Understanding and Evaluation of Risk in Sukuk Structures

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Abstract

**Purpose:** The paper first reviews Sukuk risk classification schemes based on extending and adapting the risk classification schemes of conventional finance. It is then argued that risk classification schemes based on Sukuk structure provide significant insights into Sukuk risk not obtainable from conventional schemes. This is because Sukuk structure risk classification schemes link Sukuk risk more directly to the fundamental causal factors creating those risks. These links are less evident in conventional risk classification schemes. It is hypothesised that Sukuk structure risk factors will prove to be highly significant in multifactor expected return regressions.

**Design/Methodology/Approach:** The paper argues that, given the paucity of the empirical data currently available to researchers in Islamic finance, greater care needs to be taken in hypothesis development than is necessary in conventional finance. The limited data available should be used for testing hypotheses and not ‘wasted’ in hypothesis formation. Through a meta-analysis of the existing literature on Sukuk risk it is hypothesised that Sukuk structure risks will be highly significant in explaining Sukuk returns and returns volatilities in empirical tests.

**Findings:** The main Sukuk structures, debt based, equity based, assets based, agency based, and hybrid structures, arise directly from the requirement of Sukuk to conform to the *Shariah* and to the fundamental ethical principles of Islamic finance and business. Further, Sukuk risk profiles are directly related to Sukuk structures. Thus, Sukuk structure risks are essentially *Shariah* risks. The paper presents a Sukuk risk classification matrix based on an evaluation of Sukuk structure risks.

**Research limitations/implications:** The findings on the relation of Sukuk risks to Sukuk structures require corroboration by rigorous empirical tests.

**Social implications:** The paper contributes to work on the creation of evidence based risk management techniques in Islamic finance and to the expansion of ethical financial management.

**Originality/value:** The paper is one of the early detailed academic studies on the evaluation of risks arising from Sukuk structures.

**Paper type:** Literature review and hypothesis development paper.
Keywords: Islamic banking, Islamic finance, Sukuk, risk, Sukuk structures, Sukuk structure risk factors.
1. Introduction

1.1. The expected returns model research programme

The paper reviews and evaluates the risks associated with Sukuk, and in particular with risks arising from differences in Sukuk structure.

This research is set within a wider research programme, the eventual aim of which is to apply to Sukuk the expected returns models that have proved to be successful in the analysis of equities and conventional bonds (Haugen and Baker (1996), Pagas (2008)).

An expected returns model, an ER model, is a multifactor risk model of the form:

\[
E(R_A) = c_A + \beta_{1,A} F_1 + \beta_{2,A} F_1 + \ldots + \beta_{n,A} F_n + \varepsilon_A
\]  

(Equation 1)

\(E(R_A)\) is the expected return of security \(A\), \(c_A\) is a constant term, \(F_k\) is the \(k^{th}\) risk factor, \(\beta_{k,A}\) is the exposure of security \(A\) to the \(k^{th}\) risk factor, and \(\varepsilon_A\) is an error term.

ER models have a mathematical form similar to the more well-known arbitrage pricing models, APT models. However, ER models and APT models differ fundamentally in terms of their motivations and interpretations. In APT models all of the risk factors, \(F_k\), are economic risk factors, i.e. factors such as CAPM \(\beta\)s and unexpected changes in oil prices, interest rates, and industrial production that affect the fundamental value of the real assets underlying the financial security \(A\). Typically, from around three to seven risk factors are used in APT models. ER models, on the other hand, include two kinds of risk factors. Firstly, the economic risk factors used in APT models are also used in ER models. However, ER models also include behavioural risk factors, i.e. risk factors arising from the systematically irrational behaviour identified and investigated in the literature in behavioural finance. For example, high earnings-to-price, dividends-to-price, sales-to-price, and book-value to market-value ratios can be interpreted as proxies for security \(A\)’s exposure to the investors’ overreaction factor (Lakonishok, et al, 2002). Typically, ER models include at least twenty economic and behavioural risk factors, and frequently many more.

In the academic finance literature APT models have been studied more extensively than ER models. In part this is due to the dominance in academic finance of the neoclassical model of economics, in which rational self-interest is the fundamental assumption. The rational self-interest assumption implies that financial markets are semi-strong efficient, or at least near-semi-strong efficient. Hence, from the neoclassical perspective behavioural risk factors are not regarded as being of much significance. However, semi-strong efficiency is an unrealistic
assumption to make for the still developing markets in Shariah compliant financial securities. Hence it is logical to base the risk-expected return analysis of Islamic financial markets on ER models, which are more general, and make fewer presuppositions than the more well-studied APT models. In addition, extensive research in behavioural finance indicates that behavioural risk factors are significant in explaining securities returns, and that ER models out-perform APT models in terms of their explanatory and predictive power.

There are three steps in the development of ER models.

