario allow to follow by others practioners in explore the measurement of intellectual capital. Therefore, current study will be based on VAIC model to focus on Malaysian Islamic and Conventional banking sector. Basically, VAIC focusing on three indicators, namely capital employed efficiency, human capital efficiency and structural capital efficiency which is also the main components of intellectual capital (Pulic, 2004b).

According to the assumption in VAIC model, the capital employed efficiency consists of both physical and intellectual capital is used for production. They both are considered as investment items and thus, treated as functions of value added creation. Hence, banks' net book value of total assets were considered as the capital employed. Intellectual capital consist of human capital and structural capital as well as capital employed. Nonetheless,

these are treated as independent variables following most previous studies such as those done by Young et al., (2009); Zeghal and Maaloul (2010) and Wang (2012) with similar frameworks adopted on a company's value through the consideration of both combinations of financial capital and physical capital (Edvinsson & Malone, 1997; Roos et al., 1997). Similarly, the VAIC provides information on value creation efficiency for an organization's physical and intellectual capital (Tan et al., 2007).

Likewise, it was not only measured the intellectual capital for the organization, but also measured on the efficiency of the organization as a whole (Mohiuddin et al., 2006). Pertaining to this, VAIC generated based on the analytical procedures of management, shareholders and other relevant stakeholders in a way of effectively monitored and evaluated value added efficiency by company's total resources used as major resources of intellectual capital. Similarly, Firer and Williams (2003) suggested that VAIC represented the coefficient of value added efficiency for intellectual capital within a company and is comprised of the sum of three efficiency coefficients namely human capital efficiency, structural capital efficiency and capital employed efficiency.

The capital employed was the indicator of the value added efficiency of capital employed, human capital were the indicator of the value added efficiency of human capital, and structural capital was the indicator for the efficiency of structural capital. This method facilitated the measured of each sources of intellectual capital's contribution. The calculation of the VAIC method will be based on the steps (Pulic, 1998; Firer & Williams, 2003; Pal & Soriya, 2012) shown below. In accordance to the stakeholder theory (Meek & Gray, 1988; Donaldson & Preston, 1995; Riahi-Belkaoui, 2003; DTI, 2006), the value added which represented the net value or wealth of firms created during the year was expressed as per the equation in formula (1):

VA = OUTPUT - INPUT

Where:

VA: Differences between output and input is the value created by the organisation.

Output: Total of all income or revenue generated from all products and services sold.

Input: All the expenses incurred excluding labour, taxation, interest, dividends and depreciation.

The calculation of value added was based on the stakeholder theory as viewed by Donaldsson and Preston (1995) in Pulic (1998). Based on theory, it is suggested that any party that affect or can be affected by what the firm does has an interest (stake) in the firm. In this context, "stakeholder' including not only the vendors, employees, customers, directors, and the government, but also the members of the community as a whole. Therefore, the value added by firm to these stakeholders is a broad performance measure of the firm compared to accounting profit which only calculates the returns attributable to the shareholders of the firm. According to Riahi-Belkaouni (2003), the value added by the firm during the particular period can be calculated by using the following formula (2):

R= S – B – DP –W – I- D – T

Where:

R: Retained earnings for the period

D: Dividend paid to shareholders, and

S: Net sales revenue

W: Employees' salaries and wages

I: Interest expenses,

T: Taxes.

B: Cost of goods sold plus all expenses.

Equation (3) thus posits that:

S – B = DP + W + I + D + T + R

The left hand sided of the above formula shown the total value generated by the firm during a particular period, and the right hand side shows how the firm has distributed its generated value among stakeholders such as employees salaries and wages (W), debt holders or interest (I), government is Taxes (T), and shareholders or Dividends (D), Retained earnings (R) and Provisions for Depreciation (DP). Therefore, formula 3 can be re-arranged to calculate the value added by the firm as shown in Formula (4):

$$\mathbf{VA=}\ DP + W + I + D + T + R$$

Where:

VA = I (total interest expenses) + DP (depreciation expenses) + D (dividends) + T (corporate tax) + R (profit retain for the year)

Following on Pulic (2000a, 2000b) and Firer and Williams (2003), next steps shown the calculation of (VAIC) and its components such as the coefficient of capital employed, coefficient of human capital and coefficient of structural capital. The second step involved is used to assess the relation between value added and human capital. The value added human capital coefficient indicate how much value added has been created by one financial unit invested in employees. For Pulic (2004), employee costs are considered as an indicator of human capital. These expenses are no longer part of the inputs. This means that the expenses related to employees are not treated as the cost, but as an investment. Thus, relationship between value added and human capital indicated the ability of human capital to create value of the company. Human capital efficiency also represented the value of employees. In short, human capital efficiency included the employees' skills, experiences, productivity and knowledge (Clarke et al., 2011). Pulic were calculated human capital employed as shown in Equation (5):

Indicator of Human Capital Efficiency (HCE)

HCE = VA / HC

The second efficiency measurement is structural capital efficiency. Structural capital efficiency in intellectual capital consists of a company's strategy, brand name, organisational network, customer database, and patents. Pulic argued that there is an inverse relationship between structural capital and human capital in the value creation process. In short, if structural capital contributes less to the value creation process, the human capital will contribute more in return. Pulic calculated structural capital (SC) and structural capital efficiency (SCE) as in Equation (6):

Indicator of Structural Capital Efficiency

SCE = VA/HC

Where, **SC** = VA – HC (an appropriate proxy for structural capital); result of human capital past performance).

HC- Total Salaries and wages for a company

The third efficiency measurement is the capital employed efficiency. Clarke et al., (2011) defined capital employed efficiency as the efficiency of intellectual capital that both human capital efficiency and structural capital efficiency fail to capture. Capital employed efficiency basically describe how much value added is created by spending money on capital efficiency. Capital efficiency refer to the capital employed (book value of asset) or in other words, the equity value of the firm. Pulic's calculated the capital employed efficiency as in Equation (7):

Indicator of Capital Employed Efficiency

CEE = VA/CE

Where,

CE = Physical Assets + Financial Asset = Total asset-Intangible asset

All the efficiency measurements (human capital efficiency, capital employed efficiency and structural capital efficiency) bring the VAIC as one. VAIC can be calculated by compiling all the equations above to become a final equation (8):

VAIC = CEE + HCE + SCE

Where,

VAIC: Indicate corporate value creation efficiency on a firm's resources

Newly created Value Added, calculated as follows:

VA = Operating Profit + Employee Costs + Depreciation + Amortization

OR

VA = Output (Total Income) – Input (Costs of purchasing goods and services)

Human Capital Efficiency (HCE) = VA/HC

Structural Capital (SC): Result of human capital past performance (organisation, licenses, Patents, image, standards and relationship with customers).

Therefore;

Structural Capital Efficiency (SCE) = SC/VA

Capital Employed (CE): All material; and financial asset

Capital employed Efficiency (CEE) = VA/CE

Intellectual Capital Efficiency (ICE) = HCE + SCE

ICE-Indicator which shows how efficient IC is in creating value.

VAIC = ICE + CEE:

Indicate on value creation efficiency for all of the resources (sum of the previous indicators). Hence, it does expresses the intellectual ability of a company, regional or national economy. Furthermore, being exploratory in nature, current study is set to evaluate the intellectual

capital performance of the Malaysian Islamic and Conventional banks through comparatives analysis. The traditional way of ranking on Malaysian banks presented as to compare based on the ranking according to the VAIC calculations is illustrated. Additionally, the coefficient is considered as a tool for the measurement of intellectual capital based on Pulic's model. Although the method utilize on the accounting data to develop the coefficient, the highlight is on the role of resources which create value for a company with respect to the indicators considered by the VAIC to represent the independent variables (e.g; Goh, 2005; Kamath, 2007; Yalama & Coskun, 2007; Muhammad & Ismail, 2009; Ting & Lean, 2009; Mondal & Ghosh, 2012; Rehman et al., 2012) for the regression model (e.g; El-Bannany, 2008, 2012; Joshi et al., 2010).

3.4.2 The Measurement of Dependent Variable

The objective of this study is investigate the relationship between the technical efficiency performance and the intellectual capital and its main components among the Malaysian Islamic and Conventional banks in Malaysia. In order to validate the relationship or impact of intellectual capital including its major components towards efficiency performance, for these reasons, the study has adopeted a methodology based on DEA whereas the analytical methods based on the linear programming procedures use Farrell's efficiency measure (Farrell, 1957). Generally, the efficiency entailed on the performance or function to maximize a preferable outcome with given on resources (Yao et al., 2010).

Meanwhile, in absolute terms, efficiency produce mostly involved "a comparison of observed output to maximum potential output obtainable from the input, or comparing observed input to minimum potential input required to produce the output, or some combination of the two" (Fried et al., 2008). In relative terms, it is a comparison of

productivity among a number of organizations in the same production process so as to recognize the efficient configuration of resources that can produce the desired outcomes. According to the measurement of efficiency performance, it can be based on two componets namely technical efficiency and allocative efficiency. The former is refer to the ability that maximizing the output using a given input while the latter is refer to the ability to use inputs in an optimal proportions, given their prices and production technology. Both measurement are frequently used to evaluate the overall economic efficiency (Coelli, Rao, & Barttese, 2001). This approaches offer the benefit of allowing a direct comparison between the firms that are in the same industry and nature of business with the aim of achieving improvement through benchmark. It overcomes one of the main limitations of the current intangible assets metrics allowing a comparison between firms regarding their management of intangibles.

