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What is Missing in Pricing Sukuk Securities?

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Abstract:

The financial engineering effort during the past century led to the development of Islamic Capital market product. One spectacular development is the structuring and origination of Sukuk (Islamic Bonds) securities. Despite it is sometimes termed Islamic bonds, Sukuk securities is fundamentally different than conventional bonds. These structural differences in addition to the general principles any Islamic product has to adhere to that is; Islamic law (shari'ah) principles make the pricing of Sukuk securities differ from the pricing of Conventional bonds. This different happen in the appropriate discount factor that is needed to be applied to the cash flow stream. We argue that the first step toward developing Shari'ah compliant profit rate is the recognition of the need to distinguish between two broad categories of Sukuk: the first is equity based Sukuk and the second is the debt based Sukuk. The profit rate of equity based Sukuk is to be developed using one of the equity models (CAPM and APT). On the other hand, profit rate curve for debt based Sukuk is to be estimated using interest rate estimation and fitting models.

Key words: Sukuk, Benchmark rate, Profit rate curve, Term structure of interest rate, Equity based Sukuk, Debt Based Sukuk

1. Introduction

Sukuk (Islamic Bonds) pricing is one of the long-standing and very important questions in Islamic finance in general and in

Sukuk market in particular. That is, how to price Sukuk issues whether those issued in the primary market or those traded in the secondary Market. This problem can be considered the NP-hard problem of the Islamic finance due to its difficulty as well as the outreaching effect it has over the whole Islamic finance industry. This problem is common to all the Islamic products whether banking products, Takaful products or capital market products.

The current practice by Islamic financial institutions is to price Sukuk whether debt based or equity based using interest rate related benchmark such as LIBOR (London Inter-Bank Offered Rate) or other interest rate proxies. This includes Sukuk securities where the resultant cash flows (profits/rental income) are priced those proxies. This practice has been criticized by Shari'ah scholars as one of the main principle under the Islamic Law (Shari'ah) is the prohibition of interest (riba). Riba is defined as unjustified increment in borrowing or lending money. Hence, a financial transaction under the Islamic law has to be free from riba in substance as well as form and any form of interest-rate related benchmarks are not acceptable.

A number of proposal have been proposed during the past decades, but none of them have succeeded in gaining consensus from the Sukuk market's stakeholders. The absence of the Islamic Benchmark Rate (IBR) and the resulting profit rate curve(s) is one of the main contributors toward the thin Sukuk secondary market.

The revival of Islamic Financial Systems (IFS) since 1963 has led to growing demand for new securities to be offered in organized Islamic Financial Markets (IFMs). Financial engineering within the Islamic Capital Market has succeeded during the last century in structuring and developing the Sukuk securities (Islamic Bonds) that adhere to Shari'ah principles and offer investors and issuers a very attractive investment/ financing instruments with very attractive risk/return profiles. Currently, Sukuk Securities are playing a

vital role in the development of Islamic Capital & Money Market. Several Islamic as well as non-Islamic jurisdictions such as United Kingdom, Germany, Senegal, Oman, Luxembourg, Hong Kong, South Africa, Russia and others have either already issued Sukuk or are in the midst of Sukuk issuance.

As well, the Sukuk market has witnessed a number of improvements during the past two years including (IIFM, 2014):

- Issuance of long term Sukuk s by Malaysia & Saudi Arabia
- Issuance of Perpetual Sukuk, GEMS (school operator) from UAE
- Issuances of Tier 1 & Tier 2 Sukuk by financial institutions
- Debut International Sukuk by United Kingdom
- Debut Senegal Sukuk in local currency
- Pipeline of debut Sukuk from Luxembourg, South Africa, Hong Kong etc.,

This paper is organized as follows: in section two, the definition of the Sukuk and the distinguishing characteristics are highlighted.