**STEP 1:** The first step is the identification and evaluation of the risk factors, the $F_k$, to be used in constructing the $ER$ model. In many ways this first step is the most important. Once the risk factors have been chosen, the construction and critical testing of the $ER$ model is a purely technical and routine matter, involving the application of standard statistical and optimisation techniques.

This paper is concerned with STEP 1, and in particular with the identification and evaluation of risks caused by the Shariah structures of Sukuk.

**STEP 2:** Once the risk factors have been chosen, the $ER$ model is constructed in STEP 2. The key stages in STEP 2 are using multiple regression analysis to estimate securities’ exposure to the risk factors, i.e. to estimate the $\beta_{k,A}$, and testing for stability of the $\beta_{k,A}$ over time.

**STEP 3:** Finally, in STEP 3 optimisation techniques are used to construct portfolios that are optimal with respect to their risk-expected return characteristics. STEP 2 tests how the risk factors are priced in the market. STEP 3 tests the extent to which the market mis-prices these risks.

1.2. Methodology

The expected returns model research programme outlined above follows the deductive methodology. The grand hypothesis is:

$H_g$: Expected returns models will be successful in explaining and predicting the returns and the volatilities of returns of Shariah compliant equities and Sukuk.
As noted above, STEP 1, the identification of the risk factors to be used in the expected returns model, is the most important, and the most difficult step. The importance of STEP 1 can be seen by considering what would be the result of omitting STEP 1 and proceeding directly to STEP 2. Beginning with STEP 2 would mean that the regressions used in estimating Equation 1 would be, so-called ‘kitchen sink’ regressions, in which ‘everything is thrown at the model except for the kitchen sink’, i.e. the factors $F_k$ used in a kitchen sink model include, more-or-less, all the factors we can think of and for which data is available. There are two serious drawbacks with this approach. A kitchen sink regression is very successful at fitting the model to the data used to estimate the model. However, this is only because so many factors are included in the model. The apparent explanatory power of the model disappears as soon as it is applied to out-of-sample data. The second drawback is more subtle. The kitchen sink regression will result in some of the $\beta$ coefficients being significant, and some insignificant. It can then be hypothesised that the factors with significant $\beta$ coefficients are the ‘real’ risk factors, while the statistically insignificant factors can be discarded. The model can then be cut-down to a smaller model in which only the significant factors are included. The subtle point is that all of the data has been used up in generating the cut-down model, i.e. all of the data has been used in developing a hypothesis about which risk factors are important in explaining security returns. The data cannot then be used to test the cut-down model, since it has already been used to find the cut-down model.

This second drawback is of extreme importance for studies in Islamic finance. Islamic financial markets are a relatively recent development. Unlike in conventional finance, researchers in Islamic finance do not have long time series of data at their disposal. Hence, the data that is available must be used as efficiently as possible. Data should be used to test hypotheses, and should not be used up in merely developing hypotheses.

The approach of this paper is to apply the meta-study method in order to generate the hypotheses about which risk factors are expected to be significant in an $ER$ model. Once the factors have been identified the $ER$ model can then be constructed and tested by following the procedures outlined in STEP 2 and STEP 3 in Section 1.1 above\(^2\). Thus, the limited data available will not be used up in formulating the hypotheses.

\(^2\) At the time of writing STEPs 2 and 3 have recently become feasible due to an agreement between the authors’ institution, the University of *********, and Idealratings, Inc. to undertake together a programme of joint research in Islamic finance. Idealratings is a leading provider of Islamic financial data, including a Shariah compliant screening and income purification service covering over 40,000 listed equities and virtually the entire Sukuk universe. While the data time series are considerably shorter and less complete than those available in conventional finance, the data resources are sufficient for substantial progress to be made in the research questions addressed.
The meta-study approach used in this paper is very common in the academic literature in Islamic finance, in contrast to conventional finance where empirical studies are dominant. This is due to the limited data that is currently available to researchers in Islamic finance, and which is required for conducting empirical tests. The advantage of meta-study analysis, however, is that the limited data available has not been consumed in formulating testable hypotheses. Important sources from which the secondary data is obtained include government studies, reports and archives, textbooks, and professional and academic journals (Saunders, Lewis & Thornhill, 2007).

The next section describes the risk concept in Islamic finance. Section 3 describes the risks of Sukuk, and in particular discusses risk classification schemes for Sukuk based on conventional bonds conceptual of product mechanism, extending the risk classification schemes currently used for conventional securities. The main contribution of the paper is in Section 4, which discusses risk classification schemes based on Sukuk structures. It is argued that structure based risk classifications give greater insight into Sukuk risks than adaptations of conventional risk classifications. This is because structure based schemes are better at capturing the causal links that exist between Sukuk risks and the fundamental requirement for Sukuk to conform to Islamic ethical principles and the Shariah. These links are summarised in the Sukuk risk structures matrix of Table 1. Section 5 concludes by reviewing the main conclusions on Sukuk risks within the wider expected returns model research programme.