It is important to underline that DEA provides an aggregate measure of relative efficiency for each company, the analyst can realize a ranking system of the firms within their industry. In this way, the low-ranking banks that DEA labels as inefficiency in ectracting value from their intellectual capital, will have a model to imitate in the high-ranking ones; the best practices of their sample. These results of DEA analysis offer a guidelines to become more efficient that prescribes the inefficient banks specifically benchmarked to follow and what adjustments to the inputs and outputs that should be made in order to reach the efficiency frontier. Another important key advantages of DEA over other methods of performance evaluation is allow to consider a number of output and input simultenously, regardless of all variables of interest either being measure in common units (Sexton, 1986).

In the problem of intellectual capital value creation, the DEA provide much more flexibility to dial with the choices of inputs and outputs that may highly vary according to the business sector under the study. In the case of literatures that offered on multiple possibility of choices

for instance, number of recorded patents, number of product or process innovations and other similar example. It also important to select inputs and outputs in such a way of all the components of the intellectual capital of the baning are considered in the analysis. The dependent variable is a technical efficiency of Islamic and Conventional banks in Malaysia. The concept of the technical efficiency basically to be used in comparing the relative efficiencies of economic entities. A firm can be said to be efficient relative to another if it produces either the same level of output with fewer inputs or more output with the same or fewer inputs. Meanwhile, a single firm can be consider as technically efficient if it cannot increase any output or reduce any input without reducing other outputs or increasing other inputs.

Hence, the Data Envelopment Analysis (DEA) approach will be undertaken in the context of technical efficiency in the microeconomics theory of production. DEA provides a similar notion of efficiency but the main dfferences is DEA production frontier is not determine by specific equation but it is originally generated from the actual data for the evaluated firms also known as Decision Making Units (DMUs). In fact, the choice of the DEA is justified by the complexity of the processes that transform intellectual capital investment in value within a firm; that are hard to be identify and difficult to model, so that the properties of DEA makes this method particularly feasible to solve a problem of such nature. It is important to underline that DEA provides an aggregate measure of relative efficiency for each of the banks.

The analyst can realize a ranking system of the firms within their industry. In this way, the low-ranking companies that DEA labels as inefficienct in extracting value from their intellectual capital wil have to model to imitate in the high ranking ones; the best practice of their sample.Actually, the DEA allows to focus on the “real” production frontier determined

by the DMUs, however it is not necessary to be able to estimate a "priority" the best production function, this way the analyst doesn't have to model the process of value-creation, but can determine the production frontier (value production) by means of the sample choosen for the analysis. In those terms, the choices of sample of the firms within the same business sector become essential especiallt for the first have to ve comparable for dimensional and industry, in order to presume that the intangible processes of value-creeation are similar. Moreover, the benchmarks obtained through the analysis are an example to follow for inefficienct companies and it would be inconsistent to imitate the firms belonging to another business sector.

DMUs is a separate organizational units that governed by an individual known as "manager", "director or "officer". The DEA is widely used as linear-programming based composite tool which was developed by Charnes, Cooper and Rhodes (CCR) in 1978 and later extended by Banker, Charnes and Cooper (BCC) in 1984. The advantages of this approach is the provision of additional information compared to traditional financial ratios, especially when there is more than one ratio as any wrong interpretation may be avoided (Feroz, Kim & Raab, 2003). It is important to underline that DEA provide an aggregate measure of relative efficiency for each company, the analyst can realize The CCR model is the most basic DEA model.

The CCR model is assumed to be under a Constant Return to Scale (CRS) activities. However, the assumption is not appropriate if not all companies are operating at the optimal scale. BCC model overcome this problem by allowing for Variables Returns to Scale (VRS). Assume that there are n DMUs (DMU1, DMU2 …and DMUn) with s different outputs and m different inputs. DMUj (j = 1, 2, …, n) consumes amount xij (i = 1, 2, …, m) of input i to produce amount yrj (r = 1, 2, …, s) of output r. Linear programming in the envelopment

form of an input-oriented BCC model is used to evaluate the efficiency of DMU. The outcome of the BCC model represents Pure Technical Efficiency (PTE) while that of the CCR model reflects Technical Efficiency (TE) of the target DMU. Dividing TE by PTE, the scale efficiency (SE) can be obtained. The SE represents the proportion of inputs that can be further reduced after pure technical inefficiency is eliminated if scale adjustments are possible (Hung & Lu, 2007; Hung, Lu & Wang, 2010).

In microeconomics analysis. Efficiency production is defined by technological relationship with the assumption that firms are operated efficienctly. Whetеher or not, the firms has to assess the same technology, it is assume that they are operated on the frontier of their relevant production possibilities set. Hence, it is called technically efficient by definition. Nevertheless, the objectives of the DEA is to determine which firms are operated efficiency frontier and which firms are not. If the frms input-output combinations lies on the DEA frontier, the firms might be consider efficient if the firm; is input-output combination is lies inside the DEA frontier the firms probably is inefficient.

3.4.3 The Measurement of Control Variables

Leverage could be measured based on the amount of assets financed by debt. Originally, debts from the creditors were used to finance assets and not funded by shareholders because they are investors. Thus, Jensen and Meckling (1976) in Istanti (2008) spotted the potential assets for transferring wealth from debtor or shareholder between the shareholders and managers of a company that consent very high levels of debt. Firms which have very high debts in their capital structures will bear higher agency costs compared to firms that have a small proportion of debts. According to Zeghal and Maaloul, (2010), Firer and Williams,

(2003), postulated that to measure the proxy as a control variable from the bank's leverage is by using a ratio of total liabilities to total assets. Based on the justification, the higher the leverage is, the more the banks will put an effort and concentrate on their meeting the demand of their debt holders.

This could also considered as viewed from the stakeholders similarly as presumed from the point of VAIC. Logically, the higher the debt owned by the banks in return will potentially pay a higher interest payment to the debt holders. Thus, the image of the banks will make them less attractive by the investors as the banks is highly exposed to the risk of unable to make an interest repayment. Size is another control variables for the study. In order to proxy the size as follow by Firer and Williams (2003), Biekpe (2011), Alhassan and Asare (2016). Based on the existence of economies of scale in the banking industry. This was justified with the fact that benefit in economies of scale will result in reducing on the production cost as a result will increase to the large bank's performance. Again it will also affect the risk-bearing ability of banks. In addition, the larger banks somehow has the opportunity to diversify their portfolio as compare to the smaller banks.

The proxy for size is the natural logarithm of total asset. The larger a firm is, the higher the tendency of demand for the delivery of information compared to from smaller companies. By revealing a more varied range of information, a company tries to imply that it has applied good corporate governance. According to Purnomosidhi (2005) and Istanti (2009), a large company probably does provide more activities and usually had business units as well as potential long-term value creation. In addition, large companies are often supervised by a group of interested stakeholders who look at how the management manages the company in terms of intellectual capital such as the employment of the organization's employees.

3.4.4 Index Measurement Methodology

The selecting of DEA model must be more appropriate which refer to return to scale either it is constant or variable that describes the consider production process. Secondly, it must be identify the orientation of the problem; output oriented, input oriented or input-output oriented (Coelli et al., 1998). An Input oriented DEA model aims at reducing the inputs amount at the present level whilst, the output-oriented model, maximizes output level under at most the present input consumption. In the literature, all authors are in agreement that the return to scale of knowledge and intellectual capital is increasing. Basing on this assumption, the DEA model constant return to scale (CRS) is not suitable to this study (Charnes et al., 1978). This leaves the model BBC (Banker et al., 1984) that is characterized by variable return to scale (it is also indicated as VRS model).

This part is aim to evaluate the overall technical efficiency of Malaysian bank which is aligned with the functions of the banking institutions that were treated as the financial intermediaries, hence the current study had employed on the intermediation approaches.The intermediation approach was suggested by Sealey and Lindley (1997). The technique is widely used by the most studies which focus on Conventional bank in Malaysia (Matthews & Ismail, 2005; Omar et al., 2006) and Islamic bank studies (Yudistra, 2003; Hassan, 2006; Sufian, 2006a; & Shamsher et al., 2008). In fact, the intermediation approach is counterparts of the economic production approach. Practically, the banks are viewed as intermediary financial institutions which offer the financial services. They collect funds from depositors and purchase funds with the assistance of labour (Human Capital) and capital, and transform these generated funds into loans and other financial assets. In other words, deposits were held by the bank together with labour and capital are treated as inputs, while the volumes of earning assets are defined as measures of output.

The intermediation approach based on the extent literatures is more appropriate to evaluate the financial institutions due to the reason because this approach may be superior for evaluating the importance of frontier efficiency to measure the profitability of financial institutions since the total costs are not only include the production costs in maximize the profits (Iqbal and Molyneux, 2005). Moreover, the intermediation approach is inclusive of the interest and funding expenses which accounts for between one-half and two-thirds of the total assets (Mohamad et al., 2008).

In this study, the inputs used are capital (measured by fixed assets), total deposits (total funds which contain total customer deposits and deposits on short-term funding) and labour (measured by personnel expenses). All variables are measured in millions of Malaysian Ringgit (RM), whereas outputs used are total loans and security investment. In 1957, Farell introduce basic knowledge about efficiency of unit production through the concept of input-oriented measurement which is known as linear programming and assumes that there would be no random mistakes used to measure technical efficiency. In short, technical efficiency is referred to as measurement of effectiveness in which a series of inputs is given in order to produce outputs. Technically, it is only practiced when a minimum level of inputs is used to produce the maximum number of outputs, or when a reduction in input level is used to produce the same amounts of output. The study is based on the bi-variant analysis and variable regression analysis method to match the theoretical analysis and databases and used to explore the link between technical efficiency and three major indicators under the VAIC method namely capital employed efficiency, structural capital efficiency and human capital efficiency.

