المجلة العربية للعلوم و نشر الأبحاث

Arab Journal of Sciences & Research Publishing

AJSRP

The risk of Sukuk (Islamic bonds) and conventional bonds: comparative study

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Abstract: The current study aimed to investigate one of the key products in the Islamic capital market, which is the asset-backed Islamic bonds, known as (sukuk), the study aims to investigate the risk of sukuk and compare and contrast (sukuk) to conventional bond, moreover, the study attempts to discuss factors that affect the price of (sukuk) and conventional bond and to recommend a pricing model that can be applied to (sukuk). The study applied a mixture between quantitative and qualitative method. The qualitative research is covered in Reviewing Literature related to (sukuk) and bonds and the quantitative method is used to explain the models of conventional bonds and using the same model for Islamic bonds (sukuk) by comparing the coupon rate, duration and convexity of conventional bonds and Islamic bonds using suitable equation. The data gathered for the current research is obtained from Dow Jones (sukuk) Index in a number of different regions such as Malaysia, Saudi Arabia, Kuwait, Qatar, Bahrain, the UAE and Pakistan. The findings showed that the calculated (sukuk) prices is shown to be different from the Dow Jones, and it represents a more accurate representation of the market price of the (sukuk) bonds, given that investors use the rate of return of 3.75%. The conventional bonds pricing model can be used to price (sukuk), simply by changing the coupon rate with profit rate. They are also generally exposed to the same risk, however (sukuk) are exposed to more risks such as shariah compliance risk and regulation risk. Despite the additional risks, (sukuk) has slightly lower risk than conventional bonds due to the principle of profit and loss sharing and the existence of the assets.

Keywords: (sukuk), Bonds, Ownership, Return, Rate and Payment, Pricing, Coupon Rate, Cash Flow

Introduction

1- Theoretical aspects of Islamic finance

The essential characteristic of the Islamic finance system is the ban of interest, also known as riba (Arabic; ربا), in the (Quran) and (Sunna). According to Razi (2008), when two parties exchange an item of the same kind and in return one party receive an extra of what he gives, the extra is referred to as the (riba). For an example, when someone gives 100 units of silver and received 120 units of silver in return, the extra 20 units are considered as (riba).

Similarly any financial transactions with an element of (riba), such as advancing money on interest, saving deposits in a bank in order to earning interest, getting agreement or concessions in rates of goods or commodities against in the forefront payments of price, mortgaging and benefit from an income-yielding

property against a specific amount, to be returned in full when the property is redeemed and investing the money in a transaction or trade against a predetermined and fixed rate of profit, are all prohibited transactions in Islamic finance because these transactions involve riba in some ways.

Evidence of prohibition (riba):

- "Do you who believe, you shall not take (riba), compounded over and over. Observe God, that you may succeed" (Quran 3:130)

- "Prophet (pbuh) cursed people who deal in Riba" (Sunna)

- "The Prophet (pbuh) cursed the receiver and the payer of riba, the one who records it and the two witnesses to the transaction and said: "They are all alike [in guilt]." (Sahih al-Muslim, Sahih Al-Bukhari, Tirmidhi, Ibn Majah, Bahiqi and Musnad Ahmad)

There are three types of (riba) in transaction:

- Riba of-jahiliya — it is defined as an additional or extra interest payment to have extension for due date of payment. This (riba) on credit.

- Riba an-nasiya — it is defined when two parties exchange the same kind of items however one or both parties' delays payment or delivery. This riba is also on credit.

- Riba al-fadl — it arises when there is an extra payment when the unit of the same kind is exchanged.

Another element prohibited in shariah law and therefore Islamic finance is uncertainty (gharar). The literal meaning of (gharar) is risk, uncertainty and fraud. Gharar is defined by Muslims scholars (e.g. Muslim Ahmad, Abu Dawud, etc.) as sale of possible items which existence or characteristics are not clear or certain, due to the risky nature that makes the trade similar to gambling. Due to this, any transaction which involves gharar (uncertainty or speculation) is forbidden. Both parties must have perfect knowledge of the subject matter of the contract and its association. The logic behind prohibition of (gharar) in Islamic rule is mainly to protect the weak from exploitation, as (gharar leads to destruction and loss. In addition, there are some businesses that are considered as illegal and immoral in Islamic finance, such as alcoholic products, weapons, tobacco, and consumption of pork. Gambling (maysir) is also not a compatible activity in Islam.

In the Islamic theory, parties that are a part of the financial activities or involved in a financial transaction must share the profit that is earned from the transaction and also share the risks of losses that are associated with the transaction. A return from that asset is allowed as long as the risks of losses are shared by both lender and borrower. Additionally, Islamic finance transaction has to be linked to a tangible known asset, such as commodities or real estate. Under sharia principle, money is never considered as a type of assets class, as money is not tangible, hence it cannot earn a return.

Sukuk is an Arabic term for bonds, which means officially authorized document. Sukuk has been defined in various ways, by various individuals and organisations. By the Accounting and Auditing Organisation for Islamic Financial Institutions (AAOIFI), sukuk is defined as "certificates of equal value representing undivided shares in ownership of tangible assets, usufructs and services or in the ownership of the assets of particular projects or special investment activity" (AAOIFI's Shariah Standards for Financial Institutions, 2008), whereas Malaysian securities commission defined sukuk as "a document or certificate which represent the value of an asset" (Securities commission, 2004). Brackbill (2008) defined sukuk as "sort of financial tools which have been utilized by Muslims nation as far back as the Middle Age, when sukuk had a way of payment in business activities".

Sukuk supplies sovereign governments and corporations with accessibility to the large Islamic finance liquidity pool, in addition to their base of conventional investor. Proper (sukuk) structures are recently established in various corporate and sovereign issues in the global bond markets. Gulf Cooperation Council (GCC) and Malaysia are the primary hubs for sukuk issuance; but that does not mean sukuk issuance is restricted to Islamic countries. The rapid growth, efficient operation, stability of Islamic finance and the increase of Muslim population around the world led to the increasing popularity of Islamic products, expanding its reach to non-Muslims countries as well. The numbers of sukuk issuance are rising in Asia, the USA as well as Europe.

The variety and possible different usage of (sukuk) makes its popularity to increase in last few years. Sukuk can be used as a way of increasing government finances via sovereign issues, or as a way of companies and firms to get funding by issuing corporate sukuk.