2. What is Sukuk?

Sukuk is defined by the International Islamic Financial Market (IIFM) as *'commercial paper that provides an investor with ownership in an underlying asset'*. On the Other hand, the Islamic Financial Services Board (IFSB) defines sukuk thus:

> 'certificates with each Sak representing a proportional undivided ownership right in tangible assets, or a pool of predominantly tangible assets, or a business venture (such as a Mudarabah). These assets may in specific project or investment activity be in accordance with Shari'ah rules and principles.'

Bahrain-based AAOIFI (Accounting & Auditing Organization for Islamic Financial Institutions) (2003) defines Sukuk as:

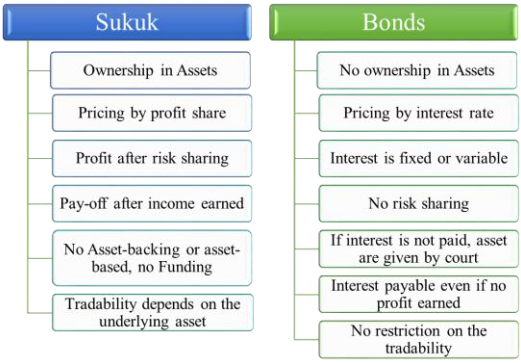
> 'Certificate of equal value representing, after closing subscription, receipt of the value of the certificates and putting it to use as planned, common title to shares and rights in tangible assets, usufructs and services, or equity of a given project or equity of a special investment activity.'

According to the above definitions, Sukuk securities represent undivided ownership interest in real assets whether tangible or intangible or their usufruct. Sukuk securities does not represent a passive claim on the cash flows generated by those assets, which make it a different instrument from the conventional bonds.

In essence, Sukuk are securitized financial instruments. Securitization is defined as transferring a non-tradable asset into a tradable one. Securitization process is accomplished through pooling and packaging the non-tradable assets into securities with risk and return profile that match investors' needs. In most cases, the underlying assets result in deterministic cash flows, which provides predictable, fixed returns for the investor.

Sukuk is considered to be the Islamic equivalent to bonds. The main distinguishing feature is that sukuk are asset backed and the investors must own a pool of assets supporting the issue (in other words the rights and the obligations relating to those assets) and not just the right to a debt or a revenue stream divorced from ownership of the actual assets themselves. That is, the cash flows that investors expect to receive as investment returns are recourse by the cash flow generating ability of those assets. Cakir and Raei (2007) see Sukuk as equivalent to conventional bonds when it comes to aspects of rating, issuance and redemption procedures, return payments, and default clauses. The main differences between Sukuk and conventional bonds are illustrated in the following exhibit.

Exhibit (1): Differences between Sukuk and Conventional Bonds



Sukuk securities can be classified based on different criteria. One criterion is the underlying contract in the sukuk structure. According to this criterion, sukuk is classified as either: sale based, lease based, partnership based, or agency based. Also, sukuk can be classified according to the technical and commercial features of the sukuk into as either Asset based (normal), asset backed (ABS), or Hybrid structure (convertible and exchangeable). As well, sukuk securities can be classified as those that are tradable and non-tradable in the secondary markets.

The origination (securitization) process typically involves the structuring and packaging of pools of Shari'ah-compliant assets with or without credit enhancement into securities. The issuance of Sukuk requires an exchange of a Shari'ah-compliant underlying asset(s) for financial consideration through the application of various Shari'ah modes of financing including Ijarah, Salam, Istisna, Murabaha, etc.

All Sukuk issues requires three main constituent parties to be involved. Those parties are as follows:

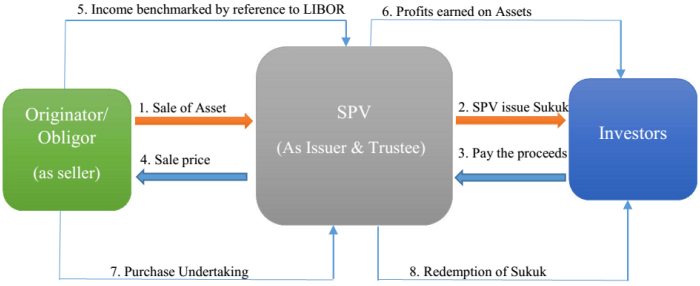
1. The obligor (the company that ultimately wishes to benefit from the proceeds of the sakk).
2. The issuer/trustee (normally a special purpose vehicle (SPV));
3. The sukuk holders (or investors);

The issuance of Sukuk is based on the following three principles:

1. The privileges and responsibilities of stakeholders have to be transparent and unambiguous.
2. Sukuk must be backed by genuine underlying operating (income producing) assets.
3. The return on Sukuk securities must be originated from assets underlying the structure.