3.5 Multiple Regreession Models

Multiple regression analysis is used to test the advanced propositions. The analysis is a statistical technique which can be used to analyse the relationship between a single dependent variable and several independent variables (Neter et al., 1996; Hair, 2009). An example of a multiple regression equation is as follows:

$$\mathbf{Y} = \alpha + \beta 1X1 + \beta 2X2 + \beta 3X3 + \ldots\ldots\ldots + \beta kXk + \varepsilon$$

Where,

Y= predicted value of dependent variable,

α = y intercept, value of y when all x(s) = 0;

X= various independent variables;

β1….k = varioius coefficients assigned to independent variables during the regression; and

ε = standard error of estimates

Basically, the regression result will produce beta coefficients or regression which range from -1.00 to +1.00. These indicate the strength of the relationship between the dependent variable and the independent variables (Hair, 2009). In this study, the main objectives was to investigate on the relationship between the intellectual capital efficiency (VAIC) and technical efficiency performance among the Malaysian bank. The research aimed, also under the specific research objectives one in order to determine the relationship of three main components of intellectual capital namely human capital efficiency (HCE), structural capital efficiency (SCE) and capital employed efficiency (CEE) respectively with the performance of Conventional and Islamic banks which is based on their technical efficiency. Throughout the result, its also answer the specific objectives two which is to investigate the most influence of intellectual capital elements that impact on performance based on technical efficiency of Conventional and Islamic banks in Malaysia. The regression model also will

illustrate the relationship of VAIC and its components with the technical efficiency performance overall for Malaysian banks. Accordingly, the study have two main regression models developed in order to investigate the relationship based on the VAIC and its sub-components of HCE, SCE and CEE efficiency with the Malaysian bank based on technical efficiency (TE). Therefore, to analyse the respective relationship defined in prior section, linear multiple regression analysis is performed based on the following general general models.Model 1 was used to investigate the VAIC that effect on the performance of Malaysian banks measure based on the technical efficiency (TE) of the Islamic and Conventional banks in Malaysia.

Model 1:

$$EFE_{it} = \alpha + \beta_1 VAIC_{it} + \beta_2 SIZE\ \varepsilon_{it} + \beta_3 LEV \varepsilon_{it} + \varepsilon_{it}$$

Since VAIC is a composite of three measures namely human capital efficiency (HCE), structural capital efficiency (SCE) and capital employed efficiency (CEE) thus, three main elements of VAIC are included into the regression model 2.

Model 2:

$$EFE_{it} = \alpha + \beta_1 HCE_{it} + \beta_2 SCE_{it} + \beta_3 CEE_{it} + \beta_4 SIZE\ \varepsilon_{it} + \beta_5 LEV \varepsilon_{it} + \varepsilon_i$$

EFE = Refers to the technical efficiency scores obtained through the input-oriented BCC model under the assumption of variables return to scale.

Firm Size =Natural logarithm (Log market capitalization) of a company's total assets.

Leverage = Measure the ratio of total debt to total assets.

CHAPTER 4

RESULTS AND DISCUSSION

4.1 Introduction

Several studies has been done previously in investigated the performance of Malaysian banks with respect on their roles of intellectual capital and its main components in order to enhance their level of efficiency performance. However, most of the previous studies is subject to the conduct of the research in particular areas that focusing on Conventional banks only. Interestingly, Malaysian banking sector were administered and underlies based on two main banking systems either the banks is practices for the interest as their strong foundation basically practices by Conventional banks or the bank are concern for the profit and loss shared as the bank's principle that mostly applied by Islamic banks. Hence, through both of these principles it does have contributes towards a positive movement and the growth of Malaysian economic supported with the several achievement so far among the Malaysian banking performance that also highly recognized by the domestic authority. This chapter is organized on reveal the findings for Islamic banks follow by the Conventional banks and lastly reveal on the finding for Malaysian banking sector as a whole.

4.2 Empirical Findings for Malaysian Islamic Bank

Allign with the objectives of the current study, based on the VAIC methodology the finding revealed for Malaysian Islamic Banks with respect on the ranking of VAIC and VA. Unlike Conventional banks, Islamic banking is underlies through the principle of "Shariah law" purposely turn to be the strongest reason and play in constantly in expanding globally. According to Cihak and Hesse (2010), most Islamic banks are tend to be financially stronger

as the profit generated from the low risk of investment while sharing even gained losses. Therefore, sample number of 16 licensed Islamic banks that operated and registered under BNM and categorize which 10 of Islamic banks known as domestically owned while the remaining fall under foreign controlled Islamic banks from 2007 until 2016 (BNM, 2017).

4.2.1 VAIC and VA Ranked for Malaysian Islamic Bank

VAIC basically enlightened on how well or bad for respective banks in created their potential value added that offered a neutral possibility in evaluated the best practices and benchmarked (Mavridis, 2005). VAIC model were subjected to interest and developed well-known of choices among others which designed for measured the intellectual capital. Thus, demonstrated under Table 4.1 was a listed for Malaysian Islamic banks revealed on banks ranked after formulated VAIC methodology (HCE + SCE + CEE). From the findings, it was revealed that Maybank Islamic Bhd was the top performance with the highest VAIC scored in total average of 47.1791. Followed by Public Islamic Bank Bhd which was placed second position on total average of VAIC at 35.4844. Meanwhile, the third position was refered to AmIslamic Bank Bhd with average of total VAIC scored at 33.7364. In contrast, Al-Rajhi Banking & Investment (M) Bhd appeared as least efficient among Islamic banks with average VAIC scored at 1.1041.

Another two banks that shown on the lowest VAIC scored was Kuwait Finance Bank Bhd and Asian Finance (M) Bhd with total average of VAIC scored at 1.2616 and 1.3532 respectively. Again, if VAIC measured individually for the banks were shown that Maybank Islamic Bhd does not only most efficient Islamic bank but also according their value added was the second highest with average VA of RM814, 289.33 after the Asian Finance Bank Bhd and Bank Islam (M) Bhd. Basically, being efficient alone were not considered as

inefficient as it must has the ability to create values. Likewise, in the case of Asian Finance Bank Bhd, it shown that VA were created effectively.

Table 4.1: VAIC and VA Rank for Malaysian Islamic Bank (2007-2016)

Islamic Bank	*HCE*	*SCE*	*CEE*	*VAIC*	*VA (RM)*	*VAIC Rank*	*VA Rank*
Maybank Islamic Bhd	46.1902	0.9780	0.0108	47.1791	814,289.33	1	3
Public Islamic Bhd	34.4988	0.9708	0.0147	35.4844	527,521.67	2	4
AmIslamic Bhd	32.7543	0.9679	0.0142	33.7364	270,986.70	3	8
HSBC Amanah Bhd	14.7973	0.8453	0.0145	15.6571	172,285.38	4	10
Hong Leong Bank Bhd	11.3043	0.9079	0.0124	12.2246	200,904.80	5	9
CIMB Islamic Bank Bhd	8.5713	0.8396	0.0119	9.4228	520,230.89	6	5
Stand Char As Saadiq.	8.1716	0.8150	0.0074	8.9940	48,835.67	7	16
RHB IslamicBhd	5.7129	0.7733	0.0129	6.4991	276,372.80	8	7
OCBC Al-Amin Bhd	3.4685	0.8308	0.0113	4.3106	109,935.89	9	13
Affin Islamic.Bank Bhd	3.5647	0.4007	0.0153	4.2014	139,697.60	10	12
Bank Islam (M) Bhd	2.5192	0.6015	0.1976	3.3183	922,760.50	11	2
Alliance Islamic Bhd	2.4867	0.5827	0.0209	3.0903	142,905.71	12	11
Bank Muamalat (M) Bhd	1.9542	0.4795	0.0170	2.4508	319,821.80	13	6
Asian Finance Bhd	1.1880	0.1551	0.0102	1.3532	23,101,004	14	1
Kuwait Finance House	0.6243	0.6301	0.0072	1.2616	62,360.20	15	15
Al-Rajhi Banking & Invst	1.0555	0.0382	0.0104	1.1041	77,522.40	16	14

The foreign Islamic banks referred to HSBC Amanah Bhd was denominated on the highest VAIC scored of 15.6571. The values of VAIC scored due to the contributed mainly from its human capital efficiency. Basically, by invested more on thre human mind or employee's knowledge and skilled, somehow generated more units per value hence improved directly on the efficiency performance. Furthermore, HSBC Amanah Bhd was placed at second position after the Asian Finance (M) Bhd with value added averagely RM172, 285.35 and RM23, 101,003.50 respectively. In summary, the current study have demonstrated on the Malaysian Islamic banks either domestically or foreign controlled banks, technically both have emphasize on the utilization of human skills which were enhanced on the employee's

knowledge while delivered their job performance as their main alternatives in driving the bank's efficiency performance instead of too depending heavily on physical and structural asset.