Global sukuk market

Islamic capital market has been growing fast, mainly in the sukuk market where most Muslims and non-Muslims invest. According to Aziz (2010) the Governor of the Central Bank of Malaysia said that the progression that has been reached in the capital market generally and in the sukuk market specifically reflects the capability of Islamic finance to meet the need of the modern economy.

The inventiveness of Islamic finance is represented in the sukuk. This significant part of Islamic finance has seen an energetic flow of cutting edge products and structures. Sukuk has played an important position as a platform that fosters interlink with the international market. Sukuk market has shown its potential to efficiently intermediate funds across border, hence sukuk participates in the effective allocation of funds in the international financial system.

Standard & Poor's (2011) report shows that Western investors are interested in the sukuk market due to the yield of sukuk which is slightly higher and more liquid as compared to the conventional bond. The

same report also shows that the sukuk issuance hit a record of USD 51.2 billion in the year of 2010. This number includes sukuk issued and matured in the same year. For 2011 S&P believed that level of sukuk issuance depends on the level of global economic recovery, as between 2001 and 2007 financial institutions were the major sukuk issuer with 65% share, however their share drops to 12% in 2010.

Below figure (1) shows the total global issuance of sukuk, comparing domestic issuance and international issuance. The numbers include sovereign, quasi sovereign and corporate issues between 2001 and 2010.

Source: International Islamic Financial Market (2010)

Figure (1) Global sukuk issuance (2001 to 2010)
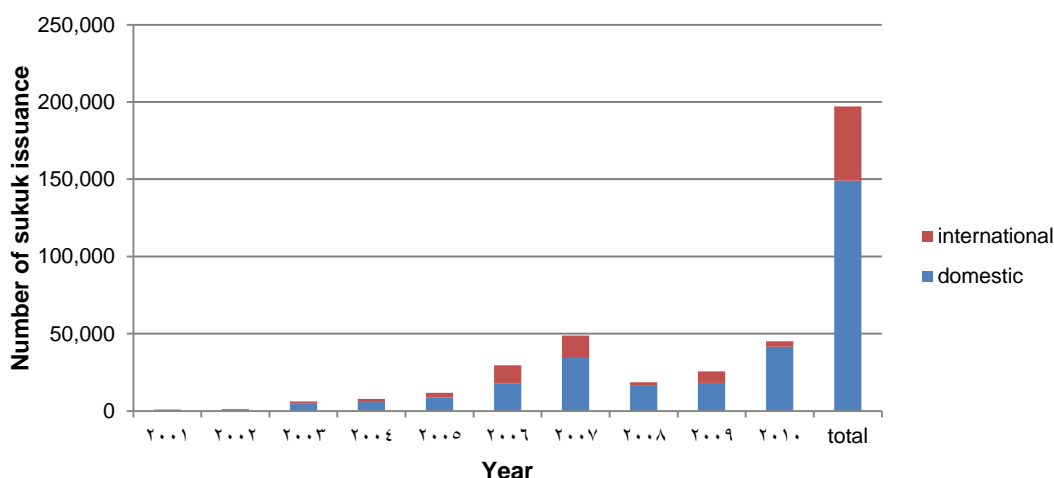
Research problem

The main market for sukuk today is Malaysia, where 78% of sukuk is traded in 2010. Despite the economic downturn, the Asian market is still expected to do well in the medium term. There was a possibility for the Gulf Cooperation Council (GCC) to catch up and play significant role in the market. Members of GCC are Saudi Arabia, United Arab Emirates, Bahrain, Qatar, Oman and Kuwait. Bahrain was the leader of the Islamic capital market in the GCC and UAE became part of the sukuk market in late 2004.

Various projects in the GCC are estimated to reach $1.9 trillion, and the projects will need huge sum of funds. Banks in the GCC tried to equalize their loans with stable funding via sukuk to leverage the fast increase in real estate. The economic downturn caused the financing requirements of Gulf issuers to shrink. The financial institutions in GCC have since experienced inconsistency between long-term maturities on loans and the short-term financing that backs the loans (Vision Focus, 2009).

Pakistani market is also considered as one of the most active market in the world. In 2007 its market shows notable growth through a huge increase in volume issued. The value of sukuk issued in 2007 was USD 1 billion (The Ultimate Middle East Business Resource, 2008).

In 2009 the UK was reported to be the most developed European countries for sukuk market specifically and Islamic finance in general. Initially, due to legislation difficulties, UK issuers have never issued a public listed sukuk. Efforts were taken to amend the Finance Act and this change allows issuance of sukuk which uses sale and lease backed structures, creating the possibility to issue real estate-based sukuk. In addition to the Finance Act, the UK also amended some other regulatory frameworks to create equal opportunities for Islamic financial institution. Despite this investor were still anxious investing in different structures and hence the requirement for high returns to compensate for the high level of risk. Most of the sukuk was issued at a larger spread than the conventional bond.

Other European countries are also in the Islamic finance market, Germany's state of Saxony issued sukuk with the amount of €100 in 2009 and a number of Switzerland banks offered shariah compliant products. The most significant change emerged in France in 2010 where the government developed and approved a new regulation to sell sukuk starting in 2011 (Money Jihad, 2011). Table (1) below shows how sukuk expanded world wild across countries:

Source: International Islamic Finance Market

Table (1). global sukuk issuance and its value, 2010

Country	Number of issues	Volume (USD, in million)
Malaysia	1592	115393.76
Bahrain	125	6291.69
Indonesia	70	4658.5
UAE	41	32201
Pakistan	35	3447.207
Saudi Arabia	22	15351.88
Sudan	22	13057.713
Brunei Darussalam	21	1175.91
Kuwait	9	1575
Gambia	7	2.086
Qatar	6	2500.79
Singapore	5	191.96
USA	3	767

Country	Number of issues	Volume (USD, in million)
UK	2	271
Germany	1	123
Turkey	1	100
Japan	1	100

The research problem focuses on comparing and contrasting the differences between (Sukuk) Islamic bonds and traditional bonds and attempt to illustrate the margin of risk among each one.

- **Scope of this report**

There have been a number of studies done on Islamic bonds (sukuk). Most of these studies mainly tried to either show the difference or show the similarity of sukuk to conventional bonds. This study attempts to go a step further and achieve the following aims.

1- To investigate the risk of sukuk

2- To compare and contrast sukuk to conventional bond

3- To discuss factors that affect the price of sukuk and conventional bond

4- To recommend a pricing model that can be applied to sukuk

5- To find out whether sukuk in the market are in line with Islamic law (i.e. no riba, asset-backed)

6- To find out the compatibility of the current market regulations with shariah law

The first three aims are covered in the Literature Review section, and the last three in the Methodology and Results sections.

➢ **Differences of sukuk and conventional bonds**

1- Definition

Even though the market treats sukuk and conventional bonds the same way, the basic distinction comes from their definitions. Bond is a security that is a form of debt. The debt has to be paid back before a particular date, known as its maturity. It is also essential to pay interest, which is the coupon, for the debt or for paying the principal at maturity. The interest is paid at a fixed rate (Shaukat, 2009). On the other hand, sukuk is fixed income certificates that are in line with Islamic law which prohibits interest (riba). The financial assets, also has to be in line with Islamic law, must be identifiable.

2- Ownership

Sukuk is an agreement that forms financial obligation between the investor and the issuer. It expresses ownership in existing and known assets. Conventional bond is a loan agreement. It does not transfer ownership of any part of the commercial company or industry issuing the bond to the bond holder.

3- Return

Return of a sukuk comes from the profit of the lease or partnership agreement. Sukuk requires tangible assets and sukuk price is determined by the combination of market forces and the value of the underlying assets, which might depreciate or appreciate. Return of a bond is an interest which is an additional sum charged on a loan. The interest amount is not determined as a percentage of the real profits but as a percentage of the capital.

4- Rate and payment

Sukuk is also different from conventional bonds in terms of rate and late payments. In conventional bonds interest rate is obligations. In the case of failure, the borrower has to repay on the agreed time the interest accumulated. The interest relies on the length of time the funds are used by borrowers. Sukuk charges a profit on top of the principal and if a failure of repayment or postponement emerges, retribution is charged. In fact, the lender under Islamic finance is facing more risk. However, risk and rate are positively related to the expected rate of return, which should be higher in Islamic instruments (Ramasamy et al, 2011).

5- Pricing

Sukuk pricing technique cannot diverge much from conventional bond as opportunities of arbitrage would be appear otherwise. If sukuk is overpriced, investors will avoid investing in sukuk and vice versa. Effective fair price is required to prevent arbitrage between sukuk and conventional bonds.

Pricing technique is closely linked with yield rate, duration and convexity. These measures are considered as the main tools in any fixed income to assess and evaluate whether it is conventional bond or sukuk.

- **Yield to maturity**: it is the internal rate of return that is gained by the bond holder, who purchases a bond at spot market price and holds the bond till the maturity day, allowing the bond holder to all coupon payment and also maturity payment (Safari, 2011). Sukuk value and bond value are very sensitive to yield to maturity, and the yield rate has reverse link to the value of bond and sukuk, which means that if the yield rate decline, the value of bond or sukuk increase.

- **Godlewski et al (2011)** shows that there is no definite relationship between Islamic sukuk and conventional bond yield. Any changes in the yield of an Islamic sukuk or conventional bonds do not

generally change the other. It implies that not only yield of an Islamic sukuk differ from conventional bond, the yield also does not have causal effect with each other.

- **Duration:** commonly, duration of conventional bonds is used to measure the price sensitivity to yield and the changing price in percentage for a parallel shift in yield. Duration is the first derivative of the price yield curve. Duration of an Islamic bond shows a price yield link, which is used as a measure of the risk of the Islamic bond. The slope of the price yield line is the duration, in the other words, it is the weighted average of time, and the investors should wait to turn their money (Ramasamy et al, 2011).

- **Convexity:** convexity is the second derivative of the price yield curve and it measures the sensitivity of the duration of a bond to a change in the interest rate. Using duration as a measurement is not accurate as the price yield curve is not a straight line. The price yield curve slope has a convex shape.

6- Coupon rate

In conventional bond the interest rate must be paid by the issuer on a regular basis. A coupon is generally paid semi-annually. The interest is calculated using the coupon rate and it is time-based. Sukuk has a profit rate that is equivalent to the yield rate of conventional bonds which is based on the coupon interest rate (Ramasamy et al, 2011).

For example, in the case of ijara, the issuer of the sukuk sells assets to the special purpose vehicle (SPV) who will raise fund via issuing a sukuk. The assets will be leased by the SPV and the rent will be collected and passed to the sukuk holder in the form of a coupon. The SPV will sell the assets to the issuer at a pre-agreed price at maturity. Hence the principle will be collected and passed on to the sukuk holders Cakir and Raei (2007).

Cash flow

Some sukuk are issued as a confirmation of indebtedness that occurs from the sale of assets, such as murabahah and istisna. Commonly these types of securities have only cash flows. Also, these securities have no right to own, and have no ability to get the proceeding from the last sale of the assets. Having the right to cash flow could be agreed the same way as profit sharing, through a ratio that is agreed in advance or a deep discount system. Islamic zero coupon works on the same concept as zero-coupon bonds, however Islamic zero coupon operates based on a sale agreement which creates an acceptable transaction in Islamic finance.

There are couple of differences between Islamic and conventional finance in calculating cash flows. First, the profit rate that given by Islamic bond (sukuk) has no connection with the length of time. Second, if a default or delay in payment emerged because of unexpected causes, the amount which must be paid will not be added to the principle, unlike the conventional bond, and compound interest is calculated.

The deep discount method employs no payment during the life of bonds or sukuk to the investors, however, interest is embedded – interest is the difference between face value and discount value (Rosly & Sanusi, 1999). The default risk will rise in both conventional bond and Islamic bond, because the amount of face value is paid at maturity. According to Aggarwal and Yousef (2000), to defeat the credit risk for Islamic and conventional bonds investors, the issuer must be forced via indenture provisions, to set aside a recurring annuity in a sinking fund. In the case of a failure arising from the borrower side, funds will be transmitted to the sinking fund by default or hold-up which will happen in zero coupon bonds. Straight cash flow does not take place between lender and borrower, and it does not directly fund transfer from the issuer to sinking fund.

Factors that influence sukuk price

Jadwa investment (2009) believed that the factors influencing sukuk pricing are as follows:

- **The reference rate:** an increase in the interest rate affects the fixed coupon sukuk negatively, and hence reduces the attractiveness of the sukuk which will lead to a decline in the price of the sukuk. Conversely, a decrease in the interest rate has positive impact in the price of a fixed coupon sukuk. Interest rate has no strong impacts on the variable coupon sukuk.

- **Time to maturity**: when time to maturity of a sukuk is near, the price of the sukuk is moving towards its face value.

- **Inflation:** inflation has negative impact to the real value of a coupon as it cuts the value of the coupon payment and also lowers the price that will be given to the investors.

- **Liquidity**: the obstacle of finding sellers or buyers could be a barrier to investors to be a part of sukuk trading at the price proposed by contemporary transaction. The main measure of liquidity is the bid-ask size spread; the bigger the spread the higher the liquidity risk. The lack of liquidity will be revealed in the lower prices.

- **Credit risk:** the ability to pay back coupon and principal, by sukuk issuers, to investors on time has a significant effect on the price of sukuk. The credit ratings have an objective to reflect this risk.

- **Sharia compliance**: likely change of view by scholars can threat the market point of view of sharia-compliance of a sukuk; impacting the inclination of some investors to hold sukuk and hitting prices.

- **Market conditions**: the various market conditions can determine the sukuk price even if there is no change in basics of the issuer. For instance, when financial crisis occurred, the prices of debt that has been considered as greatly safe, like those issued by governments, increased and at the same time, the price of debt that is issued by others have been considered risky, and the price declined extremely.

During the financial crisis investors required an excessive return, which means the spreads on new issues must be broader than those that were issued in the previous year.

- **Coupon level**: in the case of a sukuk which has a very high coupon rate as compared to another sukuk in the market when everything else being the same, the sukuk with a very high coupon rate would be traded at a premium price over other sukuk which has lower coupon rate.

The price indicates the market value of the sukuk; however, it does not reflect the intrinsic value, which can be observed by contrasting the two. Intrinsic value is the present value of the cash flows produced by the sukuk. Except when the coupon is fixed, the cash flows are unspecified as they are impacted by the changing of interest (e.g. LIBOR, EURIBOR, SAIBOR, etc.). Consequently, it is difficult to value a variable coupon sukuk, as it would need presumptions with regard to the future movements in the interest. Discount rates are also needed to work out net present value.

Methodology

In this research, the methodology used is pluralistic research, which is mixture between quantitative and qualitative method. The qualitative research is covered in the Literature Review section that precedes this section.

The quantitative method is used to explain the models of conventional bonds and using the same model for Islamic bonds (sukuk). The objective is to compare the coupon rate, duration and convexity of conventional bonds and Islamic bonds.

➢ **Formulas**

As discussed in the previous section, bond value is immediately linked to the cash flows. The cash flows are discounted at the yield rate to derive the fair value of the bond, and also its duration and convexity. The interest that is received by the bond holder on a regular basis is basically the cash flow. The interest rate each year is calculated by taking face value of a bond and multiplies it by the coupon rate. At the end of the bond life, which is known as maturity, the bond holder will get his or her money back which he or she invested along with the last interest. The principle sum given to the bond holder is known as a redemption value.

$$CF = \ FV * CR \qquad\qquad equation\ 1$$

Equation 1: Interest or cash flow of a conventional bond

Where:

- CF is a cash flow of a bond
- FV is a face value of bond
- CR is a coupon rate

The above formula also applies to the Islamic bond (sukuk), by changing the coupon rate with profit rate. However, if there is no coupon in the bonds, such as deep discount murabahah or istisna, the amount of money that is transferred to the sinking fund is going to emerge as a cash flow, after taking the principle amount out.

The profit rates in sukuk or interest rates in conventional bond are accumulated throughout the year until the maturity date is reached. Then the bond holder will receive the redemption value in the last year.

$$c_1 + c_2 + \cdots + c_m + R \qquad F = 1, 2, \ldots., m \qquad equation\ 2$$

Equation 2: Cash flow throughout the life of a bond

Where:

- **C is the coupon value**

- **R is the redemption value**

- **F is the life of bond**

The cash flow received throughout the life of a bond must be discounted at yield rate (YR) and added together to derive the fair value of the bond, which is the present value of the cash flow.

$$\mu = \frac{c1}{(1 + YR)} + \frac{c2}{(1 + YR)^2} + \cdots + \frac{cm + R}{(1 + YR)^m}$$

$$\mu = \sum_{f=1}^{m} \frac{c_f}{(1 + YR)^f} + \frac{R}{(1 + YR)^m} \qquad equation\ 3$$

Equation 1: Fair value of a bond

Where:

- μ is the fair value of or discount total cash flow

- To derive duration, discounted cash flows are multiplied by the time (years) and the total of the cash flows multiplied by time divided by fair value of the bond will be the duration.

$$v = \frac{c1}{(1 + YR)} \times t1 + \frac{c2}{(1 + YR)^2} \times t2 + \cdots + \frac{(cm + R)}{(1 + YR)^m} \times tm \qquad t = 1, 2, \ldots, m$$

$$v = \sum_{f=1}^{m} \frac{cf}{(1 + YR)^f} \times tf + \frac{R}{(1 + YR)^m} \times tm \qquad equation\ 4$$

Equation 4: Total discounted cash flow over the life of a bond

Where:

- v is the total of discounted value and time

- Duration can then be calculated by dividing the total of discounted value and time (υ) with fair value of the bond (μ).

$$D = \frac{v}{\mu} \qquad equation\ 5$$

Equation: 2 Duration

Where:

- D is the duration

- The slope of the price yield curve is given by the duration; however the duration does not give us the expected fall in the value of a bond. To measure the change in the value of bond when the yield rate changes, modified duration should be used and it is calculate as follows.

$$MD = \frac{D}{(1 + YR)} \quad equation\ 6$$

Equation 3. Modified duration

Where:

- MD is the modified duration

- To calculate the loss of value or gain in value below formula is used.

$$\frac{dp}{p} = -MD \times dy \quad equation\ 7$$

Equation4. Change in the bond value

Where:

- dp is the change in the bond value

- dy is the change of yield rate

- MD the modified duration

- p is bond value

If there is a little change in the yield rate, the modified duration cannot estimate the gain or loss value correctly because of the convexity of the yield curve. This convexity is to be calculated in order to find the accurate gain or loss value. The mathematical definition of convexity is as follows.

$$convexity = \frac{1}{p} \times \frac{d^2p}{dy^2}$$

$$cv = \frac{\omega}{p \times (1 + YR)^2} \qquad equation\ 8$$

Equation 5: Convexity

The first convexity equation indicates that convexity is the second derivative of price with respect to yield.

The next step in calculating convexity is to multiply discounted cash flows by $(t^2 + t)$.

$$\omega = \frac{c1}{(1 + YR)} \times (t1^2 + t1) + \frac{c2}{(1 + YR)^2} \times (t2^2 + t2) + \cdots + \frac{cm + R}{(1 + YR)^m} \times (tm^2 + tm)$$

$$\omega = \sum_{f=1}^{m} \frac{c \times (tf^2 + tf)}{(1 + YR)^f} + \frac{R \times (tm^2 + tm)}{(1 + YR)^m}$$

Where:

- ω is the discounted cash flows multiplied by $(t^2 + t)$.

- All the above equations are appropriate for Islamic bonds (sukuk) as well as conventional bonds. The only change required to use the equations for Islamic bonds is to replace coupon rate with profit rate.

- **Dow Jones Sukuk Index**

    This section aims to explain the Citigroup Dow Jones Sukuk Index, which will be used in the following section to calculate, compare and contrast sukuk pricing.

The criteria for securities' inclusion into the Sukuk Index are established as follows (Guide to the Dow Jones Citigroup Sukuk Index, 2009, Dow Jones Indexes, 2006).

- The Sukuk Index simply contains US-denominated investment-grade bonds that have been considered sharia compliant. Sharia compliance is determined in three stages:
    - Certification by a Sharia Supervisory Board that has international membership or by multiple Boards from different geographic regions
    - Compliance with the 2004 standards issued by the Bahrain-based Auditing and Accounting Organization of Islamic Financial Institutions (AAOIFI)
    - The underlying assets of the bonds must be compliant with sharia principles
- The minimum maturity of the issue must be one year and the issuance must have a minimum size of USD 200 million.

- The bonds must be investment grade, which suggests that the bonds must be rated at least BBB- by the leading credit rating agencies.

The index itself is then calculated according to a methodology in accordance with the broader Dow Jones. The Sukuk Index is weighted by market capitalization and updated monthly. Each issuance that has qualified for admission in the index is weighted by the total size of the sukuk issuance. When a new issuance is made, the total size of the issuance is first obtained and the weighting in the index is calculated based on the product of the number of bonds issued and the price of each bond. In a market capitalization-weighted index, a change in the market price of any of the individual components of the index creates a change in the value of the overall index proportional to the total market capitalization of that component. The formula that describes this relationship can be summarized as follows:

$$\frac{index_{new}}{index_{old}} = \frac{\sum sukuk * price_{new}}{\sum sukuk * price_{old}} \quad equation\ 9$$

Equation 6 :Relationship between sukuk index to number of sukuk issued and price

The broader Dow Jones index calculation methodology is described in the Citigroup Global Fixed-Income Index Catalog, 2006 edition (Citigroup Index, 2006). The process described by Citigroup Index (2006) as follows:

- An issue will only be deemed as eligible for inclusion in the index if all information has been made publicly available on or before the fixing date and the first settlement date of the issue must be on or before the end of the month.

- At the end of the month, those bonds that no longer meet the maturity, size or credit rating criteria are removed from the index and any buybacks or reverse auctions on or before the fixing will cause the bond to be removed from the index.

- The constituents of the index remain the same for the entire calendar month and any interim calculations of returns are made based on the composition. At the end of the month, the index is recalculated based on the changes in the market capitalization of all the components of the index.

- Throughout the month, Citigroup will continue tracking activities in the market and any issues that have been called, tendered or which have defaulted will be removed from the Sukuk Index.

Results:

Sukuk price and total return:

Table (2). Sukuk ratings and interest rates

DATE	SYMBOL	PAR	MKV	COUP	RATING	AVLF	Int Rate
2011/09	SUKUK	15100	15901.442	4.1506	A	4.3361	0.0375
2011/09	SUKUK_3A	2100	2174.427	2.5458	AAA	3.9117	0.0375
2011/09	SUKUK_1A	8200	8646.7887	4.1272	A-	4.5758	0.0375
2011/09	SUKUK1_3	3000	3226.0914	4.8946	BBB+	2.7387	0.0375
2011/09	SUKUK3_5	9500	9941.4061	3.6495	AA-	4.0981	0.0375

- **PAR:** The face value of a bond, it determines its maturity value as well as the dollar value of coupon payments.
- **MKV**: Market value of Sukuk.
- **COUP:** Coupon rate of return, fixed rate.
- **RATING**: A grade given to bonds that indicates their credit quality.
- AVLF:
- **Int Rate**: Interest rate is the amount charged, expressed as a percentage of principal, by a lender to a borrower for the use of asset.

The data in table (2) is obtained from Dow Jones Sukuk Index. Bonds prices are calculated based on Present Value, which takes into account the time value of money. The same also applies to sukuk instruments, which according to Dar Al Istithmar (2006) are not technically bonds but asset backed trust certificates. However, due to similarities in their inherent nature, their prices are calculated similarly to conventional bonds.

According to Cakir and Raei (2007), the price of sukuk is calculated based on the amount investors expect to receive back from their investment, given the time value of money, length to maturity, repayment value (par) value of the bond, profit payable annually and the current market interest rate.

The following formula is utilized in calculating the present value of bonds:

$$\mu = \frac{c1}{(1+YR)} + \frac{c2}{(1+YR)^2} + \cdots + \frac{cm + R}{(1+YR)^m}$$

In fact, yield rate (YR) is the same as market interest rate or required yield.

The formula that is used to calculate sukuk price is a formula based on coupon rate payable, the market interest rate, time until maturity and par value.

$$sukuk\ price = c * \frac{1 - [\frac{1}{(1+i)^m}]}{i} + \frac{R}{(1+i)^m}$$

Equation 1: Sukuk price

Before sukuk price can be calculated, coupon (profit rate) should be calculated based on the profit percentage paid on the par value (face value).

$$coupon\ payment = \frac{face\ value * coupon\ rate\ (profit\ rate)}{100}$$

Equation 2 .Coupon payment

Based on Table (2). Sukuk ratings and **interest rates**, a sukuk rated A which has a face value of $15,100 has a coupon rate of 4.1506%. Below calculation shows that coupon payment is $626.7406.

$$\frac{15100 * 4.1506}{100} = \$626.7406$$

The market price for the sukuk can then be calculated as below.

$$Sukuk\ Price = 626.7406 * \frac{[1 - [\frac{1}{(1+0.0375)^{4.3361}}]}{0.0375} + \frac{15100}{(1 + 0.0375)^{4.3361}}$$

$$= 15337.9943$$

Utilising the same formula and method, prices of other sukuk can be calculated. Table (3) below summarizes

the result.

Table (3). Calculated sukuk prices

Coupon payment	Market interest	Par value	M(average life)	RATING	Price
626.7406	0.0375	15100	4.3361	A	15337.9943
53.4618	0.0375	2100	3.9117	AAA	2009.5581
338.4304	0.0375	8200	4.5758	A-	8327.8699
146.8380	0.0375	3000	2.7387	BBB+	3087.8196
346.7025	0.0375	9500	4.0981	AA-	9464.3463

The prices calculated are based on the coupon rate, which is calculated by determining the profit payable for each period, based on the average life till maturity of all the Sukuk bonds, the par value of the bond and the interest rate. The interest rate utilized was in accordance to the methodology used by Dow Jones, wherein off-the-run treasury bonds were used as the required rate of return. Information on Treasury bond interest rates were obtained from the Treasury Direct website and the most recent bond coupon rate was used as the basis for the required rate of return (3.75%).

The results from table (3) show different sukuk prices, depending on the rating of the sukuk and its coupon rate. For instance, all of the sukuk, except the AAA rated sukuk, are trading at a premium. These sukuk trade at a premium because they offer a coupon rate higher than the current market require rate of return, as shown in Table (3). Calculated **sukuk prices**. All of the sukuk bonds, except the AAA rated sukuk, have coupon rates higher than 3.75%, which is the market rate that has been utilized in this calculation.

According to Cakir and Raei (2007), irrespective of whether a sukuk is trading at a premium or at a discount, the prices always converge towards the par value when the sukuk is approaching maturity, because it is the par value that would be repaid back to bond holders. Therefore, irrespective of the current price of the sukuk bonds, their prices would eventually converge back to their PAR value towards maturity.

The prices in Table (3). Calculated **sukuk prices** are different from those stated by Dow Jones in Table (2). Sukuk ratings and **interest rates**, because as stated in their (Dow Jones) methodology:

"...bid-side prices from Citigroup are collected at the close of the local market. However, because of the illiquid nature of the bonds, the valuations placed on the bonds by traders are based more on their estimate of where the bonds might trade rather than an observation of where they actually trade" (Dow Jones, 2011).

This illustrates that the calculation in Table (**3**) represents a more accurate representation of the market price of the sukuk bonds (given that the investors use the same rate of return of 3.75%).

➢ **Sukuk yield to maturity and rate of return**

The yield is a figure that shows the rate of return to be derived from any bond or sukuk, while yield to maturity (YTM) shows the return that the investor would get if they hold the bond or sukuk until its maturity. Both of them represent different rates of return, and they would be calculated and analysed for all different rating of sukuk covered in table of Sukuk ratings and interest rates

To calculate the current yield, below formula is used.

$$Current\ Yield = \frac{Face\ Value * Coupon\ Rate}{Current\ Price}$$

Equation of Current yield

While the slightly more complex formula for calculating yield to maturity.

$$YTM = \frac{c + \frac{FV - P}{m}}{\frac{FV + P}{2}}$$

Equation of Yield to maturity

Where:

- FV is the face value of sukuk
- P is the price of sukuk
- m is the time until maturity

Table (4). Calculated sukuk yield and yield to maturity

RATING	COUP	Yield	YTM
A	4.1506	4.086	3.758
AAA	2.5458	2.660	3.727
A-	4.1272	4.064	3.757
BBB+	4.8946	4.755	3.771
AA-	3.6495	3.663	3.748

Returns are then calculated according to the formulas shown in table (5).

Source: Citigroup Index (2006)

Table (5) .Calculation methods for Citigroup Dow Jones Sukuk Index

Beginning-of-period Value =	(Beginning Price + Beginning Accrued) * Beginning Par Amount Outstanding
End-of-period Value =	[(Ending Price + Ending Accrued) * (Beginning Par Amount Outstanding – Principal Payments)] + Coupon Payments + Principal Payments + Reinvestment Income
Total Rate of Return (%) =	[(End-of-period value / beginning-of-period value)-1] * 100

Table (6).Calculated returns of different sukuk ratings

date	sukuk A	sukuk AAA	sukuk A -	sukuk BBB +	sukuk AA-
2005	1.1792	0.8945	1.2659	0.9736	1.3454
2006	5.6935	5.1046	5.8799	5.2450	6.0649
2007	3.6552	4.9150	3.5420	5.0107	2.1488
2008	**-18.7676**	-0.1680	-21.5569	-0.9664	-22.8617

date	sukuk A	sukuk AAA	sukuk A -	sukuk BBB +	sukuk AA-
2009	27.5185	4.4830	26.6877	13.9687	19.5595
2010	9.2155	9.5193	9.0478	7.5827	10.5323
2011	3.2928	1.0909	3.4193	3.0694	3.3672
Total rate of return	29.93715	29.15096	24.79592	40.41272	16.52989

Table (6) (calculated returns of different sukuk ratings) represents the overall yearly returns for each sukuk bond rating. The returns were calculated based on the bond price growth or decline for the past 6 years, based on daily returns derived from the Dow Jones index.

However, this methodology creates two issues. First, according to Dow Jones Indexes (2006), many of the bonds included in the Sukuk Index are inherently illiquid. The Sukuk Index obtains the prices of the sukuk based on the bid-prices from Citigroup at the close of the market on a particular trading day. However, the illiquidity of the sukuk means that the indicative valuation of the sukuk on that trading day may be different from the actual trading price since traders tend to value bonds based on where they think the sukuk should trade instead of the price where the sukuk is actually trading.

Second, the weighting of a bond market index based on market capitalization creates the bums' problem (Hougan, 2009). Because the index is weighted according to the total size of the individual components, it creates an inherent bias towards those companies that have issued large amounts of debt and who generally tend to have higher risk than companies who are more conservative in their debt issuances. This issue can be alleviated somewhat, however, by partitioning the universe of bonds into different sub-universes based on their credit ratings.

➢ **Performance of global sukuk**

Figure (2) represents the yearly return from October 2005 to June 2011 of various globally rated sukuk. The return of these sukuk (A, AAA, A-, BBB+, and AA-) explained the performance of these sukuk over the seven years. As AAA and AA- Sukuk issued by companies that have a very high capacity to repay their loans, with AAA rated companies having the highest capacity to repay its obligations, while A and A- Sukuk issued by companies that have a strong capacity to repay, these companies are currently stable and easily able to repay their debts, but could face challenges if economic conditions deteriorate, finally, BBB+ Sukuk issued by companies are vulnerable to changing economic conditions and could face big challenges if economic conditions decline, however, these companies have the capacity and capability to meet their debt payment obligations.

Most of the sukuk follow a similar pattern of yearly returns. The returns were marginal in 2005, with a return range from 0.97 to 1.34% for A, A-, BBB and AA- sukuk. All the sukuk recorded a gain in net value, with an average gain range of 5.10% to 6.06%. The same was also evident in 2007, but with a wider range of gains. However, the net gains in 2007 were much less as compared to 2006. In 2008, probably due to the financial crisis, all of the sukuk rated bonds witnessed a considerable loss in yield value. AA-, A and A- sukuk witnessed the most significant losses. The losses on AAA and BBB bonds were marginal, but they were losses regardless. In 2009, there was a sharp rebound in the value of these bonds, with a considerable portion witnessing double-digit growth in value (except AAA bonds). The gains were also evident in 2010 and so far in 2011.

Overall, the bonds with the highest growth rate over the past seven years are BBB (40%), A (29.93%), AAA (29.15%), A- (24.7%) and AA- (16.5%).

Ramasamy et al (2011) noted in their research paper that the yearly prices of conventional bonds and sukuk are inversely proportional to interest rates. Therefore, when interest rates fall, bond prices rise and vice versa. By applying this argument to the results from Table (4) and table of calculated returns of different sukuk ratings, it is possible and logical that the rise of bond prices in 2009 are a direct result of the significant slash in interest rates witnessed across several international markets.
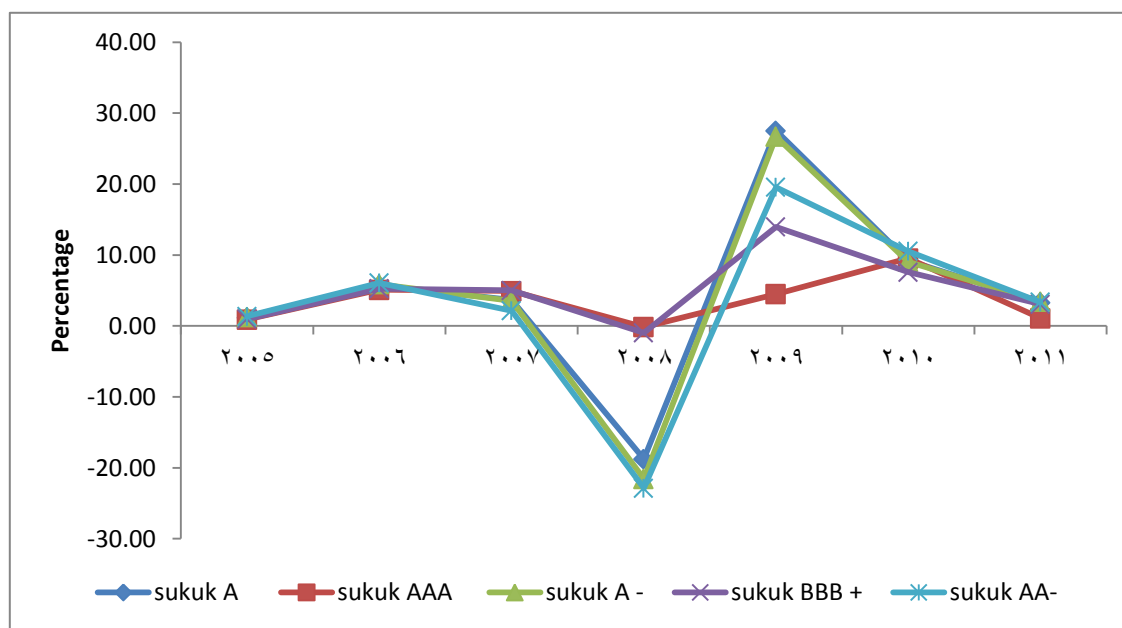

Figure (2) Performance of global sukuk from 2005 to 2011

2- Discussion

Islamic bond (sukuk) has been using the same pricing model as the conventional bonds, the difference is conventional bond has coupon rate while sukuk has profit rate, however this does not mean that they are different. Profit rate depends on the LIBOR (or any other interest rate reference such as EURIBOR, SAIBOR).

Sukuk reacts in the same manner as conventional bonds, in terms of its fluctuation when interest rate moves upwards or downwards. Most of the sukuk distributed their profit at a fixed percentage relying on LIBOR, not depending on the performance of the assets.

The rules that have been observed for sukuk are:

- Sukuk that have a larger term to maturity are more volatile than those with a shorter term to maturity.

- If the terms to maturity and the sukuk initial price remained constant, the higher the profit payments, the lower the sukuk's volatility and vice versa.

Cakir & Raei (2007) noted that, a sukuk's volatility to interest rates also depends on its yield to maturity. A sukuk with a higher YTM usually displays lower volatility and vice versa. Also, the sukuk's credit rating plays an important part as those with poor credit ratings usually have higher yields, hence higher volatility than those with better credit ratings.

As a result, investors looking to invest in lower risk sukuk would do better with investing in a sukuk with high coupon payments and a shorter term to maturity as these are less volatile. However, those seeking to obtain potentially higher returns could invest in sukuk with low profit payments and higher term to maturity, provided that there is a possibility of interest rate reduction in the foreseeable future.

By applying this principle to the five sukuk being analysed in this study, the following are evident:

- A, A- and AA- sukuk are potentially more volatile than AAA and BBB+ sukuk, which have a lower term to maturity.

- BBB+ having a higher coupon payment could attract lesser volatility than normal, while A- rated sukuk with the highest volatility could theoretically be less volatile than the rest.

The results from the analysis are in accordance with the general rule surrounding bonds with regards to their yield, coupon and Yield to Maturity (YTM), and this rule are applied to sukuk analysed in this report. From Table **(4)** (6) calculated sukuk yield and yield to maturity it can be concluded that when bonds are trading at a premium, the Coupon Rate is higher than the Yield, and the Yield is higher than the YTM, and this is immediately evident for sukuk rated A, A- and BBB+. However; in the situation where a bond or sukuk is trading at a discount, the YTM is higher than the Yield, and the Yield is higher than the Coupon, which is the case for sukuk rated AAA and AA-. So sukuk and conventional bonds can be easily traded on the open market

at a premium, discount or at par, depending on the coupon rate (profit rate), term to maturity, interest rate and yield.

Profit rate depends on the assets performance. However, in reality, the investor receives the profit rate according to the prevailing interest rate. This means that the investors have no benefit if the assets perform well, which is not compatible with Islamic law at all. The actual risk that the investor is exposed to is the interest rate risk. Another point that needs to be highlighted is the fact that sukuk are exposed to the regulation risk, where it is noted that the Islamic capital markets are regulated by conventional capital markets laws that are British, American and European laws. In reality there is no Islamic law in practice in the Islamic capital market so far that is agreed by all.

Nasser (2009) posed the question, what is going to occur if English law disagreed with Islamic law? As sukuk is an Islamic financial instrument, it should be regulated by Islamic law; otherwise it should not be known as an Islamic instrument as English or other law cannot replace the Islamic law when dealing with problem relating with Islamic finance. It is irrational to regulate sukuk with a non-Islamic rule; their essence will be lost and it will not continue to be effective in the long term.

There are various bankers who consider sukuk are unguaranteed and the existence of assets is solely to satisfied shariah demand. There is many ways to break the shariah morals at any price; however pure Islamic investors should look for instruments that are compatible with shariah. Companies and stakeholders should take into consideration how they can make great revenue without the expense of buying or selling incompatible instruments to shariah law.

3- Conclusion and recommendation:

The research has discussed and analysed various points that are associated with sukuk, such as types of sukuk, risk, pricing model, regulation and issuance of sukuk. Sukuk are encouraging majority of Muslims people as well as non-Muslims to contribute in Islamic financial market.

Islam has a specific law that is applied in the financial market, known as the shariah law. It is different from the conventional rules as the Islamic law deemed (riba), (gharar) and (maysir) as unacceptable. There are also some activities that harm the humanity soul and break the sharia law. The principle of profit and lost sharing in Islam has also been discussed. These shariah rules characterises the Islamic market.

Moreover, Sukuk reacts in the same manner as conventional bonds, in terms of its fluctuation when interest rate moves upwards or downwards, and sukuk and conventional bonds can be easily traded on the open market at a premium, discount or at par, depending on the coupon rate (profit rate), term to maturity, interest rate and yield. Also, Profit rate depends on the assets performance in sukuk while in traditional bonds

the investor receives the profit rate according to the prevailing interest rate. This means that the investors have no benefit if the assets perform well, which is not compatible with Islamic law at all.

The sukuk market continues to grow fast in East Asia and GCC, with Malaysia still the leading country in Islamic financial market in general and in the sukuk market in particular. (Sukuk al-ijara) is the most popular and well-known (sukuk) structures. With the expansion of global investors, there are going to be various numbers of investments needed and hence other structures of sukuk issuance should be applied to cover the demands. (Mudarabah), (musharakah) and (istisna) sukuk are a part of the AAOIFI standard and they are able to be used to provide a variety of (sukuk) structures.

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الصكوك (السندات الإسلامية)

الملخص: هدفت الدراسة الحالية الى التعرف على مكون أساسي للسوق المالي الإسلامي وهو السندات الإسلامية والتي تُعرف بالصكوك. حيث هدفت الدراسة الى المقارنة بين السندات التقليدية والصكوك الإسلامية من حيث المخاطرة وتحديد العوامل التي تؤثر على قيمة كل منهما، بالإضافة الى تصميم نموذج تسعير يمكن تطبيقه على الصكوك الإسلامية. طبقت الدراسة المنهج الوصفي التحليلي، حيث تم مطالعة وتحليل العديد من الأدبيات والدراسات التي تناولت مفهوم الصكوك الإسلامية، كما تم استخدام المعادلات الرياضية الخاصة بالسندات التقليدية في حساب العديد من الجوانب التي تتحكم في قيمة السند مثل معدل الفائدة الاسمي ومقدار التغير في سعر الفائدة، ونموذج تسعير السندات، وتم استخدام هذه المعدلات في تحديد قيمة الصكوك الإسلامية في السوق المالي الإسلامي. وتم جمع المعلومات والبيانات اللازمة للدراسة الحالية من مؤشر داو جونز للصكوك في العديد من الدول مثل ماليزيا والسعودية والكويت وقطر والبحرين والامارات العربية المتحدة وباكستان. أشارت نتائج الدراسة الى أن المعادلات الرياضية الخاصة بالسندات التقليدية يمكن تطبيقها على الصكوك الإسلامية في احتساب قيمتها ولكن باستبدال متغير معدل الفائدة في السندات التقليدية بمعدل الربح في الصكوك الإسلامية. وأشارت نتائج الدراسة الى أن معدل الربح في الصكوك يعتمد على أداء الأصول، وليس على نسبة فائدة محددة كما في السندات التقليدية، كما وأظهرت نتائج الدراسة أن السندات التقليدية والصكوك الإسلامية مُعرضة لذات المخاطر، ولكن الصكوك الإسلامية معرضة لمخاطر أكبر وذلك لالتزامها بضوابط الشريعة الإسلامية. وبالرغم من المخاطر الإضافية التي تتواجد في الصكوك الإسلامية الا أنها تمتاز بنسبة مخاطرة أقل؛ في جانب مبدأ مشاركة الربح والخسارة وامتلاك الأصول. أوصت الدراسة بأهمية تصميم واستخدام صور متعددة من الصكوك الإسلامية في الأسواق المالية الإسلامية وذلك لسد احتياجات المستثمرين المتنامية مثل المرابحة والمشاركة والاستصناع.

الكلمات المفتاحية: الصكوك، السندات، الملكية، العائد، معدل الفائدة، التسعير، معدل الفائدة الاسمي، التدفق المالي.