



TESTING THE FINANCIAL DISTRESS MODELS
FOR *SUKUK* ISSUING COMPANIES IN MALAYSIA

BY

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ABSTRACT

Research on financial distress is relatively young in Malaysia, especially with respect to the *sukuk* companies. Debate on the unique characteristics of *sukuk* and its increasing cases of defaults has pointed to the need for extended and deepened research on financial distress. This thesis, therefore investigate characteristics of *sukuk* companies, in comparison to bonds companies. The existing financial distress models, namely Altman (1968), Ohlson (1980) and Shuwmay (2001) models is tested to examine its prediction power on *sukuk* samples. New financial distress model for *sukuk* companies is developed which incorporated predictors based on characteristics of *sukuk* companies and cash flow variables. In addition to that, the thesis also investigates whether destruction of the US dollar cause financial distress to companies that issued dollar-denominated *sukuk* and bonds. Logit regression and hazard regression are the main statistical techniques applied in this study. Not only this study is one of the relatively few studies on *sukuk*, but to the author's best knowledge it is the first to provide forecasts of financial distress for *sukuk* companies using both static and dynamic models. This study is significant at least for four new discoveries. The first is, *sukuk* companies can be distinguished from bonds companies in term of liquidity, size and leverage (hereby, LSL). It is common in financial distress study to identify that size and leverage as significant predictors. However, it is surprise to see that liquidity is more important to *sukuk* companies rather bonds companies. It is argue that liquidity is closely related to *sukuk* companies because characteristic of *sukuk* itself that is depending on the cash flow of the underlying assets. Second, this study reveals that logit model is more suitable for *sukuk* companies, while hazard model is more suitable for bonds companies. Third, this study developed a new model for *sukuk* and discover that liquidity measured using cash flow variables are significant to *sukuk* companies. Addition of cash flow variables in *sukuk* model has increased the prediction power and lower the Type I error. Interestingly, when the same set of predictors used in *sukuk* samples is applied in bonds samples, none of the predictors are significant for bonds. This has supported earlier arguments that liquidity is the most suitable predictors for *sukuk*. The empirical analysis supports the well-known theory of trade-off theory and bankruptcy costs. The fourth is, the thesis uncovers that US dollar destruction; proxy by US stock index and US property index, has less impact on the probability of financial distress of dollar *sukuk* and bonds companies. Nevertheless, the negative coefficient sign for property index is mind stimulating; supporting the understanding that *sukuk* is closely connected to performance of the fixed assets.