4.3 Empirical Findings for Malaysian Conventional Bank

Furthermore, the next findings were shown on the Malaysian Conventional banks based on their VAIC and VA scored. The Conventional banks in Malaysia that were operated and obtained on their fully licensed status gave by the BNM was reached about 28 banks (BNM, 2017). Similarly, all of the Conventional banks categorized their banks either domestically and foreign-controlled banks. The final total of 27 Conventional banks were gathered compressed of 19 were foreign- controlled while remained of 8 Conventional banks were represented domestically controlled.

4.3.1 VAIC and VA Ranked forMalaysian Conventional Banks

According on previous studies that were done by Goh, (2005) and Nik Maheran et al., (2009) identified yet considered the Public Bank Bhd were pioneered for used efficiently utilized the intellectual capital therefore current study shown on the the Table 4.2 were declared on the similar resulted whereas the Public Bank Bhd were denominated with the highest average of VAIC scored at 5.9883 and VA scored of RM6, 075, 755.70 followed by Bank of Nova Scotia (M) Bhd and Bank of Tokyo-Mitsubishi UFJ (M) Bhd with average scored of 5.7928 and 5.6062 respectively from 2007 until 2016. In regard, the two banks recorded on lower amount of VA scored at RM82, 638.40 and RM260, 860.56 respectively as compared to Public Bank Bhd.

Table 4.2: VAIC and VA Rank for Malaysian Conventional Banks (2007-2016)

Conventional Bank	*HCE*	*SCE*	*CEE*	*VAIC*	*VA (RM)*	*VAIC Rank*	*VA Rank*
Public Bank Bhd	5.1577	0.8038	0.0269	5.9883	6075755.70	1	2
Bank of Nova Scotia	5.0072	0.7665	0.0191	5.7928	82638.40	2	18
Bank of Tokyo-Bhd	4.8055	0.7790	0.0217	5.6062	260860.56	3	14
Deutsche Bank Bhd	3.7256	0.7077	0.0187	4.4520	217790.70	4	15
United Overseas Bank	3.5210	0.7142	0.0224	4.2576	1556421.80	5	8
Bank of China (M) Bhd	3.3266	0.6947	0.0201	4.0415	97300.60	6	16
Sumitomo Mitsui Bank	3.3488	0.6761	0.0152	4.0401	68950.80	7	20
Hong Leong Bank Bhd	3.3230	0.6933	0.0201	4.0364	2320933.60	8	5
Citibank (M) Bhd	3.2886	0.6897	0.0304	4.0087	1241589.90	9	10
HSBC Bank (M) Bhd	3.1735	0.6825	0.0289	3.8849	1819692.90	10	7
Maybank (M) Bhd	2.9843	0.6353	0.0230	3.6426	7856531.10	11	1
Ambank Bhd	2.8622	0.6447	0.0252	3.5321	2181793.80	12	6
OCBC Bank (M) Bhd	2.8346	0.6336	0.0252	3.4934	1533581.60	13	9
Alliance Bank Bhd	2.8099	0.6286	0.0236	3.4621	784632.00	14	13
RHB Bank Bhd	2.8029	0.6353	0.0218	3.4600	2790125.10	15	4
Standard Char Bank	2.8361	0.5961	0.0209	3.4532	945892.80	16	11
Affin Bank Bhd	2.7892	0.7723	0.0207	3.4259	818340.00	17	12
CIMB (M) Bank Bhd	2.6670	0.6216	0.0241	3.3128	5127791.80	18	3
JP Morgan Chase Bank	2.6472	0.5620	0.0165	3.2257	87442.44	19	17
Bank of America Bhd	2.5932	0.5543	0.0213	3.1687	50853.43	20	22
Bangkok Bank Bhd	2.2110	0.4704	0.0129	2.6943	40223.20	21	24
The Royal Bank Bhd	2.1441	0.4458	0.0157	2.6056	70862.30	22	19
Inds and Comm Bhd	1.9425	0.4720	0.0107	2.4252	54285.57	23	21
Nat. Abu Dhabi Bhd	1.9459	0.4207	0.0262	2.3928	21144.60	24	26
Mizuho Bank Bhd	1.5438	0.3155	0.0148	1.8741	30501.80	25	25
BNP Paribas Bhd	1.0371	0.6230	0.0114	1.6715	44372.00	26	23
India Int. Bank Bhd	1.2764	0.0130	0.0114	1.3007	5181.80	27	27

Surprisingly, unlike the others Conventional bank, India International Bank Bhd does not only designed for being less efficient in VAIC ranked but also was inefficient to manage on created the VA. The lowest average scored for VAIC and VA were only 1.3007 and RM5, 181.80 respectively. Malaysian Conventional banks regardless in domestically or foreign

controlled banks shown that banks were heavily influenced by human capital efficiency as compared to structural and capital employed efficiency. Followed by, the structural capital efficiency and the less amount were emphasize in capital employed efficiency. As conclusion, in term of both Islamic and Conventional banks, the study have answerd based on the objectives one that investigated on the components of Intellectual capital namely Human, Structural and Capital employed efficiency among Malaysian Islamic and Conventional banks were clearly shown that the human capital efficiency were the most influence for both banks in Malaysia.

4.4 Technical Efficiency Performance of Malaysian Islamic and Conventional Banks

The study has adopted on DEA methodology and considering one of the main approached were the intermediation approach. DEA is a method that allow the management analysts to measure the relatively productive efficiency for each of the members in a set comparable organizational units based on a theoretical optimal performances for each of the organizations (Banker et al, 1984; Charnes et al., 1978). DEA evaluates relative efficiencies of DMUs without any assumptions about the functional relationship between inputs and outputs. For all these reasons, the choice of DEA is justified by the complexity of the processes that transform intellectual capital investments in value within a firm, they are hard to identify or even difficult to model, so that the properties of DEA makes this method particularly feasible solution to a problem in such natures. Basically, this method indicated that the bank will be treated as an intermediary between the capital investor and capital raiser. Within this approached, several were listed outputs indexes that selected namely total loan and security while for the input indexes which were referred to personal expenses, total deposit and other assets. All variables were measured in millions of Malaysian Ringgit (RM), whereas the outputs used are total loans and security investment.

4.4.1 Technical Efficiency Performance of Malaysian Islamic Banks

Data were gathered accordingly to match for DEA software and run by using DEAP Software which all of the data for total of 16 Malaysian Islamic banks from 2007 until 2016. Thus, finding for technical efficiency among Malaysian Islamic banks were illustrated on Table 4.3.

Table 4.3: Technical Efficiency Performance of Malaysian Islamic Bank (2007-2016)

Islamic Bank	*Technical Efficiency (TE)*	*Pure Tech. Efficiency (PTE)*	*Scale Eff. (SE)*	*Return to scale*
Maybank Islamic Bhd	0.8056	0.8948	0.9003	Increasing
Alliance Islamic Bhd	0.7745	0.8963	0.8641	Increasing
AmIslamic Bank Bhd	0.5500	0.6163	0.8924	Increasing
Public Islamic Bhd	0.5119	0.6755	0.7578	Increasing
Hong Leong Islamic	0.5066	0.6369	0.7954	Increasing
Bank Islam (M) Bhd	0.4478	0.6030	0.7426	Increasing
Bank Muamalat Bhd	0.3581	0.4156	0.8616	Increasing
CIMB Islamic Bhd	0.3421	0.4757	0.7192	Increasing
Affin Islamic Bhd	0.3246	0.5733	0.5662	Decreasing
RHB Islamic Bhd	0.3214	0.4400	0.7305	Increasing
Al-Rajhi Banking	0.3140	0.6158	0.5100	Decreasing
OCBC Al- Amin Bhd	0.2873	0.4224	0.6802	Increasing
Stand Char As Saddiq	0.2096	0.5235	0.4004	Decreasing
HSBC Amanah Bhd	0.1759	0.3137	0.5607	Increasing
Kuwait Finance Bhd	0.0593	0.2002	0.2962	Increasing
Asian Finance Bhd	0.0211	0.3345	0.0631	Decreasing

The result was based on the variable returns to scale assumption considering the most appropriate when not all banks operating at their optimal scales. Based on the findings revealed on technical efficiency which is not equal to ‘pure’ technical efficiency that higher in particular thus it could be explain there is an existence of scale inefficiencies. In short, the

banks have not operating at the optimal level of scale; nevertheless, any alteration in their operational activities would render unit into less efficient level. The highest pure technical efficiency is refer to Maybank Islamic Bhd and these bank is consider not to waste all of their resources. However, due to the scale inefficiency, the overall average on technical efficiency for Maybank recorded was as below as 80%.

4.4.2 Technical Efficiency Performance of Malaysian Conventional Bank

Next, according to the Table 4.4 indicated on the listed of Conventional bank with average of technical efficiency for the period from 2007 until 2016. Findings revealed that the foreign Conventional bank namely Bank of Nova Scotia Berhad and Bangkok Bank Berhad consider technically the most efficient bank although not on the efficient frontier. With regard on the Islamic and Conventional bank, it were classified to be scale efficient, however in term of technical efficiency at very low level. As shown on both tables for Islamic and Conventional bank such as OCBC Al-Amin, Standard Chartered and Kuwait Finance against the from the Conventional bank such as Bank of America, Royal Bank of Scotland and BN Paribas viewed as scale inefficiency of 0.680, 0.400 and 0.296 against 0.689, 0.859 and 0.827 respectively but in term of technical efficiency for Islamic bank as low as 0.287, 0.209 and 0.059 while for Conventional bank at 0.262, 0.255 and 0.175 respectively.