The restructuring process of the Sukuk securities can be represented as in the following exhibit.

Exhibit (2): Typical Sukuk Structure



3. Types of Sukuk

According to AAIOFI's definition of investment sukuk (Shari'ah Standard 17), Sukuk contracts can be structured under fourteen possible forms. The scope of assets under the Shari'ah framework that can be securitized is relatively limited by the fact that structuring and originating of Sukuk is governed by the principals of Islamic law (Shari'ah). The following is a discussion of the six major types of Sukuk:

3.1. Musharaka Sukuk (Equity Participation)

The term musharaka is derived from the word shirkah, which means partnership. Musharaka sukuk are a participatory type of sukuk that are based on sharing the profit and losses and represent an equity ownership in al-musharaka. The parties to

Musharaka agreement agree to make capital contribution to the partnership, which can take the form of either cash contributions or contributions in kind. Musharaka may take the form of unincorporated joint venture but it also may take the form of a legal entity.

The resulting profit of the musharaka is distributed among the partners according to pre-agreed proportions, whereas the resulting losses are distributed in proportion to their initial capital investment.

Musharaka sukuk can be used to finance a new project or develop an existing one, as well as finance a business activity on an equity partnership basis. The Sukuk holders are in effect the owners of the project or the assets according to their respective shares as they are all considered to be partners (owners).

The Musharaka sukuk can be negotiated and can be bought and sold in the secondary market. Musharaka Sukuk comes the second in popularity after Ijarah Sukuk.

3.2. Mudaraba Sukuk (Trust Financing)

In the Islamic finance industry, the term Mudaraba refers to a form of equity-based partnership arrangement whereby the provider of capital who called Rab Al-Maal and the other who is called Mudarib or Rab Al-Amal provides managerial skills. Mudaraba sukuk represents investment sukuk, which are ownership of units of equal value in the Mudaraba equity. The returns sukuk holders obtain according to the percentage of ownership of share. The realized profit is distributed according to the agreed upon percentages, whereas in case of a loss, Rab Al-Maal (the financier) bears the losses unless it is proven that Rab Al-Amal does not perform his fiduciary duties.

3.3. Ijarah Sukuk (Lease) (AAIOFI, 2003)

The term "Ijarah" in Islamic Finance means the 'transfer of the usufruct of an asset to another person in exchange for rental payments a "lease" (Sukuk Guidebook, 2009). In the case of a

lease-based sukuk, since the regular payments are based on rental income and there is a low probability of default on rental income, investors consider these payments to be of low risk. Accordingly, anyone who purchases the sukuk in the secondary market replaces the buyer in the pro rata ownership of the relevant assets and all the rights and obligations of the original subscriber are transferred to him/her.

One interesting feature regading the Ijarah rental payments is that the payment can be made unrealted to the period of taking the usufruct. The leasee can pay the lease payments before the the beginning of the rent period, during that period or after the period as the parties may mutually decide. Meanwhile, the sukuk holders bear all costs of maintaining any damage to the real estate (AAOIFI, 2003).

It is necessary that in an Ijarah contract that a clear definition and specification of the leased assets and the value of rent at the time of the contract. Also, Ijarah can be contracted on an asset or a building that is yet to be constructed if both of the asset and the value are known provided that the lessor has the ability to acquire, build or buy the asset being leased by the time set for its delivery to the lessee. As well, the lessor has the right to sell the leased property provided it does prevent the lessee from taking benefit from the asset. The new landlord would be entitled to receive the rental payments (AAOIFI, 2003).