ملخص البحث

البحث عن الضائقة المالية لا يزال مستجدا في ماليزيا، وخاصة فيما يتعلق بشركات الصكوك. والمناقشات حول الخصائص للصكوك وزيادة حالات التخلف عن السداد، تشير إلى ضرورة إجراء البحوث الموسعة على الضائقة المالية. ولذلك، كان الغرض من هذا البحث النظر في خصائص شركات الصكوك بالمقارنة مع شركات السندات. تم اختبار نماذج الضائقة المالية الحالية، منها: الثمان (١٩٦٨)، وأولسون (١٩٨٠)، وسوماي (٢٠٠١) لدراسة الطاقة توقعاتها على عينات الصكوك. وقد تم تطوير نموذج جديد للضائقة المالية لشركات الصكوك التي أدرجت التنبؤ على أساس خصائص شركات الصكوك ومتغيرات التدفق النقدي. كانت الإحصائية الرئيسية المستخدمة في هذا البحث هي الانحدار اللوغاريتمي والانحدار الخطر. يرى الباحث أنه من أوائل التقديم لتوقعات الضائقة المالية لشركات الصكوك باستخدام النموذج الثابت والنموذج الديناميكي. وتعد هذه الدراسة المهمة على الأقل لمدة أربعة اكتشافات جديدة. أولا، شركات الصكوك يمكن تمييزها عن الشركات من حيث السيولة والحجم والنفوذ وهي، (LSL). ومن الشائع في دراسة الضائقة المالية لتحديد حجم ونفوذ كالتنبؤ المعتمد. ومع ذلك، فإنه من المستغرب أن نرى أن السيولة هي أكثر أهمية لشركات الصكوك من شركات السندات. ويقال إن السيولة ترتبط ارتباطا وثيقا بشركات الصكوك بسبب مميزات الصكوك التي تعتمد على التدفقات النقدية للشركة المصدرة والأصول الأساسية. ثانياً، كشفت هذه الدراسة أن النموذج اللوغاريتمي هو أكثر ملاءمة لشركات الصكوك، وأما النموذج الخطر فهو أكثر ملاءمة لشركات السندات. ثالثاً، يُفهم بأن كلا التنبؤ والتقنية الإحصائية مهمة لتطوير نموذج قوي للضائقة المالية، وضع هذا البحث نمودجا جديدا للصكوك واكتشفت أن السيولة المعتدلة باستخدام متغيرات التدفق النقدي هي معتبر لشركات الصكوك. زيادة المتغيرات التدفق النقدي في نموذج الصكوك يزيد قوة التنبؤ وتخفيض الخطأ. وعندما تم تطبيق التنبؤ نفسه المستخدم في عينات الصكوك وفي عينات السندات، لم يكن أي التنبؤ معتبرا للسندات. هذا يدعم الحجج بأن السيولة هي أكثر ملاءمة للتنبؤ بالصكوك. إن التحليل التجريبي يدعم النظرية المعروفة من نظرية المفاضلة وتكاليف الإفلاس. رابعا، كشف هذا البحث أن تدمير الدولار الأمريكي، تفويض من مؤشر الأسهم الأمريكية، ومؤشر العقارات في الولايات المتحدة، له تأثير أقل على احتمال الضائقة المالية من صكوك الولايات المتحدة والشركات المصدرة للسندات. ومع ذلك، فإن علامة المعامل السلي للمؤشر العقاري هي العقل الحظ. وهو دعم على أن الصكوك ترتبط ارتباطا وثيقا بأداء الأصول الثابتة.

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DECLARATION

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This dissertation is dedicated to my beloved parents

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CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND OF THE STUDY

Business can be defined as an economic activity, which is concerned with earning money and obtaining wealth by producing and distributing goods and services. The objective of a larger business, which usually referred as company or corporation¹, has remained to generate a financial return in exchange for accepting the risk. However, Afshar (2013) argue that in order to generate a financial output, it is important to have financial input, which can be referred as company's capital. There are various sources through which a corporation can obtain the financial capital required to fund business operations. These sources include internal funds or external funds. The internal funds may consist of the company's own capital, cash or retained earnings; whereas, external funds are capital that is sourced from the issuance of equity or issuance of debts. The company can opt to choose either internal or external financing depending on their needs and its financial position. According to the pecking order theory (Myers & Majluf, 1984), there is a hierarchy of financing, where company prefers to use the internal funds first. If the internal funds are depleted or insufficient, the company will opt for debt financing and only issuing equity as the last resort.

Consequently, in order to expand the business, capital injection is required and the company prefers to issue debt. Debt issuance is preferred than equity issuance because the cost to issue debt is cheaper than equity. Besides, debt issuance does not

¹ Bursa Malaysia use terminology of 'company' to refer to the company listed under their Exchange. On the other hand, many literatures, be it Western-based or Asian-based (i.e. Malaysia) is using terminology of 'corporation' and 'firm' (e.g. firm characteristics). Hence, in the field of finance, all of these three terminologies have been used interchangeably and bring no issue. Legal perspective is not the interest of this thesis.

bring any external ownership to the company. This is in contrast to the equity issuance where the stockholders become the owner of the company. Moreover, through debt issuance, the company can get the trade-off benefit of the tax saving. If the debt is chosen as the source of financing, the company will issue the safest debt first, namely the bonds, then followed by convertible debt or any other hybrid securities². Issuing debts are associated with positive signaling in the market³ because it reflects the stable position of the company.

The above discussion is in line with the M&M proposition II⁴ (Modigliani and Millers, 1958), which suggests that the company with the greater amount of debt is more valuable because of the interest tax benefits. After the emerged of Modigliani and Miller theory, researchers have continued to argue on determining the way in which a corporation may structure its capital. This excursion has resulted in the confusing decision, conflicting theories, and mixed evidence. Considering the initial concept that company capital is likely to vary under different conditions, authors began to recognize the determinant of debt levels. Moreover, certain costs have been identified that are incurred when financing through debt including the cost of bankruptcy, where the value of the company may decrease, as the amount of debt increases. Furthermore, the overissuance of debt may trap the company into the problem of financial distress, and the worst scenario is, it increases the liquidity risk. This is based on the understanding that the company will bear the cost of capital, and increase their exposure to various market and company risks. Hence, the company is suggested to follow the optimal capital structure theory (Scott, 1976), as one of the

² Security that combines elements of debt and equity securities.