2. Risk in Islamic finance theory

In the Islamic financial system risk is an essential element of profit making. Risk forms the basis of profit in that both profits and losses are shared in a joint enterprise. Just as profit is the lifeblood of the Islamic economic system, so too is the assumption of risk. Any commercial partnership in which the profits are shared between partners and not the risk is not a valid Islamic commercial transaction. Both profits and risks must be shared.

Islam does not object to trade, nor does it simply prohibit contracts just for the sake of it. However, Islam is against guarantees in trade, as the Prophet Mohammed peace be upon him said: “al-kharaj bil-Dhaman”, which bases the entitlement to revenue on a corresponding liability for bearing losses. In Shariah it is prohibited for an individual or institution to earn a profit without shouldering a liability. For example, the capital provider in Mudaraba, or Mudaraba-like transactions, is entitled to profit because all operational losses (those not caused by negligence or misconduct on the part of Mudarib) will be debited from his capital (mal). On
the other hand a lender in *Qard*, or risk-free loan, cannot take any compensation or reward from a borrower, as his loaned money is not subject to operational risks (the borrower is obliged to return the loan principal in full at the specified payback time).

Iqbal (1997), Wilson (2008), Elfakhani and Hassan (2005), Asutay (2010) and Akram, Rafique, and Alam (2011) have all emphasised that Islamic finance structures are essentially profit sharing partnership schemes. Risk sharing is a component of trade, and shapes the behavioural norms of individuals in operationalising the system. Risk sharing shows the nature of the relationship between capital and work in the Islamic finance industry. In fact, this may be considered the best method in establishing justice between work effort and return, and between work effort and capital. Indeed, the participatory nature in Islamic financing methods is reflected in the Profit Loss Sharing theory. In Islamic financial instruments, capital and labour merge to establish a partnership. The requirement for risk sharing is an essential feature of the risk management framework for Islamic finance introduced in Junaid and Azhar (2010), namely, that:

a) Transactions should be backed by real assets.

b) Ownership of assets should be genuine, i.e. legal ownership should reflect the underlying economic reality.

c) Risk depends on real asset values.

d) Transactions should be free of *Riba* and *Gharar*.

e) Real investment is permitted, while speculation is forbidden.

f) Fixed, or guaranteed, rates of return are not permitted.

While risk cannot be avoided in Islamic finance, Islam permits, and recommends, taking prudent precautions to mitigate risks. In particular, it is permitted to make the mitigation of risks one of the key aims in the design of Islamic financial instruments. In this regard issuers and investors view Sukuk\(^3\) with great interest. For issuers, including government agencies, multinational corporations, and development institutions, Sukuk help with meeting funding requirements for large infrastructure projects and business expansion. From the investor’s perspective Sukuk can reduce investment risks. The value of Sukuk is largely stable, as it is asset backed or at least asset based, the investment time horizon of Sukuk is fixed, further reducing the risk profile, and Sukuk also help investors to reduce risk through portfolio

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\(^3\) Sukuk is the plural of Sakk. However, following many authors, this paper uses the term Sukuk for both the singular and plural forms.
diversification. Given these benefits to both issuers and investors, the high historical rates of growth of the Sukuk market are expected to continue for the foreseeable future.

As far as risk identifications in Islamic finance are concerned, risk is a main pillar in Islamic finance life cycle because the conceptual of Islamic finance transactions based on trade compared to conventional finance is based on debt. In fact, risk is associated with all Islamic finance instruments including Sukuk. In turn, risk mechanism is based on the deeply understanding of risk factors and its roots in order to apply risk management and measurement approach.

Despite this bright picture, Sukuk, and the Islamic finance industry in general, face several unique risks. Since Islamic financial institutions do not provide a guaranteed return in exchange for customers’ deposits or investments, investors may move their money to other financial institutions should the returns not match their expectations. Thus, Islamic financial institutions face liquidity risk, with the possibility of customers withdrawing funds too quickly. To add to this challenge the financial institution may also be required to pay returns to fund providers even if the underlying assets do not earn profits. These risks may, to some extent, be managed through the establishment of a liquid inter-bank market.

In the Islamic finance system, the only means available to capitalise on a business is through the various modes of partnership, in which the financier provides equity capital and shares in the risks and rewards of the venture. The capital structure of an Islamic enterprise may itself act as its own risk management mechanism, since the partnership structure encourages the partners themselves to make the required efforts to identify, measure, and manage the risks. It is notable that the catastrophic failures of risk management of the Wall Street investment banks, culminating in the financial crisis of 2008, resulted at least in part from the abandonment of the partnership structure in favour of the corporate structure, which broke the mechanism for sharing risks and rewards that existed in the investment banking partnerships. The social and community ties so central to the Islamic way of life are also a means of risk management for individuals, households and businesses. The risk management mechanism in Islamic finance is based upon strong social relationships as a means of accessing help. The risk management of physical assets in Islamic finance, particularly for businesses, revolves around a combination of savings and physical risk management. Retirement benefits too are a combination of communal risk sharing and savings.

In contrast to conventional investors, Islamic investors must also consider the ethical aspects of their investment, and the types of economic activities in which they invest (Erol, Kaynak
and Radi, 1990). For example, Archer and Abdel Karim (2006) point out that while the insights of conventional financial theory apply to Islamic investment, the restrictions which apply to the Islamic investor make investment at Islamic banks different from investment at conventional banks in several important respects:

1. In Islam an investor must pay off his debts, and his death cannot cancel these debts. Since the full repayment of debts is a duty, limited liability arrangements are unacceptable in Islamic culture.

2. A Muslim society would impose little tax upon profits. This would facilitate re-investment of profits, although there are Islamic rules about how this should be done in a partnership.

3. Overall, an Islamic investor must avoid Riba in any form (given, charging and receiving).

   In addition, Islamic investors must also avoid forbidden economic activities which include producing or dealing in alcohol or drugs, unless needed for medical purposes (Segrado, 2005). These ethical requirements impose further dimensions of risk in Islamic finance that are generally not present in conventional finance.

   Therefore, this open a door towards underpin risk identification in Islamic finance theory and how this identification mechanism reflects on Sukuk as its recent exiting Islamic finance instrument in the global finance market.

3. Risks associated with Sukuk

The previous section has indicated some, but not all ways, in which Sukuk may be less risky than their conventional counterparts. However, it is also the case that Sukuk are exposed to many dimensions of risk that do not arise with conventional bonds. According to the Accounting and Auditing Organization for Islamic Financial Institutions (AAOIFI), Sukuk Investment Standard (17) there are 14 types of Shariah structures in Sukuk securitisation, and each of those structures follows a different type of sale contract that underlies the Sukuk securitisation. This raises the question of how to identify, evaluate and measure the risks of Sukuk, and develop methods for how to manage these risks. Research has seen the emergence of a number of risk models and risk management methods for quantifying and monitoring risk (Rosman, 2009). Such methods significantly augment perspectives on risks and the ability to control them. The following discussion develops a holistic picture of the risk of Sukuk, and discusses risk classification schemes based on extending and adapting certain risk classification schemes used in conventional finance.

3.1 Shariah compliance risks
Shariah compliance risk is the risk arising from the failure of an Islamic financial instrument or contract to comply with the Shariah. These include the risk that already existing financial instruments and contracts may subsequently be declared to be Shariah non-compliant. Recently research focuses on Shariah compliance risks include Rosly and Sanusi (1999), Al-Amine (2008) and McMillen (2016) with critical evaluation of Shariah compliance risk interpretations among Shariah schools and parameters. For example, the application of bay al-inah (purchasing on credit) and bay al-dayn (sale of debt) contracts for Sukuk issuance in Malaysia, and criticism of the interest rate benchmarking and guarantee features in Sukuk operations, and Usmani (2008), with criticism of the current Sukuk mechanisms on asset ownership, guarantee, and Sukuk pricing benchmarks. More recently, Dusuki and Mokhtar (2010) criticise asset ownership in current Sukuk mechanisms, and Al-Jarhi and Abozaid (2010) discuss Shariah issues in current Sukuk structures in a paper presented to the OIC fiqh academy conference.

Alsayed (2013), however, emphasises that Sukuk currently operate within an interest based financial system, and consequently that risk management in Sukuk is very complicated and difficult within the boundaries specified by the Shariah. She argues that scholars should therefore allow for some flexibility in structuring Sukuk.

Shariah compliance risk is of fundamental importance in Islamic finance. Concern over the possible Shariah non-compliance of Islamic financial securities is widespread, and the issues are currently far from being resolved.

3.2 Regulatory and supervisory frameworks

Sukuk researchers have highlighted various risks underlying the structures of Sukuk, including Khan and Habib (2001), Jobst (2007), Tariq and Dar (2007), Jabeen and Javed (2007), Sundararajan (2007), Wilson (2009), Nanaeva (2010), Said (2011), Majid, Shahimi and Abdullah (2011), Alsaeed (2012), Noor and Shahimi (2013), and Alsayed (2013). Hence, this alerts both Sukuk issuers and investors to understand the comprehensive picture of Sukuk risk-based supervision needed for Islamic investment, supported by a clear strategy to build up risk management processes at the individual institutional level, and robust legal, governance and market infrastructure at the national and global levels (Sundararajan, 2007). In recognition of this need, the international community has established the Islamic Financial Services Board (IFSB), headquartered in Kuala Lumpur, to foster good regulatory and supervisory practices, to help develop uniform prudential standards and support good practise in risk management (IFSB, 2002).
IFSB has advanced the work on the capital adequacy framework and risk management in Islamic finance institutions, through the issuance of consultative papers on these topics in 2005. This built a road map of risk management paths customisable with Islamic finance principles. In fact, the effective supervision of Islamic banks requires that the three pillars framework of Basel III and the language of risks it introduces be adapted appropriately to its operational characteristics. Such adoption of Basel III would require a medium term effort involving: i) Strengthening the existing supervisory framework to achieve full compliance with Basel Core Principles of Banking Supervision. (ii) Developing appropriate risk measurement and disclosure procedures supported by systematic efforts to build up databases needed for risk measurement; (iii) In parallel, building up the core elements of financial infrastructure and risk management instruments to support sound development of Islamic finance (Sundararajan, 2007). This will set the stage for adopting more advanced capital measurement approaches as envisaged in Basel III, but tailored to the specific operational characteristics of Islamic finance, including the role of investment instruments such as Sukuk.

3.3 The conventional risk classification approach

Risks associated with Islamic finance instruments, including Sukuk, can be categorised by adapting the risk classification procedures applied in conventional finance. El-Hawary, Grais and Iqbal (2004) contributed to this approach with a study presenting a basic view of each Islamic finance instrument’s risk profile. The figure below shows this classification.

*Figure 1: Risk profile of Islamic finance instruments*

![Risk Profile Diagram](image_url)

*Source: El-Hawary et al., (2004)*
Figure 1 above classifies the risks typically faced in the Islamic banks applicable to its investment instruments, including Sukuk. The overview of the profile of operating risks in Islamic finance shows risks grouped into five broad categories: transaction, business, treasury, governance and systemic risks (El-Hawary et al., 2004). While these categories are also applicable to non-Islamic finance, specific risks within them are more relevant to Islamic finance, and the nature of contracts it uses. However, the nature of differences between Islamic finance instruments requires a precise listed risk profile to each Islamic finance instrument in order to gain a more accurate reading of those risk measurements on these instruments.

3.4 The stakeholder risk classification approach

It is becoming increasingly difficult to ignore the nature of different features of investment instruments according to inherited features of Shariah principles. In the Sukuk context, IFSB Standard 7 of (2005) emphasises that Islamic finance institutions may act in various capacities in a Sukuk securitisation. Its exposure to risks may be similar to that of conventional bond securitisation. However, Shariah rules and principles may add an extra dimension to the existing risk exposures and may have a material effect on the risk profile of Sukuk holders. This implies differences between Sukuk and bonds.

As well as the fact that the risk profile of Sukuk is unique, recognition of Sukuk risks is quite complex due to the innovation of Sukuk structures. Tariq and Dar (2007) presented risk characteristics of each type of Sukuk structure from a certificate type perspective by linking them with the Shariah structures underlying the Sukuk type. There were eight risk factors presenting the relationship of those risks and types of Sukuk: credit risk, rate of return risk, foreign exchange risk, price risk, liquidity risk, business risk, Shariah compliance risk and infrastructure rigidities. In addition, IFSB Standard 7 (2005) recognised a Sukuk structure risk profile based on the Sukuk stakeholder’s perspective. The standard listed five stakeholders of Sukuk who are exposed the risk of Sukuk. Those are originator, servicer, issuer, SPV and holder (investor). Categorising Sukuk risk based on the Sukuk stakeholder perspectives provides an easier way to track those risks. Also, this helps to present a comprehensive picture of the risks associated with Sukuk securitisation. Figure 2 below illustrates those risks discussed in the previous research.
Figure 2: Risk Exposure to Sukuk Stakeholders

Risk Exposure of Sukuk from Various Perspectives

- Originator
  - Risk related to repurchase undertaking (Binding promise)
- Servicer
  - Servicer Default
- Issuer
  - Credit and Counterparty
  - Default
- Holder (Investor)
  - Liquidity
  - Coupon Payment
  - Asset Redemption
  - Rate of Return
  - Impairment of Assets
- SPV
  - Bankruptcy
  - Settlement

Source: Created by IFSB standard 7 (2005) and developed by Authors (2015)
It is noticeable that Sukuk designs its risk according to Sukuk structure as securitisation mechanism as the risk picture is in horizontal stream over the natural structure of Sukuk compared to conventional bonds risk goes vertical over the natural structure of conventional bonds as it may appeared the figure below.

In fact, the stakeholder approach provides a valuable framework for understanding and interpreting the risks associated with Sukuk. The advantages of the stakeholder risk classification for Sukuk can be seen by comparing it with the risk classification scheme for conventional bonds of Fabozzi and Dattatreya (2005). In the conventional classification bond risks are classified by cash flow risks and market value risks. The conventional bond risk classification is less informative than the stakeholder model in linking the various Sukuk risks with the factors causing those risks. The figure below shows the conventional bond classification in a simple context.

Figure 3: Bond Risks Scheme

Source: Created by Fabozzi & Dattatreya (2005) and developed by Authors (2015)

4. The Sukuk structure risk classification approach
4.1 Risk underlying Sukuk structures

The aim of this study is to shine new light on Sukuk risk analysis through an examination of financial risk among Sukuk structures. Hence, a determination and interpretation of the above Figures 2 and 3, and the difference between Sukuk risk profiles and bond risk profiles are made.

Referring to previous studies conducted on risks of Sukuk structures such as Fabozzi (2000), Usmani (2008), Tariq and Dar (2007), Abdul Rahman (2008), Abdul Jalil and Abdul Raham (2012), Alsaeed (2012), Noor and Shahimi (2013), and Alsyed (2013), there is necessary room for gathering those risks and listing them for every structure of Sukuk. Sukuk structures can be classified in different categories, such as debt based, equity based, assets based, and agency based as well as a hybrid group which combines two or more structures within a single Sukuk certificate. For examples, debt based Sukuk such as Murabahah and Istisna’a, equity based such as Musharakah and Mudarabah, assets based such as Ijarah and Manfah (usufructs), and agency based such as Wakala structure.

This classification might provide a better reading of risks underlying Sukuk structures to track risks and estimate the reward measurement of each structure. In addition, this matrix, sourced from the past research in this field, helps Sukuk research analysts to figure out the comparison and differences as well as to help bridge the research gap in Sukuk risk analysis. The table below summarises the risks attached with each Sukuk structure. In terms of the methodology of the expected returns research programme discussed in Section 1, the table should be regarded as summarising a set of hypotheses on the expected signs, sizes and statistical significance of the coefficients to be obtained from the proposed multiple regression analysis.
Table 1: Sukuk Structures Risks Matrix

<table>
<thead>
<tr>
<th>Sukuk Structures types</th>
<th>Asset Based</th>
<th>Debt Based</th>
<th>Equity Based</th>
<th>Agency Based</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applicable</td>
<td>Scale of level</td>
<td>Risk Recognition</td>
<td>Applicable</td>
<td>Scale of level</td>
</tr>
<tr>
<td>Yes</td>
<td>More serious</td>
<td>Medium</td>
<td>Yes</td>
<td>Most serious</td>
</tr>
<tr>
<td>Yes</td>
<td>More serious</td>
<td>Medium</td>
<td>Yes</td>
<td>Most serious</td>
</tr>
<tr>
<td>Yes</td>
<td>Most serious</td>
<td>High</td>
<td>Yes</td>
<td>Most serious</td>
</tr>
<tr>
<td>Yes</td>
<td>More serious</td>
<td>Medium</td>
<td>Yes</td>
<td>Most serious</td>
</tr>
<tr>
<td>Yes</td>
<td>Most serious</td>
<td>High</td>
<td>No, there is no asset attached</td>
<td>-</td>
</tr>
</tbody>
</table>

If all other conditions are similar, FX risk will be the same for all types of Sukuk structure. However, those Sukuk that are liquid or relatively short term in nature will be less exposed. The composition of assets in the pool will also contribute to the FX risk in different ways.

High = Red,  Medium = Yellow,  Low = Green  (These rating hypotheses are obtained by analysing and extending the results of the previous research studies discussed in this paper)
4.2 Evaluation of risk profiles underlying Sukuk Structures

Figure 4: Risk roots in Sukuk structures

Risk management of Sukuk structures is a relatively a new subject (Alsayed, 2013). Against the earlier discussion, it has been noticeable from Table 1 and Figure 4 that each Sukuk structure has a distinctive risk profile influenced by the Shariah conditions behind the concept of the financing structure as well as the type of certificate. Therefore, the risks that Sukuk encounter vary according to the structure of the Sukuk. For example, the risks of Sukuk Murabahah, which has a fixed return, differ from those of Sukuk Musharakah; the risks of Sukuk Istisna differ from those of Sukuk Ijarah; and so on. It is important to state that these risks also vary depending on the underlying assets of these Sukuk, be they fixed or movable assets, utilities or services.

Furthermore, risk in securitisation of Sukuk structures is a complex path to follow in due it is in conjunction with serval influence mainly Shariah rules driver. As it seen in figure 4 the
risk story of Sukuk is built on the conceptual of conventional bonds. The figure explains risk factors that exposure Sukuk over securitisation life cycle.

As Sukuk risk as research concern, screening Sukuk platforms and follows is important to draw holistic picture of Sukuk risk factor and its follows over securitisation of Sukuk as this clearly attempt to display in the above matrix and figure.

4.2 Empirical studies on Sukuk structure risks

A few studies have been conducted on Sukuk structure analysis. One of these studies conducted by Abdul Jalil and Abdul Raham (2012) was about a comparison analysis between two Sukuk structures in terms of long term tenure. They determined that the amount of profit gained from the musharakah mutanagisah structure using a coupon rate of 4.5%, priced at par with a tenure of five years was greater than the Ijarah structure where the price is at a discount. In addition, they computed and compared the profits obtained from Sukuk investment in Ijarah and musharakah mutanagisah for a 3.5% coupon rate and price at par for a Sukuk with tenure of 12.5, 15, 17.5 and 19 years. They applied these two models for computing the profit. These models are based on Ijarah and Musharakah mutanagish principles. They found that Sukuk investment using the Ijarah principle is a better investment compared with the Musharakah mutanagish principle, regardless of the number of years of the Sukuk, as long as it is a long term tenure.

Tariq and Dar (2007) and Zaidi (2009) discussed the Sukuk structures and both investigated the risk associated. Zaidi (2009) concluded that the risk of Sukuk is broader than the risk of conventional bonds, due to Sukuk being burdened with additional risk factors, including Sukuk specific market risks, Shariah risk, regulatory risks, and risk factors associated with the assets underlying Sukuk. Tariq and Dar (2007) provided a Shariah compliant framework applying to Sukuk structures in order to contribute to risk mitigation.

Wilson (2008) addresses the criticisms of Sukuk Ijarah related to linking distribution to LIBOR. He examines innovations in the structuring of Sukuk securities and the potential for novel structures based on Musharakah or a hybrid of different Sukuk structures. Wilson also proposes adopting alternative benchmarks to LIBOR based on macroeconomic indicators of real activity such as GDP growth for sovereign Sukuk, and of company financial performance in the case of corporate Sukuk. However, GDP indicators may help in the case of Sukuk based on debt or assets, though not for Sukuk based on equity, because the former Sukuk rely on the
economic environment, the context of the Sukuk issuer, and the assets attached to the Sukuk, while Sukuk based on equity are more affected by the efforts of Sukuk parties such as mudarb (entrepreneur manager) who plays a crucial role in driving Sukuk mudaraba among its risk exposures.

Saad and Mohamad (2012) analysed Sukuk structure performance in the Malaysian market from 2005 till 2010. They used a multivariate regression model for the analysis to investigate the relationship between Sukuk yield and Sukuk structures. They concluded that there is a statistically significant relationship among variables. Most of the listed Sukuk are based on debt (68%), and the majority come from the infrastructure and utilities sectors (53%).

Muhamed and Radzi (2011) identified the implications for Sukuk investors choosing an asset based or asset backed structure, focusing on the Sukuk Ijarah structure as a case study. A default on asset based Sukuk is the same to investors as a default on unsecured bonds. No recourse can be expected against any of the assets used in the Sukuk. On the other hand, asset backed Sukuk may become more widely used as investors would have the ability to take possession of the assets backing the Sukuk. They concluded that asset based Sukuk may be more suitable where legal title to assets cannot be transferred to investors. The asset based Sukuk is more appropriate when there are restrictions on foreign ownership of certain asset classes such as property assets. In addition, asset backed Sukuk may not be adequate in circumstances where the enforceability of assets may provide a challenge, such as sovereign owned assets.

4.3 Managing Sukuk structure risks

Sukuk provide opportunities for financial innovation, not all of which are available for conventional bonds. While Sukuk are exposed to certain risks beyond those born by conventional bonds, Sukuk financing also provides for new ways of managing these risks, and for tailoring Sukuk instruments to the particular needs of issuers and investors. Some contributions to financial innovation in Sukuk markets are discussed below.

Considering the nature of Sukuk structures from the Shariah perspective, it is seen that the evolution of structures such as Sukuk Ijarah has been instrumental in increasing Sukuk issue size for issuers. Structures such as agency Sukuk (Wakalah) have allowed issuers to maximize the use of limited tangibles in an issuance, and thus allowed them to issue a larger quantum than if they had used an Ijarah structure. In practise, issuers like Ooredoo have used other real tangible assets such as airtime minutes via a Manfah (usufructs) structure under the Ijarah concept (Zawya, 2014).
Sukuk are based on the Shariah principles, which, when applied properly, allow avoiding many risks associated with traditional financial instruments. However, since Islamic financial institutions have to function in traditional financial markets, and due to the imperfection of modern Islamic instruments, avoidance of many risks is impossible. While conventional bond holders have a variety of instruments to manage their risks, not all of these instruments are permissible for Islamic finance institutions. For example, there is an on-going discussion in the academic literature about permissibility of using options in Islamic finance. While most derivatives are clearly prohibited by Shariah scholars, there are some options that can be attached to certain Islamic financial instruments. Smolarski and Tahir (2006) argue that call and put options can be used for hedging purposes. Obaidullah (2004) analyses options by stipulation and option of determination as possible risk management instruments in Islamic finance. Tariq and Dar (2007) suggest using embedded options as a tool for Sukuk risk reduction. They argue that Shariah, while prohibiting debt trade, allows its exchange for real goods, assets and services. Thus, a Sukuk holder can have an option to exchange his zero-coupon Istisna’a Sukuk, for example, to an apartment (after a certain period) instead of waiting for maturity. The same authors (Tariq and Dar, 2007) discuss the possibility of swapping floating-rate Sukuk with zero-coupon-fixed-rate-embedded Sukuk as a Shariah compliant instrument. Most of the authors argue that options allow for decreasing excessive risk (Gharar), which should be avoided under Shariah ruling, but are present at the current highly volatile market. While many academics agree that such detachable and non-trading options should be permitted in Islamic finance, and urge Shariah scholars to come up with a collective fatwa on this point, the latter are very reluctant to give such permission.

In 2007 Dubai’s Ports Customs and Free Zone Corporation issued the world’s first convertible Sukuk allowing to convert initial Sukuk into common shares of the originator. In 2007 Khazanah National (Malaysia) issued exchangeable Sukuk with an option to exchange them to existing shares of one of the subsidiaries of the originator. These issues attracted high interest both from investors as well as potential issuers of Sukuk as examples of risk reduction alternatives. While financial experts discuss the possibility of further innovation in Sukuk, such as mandatory exchangeable/convertibles, contingent-convertible Sukuk, reserve convertible Sukuk, etc., most of the scholars have forbidden these kinds of innovations (Abdullah and Ismail, 2008), due to their similarity with derivatives and their perceived excessive uncertainty.

Another on-going discussion among scholars is about permissibility of third party guarantees in some Sukuk issues (Hassan and Soumaré, 2007). Proponents of such guarantees,
usually issued by the governments, claim that there is no clear prohibition of such action in any Islamic source. Thus, according to this discussion, as long as the guarantor is financially and legally independent from both contracting parties involved in the Sukuk transaction, the third party can guarantee the entire investment or part of it without obtaining any fees for this operation. Opponents of such a guarantee argue that it can open the possibility for Riba and highlight the Shariah prohibition of any kind of guarantee of the capital (Al-Amine, 2008).

While this paper has focussed on Sukuk structure risks, the conventional risk classifications discussed in Section 3 are also of value in identifying, measuring and managing Sukuk risks. Thus, risk management for Sukuk can borrow from the general risk management theory in conventional finance, for example, as discussed by Reilly and Brown (2012). In this regard, Al Sayed (2013) concluded in her paper that conventional risk management, variance for total risk and the Beta coefficient for systematic risk, can be used to measure total risk and systematic risk of Sukuk. In addition, the conventional risk management strategies of diversification and hedging are applicable to the management of Sukuk risk. The multifactor expected returns models discussed in Section 1 combine the insights and techniques of conventional finance with those derived from the risk analysis of Sukuk structures. Indeed, it is hypothesised that structure risk factors will be highly significant in the proposed expected return regressions of STEP 2 of Section 1.

5. Conclusion

A number of schemes for the classification of Sukuk risks based on extending and adapting the risk classification schemes used in conventional finance have been proposed in the literature. A recent development has been the development of risk classifications based on Sukuk structures. It is argued that Sukuk structure risk classifications provide a better way of linking Sukuk risks with the fundamental factors causing those risks. Further, the different Sukuk structures follow directly from the fundamental ethical principles underlying Islamic finance. Thus, Sukuk structure risk classifications are theoretically superior to conventional classification schemes, since structure risks are created by the necessity for Sukuk to conform to the Shariah. Sukuk structure risks are essentially Shariah created risks. The evaluation of the structure risks of the Sukuk structure risk classification scheme proposed in this paper are summarised in Table 1.

Structure risks do not exhaust all the dimensions of risk to which Sukuk are exposed. Very general models for explaining and predicting Sukuk returns are the multifactor expected returns models discussed in Section 1. It is hypothesised that structure risks will be highly significant,
both statistically and economically, when included in the risk factors of an expected returns model. The empirical testing of this hypothesis is continued in the sequel.

Given the short data time series currently available to researchers in Islamic finance, empirical tests of expected returns models cannot yet be conducted to the same degree of rigour as in conventional finance. For example, it is not possible to properly test for the stability of coefficients in STEP 2 of Section 1, given the current data. Nevertheless, no data has been used up in hypothesis formation, due to the meta-study approach used in this paper to develop the hypotheses. This means that the proposed empirical testing can now be carried out to an acceptable level of statistical rigour.
References


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