3.4. Murabaha Sukuk (Cost-Plus Financing)

Under this type of Sukuk, the issuer of the certificate is the seller of the Murabaha good(s). The investors are the buyers of that good, and the Sukuk sales proceeds are the purchasing cost of that good. Therefore, the sukuk holders become the owners of the Murabaha commodity and have the right to receive its final sale price upon the re-sale of the Commodity. Having Murabaha-based sukuk that is legally acceptable is only feasible in the primary market. The trading of sukuk at the secondary market is not permitted by Shari'ah because the

sukuk represent a debt owing from the subsequent buyer of the good(s) to the sukuk holders and such trading is equivalent to trading in debt on a deferred basis, which results in riba and prohibited under Shari'ah.

Despite being debt instruments, the Murabaha Sukuk could be negotiable if they constitute a smaller part of a portfolio, which its larger part has to be constituted of negotiable instruments such as Mudaraba, Musharaka, or Ijarah Sukuk. Murabaha sukuk are popular in Malaysian market due to a more liberal interpretation of fiqh by Malaysian jurists permitting sale of debt at a negotiated price.

3.5. Salam Sukuk

In its simplest form, Salam contract involves the purchase of an asset(s) by one party from another party where the delivery is deferred whereas as the payment is made immediately.

The purchase price of the assets is typically referred to as the "Salam Capital" and is paid at the time of entering into the Salam contract. The issuer of the Salam Sukuk is a seller of the goods of Salam, the investors/subscribers are the buyers of the goods. The funds realized from subscription are the purchase price (Salam capital) of the goods. The investors in Salam sukuk are in fact the owners of the Salam goods and are entitled to the sale price of the sukuk or the sale price of the Salam goods sold through a parallel Salam contract, if any.

Salam Sukuk must adhere to all standard Shari'ah requirements that govern Salam sale contracts such as, full payment by the buyer at the time of effecting the sale, standardized nature of underlying asset, clear enumeration of quantity, quality, date and place of delivery of the asset and the like.

One of the Shari'ah conditions relating to structuring of Salam is the requirement that the purchased goods are not re-sold before actual delivery at maturity because such transactions amount to debt selling. This constraint lead to illiquidity of Salam instrument and hence makes it somewhat

less attractive to investors. Therefore, an investor who buys a Salam sukuk expects prices of the underlying commodity to be higher on the maturity date.

3.6. Istisna Sukuk

Istisna sukuk, which also knows as the "Islamic project bonds" are instruments that have an equal value and are issued to mobilize the funds required for producing products that the Sukuk holders own. The issuer of the Sukuk is the manufacturer (supplier/seller), the subscribers/investors are the buyers of the specific product. The realized funds from subscription process represent the cost of the product. The Sukuk holders own the product and have the right to receive the sale price of the Sukuk. In case there is a parallel Istisna contract outstanding, it becomes the sale price of the product sold.

Financing large infrastructure projects can be done through Istisna Sukuk. The possibility of the contractor in Istisna to enter into a parallel Istisna contract with a subcontractor determines the contract's suitability for financial intermediation. Thus, a financial institution may perform the construction of a facility for a deferred price, and then subcontract the actual construction to a specialized firm.

Broadly speaking, Istisna translates as being 'to order a manufacturer to manufacture a specific good for the purchaser'. It is of high importance under the Istisna Sukuk that the price and specification of the good to be manufactured are agreed at the outset.

4. Time Value of Money in Islamic Finance

One of the most basic concepts in finance and investment theory is the time value of money (TVM). The Islamic law (Shari'ah) does not rule out this consideration. The Islamic Finance distinguishes between two cases where there will be increase in the values of assets and their usufruct. The first

case is where a loan is given to cover the price of a commodity in any sale contract to be paid at a future date. Under this case, it is legitimate to increase the price when a commodity is sold on credit. The second case is where a loan and monetary values of loans and debts are exchanged. The Shari'ah considers a loan to be a charitable act from which one cannot take any benefit. Therefore, no additional value (time value) can be added to a loan's or a debt's principal. This prohibition indicates that Islam does not permit money to have a fixed, predetermined time value. Therefore, if money is considered a capital, then it has a time value whereas, if it is considered a medium of exchange, then it does not have a time value.