³ Issuing debt is associated with positive signaling because it's reflected the company's commitment to pay the interest. Hence company is expected to have a stable financial position.

⁴ The M&M proposition I assumed that without corporate tax, the proposition of debt and equity is independent of its capital structure.

ways to prevent the problem of financial distress. The optimal capital structure theory proposes the combination mixed of debt and equity where it involves balancing the tax advantage of debt against the value of bankruptcy cost.

There has been significant progress to understand the determinants of selection of financial instruments⁵. Nevertheless, to date, there is no study conducted to examine the effect of the selection of financial instruments (either debt-based or equity-based) on the company's survival and financial distress. Hence, understanding of the capital structure would remain incomplete without understanding it in the context of Islamic Financial Instruments (IFIs). The thesis argues that it is important to examine the composition of IFIs in the capital structure of a company. This is because of IFIs, especially with regard to *sukuk* has different financial characteristics as *sukuk* incorporated elements of equity, while bonds are pure debts. In general, debt has three basic characteristics. Firstly, the company which issuing debt has the commitment to make fixed payment in the future. Second, the fixed payments are taxed deductible, and third, failure to make payment will lead the company to default or loss of control to the party to whom payments are due.

Besides, the general characteristics above, *sukuk* (plural of *sakk* in Arabic)⁶ or also known as Islamic bonds, has additional unique characteristics and should be differentiated from common shares (equity) and bonds (debt). Both *sukuk* holders and common stockholders possess the ownership of the company, however, *sukuk* holders only own specific assets for a given maturity period. This is in contrast with common stockholders whose shares represent ownership of a company entirely and for

⁵As a result, detailed empirical evidence is available that has tested different theories of capital structure (including Bradley et al., 1984; Strebulaev, 2007) on the trade-off theories and optimal structure theories, and the work of Opler and Titman (1995), Basking (1989) and Shyam and Myers (1999) on pecking order theory. Furthermore, Welch (2004) and Baker and Wurgler (2002) have examined the market forces, and Yan (2006) and Beattie et al. (2000) studied the least-debt substitutability.

⁶ *Sukuk* also can be referred as *sanadat*, which means certificate of investment (Ayub, 2007).

indefinite time period. However, for bondholders, they do not have any ownership position in the company. Bondholders are only credit lenders to the company and they possess the first claimant status in the event of bankruptcy. Moreover, *sukuk* returns are based on the cash flows of the underlying assets, while returns on bonds are predetermined (Ayub, 2007), regardless of the financial position of the business.

Due to characteristics of *sukuk* and bonds above, the thesis argues that *sukuk* and bonds companies possibly share some similar financial characteristics due to general characteristics of debt. In addition to that, *sukuk* companies have another unique additional characteristic which is related to characteristics of equity itself and certainly on its *shariah* matters. Previous studies identified that characteristics of a company such as company size and leverage ratio are different for *sukuk* and bonds companies (Morris, 1992; Rozali, 2011).

Consequently, the question arises whether issuance of bond and *sukuk* has any trade-off benefit to the company. On the other hand, issuance of bond and *sukuk* may also increase the exposure of higher cost of bankruptcy, which causes the financial distress problem. However, despite numbers of *sukuk* and bonds default cases reported, there is no empirical evidence to support whether *sukuk* and bonds issuance causes financial distress.

Many models have been developed to predict the problem of financial distress and bankruptcy. For instance, Altman Z-score model (1968), Ohlson's logit model (1980), and Shumway's hazard model (2000). However, these studies do not test *sukuk* and bonds instruments in their models' development. This might be due to the infancy stage of *sukuk* market and the absent of adequate data at that time. Moreover, most of the existing financial distressed models were tested on one single type of industry (i.e., focused on manufacturing or consumer sector only) and were based on

the Western countries, which have different economic and financial landscape as compared to Malaysia. There are also some issues related to the statistical power of each of the model where Altman and Ohlson models are static models, which cannot capture the time-dynamic as applied in the Shumway model. Yet, the models need to be tested on *sukuk* so that a valid conclusion on the applicability of the models can be drawn from the findings. The important issues are on the ability of existing financial distressed models to capture the unique characteristics embedded in the *sukuk* structure, and how these characteristics can be an indicator to gauge the problem of the financial distress.