Table 4.4: Technical Efficiency Performance of Malaysian Conventional Bank (2007-2016)

Conventional Bank	*Technical Efficiency (TE)*	*Pure Technical Efficiency (PTE)*	*Scale Eff. (SE)*	*Returns to scale*
The Bank of Nova	0.8840	0.8932	0.9897	Increasing
Bangkok Bank (M)	0.8741	0.9007	0.9705	Increasing
Affin Bank	0.7304	0.8056	0.9067	Increasing
Bank of China (M)	0.7168	0.7571	0.9468	Increasing
Alliance Bank	0.7053	0.7668	0.9197	Increasing
UOB (M)	0.7045	0.8234	0.8556	Increasing
Public Bank	0.6894	0.8595	0.8021	Increasing
Sumitomo Mitsui	0.6752	0.7175	0.9410	Increasing
Stan. Chartered	0.6493	0.6979	0.9303	Increasing
RHB Bank	0.6375	0.7320	0.8709	Increasing
OCBC Bank (M)	0.6221	0.7204	0.8635	Increasing
Ind. Comm Bank	0.6048	0.6150	0.9834	Increasing
Hong Leong Bank	0.5801	0.6871	0.8444	Increasing
Nat. Abu Dhabi Bhd	0.5768	0.6730	0.8571	Increasing
CIMB Bhd	0.5555	0.6250	0.8889	Increasing
Maybank Bank Bhd	0.5104	0.7773	0.6567	Decreasing
Ambank Bhd	0.4873	0.5925	0.8224	Increasing
Mizuho Bank (M Bhd)	0.4555	0.5304	0.8588	Increasing
HSBC Bank Bhd	0.4081	0.4723	0.8641	Increasing
Deutsche Bank (M)Bhd	0.3319	0.3656	0.9077	Increasing
India International Bhd	0.3247	0.8548	0.3799	Decreasing
Citibank (M) Bhd	0.3096	0.3809	0.8128	Increasing
JP Morgan (M) Bhd	0.2645	0.3062	0.8639	Increasing
Bank of America (M)	0.2621	0.3804	0.6890	Increasing
The Royal Bank (M)	0.2556	0.2973	0.8598	Increasing
BN Paribas (M) Bhd	0.1751	0.2117	0.8270	Increasing

4.4.3 Technical Efficiency Performance of Malaysian Bank

According to Figure 4.1 shown throughout the study period from the year of 2007 to 2016, technical efficiency performance for Conventional bank relatively higher and considered as

technically efficient compared to the Islamic bank. The graph shown that in 2007, the technical efficiency for Conventional bank under VRS is equal to 0.559 whereas the technical efficient for Islamic bank is only at 0.212.

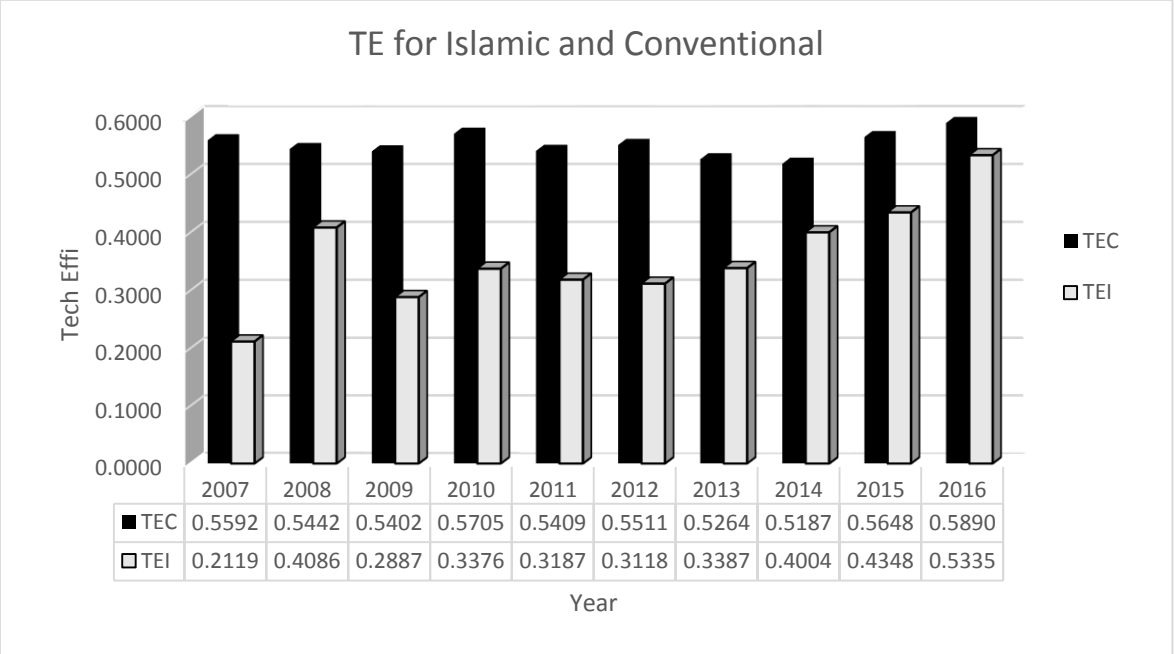


Figure 4.1: Technical Efficiency of Malaysian Bank (2007-2016)

Following the year of 2010, Conventional bank has recorded at 0.5409 on its' technical efficiency and consider slightly higher as compare to Islamic bank which is only at 0.318. As in 2016, the trend based on analysis was more likely similar as previous year whereas Conventional bank was concurred the technical efficiency at 0.588 and Islamic bank was at 0.534. Thus, based on trending analysis for both Conventional and Islamic bank, obviously concluded that Conventional bank are more utilize on their technical efficiency than Islamic bank for the period of 2007 until 2016. Overall, the Malaysian banking sector have performed and recorded at good level of scale efficiency however only for limited number among the Islamic bank which was only 5 banks out of 16 Islamic banks against the 16 banks out of 27 of Conventional banks were considered as technically efficient. Meanwhile, there

were progressively improved in preceding years hence, the second objectives for the study based on the comparison which provided differences scenarios and can be concluded that Islamic banks were less inefficient from the Conventional banks in term of their technical efficiency performance.

4.5 Relationship of VAIC and Components with Technical Efficiency Performance of Malaysian Islamic Banks.

Prior on the current study which was involved major analysis that investigated on the relationship between intellectual capital and technical efficiency were further discussed and deliberated based on the VAIC model with its manjor components namely human capital efficiency, structural capital efficiency and capital employed efficiency. Thus, for the intellectual capital and its major components that are expected to have the connection with technical efficiency among Islamic and Conventional bank in Malaysia, the multiple regression analysis was been selected. The following section of the study will further determine on which variables will affect on the technical efficiency significantly. However, in viewed of unavailability data for the respective year for several banks thus the study analyzed based on 6 years' trending analysis. In addition, two control variables presented on the model which is refer to bank size and leverage.

4.5.1 Descriptive Analysis for Malaysian Islamic Bank

Descriptive analysis presented on the mean, median, minimum and maximum values of the dependent and independent variables. The technical efficiency ranges from 0.168 to 1.00, with mean of 0.3896 and standard deviation of 0.2916. The mean value of VAIC is 11.054 which indicates that VAIC values is not high because the minimum value is -4.7642 and the

maximum value is 56.346. As VAIC is 11.054 indicating that the firm has created RM11.054 out of every RM1 invested in the bank. The standard deviation of 13.754 which consider small and the value is isolated.

Table 4.5: Descriptive Analysis for Malaysian Islamic Bank

Variables	*N*	*Minimum*	*Maximum*	*Mean*	*Std Deviation*
TE	16	0.168	1	0.3896	0.2916
HCE	16	-5.883	55.351	10.342	13.5792
SCE	16	-0.4671	1.17	0.6779	0.297
CEE	16	-0.0512	0.0296	0.0134	0.0087
VAIC	16	-4.7642	56.346	11.054	13.754
LEV	16	0.795	0.977	0.917	0.036
SIZE	16	6.388	8.259	7.249	0.409

Furthermore, if each of the components in intellectual capital were examined individually, thus mean value of capital employed efficiency is at 0.0134 which means that the value was low since minimum value was only at -0.0512 and the maximum was at 0.0296. This situation could be explained that smallest difference in between these values of capital employed efficiency was due to the low scored for the standard deviation which was only at 0.0087. Meanwhile, the mean value for human capital efficiency is at 10.342 whereas, the minimum and maximum scored for human capital efficiency were at -5.883 and 55.355 respectively with the standard deviation of 13.5792. On the other hand, the structural capital efficiency were ranged from -0.4671 to 1.17 while the mean scored at 0.6779 of standard deviation at 0.297.

This was consistently with the finding by Ho and Williams (2002), Firer and Williams (2003) and Gan and Saleh (2008). The gaps for mean scored among the capital employed efficiency (mean=0.0134; SD=0.0087), structural capital efficiency (mean=0.677; SD=0.297) and

human capital efficiency (mean=10.342; SD=13.579) suggested within period of study, those sample of the Islamic banks were generally effective in generated values from its human capital rather than from physical and structural assets. The mean for capital employed efficiency revealed much smaller than all other components of VAIC, which suggest that Islamic banks were not fully utilzed on the physical assets at optimum level. The standard deviation of all variables were relatively small included both with control variables namely the leverage and bank size. On the other hand, VAIC were revealed on the mean scored of 11.054 with ranged from -4.7642 to 56.346 describe the Islamic banks generated on the average of 11.054 in intellectual capital efficiency. Further, the multiple regression analysis were used in testing the advance propositions included under this section. The analysis is basically known as statistical technique which can be use to analyze the relationship on single dependent variable with several independent variables (Neter et al., 1996; Hair, 2009). Thus, aligned with the hypotheses which is to test the statistical relationship between technical efficiency and components of intellectual capital.

4.5.2 Regression Result for Malaysian Islamic Bank (VAIC)

Findings were revealed on the adjusted R-Square of 0.2572 with F-statistics of 11.97 ($P<0.01$). Finding also shown that VAIC revealed to be significantly positive relationship with the technical efficiency performance.

Table 4.6: Regression Result for Malaysia Islamic Bank (VAIC)

Independent	*Coefficient*	*Std Deviation*	*t-statistics*	*Prob*
Constant	-2.3930	0.7368	-3.2500	0.0020
VAIC	0.0048	0.0025	1.9100	0.0600
LEV	2.2320	0.8981	2.49	0.015
SIZE	0.0941	0.1005	0.9400	0.3510
R-Square	0.2807			
Adj R-Square	0.2572			
F-statistics	11.9700			
Prob (F-statistics)	0.0000			

4.5.3 Regression Result for Malaysian Islamic Bank (VAIC Components)

Further, to identify which sources of components in VAIC provide the strong influence towards the technical performances for improvement of the respective Islamic bank so the regression analysis will be use to test on each of the components in VAIC with the presence of control variables included into the regression model 2 accordingly. Hence, it could provided an additional evidences for those main three components namely capital employed efficiency, structural capital efficiency and human capital efficiency toward on the existing literatures.

Table 4.7: Regression Result for Malaysian Islamic Bank (VAIC Components)

Independent	*Coefficient*	*Std Deviation*	*t-statistics*	*Prob*
Constant	-2.7010	0.8574	-3.1500	0.0020
CEE	6.1034	3.0121	2.0300	0.0460
HCE	0.0062	0.0026	2.3200	0.0220
SCE	-0.1186	0.1331	-0.8900	0.3750
LEV	2.6026	1.0000	2.6000	0.0110
SIZE	0.0880	0.0999	0.8800	0.3800
R-Squared	0.3275			
Adj R-Squared	0.2901			
F-statistics	8.7700			
Prob (F-statistics)	0.0000			

Table 4.7 shown on the regression resuly on the components in intellectual capital for Malaysian Islamic banks thus proved that the human capital efficiency were provided on huge impact in influencing technical efficiency performance as compared to capital employed efficiency. Thus, among the Islamic banks in Malaysia revealed on human capital efficiency created a great impact to the Islamic banks as for improvement on their technical efficiency performance rather than capital employed efficiency. In contrast, these study revealed that no significant relationship on the structural capital efficiency with the technical efficiency performance among the Islamic banks in Malaysia. Similarly, control variables for the bank's size also does not provide significant relationship with the technical efficiency performance except for the bank's leverage which were proved to be statistically significant relationship with technical efficiency performance.

4.6 Relationship on VAIC and Major Components with Technical Efficiency Performance of Malaysian Conventional Bank.

Similarly, following section about the findings investigation for Conventional banks in Malaysia with respect on the aim for the study which explored the relationship of intellectual capital (VAIC) and its major components (VAIC components) based on the two regression model which influence the technical efficiency performance.

4.6.1 Descriptive Analysis for Malaysian Conventional Bank

As per illustrated on Table 4.8, shown on the descriptive statistics for all of the variables. The technical efficiency were ranges on minimum of 0.09 to the maximum of 1.00, and the mean scored at 0.5573 with the standard deviation of 0.2591. Followed by the mean value for VAIC were at 3.646 which indicated on value that relatively low due to the minimum

value at -1.42 and the maximum value at 8.44. It also mention on every RM3.646 that firm have created out in every RM1 that the bank have invested. The standard deviation was at 1.2924 which were considered small since the value were isolated.

In contrast, if all components in intellectual capital were examined by individually, thus the value for mean on capital employed efficiency were at 0.0201 which were lower since the minimum value was only at -0.02 and maximum at 0.03. This is shown the smallest differences between the values of capital employed efficiency was reflected from lowest value that obtained from standard deviation which only at 0.0082. Meanwhile, the mean scored for the human capital efficiency were only at 2.9936 whereas the minimum and maximum scored at -0.31 and 7.55 respectively with the standard deviation of 1.137. On the other hand, the structural capital efficiency is ranges from -1.78 to 4.2 with mean score of 0.6318 and standard deviation of 0.4019 thus provided another evidence as consistently with the finding of Ho and Williams (2002), Gan and Saleh (2008) and Firer and Williams (2003).

Table 4.8: Descriptive Analysis for Malaysian Conventional Bank

Variables	*N*	*Minimum*	*Maximum*	*Mean*	*Std Dev*
Technical Efficiency	23	0.09	1.00	0.5573	0.2591
Human Capital	23	-0.31	7.55	2.9936	1.137
Structural Capital	23	-1.78	4.2	0.6318	0.4019
Capital Employed	23	-0.02	0.03	0.0201	0.0082
VAIC	23	-1.42	8.44	3.646	1.2924
Leverage	23	0.2	1.08	0.8691	0.1082
Size	23	0.89	8.7	7.3745	0.9047

Table 4.8 shown on the descriptive analysis for Malaysian Conventional Banks. The result revealed differences of values for the Mean and Standard Deviation among the components in intellectual capital namely capital employed efficiency with the Mean of 0.0201 and

SD=0.0082, structural capital employed of Mean=0.6318 and SD=0.4019) while human capital employed were Mean=2.9936 and SD=1.137 respectively. The standard deviation for all variables were also relatively small included both on control variables. On the other hand, in term of an overall VAIC's scored, the Mean were scored at 3.646 with minimum to maximum ranged from -1.42 to 8.44.

4.6.2 Regression Result for Malaysian Conventional Bank (VAIC)

Conventional bank is regressed with the presence on two control variables with total VAIC to examine the relationship between dependent variable namely the technical efficiency. The adjusted R-square is of 0.1549 with F statistical test of 9.37. This implies that changes in VAIC can only explain about 15.49% of changes in technical efficiency. According to the result, VAIC revealed significant positive relationship with the technical efficiency and can be explained that if Conventional bank created one more unit in VAIC will raised on the additional of 0.05 units in the technical efficiency.

Table 4.9: Regression Result for Malaysian Conventional Bank (VAIC)

Independent	*Coefficient*	*Std Deviation*	*t-statistics*	*Prob*
Constant	-0.0195	0.1945	-0.1000	0.9200
VAIC	0.0594	0.0161	3.6800	0.0000
LEV	0.6995	0.2124	3.2900	0.0010
SIZE	-0.0336	0.0255	-1.3200	0.1900
R-Square	0.1734			
Adj R-Square	0.1549			
F-statistics	9.3700			
Prob (F-statistics)	0.0000			

4.6.3 Regression Result for Malaysian Conventional Banks (VAIC Components)

Based on the regression model shown under Table 4.9 revealed on the adjusted R-Square of 0.1612 with F-statistics of 6.26 (P<0.010) is explained about 16.12% on the variation in technical efficiency.The VAIC components were found statistically significant relationship to the technical efficiency. Human capital efficiency also proved to have a positive significant relationship with technical efficiency that signifying on the coefficient amount of 0.0773 with the t-statistics = 3.66; (p<0.01) indicated on the Conventional bank that created one more unit in human capital, then the technical efficiency were anticipated to increase by 0.077 units. Other components of VAIC is capital employed were found to have no significant and negative relationship with the technical efficiency performance since unpredictable coefficient of -4.886 while (t-statistics) equal to -1.67; (p>0.1). Thus, it revealed that Conventional banks created one more unit in capital employed then the technical efficiency were expected to decrease by 4.886 unit. Similarly, the structural capital also found to have no significant relationship with technical efficiency performance

Table 4.10: Regression for Malaysian Conventional Bank (VAIC Components)

Independent	*Coefficient*	*Std Deviation*	*t-statistics*	*Prob*
Constant	-0.0543	0.2049	-0.2700	0.7910
CEE	-4.8863	2.9241	-1.6700	0.970
HCE	0.0773	0.0211	3.6600	0.0000
SCE	0.0363	0.0549	0.6600	0.5100
LEV	0.6990	0.2291	3.0500	0.0030
SIZE	-0.0205	0.0265	-0.7800	0.4390
R-Squared	0.1918			
Adj R-Squared	0.1612			
F-statistics	6.2600			
Prob (F-statistics)	0.0000			

4.7 Relationship on VAIC and Major Components with Technical Efficiency Performance of Malaysian Bank

Under the objectives item three of this study, whereas to assess on the nexus between the VAIC with technical efficiency among the Malaysian bank. By doing so, thus the multiple regression analysis would revealed on the test with respect to the general objective of the study which were to investigate on the relationship between the Value Added Intellectual Coefficient (VAIC) and technical efficiency performance of Malaysian banking sector.

4.7.1 Descriptive Analysis for Malaysian bank

The descriptive statistics for all of the variables among the Malaysian bank consists of Islamic and Conventional banks based on the respective variables were presented and shown as illustrated on Table 4.11. The mean scores for all of the respective variables namely technical efficiency, VAIC, human capital efficiency, structural capital efficiency and capital employed efficiency as well as the two control variables namely leverage and firm's size were as followed 0.4885, 6.0085, 0.6507, 0.0173, 6.677, 0.8887 and 7.3233 respectively. As notice on previous analysis based on the Islamic and Conventional banks, the descriptive table have shown on the VAIC for Islamic banks were at (mean=11.054) which relatively higher as compared to the Conventional banks which were only at (mean=3.646). Similarly, as the study that has been done by Goh (2005) however the reason were probably due to the variances of the sample period for the study. In addition, Table 4.11 represented on human capital employed that had recorded on the highest values rather than both in capital employed efficiency and structural capital employed. Thus, the result on the current study have provided similar findings as the previous study which has been done by Goh (2005) that investigated on Conventional banks in Malaysia

Table 4.11: Descriptive Analysis for Malaysian Bank

Variables	*N*	*Minimum*	*Maximum*	*Mean*	*Std Dev*
Technical Efficiency	39	0.0168	1	0.4885	0.2845
Human Capital Eff	39	-5.883	55.3512	6.0085	9.4375
Structural Capital Eff	39	-1.78	4.2	0.6507	0.3626
Capital Employed Eff	39	-0.0512	0.03	0.0173	0.009
VAIC	39	-4.7642	56.3461	6.677	9.5595
Leverage	39	0.2	1.08	0.8887	0.894
Size	39	0.89	8.7	7.3233	0.7438

Furthermore, in line with Joshi et al., (2010) also revealed the similar finding based on Australian's banks. The standard deviation for technical efficiency were stand at 0.2845 which indicated that the range on how far is the variables deviate from the mean. Therefore, since the average of technical efficiency is 0.4885, deviation of efficiency level at 0.0168 and 1.000. With regards to the independent variables, the mean values for VAIC within Malaysian bank is at 6. However, if VAIC were examined by individually, it have provided another evidences as the overall Malaysian bank have exercise more on the human capital efficiency (mean=6.0085) efficiently in comparison to the physical capital (mean=0.0173) and the structural capital (mean=0.6507). Therefore, finding revealed consistently with the finding for worked done by Gan and Saleh (2008), Firer and Williams (2003) and Ho and Williams (2002).

4.7.2 Regression Result for Malaysian Bank (VAIC)

With reference on Table 4.12 refer to regression model which deal on the relationship between dependent variable and the individual independent variables namely human capital, capital employed, structural capital efficiency. Regression have shown that the changes in VAIC only can be explained about 4.86% of changes in technical efficiency. By looking on

the value of adjusted R-Square, the R-Square for individually on the Islamic bank and Conventional bank shown a higher percentage as compare to regression analysis on the combination of both Islamic and Conventional bank in Malaysia. It is important that to compare two models on the basis of the coefficient of determination whether the adjusted or not, the sample size and the dependent variable must be the same. By definition, R-square measured the proportion of the variation in the dependent variable accounted for by the explanatory variables. According to Gujerati (2004), the main characteristics for the property of R-square was non-decreasing function of the number explanatory variables or regressior as presented in the regression model. As for the case, the adjusted R square will be viewed to be lesser than the value of R square.

Table 4.12: Regression Result for Malaysian Bank (VAIC)

Independent	*Coefficient*	*Std Deviation*	*t-statistics*	*Prob*
Constant	-0.1647	0.2173	-0.7600	0.4490
VAIC	0.0035	0.0020	1.8000	0.0730
LEV	0.3853	0.2273	1.7000	0.0910
SIZE	0.0392	0.0273	1.4400	0.1520
R-Square	0.0608			
Adj R-Square	0.0486			
F-statistics	4.9700			
Prob (F-statistics)	0.0023			

This was due to the impact on the number of X variables as it were increases, the adjusted R-square will be increases as well but it always lesser than the unadjusted R-square value. Basically, the adjusted R-square were always been selected to be the best practices rather than the unadjusted R-square because it may gave the optimistic pictures of the fitness on the regression model, particularly in the situation whereby the number of explanatory X variables were larger from the number of observations. Therefore, the current study shown

the number of independent or X-variables is increases, the adjusted R-square will also rises but the value is much lower than the unadjusted R-square. In most cases, the value of the adjusted R-square resulted to be non-negative although it can be negative. In the case of the adjusted R-square turn as a negative, thus its value will be taken as a zero.

In view of the above scenario, if compare based on two regression models with only one dependent variable but have a different number of X-variables hence, it will created the impact on values of R-square and the adjusted R-square, However, one should be very cautious of choosing the model with the highest R-square. Based on the regression model 1 for Malaysian bank, VAIC were significantly positive in relationship with the technical efficiency as probability were at 0.0730. Hence, implies that the Malaysian bank were generate VAIC by one unit, thus technical efficiency performance will increased by 0.035. As the result, based on the current study revealed that under Hypothesis 1 is accepted.

4.7.3 Regression Result for Malaysian Bank (VAIC Components)

Furthermore, the regression will examine for overall of Malaysian bank based on major components in VAIC. Hence, the findings shown that adjusted R-square was increased from 4.86% to 9.46%. This have suggested that the components of VAIC were better in explained the level of technical efficiency among the Malaysian bank as compared to the aggregate measured bsed on VAIC alone. As notice on the adjusted R-square compared to the adjusted R-square for VAIC alone, among all of the Malaysian bank revealed that the value were statistically increases from 0.0486 to 0.0946. The detailed on the findings for multiple regression were illustrated under Table 4.13 which have shown on the adjusted R-Square increased significantly at 9.46%.

Table 4.13: Regression Result for Malaysian Bank (VAIC Components)

Independent	*Coefficient*	*Std Deviation*	*t-statistics*	*Prob*
Constant	-0.1294	0.2177	-0.5900	0.5530
CEE	7.1868	2.0900	-3.4400	0.0010
HCE	0.0036	0.0020	1.7700	0.0780
SCE	0.0790	0.0529	1.4900	0.1370
LEV	0.4332	0.2266	1.9100	0.0570
SIZE	0.0046	0.0282	0.1700	0.8690
R-Squared	0.1140			
Adj R-Squared	0.0946			
F-statistics	5.8700			
Prob (F-statistics)	0.0000			

For the regression analysis, the objectives is not to obtain the highest R-square but rather to obtain depend on the estimated of the true population regression coefficients either it is statistically insignificant or to have signed that contradicted upon expectation. Therefore, it should be concerned about the logical or theoretical relevant of the explanatory variables to the dependent variable and their statistical significance. According to Gujerati (2004), if in this process obtained higher adjusted R-square, then it said to be well and good, on the other hand, if adjusted R-square is lower, it does not necessarily said that the model is bad.Therefore, findings shown that only the two components of intellectual capital namely human capital efficiency and capital employed efficiency was found to be positively related with technical efficiency based on the coefficient value of 0.003 (t-statistics = 1.77; $p<0.1$) and 7.186 (t-statistics = 3.44; $p< 0.01$) respectively.

From the magnitude of the t-statistics, capital employed efficiency provide a greater significant contribution to the model compared to human capital efficiency. The finding implies that as capital employed efficiency increases by one unit, technical efficiency increases by 7.186 units similarly, human capital efficiency increase by one unit, technical

efficiency increases by 0.003 unit. Nevertheless, structural capital efficiency is not significant with technical efficiency. This concluded that, Malaysian Bank with greater human capital and capital employed tend to have higher technical efficiency performance but not with the structural capital. Hence, the hypothesis under item H2 and H4 is accepted however for the hyphothesis under H3 is rejected.

4.8 Discussion of the Results

Intellectual capital contributes huge and progressive amounts in way of creating value which eventually will lead to the competitive edge towards the firm's performance. However, all of it must be depend on assessment and practice of intellectual capital within an organization. In other words, intellectual capital takes an organization towards superiority and recognition of invisible characteristics as the performance yet successful of an organization is attached with efficiency on how to manage intellectual capital's in views on numerous aspects. The overall research objective is to investigate the relationship between the VAIC and technical efficiency among Malaysian banks particularly for Islamic and Conventional for the period of 2007 until 2016 while controlling for a firm-specific variables. This study's findings perhaps will attract some interest beyond intellectual capital performance literatures and act as a basis for further discussion in determining their roles of intellectual capital especially within banking sectors.

Furthermore, this study conducted in view of the fact that both intellectual capital and Malaysian banking are still relatively young concepts for developing countries encounters with many challenges. Intellectual capital in Malaysia had been investigated with ongoing discussions yet it is still considered at its infancy stages as none of the studies have agreed on a specific methods for measuring intellectual capital. Therefore, it is expected that any

related discussion on intellectual capital must also be aligned with the concepts of value creation as the logical value creation is somehow relevant to both individual and national banking functions. An in-depth literatures reviewed on the VAIC model were taken as it is considered the most appropriate methods for measuring intellectual capital for the used of secondary data.

This study is important as a comparison between the two banking systems working in the country; Islamic or Conventional banking on which is more technical efficient and in turn, contributed more to the development of the national economy. The data were completely to examine based on the objectives and revealed that most of the banks in Malaysia had achieved their efficiency through its scale frontier but not on the technical frontier, thus imposing a problems on the scale efficiency but yet not to provide any related issues towards the overall of banking system in Malaysia. Hence, the focus should be on the banks' managerial skills and investment in intellectual capital so as to assist in the consideration of investment decisions in order to be able identify any signs of either overinvestment or underutilize in intellectual capital in order to technically improving their efficiency.

The overall findings has précisely and revealed that the performance of Malaysian bank technically efficiency in utilized on their human capital efficiency in comparison to the capital employed and structural capital efficiency supported with the mean's score for human capital which were the highest at 6.0085. The finding similar and consistent with the findings of Gan and Saleh (2008), Firer and Williams (2003) and Ho and Williams (2002). Nevertheless, human capital for Islamic banks were much higher than that of Conventional banks as the mean and standard deviation (Sd) for both Islamic and Conventional banks were at 10.342; Sd=13.579 and 2.9936; SD=1.137 respectively. Furthermore, according to the regression results that examine the relationship between the VAIC attached with additional

control variables. Thus, the empirical findings of this study show that Malaysian bank have a positive and significant relationship with VAIC and technical efficiency. Human capital and capital employed efficiency have provided a significant and positive relationships with technical efficiency. However, structural capital efficiency has a negative relationship with technical efficiency. This finding contradicts with the findings of an existing empirical study done by Zou and Huan (2011) which proved that the structural capital has the biggest impact on technical efficiency compared to capital employed and human capital among China listed banks.

However, this situation is inverse, leading to the conclusion that the structural capital component was represented one of the main components of intellectual capital and revealed insignificant element forVAIC in influencing the technical efficiency among Malaysian bank as a whole. This conclusion is important since the banks could realize that the investment using the elements of structural capital such customer databases, organizational structure, functional organization, procedures, rules of conduct and others were not fully influences the technical efficiency for Malaysian banking sector. The fact that banks (as compared to the other industries) often do not involved on structural capital, specifically in terms of innovation and process capital which included on research and development, patents, and organizational procedures and processes may be the main reason to the failure of the structural capital in providing significant technical efficiency.Study have suggested that banks should continue to invest in human and capital employed efficiency through the provisions of technology at the same time concerned that this types of capital were needed to be fully utilized and to be manage efficiently.

On the other hand, human capital efficiency and capital employed efficiency were shown as significantly positive with technical efficiency performance. Recommendation on banks can

achieve efficiency through the enhancment of the value in their human capital and physical assets. Meanwhile, bank should also focus on the investments in human capital such as spending on the training and development of their employees in order for Malaysian banks, especially Malaysian Islamic banks to accelerate smoothly. According to Mohiuddin et al., (2006) practically human capital efficiency consider as major contributors affected overall total of VAIC among Malaysian banking sector. Basically, human capital require professional and ability of the workers or customer service in responding and handling the customers. This is due to the fact that in banking and finance industry involved on the nature of business that mainly engaged in providing financial services.

Therefore, the value creation is enhance basically reflected with highly connected during on the time when the services is served given by the customer service or employees (Joshi et al., 2013).Thus, prior on the empirical findings which is based on the existing literatures that consistent with the current study stated that, human capital efficiency stand as primary leading factors in which being the subject for management in enhancing more effort in emphasizes the human capital since it were treated as an effective alternatives to create bank's value as well as improving on the level of bank's efficiency (Wang & Chang, 2005).

CHAPTER 5

CONCLUSION

5.1 Introduction

This research study pointed out on the significant roles played by intellectual capital efficiency in relation to the technical efficiency performance of Malaysian Islamic and conventional banks. Empirical evidence found to have a positive relationship between the intellectual capital efficiency (VAIC) with its major components of human cpital efficiency, structural capital efficiency and capital employed efficiency as an independent variable and technical efficiency which stand as a dependent variables. These result are particularly encouraging since exposed on the real possibility that investment in intellectual capital efficiency somehow in return will provide a greater efficient and effective way of managing in creating value added among the financial institution in Malaysia and influencing to be more competitive within market.

The findings also considered as an additional evidences toward the existing literatures that postulated on the similar suggestions. Nevertheless, although the empirical findings of the study found to be imperative however it is considered as another footstep in the process of creating and setting standards in facing the challenges within knowledge economy era. Malaysia is currently entering into a knowledge based economy where the challenges of globalization has induce developing countries to move fowards into knowledge based economy (Bhatiasevi, 2010) ever since, the implementation of eight Malaysian plan (2001-2005), whereby Tun Mahathir highlighted that country will faced even with greater challenges from the globalization and liberalization as well as rapid development from Information Communication and Technology (ICT) which forced the shift from being input

driven into the knowledge driven as a ticket to achieve the vision of 2020 and in progress of turning into a developed nation (Abdulai, 2004; Bhatiasevi, 2010). Aligning with findings of the current study, and consistent with previous study done by Chen et.al, (2005), thus, suggested that if VAIC were examined individually, hence it may command on the different values as opposed to aggregate measured of VAIC.

Findings shown on conventional banks demonstrating on weak relationship between capital employed and technical efficiency compared to Islamic banking sectors yet both banks were not influence with any changes per unit on structural capital efficiency and technical efficiency performance. Therefore, it is crucial for the banking industry to progressively prepared in facing any uncertainty in risk within the modern financial challenges where everything were depended on it's talents (human capital), the quality of tools (structural capital) and physical or financial (capital employed). In short, intellectual capital efficiency resources have to be identified within the banking sectors and be well-prepared in order to accomplish on their main agenda for developing the economy.

5.2 Summary of the Results

The relationship between intellectual capital and firm's financial performance was became the subject of countless of studies. Prior on many research conducted previously in all countries, intellectual capital always considered as the independent variables in measured firm's performance. Basically, for operational point of view, it is similar as firm's monetary values which refer to the exchange for the price paid on products or services that served (Hsu & Wang, 2012). Hirschey and Wichern (1984) and Venkatraman and Ramanujam (1986) described on the performance is to include both accounting and market measurements. The accounting measurement normally involved the ROA which has explain on how company's

management is efficiently in using their assets for earn profit, while ROE used to measure firm's efficiency in generated profits from the net assets (Usoff et al., 2002). While, for the market-based performance, basically market-to-book value and Tobin's Q are widely used to reflect on market's assessment of firm's value.

The market-to-book value somehow considered the indicator of market-to-book value approached for intellectual capital (Edvinsson & Malone, 1997; Roos et al., 1997; Sveiby, 997). Meanwhile, Tobin's Q refer to the ratios of firm's market value as the replacement cost of its assets (Chung & Pruitt, 1994). Usually, all these measurements practically subject to the performances and being criticized once as not meeting standard guidelines for strategic decisions due to fail to underline the effect of why the firms have low performance. The current study is examines the intellectual capital efficiency of Malaysian bank by using the combination of VAIC and DEA analysis. In order to measure the banks' performance, this study mainly adopts the DEA model.The analysis has provide the technical efficiency performance of Islamic and Conventional bank which also referred as dependent variable. The DEA analysis had outlined the input and output indexes based on the intermediation approach in order to measure the banks' technical efficiency performance.

In contrast, independent variables is VAIC and its major components namely human capital efficiency, structural capital efficiency and capital employed efficiency. In short, the VAIC model is designed as analytical procedures that enable the management, shareholders and other relevant stakeholders to effectively monitor and evaluate the efficiency of value added by both a firm's total resources and each of its major components (Ho & Williams, 2003). In addition, in order to determine the relationships between independent variables, bank size and leverage is fixed in order to isolate each factor that is significant in relation to technical efficiency.

Table 5.1: Summary of Major Regression Result for Malaysian Bank

	Islamic Banks			*Conventional Banks*			*Malaysian Banks*		
	Coef	*t-stat*	*sig*	*Coef*	*t-stat*	*sig*	*Coef*	*t-stat*	*sig*
Constant	-2.7010	-3.1500	0.0020	-0.0543	-0.2700	0.7910	-0.129	-0.59	0.553
HCE	0.0061	2.3200	0.022**	0.0773	3.6600	0.000***	0.0037	1.77	0.078*
CEE	6.1034	2.0300	0.046**	-4.8863	-1.6700	0.097*	7.1868	3.44	0.001***
SCE	-0.1186	-0.8900	0.3750	0.0362	0.6600	0.5100	0.079	1.49	0.137
VAIC	0.0048	1.9100	0.0600	0.0594	3.6800	0.000***	0.0035	1.8000	0.0730*
SIZE	0.0880	0.8800	0.3800	-0.0205	-0.7800	0.4390	0.0046	0.17	0.869
LEV	2.6020	2.6000	0.01***	0.6990	3.0500	0.003**	0.4332	1.91	0.057*

5.3 Limitation and Direction for Future Research

There were several limitation identified on current study such as inability to specify the roles played by manager in decision making since findings does not fully influence specifically in technical efficiency performance since was conducted involved on analysis only from the secondary data. Besides, the findings from the data which was considered relatively small in sample data which had focused in Malaysian Islamic and Conventional banks only; hence, the results was unable to provide individually and only can be viewed as general beyond this industry. In future study, perhaps could provide and recommend to employ on different DEA approached in study the intellectual capital efficiency while regression of intellectual capital management efficiency score would be based on other type of explanatory variables such from the perspectives of corporate governance components. Additionally, for future study might be include all Malaysian banks within banking sector and extend related sectors such as Finance and Insurance sector. This will provide comprehensive and complete reports on overall sectors' efficiency performance. In order to provide better results it is suggest to

increase the size and length of the study period. It should be noted that existing studies that examines on the relationship between technical efficiency and intellectual capital for Islamic financial institutions at Malaysia were still at its preliminary stages. Thus, this study is considered one of a kind. As for the future Islamic finance industry predicted to face strong competitions that brings many challenges, therefore it was encouraging to provide more empirical evidences in the field that needed for better improvement and development of national economy.

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