5. Problem Statement

Traditional valuation theory states that the price of an asset is the sum of the discounted future benefits accrues from that asset. The same general concept applies for the pricing of Sukuk. The theoretical price of a coupon bond $P^c(t,T)$ can be represented as:

$$P^c(t,T) = \sum_{u\in(t;T]} C(u).P(t,u)$$

Where $C(u)$ denotes the cash flows (coupon and principal) received by the coupon bond holder at time u, $P(t,u)$ denotes to the discount factor of \$1 received at time t. The coupon bond can be seen as a portfolio of zero coupon bond where each coupon payment is discounted at the zero discount rate after applying risk premiums that corresponds with the risks involved.

The same methodology is applied for pricing Sukuk Securities where LIBOR or other interest rate based measures serve as a zero discount rate. One can see how this practice is flawed for technical as well as Shari'ah perspectives. From technical perspective, LIBOR is a dollar-based rate at which

eurobank would lend Eurocurrency to other eurobanks. This rate reflects the credit risk of creditworthy borrowers but not a pure risk free rate. As well, Libor is a short-term benchmark where the maximum maturity is one year. Accordingly, LIBOR benchmark works for floating rate Sukuk but not for long-term fixed rate Sukuk. From Shari'ah perspective, some prominent Shari'ah scholars of Islamic finance noted that benchmarking by an interest rate is not forbidden but it is not desirable. Benchmarking with an interest based index is permitted until an alternative Islamic benchmark is established. Wilson (2008) noted that using LIBOR to price Sukuk securities is not preferable by Islamic scholars.

The absence of an organic benchmark rate that is used as a starting point towards determining the required profit rate (yield) term structure to price Islamic financial products in general and Sukuk securities in particular. Organic in this context means a profit rate that is developed within the Islamic finance system and that reflects the risks characteristic of the different Sukuk structures.

The idea of this research emerges as a result of extensive research within the area of Islamic Financial Engineering. The development of Sukuk securities is one of the advances in the financial engineering area in the last century. Yet, this development has NP-hard problem that is, the development of Islamic Benchmark Rate (IBR).

It is worth mentioning, that all Islamic products of banking, Takaful, Capital Market, and derivative securities have this deficiency. Accordingly, driving a pricing profit rate structure for one of these products will solve the pricing problem for all other products.

6. Literature Review

1. Proposed models

During the past three decades, a number of pricing alternatives have been proposed. The majority of which are of pragmatic

nature and do not backed by theoretical foundations as well as practical applicability across the different countries and Sukuk types. The following are the main models proposed:

a) Rate of Profit Mechanism Model

This model was proposed by Dr. Abd Hamid AlGhazali. This model works through the analysis of the money market profit rate. The model has been criticized on the ground that the concept as well as the scope of profit is not well-defined. In other word, the expected profit from each project or from group of projects that involved in specified activity that should be considered.

b) Rate of Dividend of Islamic Banks Deposits and Investment Accounts Model

The model was proposed by Dr. Muhamad Abdul Halim Umar who advocated a benchmark based on the dividends distributed by Islamic banks to the depositors. According to him, by providing mathematical index to specify the profit rate as compared to conventional counterpart this will remove the uncertainty and doubt. The model has been criticized on the ground that it is tantamount to changing the name of the interest rate to the profit rate but the essential elements have not changed.

c) The Creation of an Inter-Islamic-Bank Market Based on Islamic Principles

This approach has been suggested by Sheikh Muhammad Taqi Usmani who purposes creating a pool of funds which invests in asset-backed instruments such as Musharaka, Ijarah, etc. If the asset included in that pool are of tangible nature, like leased property or equipment or shares in business concerns, these units can be bought and sold on the basis of their periodically-determined net asset value (NAV). These units may be tradable and can be used for overnight financing. For instance, banks having excess liquidity can purchase those units and sell them

when they have liquidity shortage. This arrangement may create inter-bank market and the value of the units may serve as an indicator for determining the profit in Murabaha and Ijarah also.

d) Tobin's q Theory

This model is proposed by Prof. Abbas Mirakhor according to which the cost of capital can be measured without resort to a fixed and predetermined interest rate. The suggested procedure is simple and is based on the well-known Tobin's q and can be used in the private as well as in the public sector to obtain a benchmark in reference to which investment decisions can be made.

The rate of return is the ratio of profits to physical capital employed valued at cost of replacement, while the corresponding cost of capital is the ratio of the same profit figure to the company's financial valuation.

e) A Benchmark that fits both Islamic and Conventional Banks

This model is proposed by Dr. Aznan Hasan who stated that it is possible to use the rate of Policy Rate (OPR) in Malaysia, which is in line with Shari'ah principles and suits both Islamic banks as well as in conventional banks. Based on that rate, the banks will determine their own respective interest rates and accordingly price all loans and financings.

This proposal of creating two types of rates, one for Islamic banks and another for conventional banks seems easier to be implemented but after having a detailed analysis he opines that it will be impossible to execute as it will be open to arbitrage activities since there are two different pricing indexes. The arbitrage will result in negative impact to Islamic banks since they are smaller in number compared to the conventional banks.

f) Arbitrage Pricing Model

This model proposed by Omar, Noor, Meera, et al. (2010). The proposed model relies on the conventional Arbitrage pricing theory (APT). Whereas APT assumes a 'factor model' of asset returns, the required return is determined by a number of factors. The model advocates the inclusion of a borrower specific risk as part of the total return required. According to the APT, the required rate of return of a financial asset can be modeled as a linear function of various macro-economic factors. A factor-specific beta coefficient represents the sensitivity to changes in each factor.

The estimated rate of return derived from the model will then be used to value the asset correctly. The asset price equals the end of period expected price discounted at the rate implied by the model. If there is divergence in price, an arbitrage activity should bring it back into line. The mathematical representation of the model is as follows:

$$r_j = a_j + b_{j1}F_1 + b_{j2}F_2 + b_{j3}F_3 + \cdots + +b_{jn}F_n + \varepsilon_j$$

Where

- a_j : is a constant for asset j;
- F_k: is a systematic factor;
- b_{jk}: is the sensitivity of the jth asset to factor k, also called factor loading; and
- ϵ_j: is the risky asset's idiosyncratic random shock with mean zero.

Idiosyncratic shocks are assumed to be uncorrelated across assets and uncorrelated with the factors. The APT states that if asset returns follow a factor structure, then the following relation exists between expected returns and the factor sensitivities:

$$E(r_j) = r_f + b_{j1}RP_1 + b_{j2}RP_2 + \cdots + b_{jn}RP_n$$

- RP_k: is the risk premium of the factor
- r_f : is the risk-free rate

g) Islamic Interbank Benchmark Rate (IIBR)

The Islamic Interbank Benchmark Rate (IIBR) that has been announced at the 18th annual World Islamic Banking Conference in Bahrain uses the rates contributed by 16 Islamic banks and the Islamic sections of conventional banks. The rate is to provide a reliable alternative for pricing Islamic instruments to the conventional interest-based benchmarks used for mainstream finance.

According to Thomson Reuters, the principle differences between IIBR and LIBOR are as follows:

- IIBR measures expected profit while conventional benchmarks such as LIBOR measure interest rates.
- The IIBR question for contributors explicitly refers to the cost of raising Shari'ah compliant funding.
- The IIBR is based on returns generated by Islamic assets, hence a reference to an Islamic asset risk profile.
- The IIBR is linked to the economies of the Islamic world and not to the macro-economic events and financial risks of Europe and the US, although there is invariably some correlation to global markets.

According to Thomson Reuters, the IIBR is principally utilized as a reference price rate for Shari'ah compliant instruments including corporate finance and investment assets Sukuk and other Shari'ah compliant fixed income instruments.

2. Term Structure of Interest rate Theories

2.1. Pure Expectation Hypothesis (PEH)

This hypothesis theory explains the yield curve in terms of expected short-term rates. It is based on the general premise that the two-year yield is equal to the yield on a one-year bond today plus the expected return on a one-year bond purchased one year from today. This theory suffers from a weakness that

it assumes that investors have no preference when it comes to different maturities and the risks associated with them.

2.1.1. Implication for the yield curve

According to this hypothesis, a rising term structure of rates means that the market is expecting short-term rates to raise. Therefore, if the two year rate is higher than the one year rate, rates should rise. In case that the rate-term structure is flat, the market is expecting that short-term rates will remain low or hold constant in the future. A down sloping yield curve indicates the market believes that rates will continue to decline.

2.2. Liquidity Preference Theory

According to this theory, investors require to be compensated for interest rate risk that is associated with longer-term issues. Long-term issues have greater price volatility. The structure is determined by the future expectations of rates and the extra premium (liquidity premium) for interest-rate risk. As interest-rate risk increases with maturity, the yield will also increase.

2.2.1. Implication for the yield curve

According to this theory, the yield curve starts to get a little more bent, which results in a positively sloped yield curve. This theory has no predictions regarding the direction of the yield curve. The direction of the yield curve could be an upward sloping, flat, or declining. However, the yield premium will increase fast enough to continue to produce an upward sloping curve with no concerns about short-term interest rates. In case of a flat or declining term structure of interest rates, the theory suggests that short-term rates will continue to decline given the theory's prediction that the yield premium will continue to increase with maturity.

2.3. Market Segmentation Theory

This theory states that the supply and demand of funds in a certain maturity sectors determines the interest rates for that sector. In other word, this theory look to the whole market as a sum of segments according to the maturities required and each segment has its own market mechanism (supply and demand) that determines its term structure independently of other segments. This theory can be used to explain every type of yield curve an investor can encounter in the marketplace. A branch to this theory is that if an investor is willing to go out of his sector, he has to be compensated for bearing that additional risk. This conclusion is known as the Preferred Habitat Theory (PHT).

2.3.1. Implication for the yield curve

According to this theory, any type of yield curve can be encountered, ranging from a positive (upward) slope to an inverted (downward) slope, as well as a humped yield curve. A humped curve is where in the middle of the curve the yield are higher than the short and long ends of the curve. The curve's future shape is based on where the investors are most comfortable and not where the market's expectations regarding future expected yields.

7. Developing a Holistic Sukuk pricing Mechanism

AAOIFI Statement (2008) precludes the originator from granting a purchase undertaking to the SPV/Trustee. It is also precludes the Exercise Price to be a fixed amount according to a formula. The rationale for this ruling has been that al-musharaka sukuk are in fact equity-based instruments and therefore the partners in the musharaka must share the risk of both profit and loss. Therefore, determining the value of the al-musharaka assets by reference to the face amount of the sukuk (or by reference to a shortfall amount) is akin to a profit and principal guarantee. This is not permitted under Shari'ah

unless given by an independent third party that is different from the originator.

This new ruling has led to a new direction in pricing Sukuk securities. The above-mentioned model try to determine the one profit rate that fits all Sukuk securities (equity based and debt based Sukuk). Accordingly, A mechanism is in order to price, estimate the profit rate curve, equity based Sukuk that is different than that used to price debt based Sukuk. The profit rate curve of equity based Sukuk is to developed using equity models such as Capital Assets Pricing Model (CAPM) or Arbitrage pricing Model (APT). On the other hand, the profit rate curve of debt based Sukuk is to be developed using interest rate estimation models such as one factor and multifactor general equilibrium models and arbitrage free models such as Heath- Jarrow-Morton (HJM) Model. In addition, parametric and non-parametric methods of fitting the profit curve can be used.

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