In addition to the above discussion, there were also increase in the interest of US dollar-denominated *sukuk* and bonds. This interest emerges because of higher demand for US dollar as the main international currency as compared to other currencies. As at end of the year 2014, the US dollar-denominated corporate bonds are worth USD276.11 billion (Wall Street Journal, 2015). Issuing bonds in foreign currency bring two risks, namely the sovereign risk (i.e., country risk/political risk) and foreign exchange risk. The country risk such as the US mortgage subprime crisis in the year 2009 has impacted the economy of many countries. In the Malaysian context, it was identified that in the short run, the Malaysian market's response to the US market was more immediate compared to its response to the Japanese market (Ibrahim, 2005).

Unfortunately, since the collapse of the gold-linked dollar in the year 1973, the dollar has become weak and unstable because the value of the dollar can be manipulated (Forbes & Ames, 2014). The States tried to increase the dollar supplies in the market by reducing its interest rate; however, this had suggested the destruction of the US dollar. The abandon of the gold-linked dollar resulted in the 45 percent

declined of the Dow Jones Industrial Index in the year 1974, and consequently leads to many financial crisis and energy crisis (Ross, 2013). The subprime crisis is the result of the weak Dollar, where dollar starts to shrink in percentage. As at the year 2014, it was reported that the US has accumulated USD17.8 trillion worth of total debt, which is about 103 percent of the US total GDP (Money Morning, 2015). Out of this debt, 34 percent or USD6.1 trillion is owned by the foreign country⁷.

To stabilize the value of Dollar, the Federal Reserve (The Fed) decided to stimuli the economy through the quantitative easing (QE) strategy. Bond buying and large-scale assets purchases (LSAPs) are part of the QE strategy to expand the monetary base. However, it was reported that QE strategy was not effective when its interest rate approaches to zero (Appelbaum, 2014). The inefficient of this monetary strategy suggested that the economy is close to the liquidity trap (Krugman, 2008). Theory of liquidity trap is a situation in which a factor that is implemented to stimulate the economy fails to deliver the desired results. Accordingly, similar to bonds, once *sukuk* were issued in the US dollar denomination, there will be an additional risk to the issuers. Hence, it is important to understand how this additional risk (i.e. dollar destruction) increases the probability of financial distress among the *sukuk* and bonds companies.

Detecting symptoms of financial distress at an early stage is crucial because it can prevent an issuing company from filing for bankruptcy. The findings of this study possibly will give an additional evidence of whether the current practice of *sukuk* and bonds are factually different, and how these can affect the development of the financial distress model. Although there are various financial strategies that may

⁷ More than 20 percent (USD1.26 trillion) of the US debts are owned by China. If China sold the debts, it will bring a great impact to the value of the US dollar. To date, China has exercised more than USD75 billion of US bonds.

support the firms' survival, it is more important to predict the financial distress earlier because it is more cost effective⁸.

1.2 PROBLEM STATEMENT

This thesis takes the position that *sukuk* is a special class of financial instrument, and that *sukuk* should be distinguished from conventional bonds. *Sukuk* is an equity but can be structured on a debt-based model⁹ or an equity-based model¹⁰ (Idealratings, 2013). Unfortunately, in practice, *sukuk* have been treated like bonds because *sukuk* share some similar rating classifications¹¹ and financial characteristics¹². *Sukuk* have been classified as a fixed-income, and is sold in the debt market. *Sukuk* will have greater risks if they are imitated and treated similarly to bonds, which is pure debt. Yet, *sukuk* are cash flow oriented instrument where incomes investors receive from them depend on the value of the underlying asset. Moreover, the issuer needs to implement a top-up mechanism in case there is a shortage of the asset's value. Hence, this indicates that both of the sources of cash flows are important to be monitored as they reflect the financial position of the company.

Safari, Ariff, and Shamsher (2013) proved that *sukuk* belong to a different class of debt where yields of *sukuk* are significantly higher than yields of conventional bonds. Furthermore, *sukuk* can also affect the risk measure whereby the risk of *sukuk* companies changed after the *sukuk* issuance. This is further evidenced by the numbers

⁸ Due to the financial distress events, prior studies have suggested various recovery process, for instance, financial restructuring (Kam, Citron, & Muradoglu, 2010), merger and acquisition (Pole mis & Gounopoulos, 2012), efficiency-oriented recovery strategies such as cost cutting and asset reduction activities, or entrepreneurial-oriented strategies (Laitinen, 2011; Routledge & Gadenne, 2004; Smith & Graves, 2005).

⁹ Ijarah or murabahah. *Sukuk* holders are still the owners of the underlying asset that is leased to the beneficiary.

¹⁰ i.e., Musharakah.

¹¹ Where the rating for *sukuk* is based on the company's performance, not on the *sukuk* itself.

¹² Some *sukuk* have fixed term maturity, coupons, and are tradable at normal yield prices.

of default, financial distress statuses and filing for bankruptcy among *sukuk* companies.

The first *sukuk* default happened in 2008 in the United States of America when an oil and gas company, East Cameron Partners (ECP) filed for bankruptcy protection under Chapter 11¹³. The company failed to pay the periodic returns amounted to USD166 million of its *sukuk* issued in 2006. *Sukuk* default also occurred in countries of the Gulf Cooperation Council (GCC), for instance, Nakheel *Sukuk* of Dubai¹⁴. There were also *sukuk* default cases in Malaysia, among the companies involved are Johor Corporation, Tracoma Holdings Berhad, and Nam Fatt Corporation Berhad, which have been listed under the Practice Note 17 (PN17)¹⁵ status. There were also *sukuk* which rating has been downgraded such as the Alam Maritim *sukuk*¹⁶, and the MRCB Southern Link *sukuk*¹⁷. These problems have led to negative profit income, and have increased the probability of financial distress among *sukuk* companies.

Unfortunately, there is no mechanism established to detect such financial distress problem. Issues¹⁸ surrounding the *sukuk* issuance have steered to another puzzle, whereby *sukuk* issuances might have the same effect as debts (bonds), as claimed by the theory of bankruptcy costs and trade-off theory (TOT). The theory of bankruptcy costs postulates that higher debt (bonds) issuance may increase the

¹³ Chapter 11 of the United States Courts proposes a plan for restructuring to keep the business alive and pay the creditors over time (“United States Courts,” n.d.).

¹⁴ Nakheel *sukuk* were structured as asset-based *ijarah* (Salah, 2010). Asset-based *sukuk* have some *shariah* compliant issues.

¹⁵ A company with financial conditions and level of operations that are on a consolidated basis does not warrant continued listing on the Official List of the Bursa Malaysia. The company must comply with the requirement stated by the Exchange if they want to remove their status from PN17, otherwise they will be suspended and subsequently, delisted from the Exchange.

¹⁶ Downgraded from AIS to BBIS with a negative outlook. Alam Maritim’s orderbook recorded at RM471 million at the end of June this year (2Q16), a sudden drop from its historic level of above RM1 billion. This situation has reduced their cash flow and low liquidity buffers to meet their financial obligations (The Malaysian Reserve, 2016).

¹⁷ Downgraded to C1 from BB3 (RAM, 2012).

¹⁸ That *sukuk* is treated similarly to bonds by the industry practitioners, default problems, rating downgraded, and negative profit. Even *sukuk* has higher liquidity risk because it cannot be traded at a secondary market.

potential of bankruptcy problems. On the contrary, debt (bonds) is said to offer benefits to the company because of its trade-off between potential bankruptcy and tax-advantage. As far as the current practice of asset-based *sukuk* is concerned, it possesses underlying assets, and *sukuk* holders only have rights to the cash flows (benefits) of the assets, and not the recourse of the assets. The understandings on the TOT remain incomplete, especially with respect to Islamic financial securities, such as *sukuk*. Hart and Moore (1995) argued that TOT cannot explain the types of debt claims observed in practice.

Consequently, a question arises of whether *sukuk* issuance will bring the same effect as the other types of debt issuances, as claimed by the trade-off theory. *Ceteris paribus*, if the current practice regards both *sukuk* and bonds as two similar financial securities, then this study expects that *sukuk* and bonds issuance would have similar trade-offs. Nevertheless, *sukuk* have different characteristics, and consequently, the applicability of the trade-off theory in *sukuk* remains perplexing. There is a lack of empirical researches that are focused on *sukuk* samples. Majority of the studies have concentrated on the yield of *sukuk* (Cakir & Raei, 2007; Safari, Ariff & Shamsheer, 2013; Ariff & Safari, 2012), rating changes, *sukuk* defaults (Majid, Shahimi & Abdullah, 2011), determinants of *sukuk* issuance (Haniffa, Masih & Batcha, 2014; Nagano, 2013), and wealth effect of announcement of *sukuk* issuance (Ibrahim & Minai, 2009). Yet, conceptual studies on *sukuk* are in abundance.

Hence, this thesis poses this question on the availability of financial distress prediction model for *sukuk* companies. The definite answer is that, to date, there is no financial distress prediction model that has ever been established for *sukuk* companies. Popular financial distress models, such as the Altman (1968), Ohlson (1980), and Shumway (2001) models (henceforth, AOS models) do not consider the effect of

capital structures (debt or equity issuance) in forecasting financial distress, and hence, do not incorporate any characteristics of *sukuk* companies in the model development.

Therefore, this thesis questions the capability of the AOS models to predict the financial distress of *sukuk* companies. A capable model means that the model must be able to incorporate the characteristics of *sukuk* companies. This is because *sukuk* and bonds are different financial instruments; the characteristics of these financial instruments should be reflected in the company's characteristics. These characteristics can be measured through financial ratios, namely size, leverage, liquidity, efficiency, profitability, and market ratios.

A capable model for *sukuk* companies would also mean that the model is able to produce higher prediction power, and lower type I error when applied to a *sukuk* sample, compared to a bonds sample. However, the AOS models have never been tested on *sukuk* companies. The financial distress predictions of *sukuk* companies would have to be based on the value of the company as a whole, and not on the ownership of the underlying assets. Hence, it is reasonable to test the AOS models using a *sukuk* sample, and to develop a new financial distress prediction model for *sukuk* companies. With the above issues in mind, learning more about the relationship between financial characteristics of *sukuk* companies and problems surrounding the *sukuk* issuance could help minimize the overriding problem of financial distress among *sukuk* companies.

In addition, it has become increasingly difficult to ignore the importance of the US dollar in financial transactions. An increase of US-dollar denominated bonds means that the dollar supply has increased worldwide through debt creation. Unfortunately, there is an increasing concern that the US dollar is at a disadvantage over other currencies due to its destruction. Destruction will happen when the US

monetary policy, namely the reductions of nominal interest rate close to zero, and the dollar supply cannot jump-start the economy. In fact, the collapse of the US property market, and the stock market is a signal that the dollar supply has worsened the US economy. This monetary effectiveness has caused a liquidity trap, which indicated dollar destruction. Hence, one might ask, how can dollar destruction cause financial distress to dollar-denominated *sukuk* and bonds?

The performances of *sukuk* and bonds also depend on their currency-denomination. Hence, when the dollar has lost its value, it affects the value of the underlying assets that are priced in dollar. To service the debt, the company needs to top-up the payment to investors using their own cash, and consequently, this will lead to financial problems among the issuing companies. The effect is endless because it will affect the whole financial performance of the company.

However, there is limited academic evidence that can show any effect of the destructions of the US dollar on any debt company, specifically on *sukuk* companies. This is because most of the current researches tended to focus on the impact of the US dollar on the stock market, and investment portfolios rather than on the debt market. Since *sukuk* and bonds are different, this thesis expects that the dollar destruction should have a different effect on dollar-denominated *sukuk* and bonds companies. After synthesizing the above issues, this thesis aims to develop a financial distress prediction model for *sukuk* companies. Detailed objectives are discussed in the next section.

1.3 OBJECTIVES OF THE STUDY

The main objective of this study is to develop a financial distress prediction model for *sukuk* companies in Malaysia. The specific objectives are as follows: