

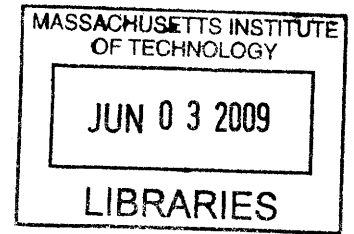
A New Approach to Product Development in Islamic Finance

by

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ARCHIVES



SUBMITTED TO THE SYSTEM DESIGN AND MANAGEMENT PROGRAM
FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF
MASTER OF SCIENCE IN MANAGEMENT AND ENGINEERING
AT THE
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

SEPTEMBER 2008

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Abstract:

Islamic Finance is a banking sector which caters to the Muslim population's banking needs by complying with the Islamic financial law. In this research some of the most prevalent financial products in Islamic Finance are surveyed and various forms of Islamic asset securitizations (Sukuks) are studied. Two issues of Islamic asset securitizations (Sukuks) are analyzed in detail. This analysis involves determining how well Sukuks serve the needs of Islamic Finance customers and also their shortcomings. In order to develop more customer-need centric financial products in Islamic Finance a new product development template is proposed. This template is a step-by-step process of developing Islamic financial products and is derived from the best practices of product development in the engineering domain. This methodology aims to formalize and improve the product development process in Islamic Finance. As an illustration of the proposed template, a new product is developed for Islamic Finance using this template. This example illustrates how religious restrictions in Islamic Finance dictate the form and substance of financial products during their development.

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Chapter 1 - Introduction:

1.1 Statement of problem:

Institutional constraints in finance provide the impetus for engineering innovative financial products. One such example of institutional constraints is the religious prohibition against interest and excessive risk in Islamic Law. In the last three decades the Islamic Finance industry has emerged to cater to the banking needs of Muslims in Islamic Law compliant manner by improvising numerous financial products. However these products fall short of fully complying with the Islamic financial law and serving customer needs. Most of the products that have been developed for Islamic Finance are conventional financial products tweaked for Islamic Finance, and in substance, they are not very different from their conventional counterparts. Islamic Finance products are inferior in quality to their conventional counterparts. These drawbacks in Islamic Finance products inhibit the growth of the Islamic Finance sector and as a result its penetration remains negligible among Muslim populations. The root cause of this problem lies in the lack of formal product development process in Islamic finance. One way to improve the quality of the next generation of products in Islamic Finance is to use a rigorous product development process which ensures that all of the consumer needs are met and that product quality and cost structure are better than the conventional products.

1.2 Outline and preview:

The first chapter of this thesis gives a brief introduction to Islamic finance and surveys various Islamic financial instruments that are being currently used. The second chapter provides an in depth analysis of the most prevalent and successful Islamic financial product, Sukuk. It analyzes two issues of Sukuk and highlights various problems with Sukuk and the two issues. The first two chapters provide an in-depth understanding of the functioning of Islamic securities. A new product development template is proposed for Islamic Finance in chapter 3. This template is a step-by-step description for developing products in Islamic Finance. In chapter 4, a hypothetical case is used to illustrate product development in Islamic finance using the proposed methodology for developing a new product.

1.3 Summary of results:

In this thesis, an in-depth understanding of the structuring of existing Islamic Finance products is gained. Then shortcomings of existing Islamic financial products are highlighted and as a remedy to these shortcomings, a new product development methodology for Islamic Finance is proposed. To test the effectiveness of this product development methodology, a new Islamic Finance security is developed using the proposed template.

1.4 Introduction to Islamic finance:

Islamic Finance is a banking system, where the banking activity is in accordance with the Islamic Law. Islamic Finance industry has been growing at an average rate of 15% over the last three years and currently Islamic Finance institutions manage more than US\$800 billions of assets¹. Islamic law prohibits *Riba* and *Gharar* in commercial transactions. *Riba* is an Arabic word, which literally means “to grow, to exceed, to be more”. In the context of commercial dealings, *Riba* means charging or paying interest. Islamic Finance requires that financiers extend interest free loans to the needy individuals who seek loans because of their poor circumstances. For commercial and other types of loans, financiers are required to be investors in the projects they are financing. Financiers are required to get their share in the profit or loss from the venture as a compensation for their financing. There are several financing instruments, which have been devised in Islamic Finance which structure commercial loans as investments thereby making them compliant with the Islamic Law. Prohibitions in Islam against *Riba* are very severe. The main reason for such prohibitions is to create a society which is more equitable, just and compassionate.

Financing done according to Islamic Finance is required to be backed by assets. For example, in conventional financing, a loan is extended to a debtor on a basis of credit quality of the debtor. In Islamic Finance, the financier is required to find out reason for requiring the loan by the borrower. If the purpose of the loan is to buy/build tangible assets, the financier is required to purchase those assets, and actively co-manage them along with the debtor. This makes the financier a co-investor in the project along with the debtor, since the financier is an owner of the assets. In Islamic Finance, the financier is also required to make sure that the funds extended are not used for purposes that are forbidden in Islamic Law. Some examples of forbidden trades in Islamic law include gambling, alcohol, arms, pornography, etc.

The word *Gharar* does not have a precise meaning in the Arabic language; it loosely means uncertainty, deception and delusion. The best definition of *Gharar* in the context of its prohibitions in Islamic Law is to “trade in risk”. *Gharar* is the sale of probable items whose existence and characteristics are not certain, due to their risky nature, which makes the trade similar to gambling. Prohibitions against *Gharar* are less strict, and certain level of *Gharar* is acceptable by Islamic Law in commercial transactions. Loosely speaking, *Gharar* arises in those financial transactions, that are very ambiguous and the outcome of profit or loss is not well understood, or the likelihood of a loss is very certain. Some researchers have formalized *Gharar* in financial transactions as zero sum games – i.e. games in which one party in a transaction gains and the other party loses². The gains of one party are at the expense of the other party. Gambling is one clear example of a zero sum game. Most financial transactions fall into the category of mixed games, in which the outcome is either zero sum or positive sum. The degree of *Gharar* in such a financial transaction depends upon the likelihood that the outcome of the game is zero-

¹ Jobst, Andreas, *Islamic Bond Issuance-What Sovereign Debt Managers Need to Know*, IMF, July, 2008. (PDP/08/03)

² Al-Suwailem, Sami, *Hedging in Islamic Finance*, Occasional Paper No. 10, Islamic Development Bank, 2006.

sum. According to some Islamic law scholars, presence of excessive risk (or randomness) in a financial transaction makes the transaction non-compliant with the Islamic Law on the basis of *Gharar*³. Since almost every financial transaction involves certain level of uncertainty, only those transactions become invalid that involve excessive uncertainty to an extent, that there is considerable chance of creation of ill-will and animosity between the transacting parties.

1.5 Modes of Islamic Finance:

Following is the list of most common instruments used in Islamic Finance for project finance.

1.5.1 Musharaka:

The literal meaning of the Arabic word “*Musharaka*” is to share. *Musharaka* resembles a joint venture among a group of investors. These investors pool in money for a *Musharaka* and divide among themselves any losses or gains from the venture. The ratio of profit distribution among the partners in the joint venture is pre-determined and none of the partners is entitled to a guaranteed return. Losses are divided among the partners according the ratio of their invested capital.

1.5.2 Mudarabah:

Mudarabah is a special type of *Musharaka* (joint venture) in which one partner is responsible for the managing and running the business while the other partner (or partners) provide the capital. The profit/loss distribution among the partners is pre-determined.

1.5.3 Murabaha:

Murabaha is a particular kind of sale transaction, in which the seller expressly mentions the cost of the sold commodity, and sells it to another person by adding some profit or markup. This profit is determined by mutual consent. The exact cost of the commodity is required to be known at the time of *Murabaha* sale. *Murabaha* is not a loan given on interest. It is a sale of a commodity in which the payment is differed and the price includes an agreed profit added to the cost. *Murabaha* can only be used to purchase commodities, and cannot be used as a financing product to pay bills and salaries. Islamic scholars recommend *Murabaha* is only when *Musharaka* or *Mudaraba* modes of financing are not possible⁴.

³ El-Gamal, Mahmoud A, *An economic explication of the prohibition of Gharar in classical Islamic jurisprudence*, 4th International Conference on Islamic Economics, Leicester, UK , 13-15 August, 2001.

⁴ Usmani, Muhammad Taqi, *An Introduction to Islamic Finance*, 1st ed. Kluwer Law International.

1.5.4 Ijara:

Ijarah literally means “to rent”. It resembles the conventional lease structure. *Ijarah* is employed to rent the services of an individual. It is also used to transfer the usufructs of assets (the rights to use the assets) to other person or entity in exchange for rent. In case of late rental payments, the lesser cannot charge extra amount from the lessee. However the lessor can require the lessee to pay certain amount to a charity as a penalty. The rents can be variable if it's a long term lease.

1.5.5 Salam

Salam is a sale in which the seller undertakes to supply some specific goods to the buyer at a future date in exchange of advanced payments fully paid in cash. The purchased good is delivered on an agreed upon exact future date. The agreed upon price is usually less than the future spot price. *Salam* can be used only to purchase those commodities, whose quality and quantity can be clearly specified.

1.5.6 Istisna

Istisna is a sale in which the asset to be purchased is sold before it comes into existence. It is usually used to place an order to manufacture a specific asset. The details of the commodity, its exact price and the delivery dates are pre-settled. It is not necessary for the price of *istisnaa* to be paid in advance and the payments can be made in installments. The contract of *istisnaa* can be cancelled before the manufacturer starts on the project.

1.5.7 Bay al Urboon

In this contract the buyer pays some amount of the price money upfront for a good that is going to be delivered in the future. If the buyer wants to keep the good, the advance amount is included in the price of the contract. Otherwise it belongs to the seller. The legality of *Urboon* contract in the Islamic Law is debated and some schools of thought in Islamic Finance consider *Urboon* to be invalid.

2 – Chapter 2 - Sukuks:

This chapter provides an in-depth analysis of Sukuks. Most of the growth in the Islamic Finance industry has been driven by the issuance of Sukuks (Islamic asset securitizations). At the end of 2007, total outstanding Sukuks exceeded US\$90 billion and based on the current trends the total amount of Sukuk is likely to exceed US\$200 billion by 2010⁵. Sukuks are Islamic Law compliant alternatives to conventional debt. Growth in Sukuk issues has been primarily coming from the supply side and the absence of fixed income instruments creates enough demand for the Sukuks. Debt markets in the Middle East are still under-developed, and Sukuk issues in the public sector help create an investor base for future corporate sponsored issues.

2.1 Introduction to Sukuks:

Sukuk is an Arabic word for a financial certificate and Sukuks are the Islamic Finance counterparts of bonds and securitizations. They are Islamic law compliant asset backed securities which are backed by Islamic Law compliant synthetic loans, sale-leasebacks or profit-sharing arrangements. Sukuks are similar to mortgage pass-throughs. However investors own a portion of the underlying asset, which collateralizes the debt.

Sukuks are not debts of the issuer; they are fractional or proportional interests in underlying assets, usufructs, and services or equity participation in projects or investment activities⁶. The investors also participate in the profit or loss of the underlying asset. Some of the Sukuks pay pre-determined returns, while others allow sharing of profits and in some instances losses. Sukuks have been issued by governments, corporations and quasi-government organizations.

Following are eight different types of securitizations for Sukuk:

1. Securitization of an existing or to-be-acquired tangible asset.
2. Securitization of an existing or to-be-acquired leasehold estate.
3. Securitization of presales or services.
4. Securitization of presales of production of goods at a future date.
5. Securitization to fund construction.
6. Fund acquisition of goods for a future sale.
7. Fund capital participation in a business or investment activity.
8. Fund asset allocation and agency management.

Most Sukuk issues have government credit support. However further growth of Sukuks is impeded due to lack of legal frameworks for origination, trading and investor protection, absence of accounting standards and plethora of regulatory hurdles.

⁵ Jobst, Andreas, *Islamic Bond Issuance-What Sovereign Debt Managers Need to Know*, IMF, July, 2008. (PDP/08/03)

⁶ Shari'a Standard No. 17 in *Shari'a Standards: The Full Text of Shari'a Standards as Rabi' 1425 – May 2004* (Accounting and Auditing Organization for Islamic Financial Institutions, 2004).

2.2 Structure of Various Sukuks:

In this section four basic types of Sukuks (Islamic Asset Securitizations) are explained. The four types of Sukuks are:

1. Ijara Sukuk
2. Mudaraba Sukuk
3. Musharaka Sukuk
4. Murabaha Sukuk

2.2.1 Ijara Sukuk:

Ijara Sukuks are the most prevalent form of Islamic asset securitizations. It is mainly used for financing real estate projects, private equity and machinery/equipment finance. The company seeking funds (Project Company) creates a special-purpose-vehicle (SPV/Funding Company/Issuer) and transfers assets to this SPV and the SPV holds the legal title to these assets. In some Ijarah sukuk, the asset owner (Project Company) leases the assets to the Issuer and rents the asset back, thereby avoiding a true sale of assets. These assets are usually real assets, but lately assets like marketing rights and utility bill collection rights have also been used. The SPV (Funding Company/Issuer) issues Sukuk certificates to investors, and investors give cash to the issuer in return as investments. The project company (debtor) leases the assets back from the SPV and pays rents to the SPV for the leased back assets. The credit risk of non-performance by the lessee is covered by a guarantee on the payments due to Sukuk certificate holders. The rental streams from the leases can be structured to produce precise cash flow, fixed or variable, based upon an amortization schedule. The project company (debtor) also signs a purchase undertaking that if it defaults on rental payments or at the termination of the loan term, it will have to purchase the assets from the SPV at the outstanding principal amount of the loan. Sometimes a generic Sukuk structure is created by pooling in Sukuks of many SPVs. Ijara Sukuks are not rated on the basis of the assets under SPV, but on the basis of the credit quality of the debtor (who is the ultimate purchaser of the asset at maturity).

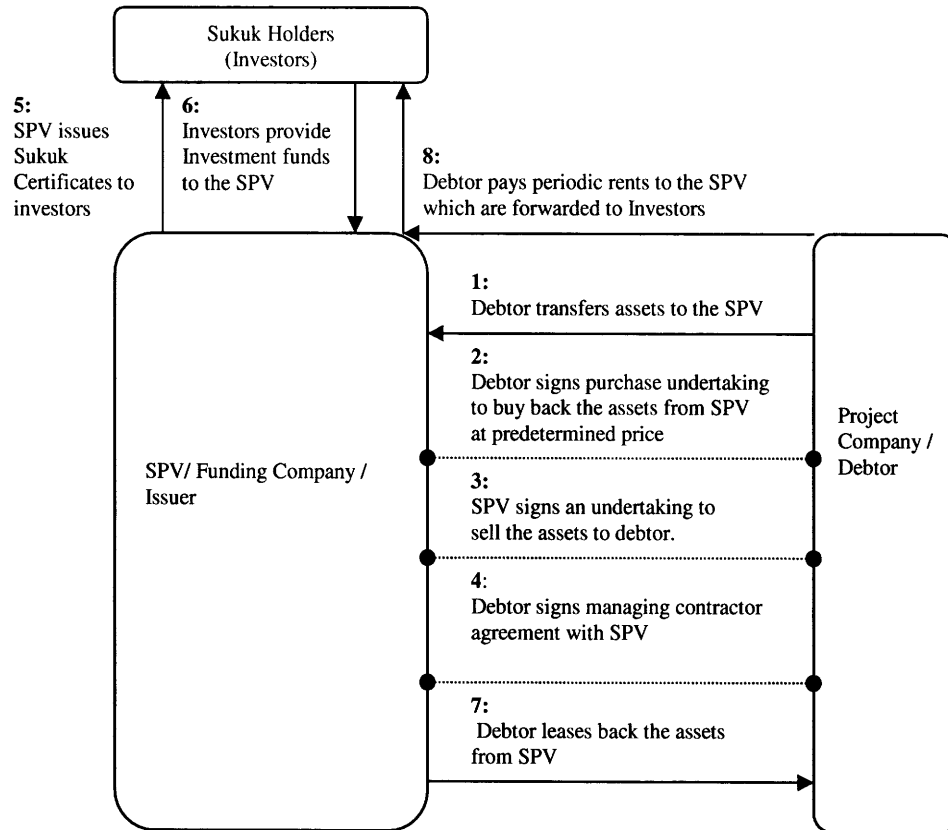


Figure 1: Structure of Ijara Sukuk

2.2.2 Mudaraba Sukuk:

Mudaraba Sukuk is used to create limited liability partnerships, investment funds and joint ventures. There are two main entities in this structure – the Modarib (Manager) and investment partner. The investment partner can be a group of investors, who advance funds to found a joint venture. They assign a manager to manage the investment fund, or the project which was built using the funds. Proceeds from the investments are shared according to pre-agreed terms.

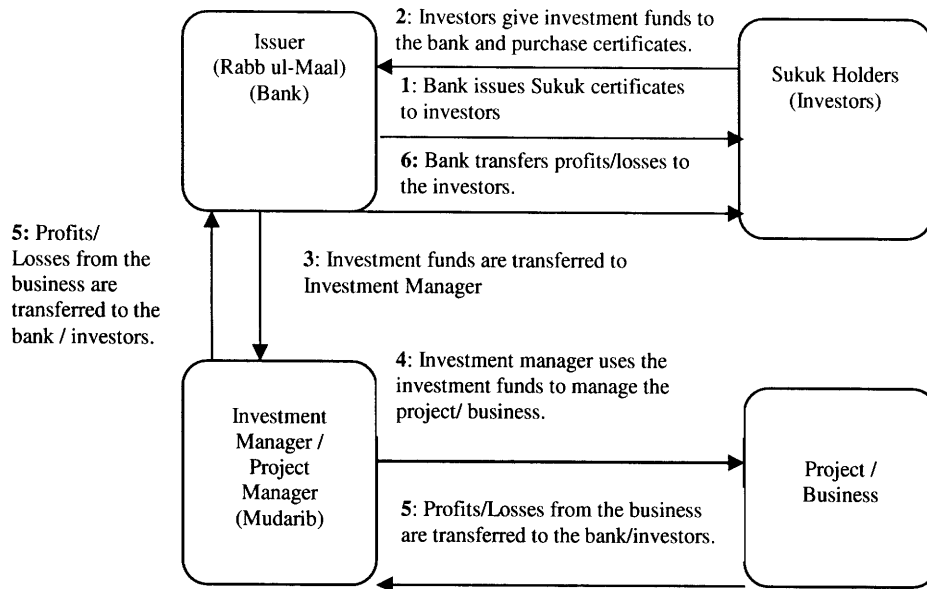


Figure 2: Structure of Mudaraba Sukuk

2.2.3 Musharaka Sukuk:

Musharaka Sukuk is commonly used to structure a joint venture partnership in which investors pool in their investment monies to finance a project. The profits/losses from the investments are shared among the investors. Another form of *Musharaka Sukuk* involves forming a Funding Company (SPV). The Funding Company (SPV) issues Sukuk certificates which the investors buy to invest their funds. The joint venture is managed by the project company (debtor). The investors are partners in the venture and receive shares (*hissas*) in the Project Company according to their contribution. The project company can buy shares (*hissas*) from the funding company from time to time. The proceeds from the sale of shares to the Project Company are distributed to Sukuk holders, according to pre-agreed formulas. The price of shares can be determined from secondary markets or it can be pre-determined.

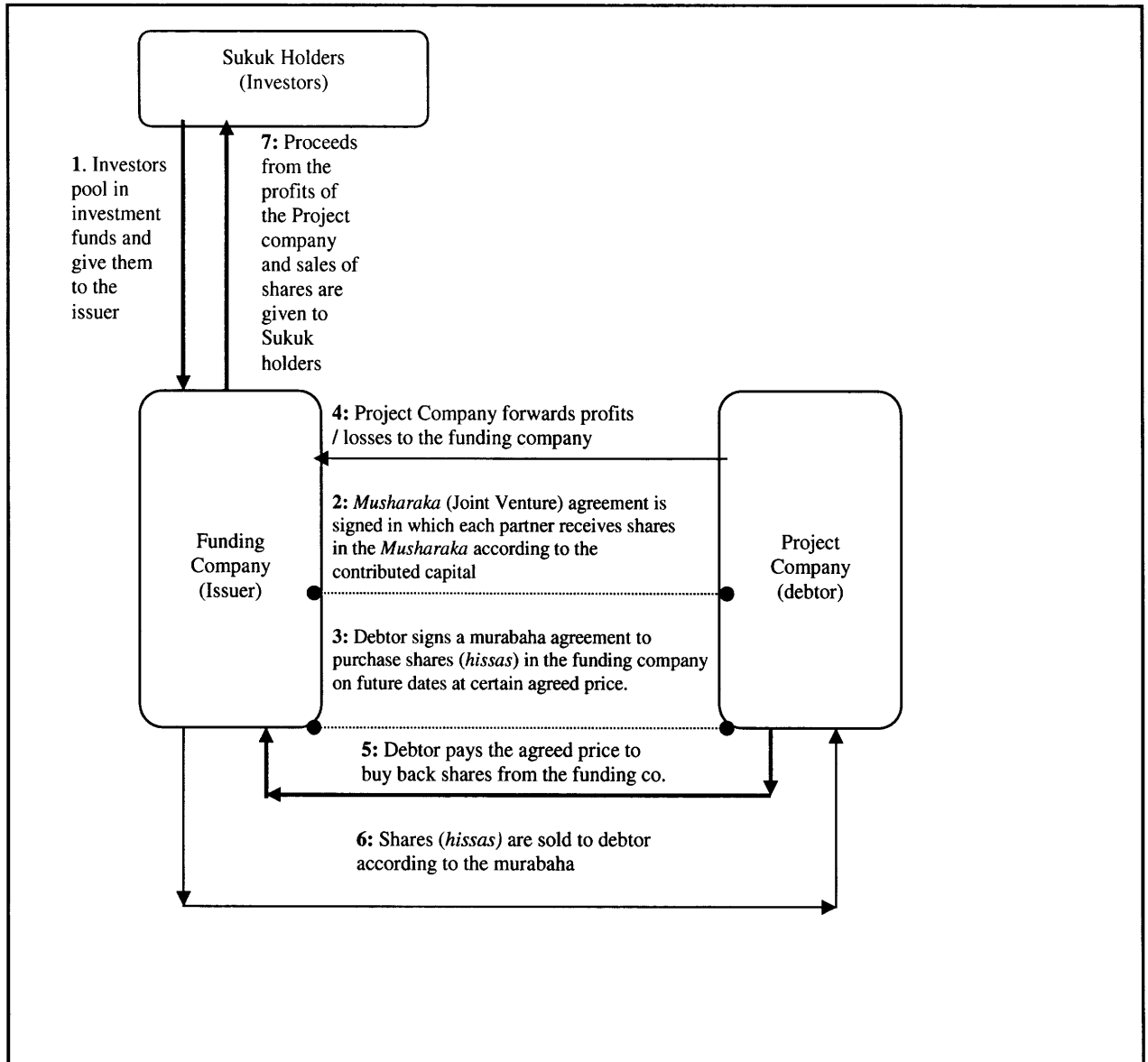


Figure 3: Structure of Musharaka Sukuk

2.2.4 Murabaha Sukuk:

Murabaha Sukuk is used for financing inventory or as a pure debt. Its validity according to Islamic Finance Law is much debated and is termed non-compliant with the Islamic Finance Law in many countries⁷. An issuer (SPV) issues Sukuk certificates, which the investors buy to invest funds. The Sukuk certificate represents “participation interest” in the underlying Murabaha agreement. The collected investment funds are used to buy metal in the spot market. The metal is sold to the operating company (debtor) and has a deferred payment obligation. If the operating company needs cash only, it sells the metal

⁷ El-Gamal, Mahmoud A, *Limits and Dangers of Shari’a Arbitrage*, 4th International Conference on Islamic Economics, Leicester, UK , 13-15 August, 2001.

to the metal purchaser. Therefore operating company transforms metal financing to pure debt financing. Usually, metal seller to the issuer and metal purchaser from the operating company is the same entity.

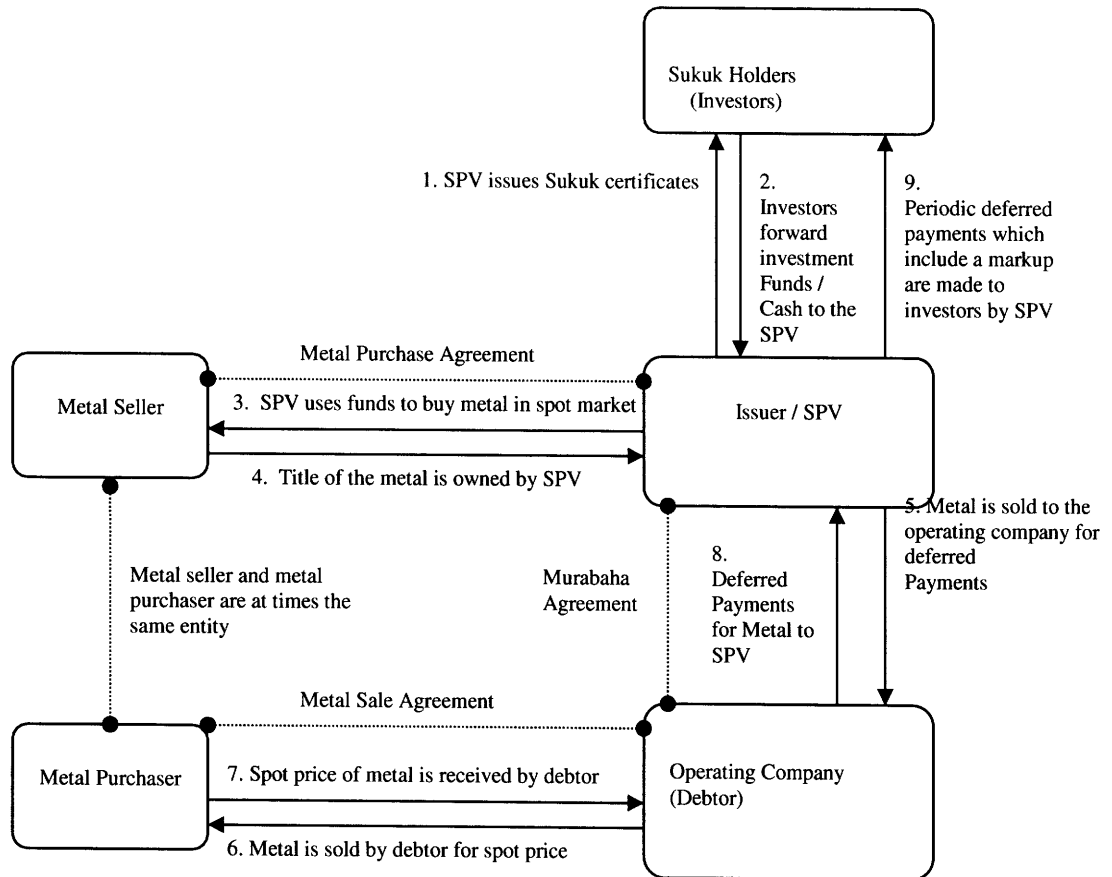


Figure 4: Structure of Murabaha Sukuk

2.3 Case Study 1: SABIC's Investment Sukuk⁸

2.3.1 History of corporate debt in Saudi Arabia:

Corporate debt issuance is a recent phenomenon in Saudi Arabia. Saudi ORIX Leasing Company was the first to issue SAR 50 million corporate debt in March 2003, followed by Saudi Hollandi Bank's issuance of subordinated debt for SAR 700 million in late 2004 (privately placed). The first Eurobond US\$ 600 million was issued by Saudi British Bank in March 2005. Government bonds are also a relatively new phenomenon in Saudi Arabia. There has been a strong cultural bias against fixed income securities in Saudi Arabia because of prohibitions in Islamic Law against interest. This has prevented creation of secondary markets for such instruments and has resulted in excess liquidity in banks.

2.3.2 About SABIC:

SABIC (Saudi Arabia Basic Industries) is a diversified manufacturing company, active in chemicals and intermediates, industrial polymers, fertilizers and metals. It is the largest public company in Saudi Arabia and is listed on the Saudi stock exchange (Tadawul). The Saudi government owns 70% of its shares. It has 17 affiliate companies including the former GE Plastics division. SABIC Sukuk, issued on 11th July, 2007, was the second fixed income, Islamic Law compliant investment instrument available in local currency to Saudi nationals.

2.3.3 SABIC's Sukuk has the following structure:

Following are important elements of the SABIC Sukuk:

- a) **Sukuk type:** The SABIC Sukuk is an investment Sukuk. Sukuk holders have an ownership in the marketing rights of SABIC, as opposed to a tangible asset such as property, plant and equipment.
- b) **Periodic distributions:** At each periodic distribution date, Sukuk holders will get the following amount:

$$\text{Amount} = P \times (S + M) \times D / 360$$

P = Aggregate face value of the Sukuk. Face value of the Sukuk declines as described below under bullet "c".

S = Benchmark Rate (SIBOR)

M = Margin (38bps)

D = Actual number of days in such periodic distribution

- c) **Purchase undertaking:** SABIC undertakes to give Sukuk holders a right to sell their Sukuk certificates back to SABIC on every fifth anniversary of the issue at

⁸ SABIC SUKUK 2nd issue [online]: Available at : <http://www.sabic.com/me/en/investorrelations/Sukuk/sukuk2.aspx> [Accessed on 27 June 2008].

the predetermined face value of the Sukuk. The face value of the Sukuk declines according to the following schedule [Table 2]:

Date	Face Value(% Purch. Price)	NOTES
[2007-2011)	100 %	
[2011- 2013)	90%	Holders have right to sell the sukuk at 90% of purchase price on July 2012. They will get an extra 10% of purchase price from the reserve.
[2013-2015)	80%	
[2015-2016)	70%	
[2016-2018)	60%	Holders have right to sell the sukuk at 60% of purchase price on July 2012. They will get extra 20% of purchase price from the reserve.
[2018-2019)	50%	
[2019-2021)	40%	
[2021-2022)	30%	Holders have right to sell the sukuk at 30% of purchase price on July 2012. They will get an extra 30% of purchase price from the reserve.
[2022-2024)	20%	
[2024-2026)	10%	
[2026-2027)	5%	
On Expiry	0%	. They will get extra 40% of purchase price from the reserve.

Table 1: Amortization schedule of the SABIC Sukuk

Following diagram shows the repayment profile of SABIC Sukuk.

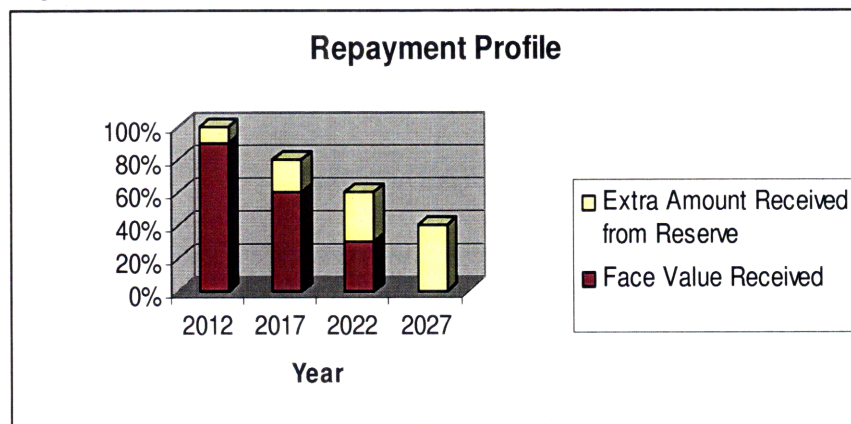


Figure 5: Repayment profile of SABIC Sukuk

- d) **Excess reserve:** All the excess income from the Sukuk assets, after paying the periodic distribution amounts to the Sukuk holders will be kept in a reserve. If there is a shortfall in the periodic distributions, reserve will be used to fill the shortfall. Holders of the Sukuk will be entitled to receive an extra amount up to 10% of the face value of their Sukuk payable on each fifth year date to the extent their Sukuk is current on that date. This payment will also come out of the reserve. Any excess amount after paying sukuk holders will belong to Sukuk Administrator (SABIC), thereby incentivizing it to manage the reserve and Sukuk assets in the best possible manner.
- e) **Tax Rules:** Investors will not be charged any Tax from the proceeds of the Sukuk.

- f) **Underlying asset of the Sukuk:** SABIC marketing rights form the underlying asset in which investors invest through Sukuk. These marketing rights set for Sukuk are explained as follows:
- i. SABIC has an exclusive right to market and provide sales/services to its subsidiaries.
 - ii. 30% of these rights and obligations had previously been transferred to SABIC Sukuk 2006 LLC for the previously issued SAR 3B Sukuk in 2006.
 - iii. Remaining 70% of the rights is transferred to SABIC Sukuk 2007 LLC for this Sukuk.
 - iv. The issuer (SABIC) agrees to transfer to the custodian (HSBC), for the benefit of Sukuk holders the Sukuk assets for the duration of 20 years.
 - v. The custodian (HSBC) engages a Sukuk Administrator (which is SABIC) for 20 years to perform all the marketing services that SABIC is required to perform to the best of its abilities. SABIC LLC charges marketing fee from its subsidiaries for providing marketing services. Historically these marketing fees and associated costs have been following.

Year	Marketing Income	Marketing Costs
2004	SAR 1.67B	SAR 84M
2005	SAR 2.14B	SAR 93M
2006	SAR 2.50B	SAR 106M

- g) **Default events:** Following events will trigger a default on behalf of Sukuk administrator (SABIC):
- i. Periodic distributions are not given to Sukuk holders on periodic distribution dates (every quarter).
 - ii. Amount given on any fifth year date is less than the extra amount (10% of face value).
 - iii. Breach of other obligations by the Sukuk Administrator and other extra ordinary events.
 - iv. If SABIC becomes insolvent.
- h) **Recourse in default:** In the event of default, the Sukuk holders are not entitled to cause the sale or other disposition of any of the Sukuk assets. The sole right of Sukuk holders against the issuer shall be to enforce the obligation of Sukuk Purchase Undertaking. The Sukuk purchase undertaking gives the right to Sukuk holders to sell the Sukuk to SABIC at face value. Custodian (HSBC Bank) is indemnified from all liabilities.
- i) **SABIC capital structure:** SABIC will set aside 10% of its net profits every year to form a statutory reserve. After statutory reserve reaches 50% of the capital, 5% of the paid up capital shall be distributed to the shareholders as dividends. The value of total loans which SABIC enters may not exceed 50% of the share capital.
- j) **Interest rate risk management at SABIC:** SABIC had significant exposure to short term interest rate fluctuations because of its borrowings at floating rates. SABIC entered into an interest rate swap agreement with a notional value of SR 13.6 billion to hedge the volatility in

interest rates related to outstanding debts. This transaction was not Islamic Law compliant.

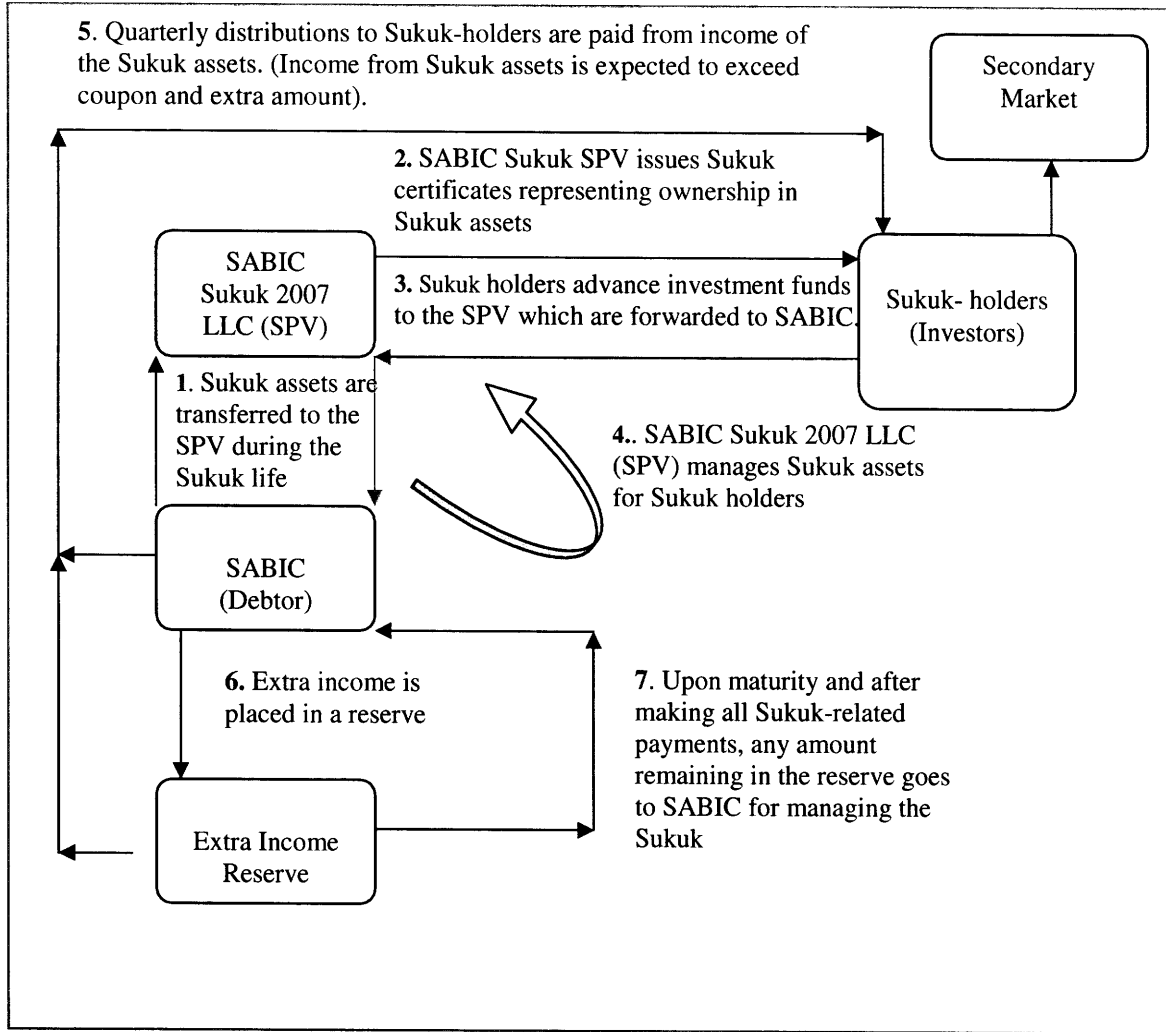


Figure 6: Structure of SABIC Sukuk

2.3.4 Comments on SABIC Sukuk:

SABIC Sukuk structure is not an Ijarah Sukuk based on selling and leasing back real assets. Such Sukuk would not have been allowed by the Saudi Islamic Law scholars, because the ownership of assets in the typical Ijarah Sukuk is not a real ownership in a sense that owners cannot freely sell these assets in the open market. SABIC's Sukuk is an *investment* Sukuk, where Sukuk assets represent an investment for 20 years in limited rights and obligations of SABIC in certain marketing contracts. The marketing unit is an independent subsidiary of SABIC, which provides marketing services to all the 17 affiliate companies of SABIC. It receives fees from the 17 SABIC subsidiaries for conducting marketing and sale activities for them. The Sukuk entitles Sukuk holders to get a share of net income of the marketing unit of SABIC for next 20 years. SABIC has not previously issued any conventional debt inside Saudi Arabia. Foreign subsidiaries of SABIC have previously issued conventional bonds in the UK and Denmark. This makes it difficult to compare the Sukuk issue of SABIC with a conventional debt issued by SABIC.

The portion of the redemption amount guaranteed by the purchase undertaking gradually decreases, whereas the portion tied to the extra reserve (which is not guaranteed by purchase undertaking) gradually increases. This redemption method gradually exposes SABIC Sukuk holders to the risks of the underlying Sukuk assets to some extent. The purchase undertaking adds a risk-free nature to SABIC Sukuk and exposes the investors to SABIC's credit risk, rather than the risks of the Sukuk assets. Most of the investors will exercise the put option on the Sukuk on the first fifth year anniversary, since they will redeem the 100% of the price they had paid for the Sukuk certificates (provided they receive the entire 10% of the face value from the extra reserve). Therefore for the first five years SABIC Sukuk is similar to a secured floating rate note. SABIC's Sukuk certificate pricing behavior in secondary markets is similar to the pricing behavior of floating rate notes, as it has been trading at 100% of the purchase price since it was issued.

SABIC Sukuk certificates also resemble preferred stock of SABIC's marketing subsidiary. The amount of periodic dividends paid on this preferred stock is linked to SIBOR. Sukuk holders have three put options as they have a right to sell this preferred stock at 90% of the face value on the first fifth year, at 60% of face value on second fifth anniversary and at 20% of face value at third anniversary. Sukuk holders will also get 10% of the face value from extra reserve, however this amount is not guaranteed.

The key objectives of the SABIC Sukuk were to jump start the capital market in Saudi Arabia and to diversify SABIC local domestic sources of funding away from just equity. Both of these objectives were met, since the Sukuk issue was greatly over-subscribed.

2.4 Case Study 2: Tabreed 2006 Sukuk⁹

2.4.1 Introduction to Tabreed Sukuk:

Tabreed (Arabic word for cooling) Inc- is a UAE based joint stock company. It was established in June 1998 and is now one of the world's largest district cooling utilities. In 2006 Tabreed required financing for the construction of two more cooling plants. Tabreed issued a \$200M hybrid Sukuk composed of *Ijarah* (Lease-buyback) and *Istasnaa* (Forward-Sale) Sukuks to finance the capital expenditure.

2.4.2 Challenges in making Tabreed's financing compliant with Islamic law.

Tabreed financing posed following two problems in its compliance with the Islamic law, which led its intricate structure.

1. According to the Islamic Law, for the Sukuk to be tradable, it has to represent an ownership interest in a physical entity, instead of just money. To comply with this rule, 51% of the assets representing the Sukuk assets have to be in physical form. For the Tabreed project, Islamic Law jurists made an exception and required that the percentage of physical assets representing the Sukuk assets can be 33% of the face value of Sukuk. Tabreed was unable to meet this requirement, since Tabreed could deliver at most \$40M in real assets as Sukuk assets which represented only 20% of the face value of the Sukuk. This meant that additional physical assets worth \$26M were required to meet the 33% threshold. To solve this problem, Islamic Law jurists suggested that Tabreed sell \$26M worth of Palladium to the issuer. By doing so, 33% of the Sukuk assets will be in physical form.
2. In Islamic-Law compliant lease structures, where assets are still under construction, the owner of assets cannot charge rent from the lessee on the present date for the assets which will be finished and rented on a future date. Islamic Law jurists proposed a new mechanism to fulfill this requirement. On each bi-annual rental payment date, Tabreed, will pay a security amount of \$1.25M to the Sukuk Issuer (Tabreed '06 Financial Corp) as a security for its future construction obligations. If the construction of the cooling plants did not occur, issuer will keep the aggregate security deposit and will not return it to Tabreed. Following diagram explains Tabreed's 2006 Sukuk:

⁹ The National Central Cooling Co. (PJSC) – Tabreed Sukuk 2007 Investor Relations [online] <http://www.tabreed.com/investorRelations.aspx> (Accessed May 3rd, 2008)

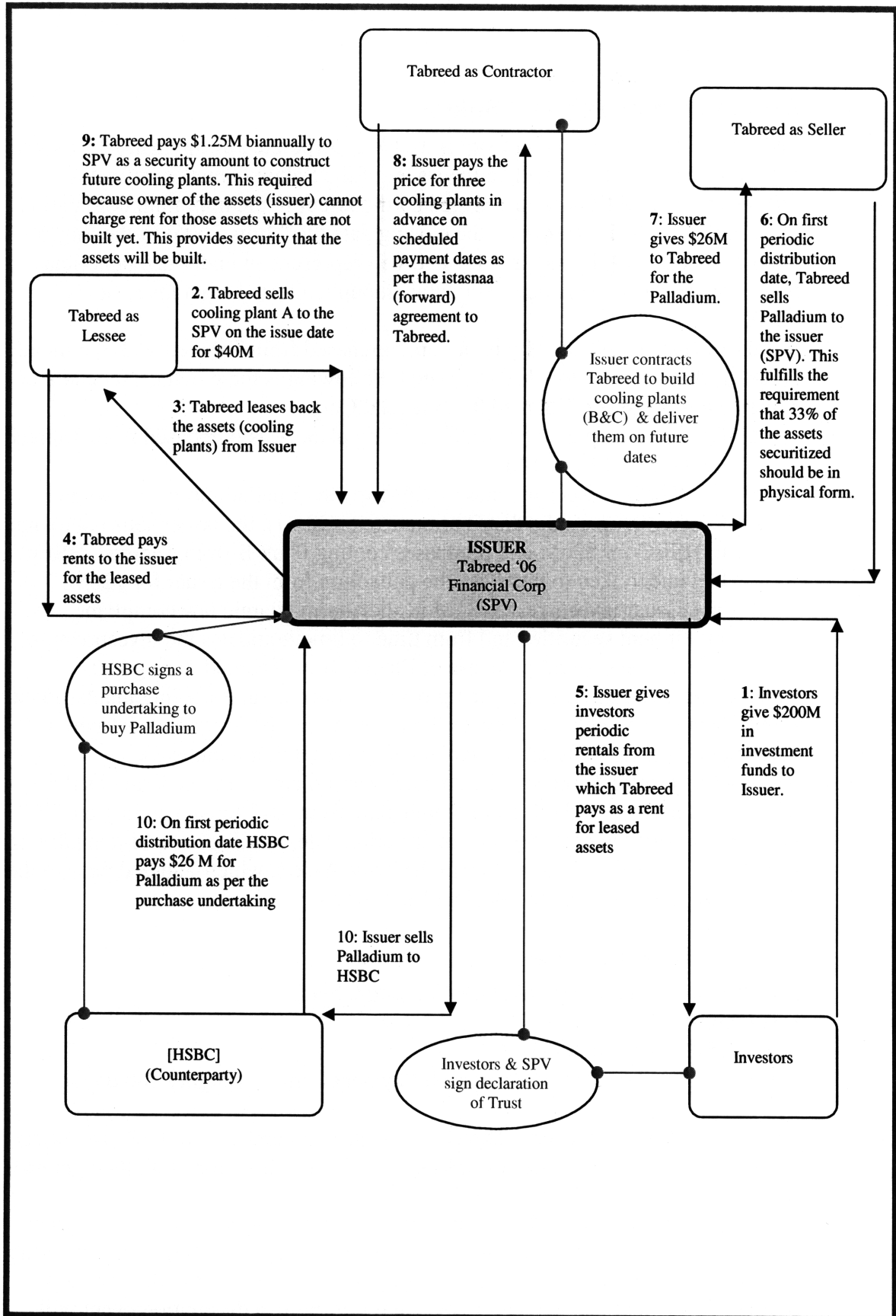


Figure 7: Structure of Tabreed Sukuk

2.4.3 Explanation of Tabreed Sukuk:

1. **Issuer:** Tabreed 06 Financial Corp is a SPV incorporated in Cayman Islands with \$1000 in share capital. It will be the issuer of the Sukuk (Trust) certificates.
2. **Sukuk (Trust) certificates** are issued by the Issuer in the minimum domination of \$100,000 to the **investors** on the closing date (20th July, 2006) of the Sukuk. Each certificate will be due in 2011 and will represent an undivided beneficial ownership in the Trust Assets. The total amount collected from investors is \$200M.
3. **Sukuk (Trust) assets** held by issuer are purchased from Tabreed with the money (\$200M) that the investors had deposited. Following is the purchase schedule of Trust Assets by issuer (Tabreed 06 Financial Corp):
 - a. On the closing date (7/20/06), cooling plant A, is purchased from Tabreed by the issuer for \$40M.
 - b. On 7/20/06, issuer purchases \$26M worth of palladium from Tabreed.
 - c. On the first periodic distribution date (1/20/07), the issuer sells palladium to HSBC for \$26M and purchases cooling Plant B from Tabreed. HSBC had undertaken to purchase the palladium from the issuer for \$26M.
 - d. The issuer invests rest \$134M in short-term Islamic law compliant investment securities and from time to time liquidates the investment to pay for the gradual purchase of Plant C from Tabreed during 2007.
4. **Tabreed as a contractor:** Tabreed procures and constructs cooling plants (Plant B and Plant C) and delivers them to the issuer as per the forward construction agreement (Istisnaa contract) as explained above (Bullet number 3).
5. **Tabreed as lessee:** Tabreed leases the delivered plants from the issuer as the plants are delivered to the Issuer commencing from 7/27/06 and ending on 7/1/11.
6. **Rental amount:** On each periodic distribution date, which occurs bi-annually, the investors receive rental amount from the Trust Assets, which Tabreed pays to the issuer. The rental amount is calculated as follows:

$$A \times (L + M) \times D / 360$$

A is the face value of the Sukuk that investors hold.

L is LIBOR

M is 1.25% margin (annual)

D is the actual number of days in each Payment Period (roughly 180 days).

7. **Tabreed as the purchaser:** Tabreed undertakes to purchase all the Trust Assets for \$200M on the expiry date of Sukuk (7/1/11). The investors will then get back the face value of their Sukuk certificates.
8. **Late payment and limited recourse:** If Tabreed fails to pay the rental payment on time, it is charged a surcharge which is equal to the rental payment. The issuer is required to give this received surcharge to a charity and not to the certificate holders. If the payment is late for seven days or more, a dissolution event will occur. Under dissolution event, pursuant to the Purchase Undertaking by Tabreed,

Tabreed will purchase the Sukuk assets for their face value. If Tabreed fails to pay the face value (\$200M) of the Sukuk for the Sukuk assets, then by the fifth day of the dissolution event, the issuer is entitled to sell the Sukuk assets to a third party. These assets may be insufficient to fund expected distributions to certificate holders and, taken as a whole, may have a value less than that of the face amount of the certificates. If after such sale, there is a shortfall in the payment due to the certificate holders; certificate holders will not have any claim against the issuer or its assets. The certificate holders will have no recourse to any other assets of the issuer. The purchaser (Tabreed) shall remain liable at all times to pay any shortfall between the proceeds of any such sale and the Exercise Price (\$200M). If Tabreed fails to pay the difference, it may be necessary to bring an action against Tabreed to enforce its obligations before the UAE courts which can be costly and time consuming.

9. **Interest Rate and Currency Risk Management at Tabreed:** Tabreed manages its exposure to short term interest rates by entering into interest rate swaps and caps agreements (in non-Islamic Law compliant manner). The notional amount of such outstanding agreements is AED 1062M. Since most of the liabilities by Tabreed are in US Dollars, and UAE Dirham is pegged to US Dollar, currency risk arising from US Dollar is not a significant concern. Tabreed is not exposed to significant credit risk, since 90% of its revenues are generated from the government owned entities.

2.4.4 Comments on Tabreed Sukuk:

Tabreed's financing used three Islamic Finance instruments – Ijara Sukuk, istasnaa and murabaha agreement. Ijara Sukuk is used to securitize assets, istasnaa is used as a forward purchase agreement and Murabaha is used as debt. The use of Palladium metal to create assets for Tabreed is very ambiguous. In the offering circular, it is not mentioned how Tabreed gets the \$26 million worth of Palladium. If it already owned the metal, it could have sold the metal in the market to get \$26 million. Most likely HSBC had arranged a Murabaha for Tabreed, in which it gave Palladium to Tabreed for deferred payment. Tabreed converted Palladium to pure debt by selling it to Sukuk holders. Sukuk holders may not be aware of the fact that they were a party to the Murabaha transaction, which is unethical, because many customers of Islamic Finance consider Murabaha as non-compliant with the Islamic law. The issue says that "Islamic law scholars made an exception in Tabreed Sukuk issue, and reduced the required percentage of physical and tangible assets from 50% to 33 %". It is not known on what basis this exception was made. Can this exception be made a permanent part of Islamic financial law, so that future Sukuk issues may not have to spend considerable time and money in expensive legal proceedings to solve this issue? It is also unknown that why the number 33% was selected, and why it cannot be 25% or 10%. The use of istasnaa agreements, along with credit enhancements by periodic security payments to procure future cooling plants, was an innovative aspect of this Sukuk issue. As these plants come online, they are transferred to the SPV and leased back. Any interruption in the rents results in a dissolution event, in which Tabreed is required to purchase the Sukuk

certificates for investors at face value. If Tabreed is unable to do so, Sukuk investors can sell the Sukuk assets to recover their investments and may not recover their initial investments. This makes the risk structure of Sukuk to conventional corporate bonds. However the price of the Sukuk issue ends up becoming more than conventional bonds because of the transaction costs involved in the creation of an off-shore SPV and extra legal work.

2.5 Credit Ratings of Tabreed and SABIC Sukuk¹⁰:

Standard and Poors assigned a BBB-/Stable/-- rating to the Tabrid Sukuk and A+/A-1 long and short term local currency corporate rating to the SABIC Sukuk. Standard and Poors primarily look at following three criteria when it assign a rating to a Sukuk.

- a) The unconditional purchase undertaking and nature of the collateral security.
- b) The source of repayment of the Sukuk.
- c) The extent of government support to the Sukuk.

The basis of rating the Tabreed Sukuk as BBB- is the functional equivalence of unconditional purchase undertaking and the parent organization's guarantee. This meant the rating assigned to the Sukuk is the same as that of senior secured corporate debt obligation of the parent. Investors are directly exposed to the parent company's credit risk, rather than the risks of the Sukuk assets; hence the Sukuk rating is same as parent's credit rating. Tabreed's ratio of secured debt to asset ratio was less than 20%. If in future this ratio goes above 20%, the ratings on Tabrid Sukuk would be revised. There were enough features in the structure of Tabreed Sukuk to render the financing comparable with other existing Tabreed secured financings.

The basis for A+ rating for the SABIC Sukuk was the purchase undertaking of the parent company. 70% of the parent company was owned by the Saudi government which further enhances SABIC's credit ratings. S&P also considered the fact that the Sukuk holders of the SABIC Sukuk benefited from a diverse cash flow stream, strong brand recognition and significant cash holdings of SABIC.

Hence the ratings of the Sukuk reflect the credit standing of the issuer, rather than the riskiness of the secured assets. This fact goes against the substance of Islamic finance, which requires that the risk that investors take while entering into a financial contract be of the underlying asset, rather than credit risk of the counter-party.

¹⁰ STANDARD & POOR'S RatingsDirect Project Finance Sukuk [online] http://www2.standardandpoors.com/spf/pdf/media/FAQ-Project_Finance_Sukuk.pdf (Accessed May15th 2008).

2.6 The Debt Nature of Sukuk¹¹:

While the purpose of Sukuk is to avoid debt, however, purchase undertakings combined with rate of return benchmarked against LIBOR make Sukuk similar to the conventional debt instruments. This fact has been a source of much debate among all the stake holders participating in Islamic Finance. Following are some contentious points against and in-favour of Sukuk by investment bankers and legal scholars in Islamic Finance:

a) Benchmarking against LIBOR:

Objection:

Returns on most of the Sukuk issues are benchmarked against standard interest benchmark rate (such as LIBOR), in a similar manner as a regular bond. This makes Sukuk very much like a debt instrument, rather than a profit/loss investment instrument.

Answer to the objection:

Following are the reasons for pricing rate of return on Sukuk similar to debt instruments:

- Conventional banking is predominant where Sukuks are issued and the pricing benchmark in the market is dictated by the conventional banks.
- Consumers of Sukuk, though inclined towards Islamic-Law-compliant investment instruments do not want to compromise on the pricing.
- To achieve price parity and be competitive with the conventional products, financial engineers design Sukuk with characteristics similar to conventional products.

b) The purchase undertaking:

Objection:

The purchase undertaking given by the Sukuk manager (e.g. Tabreed or SABIC) who manages the Sukuk assets to buy back the Sukuk assets at the pre-determined face value makes the investment relatively risk free. This again makes Sukuk a debt like instrument.

Answer to the objection:

Contrary to conventional bonds, Sukuk holders own the Sukuk assets and hence are liable for all risks associated with the ownership. Most of the time, there is no secondary market for Sukuk assets, hence it is difficult to ascertain the true market price of the Sukuk assets at the termination of the Sukuk. Therefore face value of the Sukuk assets is a good proxy for the market price. This can be further explained by the following thought experiment:

- If on the purchase date of the Sukuk, the market value of the Sukuk assets is higher or same as the face value, and if the issuer redeems the Sukuk at the face value, the investors do not earn any profit, which makes purchase

¹¹ Nazim Ali , 2008, Harvard-LSE workshop on Sukuk –Comments. 11th February. Available at nazimali@law.harvard.edu (Accessed on 11th Feburary, 2008).

undertaking compliant with the Islamic Law, which prohibits pre-determined fixed profit.

- However if the market price of the Sukuk assets is less than the face value, the investors have to investigate the reasons for such shortfall. If the shortfall is due to bad management and negligence of the Sukuk Manager (whom the investors had entrusted to manage Sukuk Assets), then the Sukuk Manager has to cover the shortfall as the penalty for poorly managing the Sukuk assets. If however, the shortfall was not because of poor management and it was beyond Sukuk Manager's control to avoid the shortfall, the Sukuk manager will not be liable for the shortfall. *In this way, the purchase undertaking is different from a unilateral guarantee, in which the guarantor has to cover the shortfall regardless of the cause of shortfall.*

A good test to determine how similar is Sukuk to conventional debt instrument is to understand the pricing behavior of Sukuks and conventional debts from same issuer in the secondary markets. Researchers at IMF studied the cost and risk structure of investment portfolios comprised of Sukuks and conventional debt (Eurobonds) issued by same entities using the value-at-risk (VAR) framework. Their research concluded that the secondary market behavior of Sukuk and Eurobonds is different and at some instances the differences are significant¹².

2.7 Conclusion:

Debt markets in the emerging markets most of Muslim countries are undeveloped, and Sukuk (Islamic asset securitization) issues backed by government credit guarantees have been successful in jump-starting the capital markets in these countries. If one analyzes Sukuks in detail, as done in this chapter, one finds Sukuks are very similar in form and substance to conventional secured debt instruments. The next generation of Sukuk issues faces considerable challenges in their compliance with the Islamic law and improvement of product quality. Compliance with Islamic law is difficult because multiple interpretations of religious texts by Islamic law scholars lead to ambiguous rulings regarding the permissibility of various financial contracts. This problem is further aggravated because product designers (investment bankers and lawyers) of structured products in Islamic finance are more focused on increasing their deal flow and underwriting revenues, and are less focused on the integrity and authenticity of the Islamic Finance products. The "rent a sheikh" phenomenon, in which product designers pay Islamic law scholars to get their approval for controversial products, leads to customer dissatisfaction with Islamic finance and inhibits its growth. Although the investors in Islamic finance products are required to understand the investment risks associated with the underlying assets and Islamic authenticity of the product, the ratings on Sukuk issues do not reflect either of these because the ratings are based on the credit quality of the debtor. There has been no precedent of default of Sukuk and investor rights are still unknown in defaults. As Islamic Finance gets integrated with the global financial

¹² Husain, Asim, *Sukuk vs. Eurobonds: Is There a Difference in Value-at-Risk*, IMF, October, 2007. (WP/07/237).

industry and as more Sukuks continue to originate or get listed in foreign countries and non-Islamic jurisdictions, it becomes even more ambiguous, how will the local laws and Islamic law interact and what will be the rights of the investors in case of Sukuk defaults? In a post-9/11 world, Sukuk issues are required to be more transparent to foreign regulatory authorities. Convoluted product structuring such as hidden Murabaha arrangements in the Tabreed Sukuk, makes any reasonable person question whether the product designers are making a fool of investors because these products do not comply with the basic Islamic financial law. The success of Sukuk and Islamic Finance so far has been primarily driven by the supply side and the fact that customers in emerging markets of Muslim countries have very limited options for fixed income instruments. However to continue with the impressive growth rates in the future, better products in Islamic Finance need to be developed in future. Most Muslims are skeptics about Islamic Finance because of its authenticity. Islamic Asset securitizations have been successful so far, because they are perceived to be most compliant with the Islamic law and they are most useful to consumers. However, other Islamic Finance products have not made any significant penetration among Muslims because of their dubious nature from Islamic Law compliance point of view.

3 Chapter 3: A template for product development in Islamic Finance:

This chapter provides a step-by-step approach for product design and development in Islamic Finance. Considerable parts of this template have been synthesized from the best practices of product development in the engineering domain. First, each step of the generic product development process is explained, and then that product development step in the context of Islamic finance is explained.

3.1 Need for a formal product development process in Islamic finance:

For the past 30 years, Islamic and conventional banks have developed numerous products to tap into the fast growing Islamic Finance market. Most of the products that have been developed for Islamic Finance are conventional financial products tweaked for Islamic Finance, and in substance, they were not very different from their conventional counterparts. One reason for the similarity between conventional and Islamic Finance products is that the product developers are experienced in developing conventional financial products, and they draw upon their experience to develop products for Islamic Finance. They by-pass any formal product development process and end up making mutations of products in conventional finance for Islamic Finance. While translating products from conventional finance to Islamic Finance may have been a right first-step to jump-start Islamic Finance industry, the second generation of Islamic Finance products requires an organic product development methodology. By following a process oriented approach, better quality products can be developed, which meet customer needs in a better manner, and which are more reliable, robust and profitable. The whole product development cycle results in better coordination and planning, and the management can better calibrate the quality and improve the quality of products.

3.2 Introduction to the product development template:

Product design and development is a mature and well-researched field in engineering¹³. While developing cars and airplanes is very different from developing financial products, the best practices from engineering product development can be incorporated to financial product development. Specifically the out of the box thinking methodology and process oriented approach of engineering product development may provide a better platform for developing new products for Islamic Finance. The proposed methodology for product development in Islamic Finance has been borrowed from engineering product development and Figure [8] gives its high level description¹⁴.

¹³ Eppinger, Steven D., *Product Design and Development*, 3rd ed. New York: McGraw Hill/Irwin, 2004.

¹⁴ Eppinger, op. cit. , Chapter 2.

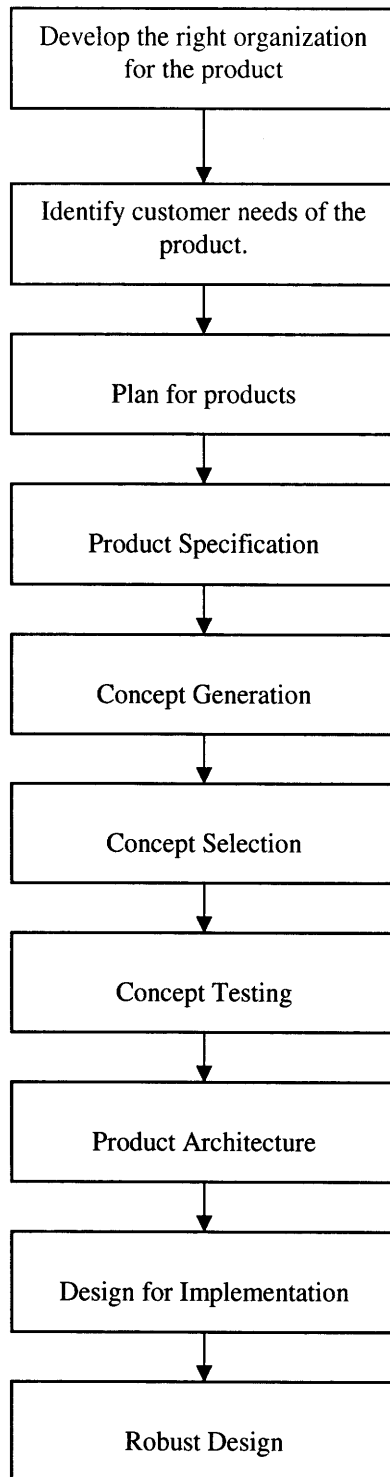


Figure 8: A template for financial product development methodology

The template consists of ten distinct steps. Following is the description of each step in a generic product development process, and how that step translates to developing products for Islamic Finance.

3.3 Choosing the right organization for product development:

RPV (Resources, Processes and Values) framework can be used in deciding what structure a product development organization should have, and how should the product development organization report to the parent organization¹⁵.

3.3.1 Functional organization:

A functional organization is based around specific functions, such as research, marketing, sales, information technology, etc. In a functional organization, individuals from different functions work together on a product. However, these individuals report to their functional managers and they could be working on multiple products simultaneously. Individuals have deep expertise in their specific functions. Coordination among various functional groups can be slow and bureaucratic. Functional organizations are feasible when product development team's processes are same as those of the parent entity.

3.3.2 Project organization:

A Project organization is project based, where experts from various functions are grouped into one team that works on a specific project. These individuals report to a project manager instead of a functional manager. Project organizations are best for specialized quick-build products.

3.3.3 Matrix organization:

A Matrix organization is a mixture of both functional and project organizations. Members of matrix organization are members of a project team, as well as a functional team. A heavy weight matrix organization is product/project oriented and its members report to the product/project manager. A heavy weight matrix organization enables better and faster integration of various functions and is best for situations when product development team's processes are very different from the parent entity's processes. A light weight matrix organization is also product/project specific, but the members report to the functional managers.

3.3.4 Organization capabilities:

Every firm and product development organization has a set of capabilities. These capabilities consist of resources, process and values (abbreviated as RPVs), which are explained as follows:

Resources:

Resources are highly trained individuals, equipment, and expertise in a particular financial product, security or a market.

Processes:

¹⁵ Clayton M. Christensen and Michael E. Raynor. *The Innovator's Solution*. Boston, MA: Harvard Business School Press, 2003.

Processes indicate how work gets done within that organization. These are patterns of interaction, coordination, communication, and decision making using which an organization creates products.

Values:

An organization's values are the standards by which employees make prioritization decisions and judge between customers, customer orders, business opportunities and operational decisions.

3.3.5 Product team placement within the parent organization:

A product team can have two different commercial structures within a parent organization, based upon its capabilities (resources, processes and values).

Mainstream Organization:

A mainstream organization inherits the processes and values of its parent organization and therefore is part of the existing business unit. It is required for those product teams whose values are very similar to the parent organization's values.

Autonomous Organization:

An autonomous organization has the freedom to select its own processes and values, and hence it exists as an independent business unit. It is best suited when product development team's values are very different from parent entity's values.

3.3.6 Choosing the right organization for Islamic Finance products:

A bank developing products for Islamic Finance will have its unique set of resources, processes and values, and it can use Figure [9] to decide which type of organization will be best for developing new Islamic Finance products. In addition to the regular resources needed to develop any financial product, Islamic Finance product development requires expertise in Islamic Finance law, a strong brand in Islamic Finance, relationships with regulatory authorities and access to a market for Islamic Finance products.

In region A of figure [9], a manager is faced with a situation where the product development team's processes and values are very different from parent bank's processes and values. This can occur if a conventional bank is developing an Islamic Finance product for the first time. In this case, an autonomous and heavy weight matrix organization structure will be the best one for the product team. On the opposite end, in region C, the manager is faced with the task of building the product that is very similar to the products of the parent's organization. Also, the skills and resources required for building this product are similar to those of the parent organization. In such a case existing functional and mainstream organization will be the best organizational structure for designing this product.

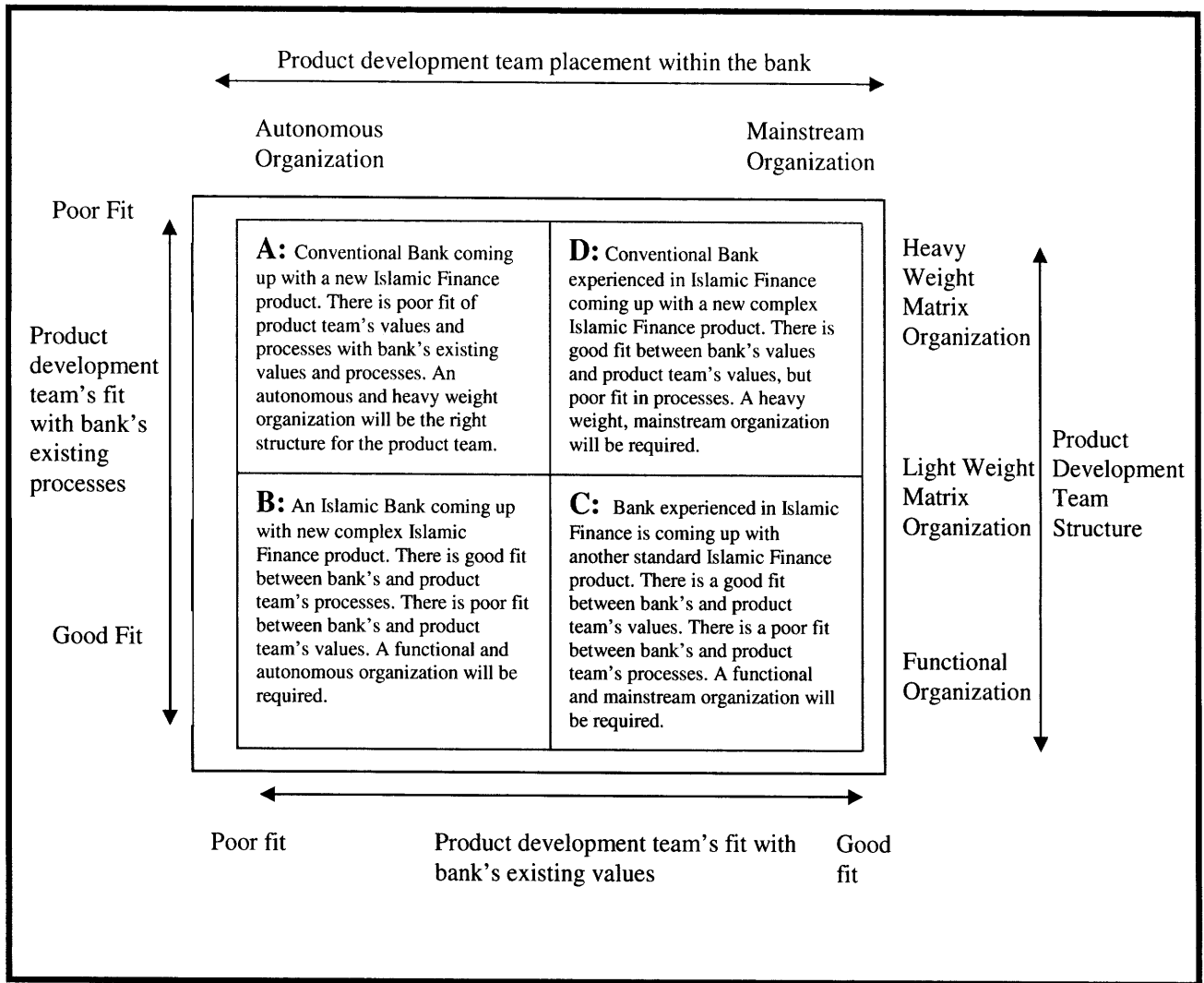


Figure 9: Selecting the right organization for Islamic financial product development.

3.4 Identifying customers and customer needs for future products:

3.4.1 The best customers for the product:

The first step in identifying customer needs is to identify who will be the best customers of future products. In a crowded market place, such as the one in which the financial industry operates, the best prospects for future products come from two types of product consumers: non-consumers and over-served consumers.

Non-consumers and over-served consumers:

Non-consumption occurs, because people want certain types of products that are not available or too expensive. Over-served customers are those, who are over-served by current products. They will be equally happy with products which have fewer features and have lower quality, provided they are much cheaper than the current products.

3.4.2 Jobs-to-be-done based market segmentation:

Historically, banks have taken either a product view or a demographic view to identify new features for future products. In a product view, the focus is on product and its features rather than customers. In a demographic view, the market is segmented based on certain common consumer features. When all the participants take the demographic view or a product view to segment the market place the entire industry eventually becomes commoditized. To fight this commoditization, product developers need to identify customer needs in a much better manner, than it has been done in the past. Researchers have proposed the *job-to-be-done* view of identifying what customers need. This approach brings forth a much better perspective of future product features¹⁶. A market is segmented on the basis of jobs-to-be done, and specialized products are made for each such segment. Consumers then *hire* this product to perform a specific job. For example, consumers hire a debit card to pay for daily expenses, get cash, secure against theft, pay for online shopping and make wallet easy to carry. Consumers can hire other candidates for this job, as well: they can use cash, credit cards, PayPal, money-order or checks.

How to discover jobs-to-be-done:

Some jobs-to-be-done for business customers of a financial product are quiet apparent – a business organization always requires to increase profits, revenues and market share, and decrease cost at the same time. Products which address these needs for businesses in the best manner are most successful. When the customer of a financial product is an individual, marketers need to use following techniques to learn about the jobs-to-be-done:

1. **Interviews and surveys:** Customers can be interviewed for their needs. The consumer needs are always changing. However there is always a job-to-be done underlying these needs. The goal of the interview and surveys is to understand those jobs-to-be-done
2. **Observation:** Observing a job-to-be done, that hasn't been done so far is a challenging task. Observing compensating behavior because no products for that specific job exist also leads to the discovery of jobs-to-be-done. For example excessive preference for a particular type of investment asset among Muslims may lead to discover jobs-to-be-done for future financial products in Islamic Finance.
3. **User based innovation:** Making a highly flexible product and letting consumers configure it, according to their needs shows what jobs the consumers really want to do. Over-the-counter financial products can be tweaked according to customer's needs. Observing consistent customer trends in those contracts may show the required jobs-to-be-done in the future financial products.

Once the observations and data have been collected, the information needs to be synthesized to understand jobs-to-be-done.

¹⁶ Christensen, op. cit. , p. 73

3.4.3 Identifying customers and customer needs for Islamic finance products:

Non-Consumption of financial products in Muslim countries:

Severe prohibitions in Islam against interest and speculation have inhibited the penetration of conventional financial products in the Muslim demographics. Hence there is a large non-consumption base of simple financial products among the Muslim population segments..

Examples of non-consumption:

Some conventional products that are very common in the developed world are still absent in Muslim countries. These include financial-derivative products, venture capital, hedge funds, REITs, ETFs, principal-protected mutual funds and foreign capital markets based investment instruments. Penetration of insurance products, such as health and automotive insurance has also been negligible in most of these countries. Fixed income investment products have recently been introduced in Saudi Arabia. Large corporations were primarily funded by equity, most of which was provided by the government. Sukuks have exploited this opportunity by providing a fixed-income type investment product to investors and corporate debt like security to the capital users. Similarly mutual funds have been only recently introduced to many Muslim countries. Credit and debit cards were also recently introduced in many countries, and their penetration remains little.

Need for better quality products:

Until recently, financial sector in most of the Muslim countries has been largely dominated by nationalized institutions or foreign banks. Nationalized banks and savings institutions are of very poor quality, and the foreign banks primarily target only the more affluent segments of the population. As the governments in these countries de-regulate the financial sector, there is opportunity for private local banks to provide better quality products than those being provided by existing government owned institutions.

Example:

In Pakistan, National Savings Certificates has been the only savings scheme that provides capital protection with monthly income coupons. It is a government owned entity that is poorly run. All the transaction records are still managed physically in paper registers, instead of computers. Monthly income coupons have to be cashed in-person at the branch offices. Branch offices are very small and very few. One has to travel long distance to access a branch office, wait for long hours in queues outside the branch and work with un-courteous staff in order to redeem investment coupons. Most of the customers are retired senior citizens or widows who are unable to perform such extreme physical exertions every month. There is definitely an opportunity for sustained innovation for providing improved investment management services against National Savings Certificates in Pakistan.

Jobs-to-be-done by an Islamic finance product:

In order to have a successful product, all the stake-holders in Islamic Finance should be considered as potential customers. Along with investors (capital providers) and corporations (capital users), customers also include government regulatory authorities, banks and monetary agencies. Following is a list of most important jobs-to-be-done by any Islamic Finance product:

1. Capital providers (individual investors) want to become better Muslims by investing their funds in an Islamic compliant manner.
2. Capital users (corporate customers) want the lowest possible cost of funds.
3. Capital market authorities want to jump start debt markets in an Islamic law compliant manner.
4. Regulatory authorities want securities in which the interests of various stake holders can be safe guarded easily.
5. Islamic law scholars do not want to compromise the Islamic law while structuring Islamic finance products.
6. Capital providers want the Islamic finance products be better then their conventional counterparts from risk-return point of view.

3.5 Product planning

A product plan identifies the portfolio of products and their market introduction dates for the next development cycle. It also indicates any compelling business trends, opportunities and competitive threats on the business horizon. Product planning involves resource allocation, staffing, determining the project time-plans and other pre-project planning activities. The most important task of product planning is balancing the product portfolio. It involves understanding the lifecycle of current products and has to ensure that the product pipeline is filled with successful products in the future. It has to consider the risk characteristics of current product portfolio and how will that risk change with the introduction of new products. The nature of the future product portfolio also depends upon the business goals of the bank. New planned products are characterized according to the following categories:

1. New Platforms: Entirely new product family is being developed.
2. Derivatives: Variants of existing products are to be developed
3. Improvements: The next generation of existing products is to be developed.
4. Fundamentally new: Entirely new, innovative products are to be developed.

Following is the four step process of product planning:

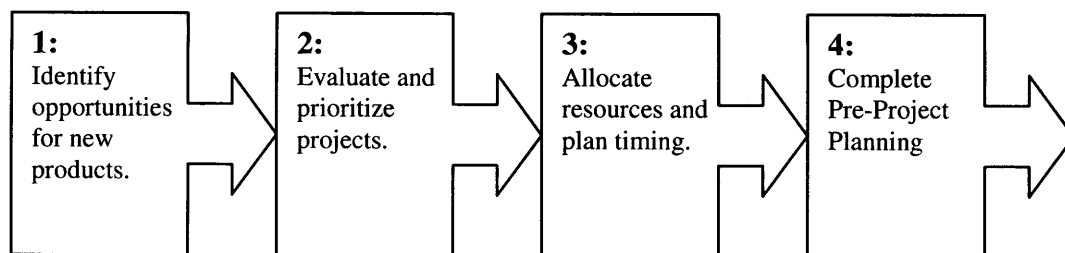


Figure 10: Four step process of product planning.

Product planning also involves getting the scope of business right. The managers have to decide which parts of product development should be done in-house and which should be out-sourced and whether to use modular/open-standard architecture or a propriety interdependent architecture.

3.5.1 Product planning for Islamic finance products:

Customer needs and trends based product planning:

Customer needs and market trends drive the planning process for Islamic Finance products. Products plans for Islamic Finance are also affected by macro-economic, social, political and demographic trends. To illustrate the point, take the example of Saudi Arabia. The recent spike in oil prices has swelled kingdom's monetary reserves. Saudi Arabia plans to undertake more than \$300 billion in mega infrastructure projects in the next five years. This means financial intermediation will be required to finance these projects. Only 20% of Saudis are home-owners because of exorbitant home prices. A good home-financing solution can help Saudis solve their housing problems. Saudi government also plans to remove subsidies in health care and privatize the hospitals. Individuals will have to pay for their own health care bills. There will be a need for health insurance products.

Product planning and Islamic law compliance:

Islamic Finance banks should particularly be in-tune with the latest developments in Islamic law to make sure their existing product portfolio complies with it. Islamic banks should also capitalize on any breakthroughs in Islamic law by innovating new products that satisfy customer needs in a better manner. Like any risk, the product plan should diversify Islamic law compliance risk by having a variety of products in its product portfolio. Recently, Murabaha based financing has been termed illegal from Islamic law point of view in Saudi Arabia. Banks will have to change their future product portfolios to exclude Murabaha based products from them.

Product planning for multiple jurisdictions:

Islamic banks operating in different jurisdictions can cross-pollinate products across different countries. For example, Islamic law practiced in Saudi Arabia is more strict than in Malaysia. A new innovative product can be first launched in the less risky testing ground in Malaysia. Based on customer feedback, it can be improved further. This product can then be customized for Saudi Arabia, and tweaked to comply with its laws and regulations. Regulators and Islamic law scholars in Saudi Arabia will have a different view of a product, if they are presented with a fully functioning, well-subscribed and successful product. Such staged introduction of products across different jurisdictions also helps to pent up the demand of them, because customers will require a successful product being offered in a foreign country be available in their home-country as-well.

Product planning for strategic positioning:

While planning the next product pipe-line, an Islamic bank also has to consider its strategic positioning within the industry. Some Islamic banks want to position themselves as more innovative and they continuously take the Islamic law compliance risk while issuing new securities. They plan for those products that strengthen their competitive position in the industry as client centric, innovative and flexible. On the other hand some Islamic banks want to position themselves as the vanguard of authenticity of Islamic finance products. Their products are very conservative and risk-averse from Islamic law compliance point of view. Customers value these banks for the authenticity of their products. Islamic banks can also strategically place themselves in the industry by choosing the right type of products in the product plan. For example, some Islamic banks may choose to specialize in industry specific asset securitizations, such as oil and gas industry. They can develop core competency in securitizing oil and gas reserves, pricing these assets and issuing derivative products based on these assets. Similarly an Islamic bank can specialize in the Islamic law compliant hedge funds and mutual funds. Because of the nature of financial intermediation in Islamic finance, risk exposure to Islamic banks is much different from the risk exposure to conventional banks. For example, an Islamic bank providing home financing is directly exposed to the risk of home prices, because the Islamic bank co-owns the home during the financing term. The product plan should clearly identify how the net risk exposure to an Islamic bank will alter because of the future products being launched by an Islamic bank.

3.6 Product specifications:

Customer needs are at times ambiguous, as they are in the language that customers speak. For example, customer need of an investment product can be as follows: “I need an investment product which is safe and I get reasonable monthly income.” Such abstract and ambiguous customer needs have to be translated into exact specifications with precise metrics. Ideally each metric should be complete, correspond to a single customer need, and be a dependent rather than an independent variable. Dependent variables for metrics give product designers freedom to design in any manner to achieve the right metrics for the product. Following is a four step process to set the product specifications:

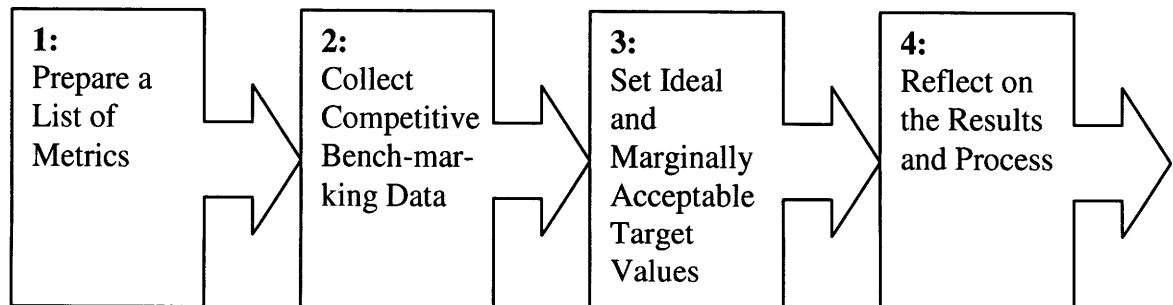


Figure 11: Four step process of setting product specifications

Traditional metrics for specifying financial products can be used in Islamic Finance as well. Figure [12] gives a list of typical metrics for a financial product.

Metric No	Metric	Units
1	Credit risk	Rating stars
2	Duration	No units
3	Currency	Dollars
4	TTM	Years
5	Historic Correlations	No units
6	Beta	No units
7	Volatility	No units
8	VAR	Dollars
9	YTM	Percent
10	Secondary Market	Binary
11	Online Trading	Binary
12	Marked To Market Frequency	Days
13	Foreign ownership	Percent
14	Capital gains tax (%)	Percent

Figure 12: List of metrics and associated units used in a typical financial product specifications

3.6.1 Product specifications in Islamic finance:

Jobs-to-be done by an Islamic Finance product need to be clearly specified so that precise description of what the product has to do is understood by the product designers. A list of metrics is jotted down that directly reflects, as much as it is possible, the extent to which the job-to-be-done is met.

Specifying how much Islamic is a given financial product:

The most ambiguous, yet the most important, job-to-be-done by the Islamic Finance product is “I want to practice Islam in my financial matters”. Ideally there should be a metric, similar to the credit ratings, that conveys how much Islamic is a given financial product. It is very difficult to precisely capture and calibrate this most important customer need in Islamic Finance. A large portion of Islamic law related to financial contracts and instruments can be interpreted differently according to various schools of thoughts in Islam. Hence the permissibility of various characteristics of financial products is a subject of active debate among scholars and practitioners of Islamic Law. Islamic financial law for contemporary finance has been actively researched by competent scholars, and stratification of Islamic products based on permissibility will be soon on the horizon. Till that time, one easy metric can be based on acceptability of a financial product by a number of schools of thought in Islamic Law. There are four dominant schools of thought in Islamic Law. One possible rating scheme can be as follows:

Rating	Description
☾ ☾ ☾ ☾ ☾	Five Crescents: The financial product is permissible by every authority on Islamic Law. This is not a new product, and its use has been permitted since classical times.
☾ ☾ ☾ ☾	Four Crescents: The financial product is permissible by every authority on Islamic Law. However it is a new product, and there has not been such product in the past.
☾ ☾ ☾	Three Crescents: The financial product is permissible by three out of four schools of thought. There is little ambiguity about its permissibility.
☾ ☾	Two Crescents: The financial product is permissible by two out of four schools of thought. Permissibility depends upon usage and circumstances.

Figure 13: Rating mechanism for Islamic Law compliance of a financial product

Similarly, precise metrics for Gharar need to be developed for Islamic Finance products. Every financial transaction has a certain level of Gharar, however the point when Gharar becomes too much for the transaction to be invalid is ambiguous. Perhaps, probability can be a good metric of Gharar. If so, product specifications for a future product can define that Gharar in the product should not be more than x%. Customer needs and product metrics can be put in a needs-metrics matrix for the product that needs to be designed. This matrix maps specific customer need to the associated product metrics. Figure [14] is a needs-metrics matrix for an investment product.

Figure 14: Needs-Metrics matrix for a financial product for the investors.

Needs / Metrics		1	2	3	4	5	6	7	8	9	10
		Credit Rating	Guaranteed YTM	Liquidity	Duration	Distribution Channels	Security Tax Categorization	TTM	Beta	Hedging Type	Shariaa Rating
1	Principal amount is very secure.	•	•						•		
2	A minimal guaranteed return.		•								
3	Can liquidate anytime.			•				•			
4	Should protect against currency devaluation.		•							•	
5	Should protect against inflation.		•							•	
6	Minimal investment required should be low										
7	Can easily get periodic distributions.				•	•					
8	Should be liable for minimal tax.						•				
9	Should be Islamic Law Compliant.										•

3.7 Concept Development:

Product concept is a rough description of the working principles and form of the product. It is a concise description of how a product will do the job that its consumer will hire it to do. A good concept generation process is structured; it thoroughly explores all the product alternatives and immunizes the concept generation activity from team politics and individual agendas. The first step in developing a concept for a new financial product is to perform the concept generation exercise. Figure [15] illustrates the concept generation process:

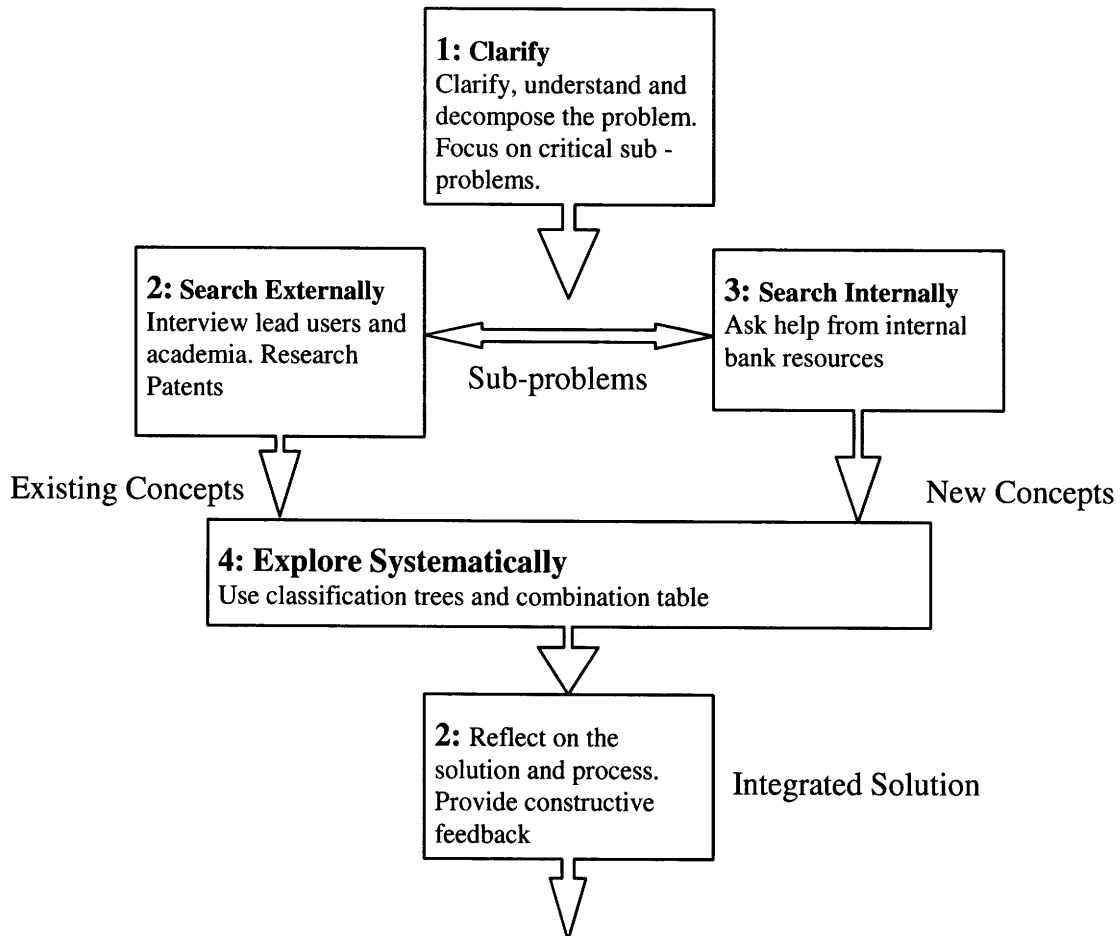


Figure 15: Product concept generation process.

Problem Clarification

During the problem clarification stage, the general understanding of the problem is articulated and agreed upon. The bigger problem is broken down into granular and simpler sub problems. The most important sub-problem is given the most attention. To find a solution to the problem, external search is done to see if the problem is already has been solved.

External and Internal Search:

External search involves talking with lead users, consulting experts, searching patents and searching published literature for the appropriate solution. External search is augmented by internal search which involves using team capabilities to develop a solution for the problem.

Tools for systematic exploration of product concepts:

Once all the product concepts have been conceived, a formal process is used to pick the best concept from many product concepts. Various factors, such as time to market, customer feedback, competitive landscape, and product implementation costs dictate the concept selection process.

Concept classification tree:

Concept classification tree divides the entire solution space of all possible solutions into several distinct classes which facilitate comparison and pruning of concepts. Each branch of the tree is a different approach to solving the problem. Branches representing less promising product concepts can be pruned, and the promising ones can be analyzed further.

Concept combination table:

Concept combination table lets product designers consider combinations of solutions fragments systematically. When a large problem is broken down to smaller sub-problems, there may exist many solution concepts for each sub-problem. A concept combination table lets product designer consider various permutations and combinations of sub-problem solution concepts to decide the final whole-product concept.

Functional decomposition:

One way to decompose a problem is functional decomposition. The problem at hand is represented as a single black box. The black box represents the overall function of the product. The single black box is divided into sub-functions, and each sub function is further subdivided into simpler sub-functions. This division process is repeated until the sub-functions are simple enough to be tackled independently. The goal is to specify functional elements without implying a product concept. Solution concepts to the simplest sub-functions are then sought using other concept generation techniques.

Testing the product concept:

The final concept is then tested against the job-to-be done by actively involving customers to test the concept. Product concept is tweaked based on customer feedback and is further tuned to address the job-to-be-done. A subset of potential customers of the target market are effectively communicated the new concept of the product. The description of the product emphasizes those features of the product that the users are most likely to consider in their decision to use the product. This may include in-depth, yet easy

to comprehend, analysis of how the product meets the user needs. Then based on customer feedback, product-concept's future outlook can be inferred.

3.7.1 Concept development in Islamic finance:

The generic concept generation process can be used for developing Islamic finance products as well. The most challenging problems in Islamic finance originate from the problem of structuring the product according to Islamic law.

External and internal search for concepts in Islamic finance:

External search for product concepts is very important in Islamic finance, because most of the problems are Islamic Law compliance specific. It is not a business of a bank to solve problems in Islamic Law, so they will rely on external resources to solve these problems. Some problems in Islamic finance can be solved internally by the bank. These include problems related to quantitative analysis, marketing, distribution, risk analysis etc.

Functional decomposition of problems in Islamic Finance:

Functional decomposition is useful in solving problems related to Islamic law compliance, because it emphasizes the functional needs of the product, without priming the product designers with a specific solution for that function. Figure [16] is an example of the functional decomposition diagram of Sukuk investment product in Islamic Finance. There are three inputs to the Islamic asset securitization product – funds from retail investors, assets from the debtor and the Islamic Law guidelines. Each box represents a piece of functionality that needs to be implemented by a specific feature of the product. Each box needs to be further decomposed into more granular functions, until the marginal utility of further sub-division is not valuable. Note that the functional elements do not specify any specific way of performing the function. Once the complex financial problem is divided into simpler sub problems, the most challenging sub-problems will stand out. Such sub- problems will need to be attended to first and allocated more resources. For example, hedging against inflation in an Islamic Law compliant manner seems to be most challenging problem in a retail investment product. Several techniques are used for innovating new product concepts in engineering which can be practiced in finance as well. These include TRIZ (The theory of solving inventor's problems), lateral thinking and structured brainstorming. Once various bits and pieces for concept ideas for various functions have been thought through, a systematic exploration of the whole product concept is done. . One such method is drawing the concept classification tree, which divides the entire solutions space into several distinct classes.

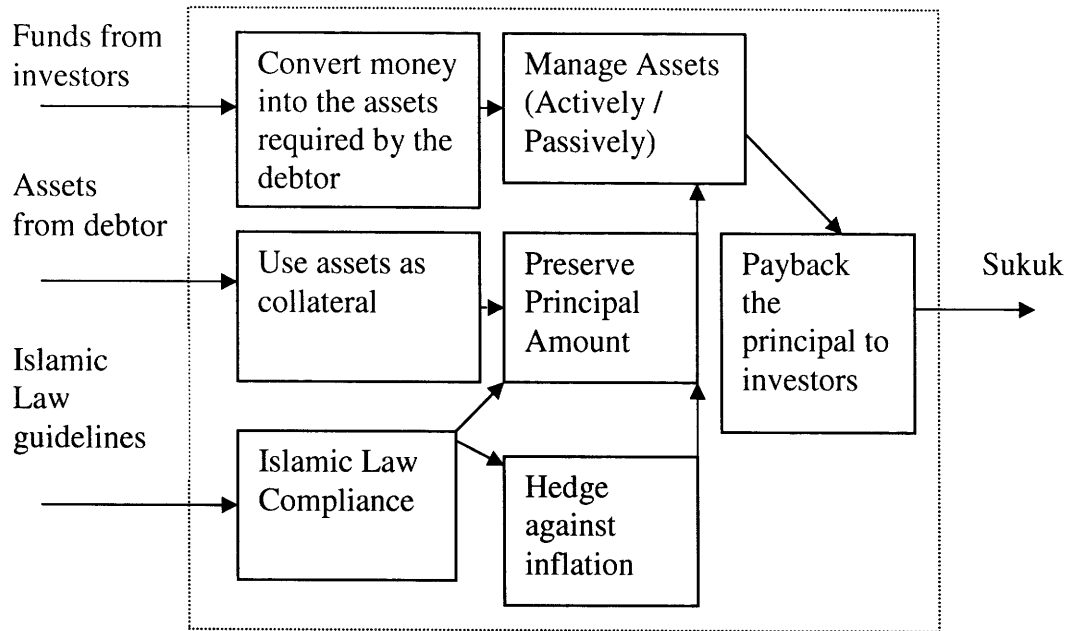


Figure 16: Functional decomposition of an Islamic Asset Securitization (Sukuk).

3.8 Product Architecture:

Product architecture for products define the different functional elements of the product and their interactions with one-another. There are two types of architecture – modular and interdependent.

Modular Architecture:

In a modular architecture each functional block implements one or a part of a function in its entirety. Interactions between the chunks are well defined, and are fundamental to the primary functions of the product. Benefits of modular architecture include component standardization, easy product change and customization, and product variety. Modular architecture enables outsourcing of different modules to external parties who have a comparative advantage in performing those functions. Modularity leads to specialization and expertise development in each module. In future, if change is required to a specific module of the product, such as inflation hedging module, that change will not affect rest of the product. An architectural diagram details the interactions of various entities in the financial contract. This enables product managers to better manage the product development and delivery. From the architecture, one can also understand, which parts of the financial product can be repackaged and resold independently, as long as, doing so does not violate the Islamic Law. Modular architecture enables easy customization of various parts of the product according to local needs, trends and regulations. This leads to the platform based product development.

Interdependent Architecture:

Interdependent and closed architecture enables better performance in functionality and reliability for the product to do the job it is required to perform. Interdependent architectures are optimized and propriety, and are needed when standardized modular architectures do not meet customer needs.

Platform based product development:

The collection of assets, including component designs, shared by these products is called product platform. While designing products based on product platform, product designers have to manage the tradeoff between differentiation and commonality between products. To better manage this task, two information systems – differentiation plan and commonality plan are maintained. The differentiation plan explicitly indicates the ways in which multiple versions of a product will be different from the perspective of the customer. The commonality plan explicitly represents the common components and assets of two different products based on same platform.

3.8.1 Product architecture in Islamic Finance:

A block level architectural diagram can be used to specify the structure of an Islamic finance product. A financial contract can be specified in terms of puts and calls, and their

payoff diagrams can further explain the payoffs of the financial contract. The architectural diagram should also include various mutual agreements among the transacting parties.

Modular and integrated product architectures in Islamic Finance:

The architecture of an Islamic finance product can be modular or interdependent. Proprietary trading hedge funds and private equity are examples of interdependent and closed architectures of financial products. The need for integrated architecture is increased in Islamic Finance because financial solutions require non-standardized, intricate, and situation specific structuring in order to comply with the Islamic Law.

Examples of modular architecture based products in finance include mutual funds, ETFs and 401K plans. Since financial instruments in Islamic Finance are required to be asset based, financial intermediaries can develop core competencies in certain classes of assets and develop products around those asset classes. Their products can be modular which plug into a larger financial product. For example, a bank can specialize in real estate asset class and offer various finance products related to real estate assets. Some examples of such products can be Islamic law compliant insurance for real estate, brokerage for real estate, REIT, rental swaps etc. These products can be plugged into for real-estate based Sukuk instrument.

Platform based product development in Islamic Finance:

A desirable feature of product architecture is to offer two or more products that are highly differentiated, yet they share a substantial fraction of their components. Since most of the products in corporate Islamic Finance will be customized solutions for specific clients – platform based product development can be used, in order to achieve faster development time, lower cost of production, customization and product variety. For example, a platform can be built around products involving asset securitization from which customized asset securitization solutions can be derived. Three variants of the asset securitization can be made for Corporate, Small and Medium Business and Small Office/Home Office market segments. Figure [17] and Figure [18] show the commonalities and differentiation plans respectively. A Sukuk based debt platform is customized for three different industrial sectors. Many components of the Sukuk product can be shared across the different types of Sukuks. For example, the promotional campaign associated with the launch of Sukuk can be similar for the three Sukuk types. Also the same lawyers can be hired for the legal deliberation related to Sukuk issues for the three types.

		Different Types of the Sukuk Product		
Components of Sukuk Product	Total number of types of components	Oil & Gas Industry Sukuk	Telco Sukuk	Real Estate Sukuk
Legal Department	3	Type 1 (Clifford Chance)	Type 1 (Clifford Chance)	Type 1
Shariaa Board	4	Type2 (Sh. Nizam et al- contract #3)	Type2 (Sh. Nizam et al, contract #3)	Type 2 (Sh. Nizam et al, contract #3)
Promotion Campaign Type	3	Type 1 (National - Event 1)	Type 1 (National - Event 1)	Type 1 (National - Event 1)

Figure 17: Commonalities Plan

		Different Types of the Product		
Components of Sukuk Product	Total number of types of components	Oil & Gas Industry Sukuk	Telco Sukuk	Real Estate Sukuk
Product Distribution	3	Type 3 (Private Banking)	Type 3 (Private Banking)	Type 2 (Retail - Institutions)
Financial Analysis Expertise	4	Type2 (Commodities)	Type1 (Blue Chip)	Type 3 (Real Estate)
Marketing / Sales	3	Type 1 (Private Banking)	Type 2 (Retail)	Type 3 (Retail / Institutional asset management)

Figure 18: Differentiation Plan

3.9 Design for Implementation:

In the engineering domain, where products have physical attributes, they have to be manufactured using complex manufacturing methods. Hence product designers, while designing engineering products have to consider manufacturing constraints, limitations and competencies, because the design of the product is dictated by them. Product designers' aim is to keep the cost of the final product as small as possible, which includes the materials cost, manufacturing costs, assembly costs and product support cost.

3.9.1 Design for implementation for Islamic finance products:

While designing an Islamic financial product, product designers have to be cognizant of the problems and road blocks a product may encounter during its implementation and roll-out. Problems that may occur during the product implementation include legal costs, local regulatory laws, distribution channels, geo-political issues, macro-economic factors etc. For example, if it is too costly to distribute the product, then the product design has to be changed to lower the distribution costs. Product designers of Islamic Finance products need to consider following aspects of implementation that are peculiar to Islamic Finance.

1. **Islamic Law compliance:** As the Islamic finance product gets more complicated in its structuring, the costs for its legal compliance also increase.
2. **Costs involved in hiring Islamic Law scholars:** Competent Islamic law scholars who are well versed in Islamic law and modern finance are a rare and much sought after commodity. Their services can be very expensive.
3. **Differences of opinion among various Islamic schools of thoughts:** In Islamic finance, innovation breeds difference of opinion. More innovative products will require much more effort in educating the customers, regulatory authorities and Islamic law scholars about them.
4. **Local laws and regulations related to Islamic Finance:** Every country, where Islamic finance is being used has its own rules and regulations. As Islamic banks become global, they have to understand the cross-country differences in rules and regulations. A successful product in one country may not be allowed by regulators in another country.
5. **Perception of Islamic Finance:** Potential customers of Islamic finance think that Islamic Finance products are just conventional products with Arabic names. Islamic debt instruments charge interest (but call it rent), and charge a premium for this¹⁷. Product designers have to design products in Islamic Finance that defeats this stereotype. Part of the solution lies in educating the customers about the Islamic finance law and how the structuring of Islamic Finance products makes them compliant with the Islamic Law.

¹⁷ El-Gamal, Mahmoud A, *Limits and dangers of Sharia arbitration*, 4th International Conference on Islamic Economics, Leicester, UK , 13-15 August, 2001.

6. **Acceptance of Islamic Financial products by conventional regulatory authorities:** Many Islamic finance instruments originate or get listed in conventional-law jurisdictions in foreign countries. Product designers have to be design products so that regulatory authorities and customers in these countries accept the products.

3.10 Robust design:

A robust product is defined as one which performs as intended under ideal and non-ideal conditions. In robust design the design parameters are set so that un-anticipated and random events do not affect the product's performance. Product designers perform a set of activities during product development to improve the desired performance of the product and minimize the effects of noise.

Design variables:

Product designers have design variables at their disposal to alter the performance of the product. However these variables do not necessarily have a linear relationship with the product performance. Product designers aim for the most optimum values of all the design variables such that the performance of the product is within the acceptable specifications of the customers.

Noise factors and control factors:

Robust design activities consist of identifying control factors, noise factors and performance metrics. Control factors are the design variables that can be varied in controlled manner, in order to explore the product performance under various combinations of parameters. Noise factors are those variables that are not controlled during the operation of the product.

Objective function:

Product designers then formulate the objective function for the product that relates to the desired robust performance. An objective function can be used to combine all the performance metrics into a single quantity. The aim of the product designers can be to maximize, minimize, be within certain target limits or reduce the signal (mean value of product performance)-to-noise (variance in product performance) ratio of product performance.

Determining critical control factors:

A systematic approach can be used to determine which control factor to use and what degree of variation is allowed in the control factor. In a full factorial experiment all the control factors, and every combination of control factor value is used to simulate the financial product. Otherwise one can use fractional factorial or one factor at a time approach. One can also use orthogonal arrays for better and less expensive simulation coverage. Similarly the noise factors can be added following a systematic approach to study their individual and compounded affects on the financial product. The affect of a given factor for various levels can be averaged to a single quantity to better understand its

cumulative effect. This technique is called the analysis of the means. By completing the entire analysis product developers can find out the critical control factors and their optimum values for a robust product. Robust design can also aim to reduce various frictions and non/counter-productive forces between different entities during the life of the product.

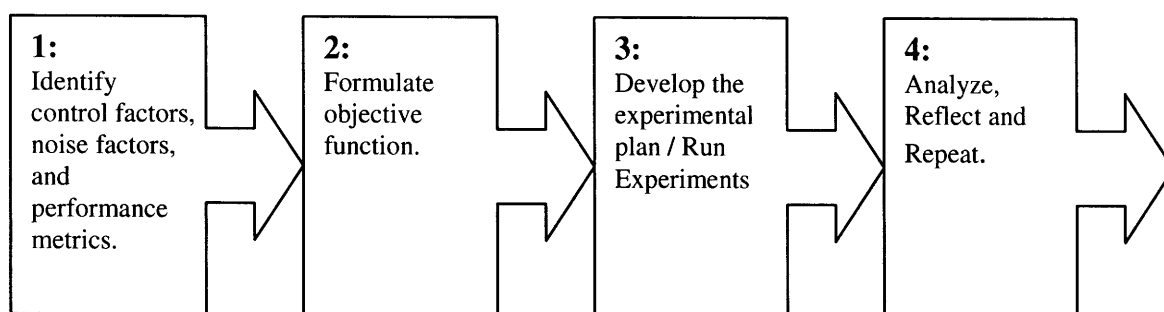


Figure 19: Four step process for a robust design of a financial product.

3.10.1 Robust design for Islamic Finance products:

Noise factors, control factors and performance metrics in Islamic Finance:

Financial products are required to be robust. They are particularly prone to macro-economic and political shocks, such as spike in oil prices, dislocations in capital and stock markets, inflation, armed conflicts, interest rates and currency fluctuations. It is impossible to design a financial product which is immune to every such external shock; however, a financial product can be made robust by design such that it withers negative external forces as much as possible. Some examples of the control factors will be the rate of return, built in options, time to maturity, duration etc. Performance metrics include security's subscription interest, customer satisfaction, interest in the further issues of the security, media feedback, market share etc.

Testing robustness of Islamic Finance products:

The first step is to mathematically model the financial product, and simulate its performance, when one or more of its variables move to abnormal range. Numerical simulation methods can be used when developing mathematical models becomes difficult.

Risk Analysis of Islamic Finance products:

Since capital providers in Islamic finance are co-investors in the projects for which the funding is required, proper risk analysis of those projects is also required. For example, an Islamic bank securitizing oil and gas reserves for Sukuk, is required to take a view on future oil prices, because oil prices directly affect the value underlying Sukuk assets, and feed into the risk-return profile of the Sukuk. On the other hand, a conventional bank

issuing conventional debt to oil company does not have to take a view on oil prices. Therefore financial engineers in Islamic finance cannot just rely on their quantitative skills, but are required to have strong business acumen of the industry for which they are designing financial products.

4 Chapter 4: Case Study – Developing an Islamic Law compliant currency exchange rate hedging and foreign currency debt financing instrument:

This chapter illustrates the use of the template developed for product development in the previous chapter for developing an Islamic Law compliant currency hedging and foreign currency debt financing instrument.

Conventional currency exchange rate hedging instruments and Islamic Finance:

Currency hedging instruments such as currency swaps, forward contracts and options have not been used in the mainstream Islamic Finance because most of the conventional derivatives used to hedge currency exchange risk do not comply with the Islamic Law¹⁸.

Asset based currency exchange rate hedging instrument in Islamic Finance:

The swap agreements in Islamic finance have to be asset based. Therefore a vanilla cross-currency swap is not permitted in Islamic finance. Product designers in Islamic finance are required to design financial products that promote real economic development. They are required to understand the underlying need for which the financial instrument is required and address that need in the product. A corporate entity can require a cross-currency swap for two reasons. Either it wants to raise funds in a foreign currency or it anticipates future cash flows in a foreign currency and wants to hedge against currency exchange rate risk and interest rate risk. Therefore, a currency hedging instrument in Islamic finance has to address these underlying needs of the corporate customer. In this case study a cross-currency hedging and foreign currency debt instrument is developed.

Hypothetical Case:

Suppose there are two corporations, Dubai Chemicals and Malaysian Chemicals, operating in Dubai and Malaysia respectively. Dubai Chemicals wants to setup an edible oil plant in Malaysia, and Malaysian Chemicals wants to setup an oil refinery in Dubai. Both companies do not have enough funds at their disposal and require external funding for their planned foreign capital expenditures. Both companies approach an international investment bank which deals in Islamic Finance to solve their funding needs.

¹⁸ Jobst, Andreas, *Derivatives in Islamic Finance*, IMF – Monetary and Capital Markets, Islamic Economic Studies, Vol 15, No 1, September 20, 2007.

4.1 Product Planning and currency Hedging and Foreign Currency Debt Instrument:

Islamic Law compliant currency exchange rate hedging and foreign currency debt instrument should be on the product road map of large investment banks working in Islamic Finance because of the following reasons:

1. Sovereign wealth funds, private equity funds and large corporations from the Middle East (which is the hub of Islamic Finance) have excess liquidity because of the recent oil boom. They want to diversify their income sources and do not want to rely on oil as their only source of wealth. They have embarked on a global acquisition spree of variety of assets, ranging from upstream petro-chemical businesses, automotive companies, investment banks, football clubs, real estate and luxury fashion brands. Such acquisitions require significant capital expenditures in foreign currencies.
2. The current turmoil in the financial markets has increased the volatility of currency exchange rates. Prohibition against conventional currency swaps, options and forward contracts considerably reduces options for exchange rate hedging in an Islamic law compliant manner.
3. Subprime mortgage meltdown and financial crisis in the US has made it difficult for corporations to raise funds in foreign capital markets.
4. Middle Eastern governments want to jump-start their capital markets and want to issue Islamic Law compliant debt instruments.

4.2 Choosing the Right Organization Structure:

Large corporate investment banks with significant experience in underwriting Islamic Law compliant corporate securities are the best candidates to develop currency hedging and foreign currency debt instruments. Within such banks, a functional and a mainstream organization will be the best organization structure for the team working on this problem. The team members assigned for this financial product would have considerable past experience in issuing Islamic Law compliant corporate securities. If the investment bank does not have prior experience in Islamic Finance then an autonomous and project organization will be the best one to develop this product.

4.3 Identifying Customers and Customer Needs:

Capital providers, capital users and regulators are all customers of this product. Each of them will have a specific list of jobs-to-be-done for this product.

Needs of capital providers:

After numerous interviews with small investors¹⁹ (capital providers) following list is compiled which includes some of the most important jobs-to-be-done by an investment product.

1. I want to practice religion (Islam) in my financial matters and thereby be a better Muslim.
2. I want to make a secure financial investment such that my principal investment is preserved and it gives me a reasonable periodic return.
3. I want to hedge against currency devaluation and inflation.
4. I want a peace of mind in my financial matters.
5. I do not want to break the prohibitions in Islam against interest.
6. I do not want an inferior Islamic Finance product than a comparable conventional finance product.
7. I want to protect my investment funds against fraud.
8. I want the investment product to be user-friendly and flexible. I should be able to invest any amount in it, and can liquidate my investments whenever I want.
9. I want the product to be transparent.

Needs of capital users:

After studying many publications and attending conferences on Islamic Finance, following jobs-to-be-done were evident from the corporate customers (capital users):

1. Corporations want to hedge their currency exchange rate exposure.
2. Corporations want to lower their borrowing cost in foreign countries, as they expand globally.
3. Corporations want to minimize their financial risks.
4. Corporations want to move to Islamic modes of financing because of various external factors.

Compensating behavior:

Other observations for inferring jobs-to-be-done:

1. There is an excess liquidity in Islamic Banks in the Middle East²⁰. Investors in the Middle East do not have many investment choices in fixed income instruments.
2. Individuals keep their liquid funds in foreign currency to protect against currency devaluation^{21 22}.
3. Individuals have a preference to work in foreign countries to hedge against currency devaluation.
4. Individuals have a preference for depositing their savings in banks in foreign countries, to hedge against geo-political risk.

¹⁹ Interviews were held at Islamic Finance conference held in 2006 and 2008 at Harvard Islamic Legal Studies Program.

²⁰ The News, 4/26/2008, <http://www.thenews.com.pk/print1.asp?id=108925> (Accessed 9/9/2008).

²¹ The Dawn, 8/25/2008, <http://www.dawn.com/2008/08/25/ibr21.htm> (Accessed 9/9/2008).

²² The Dawn, 8/11/2008, <http://www.dawn.com/2008/08/11/ibr2.htm> (Accessed 9/9/2008).

4.4 Concept Development for an Islamic Law Compliant Currency Swap:

Following is a concept generation exercise for a currency hedging and foreign exchange debt financing instrument in Islamic Finance.

4.4.1 Step 1: Problem Clarification:

The two corporations require significant capital expenditure in foreign countries in foreign currencies. They want to borrow money without breaching Islamic Law and want their foreign currency financing to be immune from the currency exchange rate fluctuations.

4.4.2 Step 2: External Search:

Currency swaps are commonly used to hedge currency exchange rate risk. Conventional currency swap contracts are not permissible in Islamic Law. Swapping financial obligations (debts) in different currencies is permissible provided these obligations occur in an Islamic Law compliant manner. Conventional loans in foreign currencies will not meet the job-to-be-done, as they bear interest. Since the two corporations are unknown entities in the foreign countries in which they seek financing, they will incur higher borrowing cost in the foreign debt issue than a domestic debt issue. Sukuks can be used to raise funds. However, one of the biggest criticisms against Sukuks is that the rental amount charged on the securitized assets is benchmarked against prevailing interest rates, such as LIBOR. This makes the rents similar to the interest payments. To solve this problem, options pricing theory can be used to find the right premium for the securitized assets. Options pricing theory has been used previously in research to price the Islamic Financial instruments and has been re-used here to price the right premium on the securitized assets in the foreign currency debt instrument. Lets assume that the total value of assets that are securitized is S and the amount of loan needed is L . The lender by loaning the assets writes a call option $C(L)$ on the assets to the borrower which the borrower can exercise by returning the loan to the lender. The strike price of this call option is therefore L . If the borrower does not pay the rents, the lender can “sell” the assets to the borrower at the face value of the loan L . The borrower has therefore written a put option $P(L)$ to the lender with a strike price of L . The put call parity relationship of this asset securitization can be written as follows:

$$S - PV(L) = C(L) - P(L)$$

The value of the outstanding loan can be written as

$$PV(L) = P(L) - C(L) + S$$

Since at every rental period, the lender can exercise the put option if the borrower defaults or the borrower can prepay the loan, there is a series of put and call options and value of the loan can be written as aggregate sum of those individual put and call options.

$$PV(L) = S_T - \left[\frac{\sum_{t=1}^{T-1} C_{t,t+1}(L) - \sum_{t=1}^{T-1} P_{t,t+1}(L)}{\prod_{t=1}^T [(1+r_f)(1+r_a)]} \right]$$

In the above equation r_f and r_a are risk free rate and the implicit risk premium for the probability of default. Using the Black-Scholes-Merton method and assuming that the market price of the securitized asset evolves following the stochastic differential equation one can find the value of the call option that the debt holders have.

$$\frac{dS_t}{S_t} = \mu_s dt + \sigma \times dW_t$$

$$C(L) = \frac{PV(L) - P(L)}{(\Phi(d_1) - b\Phi(d_2))^{-1} - 1}$$

Where

$$d_1 = (\ln(-L/S) + \left(\mu_s + \frac{\sigma_s^2}{2} \right) t) / \sigma \sqrt{t}$$

and

$$d_2 = d_1 - \sigma_s \sqrt{t}$$

From this call option value, one can find the implicit interest rate, and the annual continuously compounded interest rate, r^i of the asset securitization.

$$r^i = \frac{L}{\sqrt[T]{S_t - C(L)}} - 1$$

One can also use *Arbitrage Pricing Theory* to determine an appropriate risk adjusted rate of capital. Doing so will require figuring out which “noise” factors are most relevant to the securitized assets, and what precisely is their effect on the asset value. The conventional APT theory suggests four principal macro-economic factors responsible for determining the asset price. Counterparts of all these factors in Islamic Finance should be determined in order to use APT theory. The quantitative aspects such effort (of figuring out which variable selection regression model is best for Islamic Asset securitization) can be outsourced to an entity which is most competent in it. New techniques such as Gibbs sampling, auto-regression and Bayesian based regression models can be used to figure out the right factors affecting the securitized assets.

4.4.3 Step 3: Internal Search:

Any large investment bank should be competent in issuing conventional asset securitizations, because asset securitizations have been common in conventional banking for the last three decades. During the internal search, this capability of asset securitization within the bank can be used to issue Islamic Asset securitizations (Sukuks). Conventional asset securitizations can be adapted to Islamic Asset securitizations by complying with the following conditions.

1. Loans must lead to positive economic activity.
2. Collateral assets must be real, clearly identified and associated revenue streams and risk must also be clearly defined.
3. Investors should be exposed to the underlying risks in the collateralized assets, and should get rents only if the underlying assets are profitable. Principal protection and rents to investors should not be guaranteed.
4. Collateralized assets should not be those which are prohibited in Islamic Law, such as debts. They should not be associated with those activities which are unethical from Islamic Law point of view, such as gambling and pornography.
5. Investors should be aware of the fact that they are owners of the collateralized assets during the Sukuk term.
6. Investment funds from the investors cannot be used in short term investments which are prohibited in Islamic Finance Law, such as short term interest bearing notes.
7. Conventional insurance cannot be used in the transaction – Islamic Finance Law compliant insurance should be used.
8. Any credit enhancement for the borrower should be in Islamic Law compliant form.

4.4.4 Systematic concept search and selection:

After rigorous internal and external concept selection search has been done, a systematic process of filtering out the most promising concepts is followed. One such method is drawing the concept classification tree, which divides the entire solutions space into several distinct classes. Following concept classification tree describes the concept selection process of Islamic Law compliant foreign currency debt and swap. There are three ways to raise funds in foreign currency. Issue shares on a foreign stock exchange, issue conventional debt or securitize assets (issue Sukuk). Sukuk can be issued in the foreign country or domestically. A domestic issue of Sukuk can be swapped with a similar foreign issue of the Sukuk issued by a different entity.

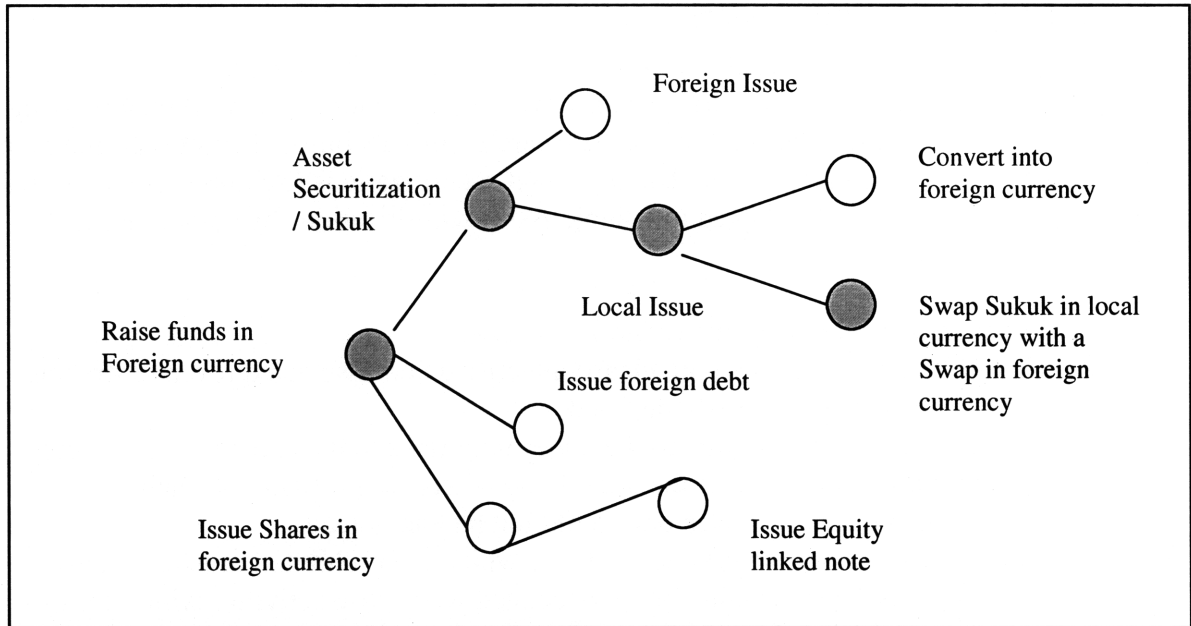


Figure 20: Concept classification tree for raising funds in foreign currency in Islamic Finance.

Another method that facilitates the comparison and pruning process of judging between various product concepts is to draw the product concept selection table. This table lists various deciding factors that need to be taken into account. Numerical weights are assigned to these factors according to their relative importance in the final product. Each concept is assigned a score for each factor based upon how well the given factor is addressed by a product concept. Following is the concept selection table for the Islamic Law compliant foreign currency debt and exchange rate hedge. There are four final concepts to judge which are listed horizontally in the top row. The decision factors are listed vertically. The Cross-currency securitized asset swap (swap of asset securitizations in different currencies) is a clear winner.

	Weight	Cross-Currency Securitized Asset Swap (Ijarah Sukuk)	Sukuk + Spot Currency exchange	Foreign Sukuk	Foreign Equity Issue
Shariaa Compliance	50%	5	5	5	5
Issue costs	10%	1	3	1	0
Ease of issue	10%	1	3	1	0
Legal costs	10%	1	3	1	0
Currency exchange rate fluctuation Risk	20%	5	0	5	5

Figure 21: Product concept selection table.

Once pros and cons of various concepts have been analyzed, a concept combination table is drawn, which enables product designers to consider combinations of various concepts in a systematic manner. Figure [22] shows the concepts combination table for the Islamic Law compliant currency swap. The selected concepts are shaded, which are combined together to make the final product.

Debt Concepts	Currency Conversion Concepts	Debt Payment Concepts
Issue Sukuk (Asset Securitization).	Buy foreign currency on spot at spot rate.	Payback in equity
Issue regular debt	Enter into a conventional currency Swap or forward currency exchange contracts.	Purchase Undertaking
Issue equity	Swap debt obligations, that are in different currencies	Embedded (Islamic Law compliant) options.
	Issue Sukuk in Foreign currency	

Figure 22: Concept Combination Table

4.5: Product architecture for Islamic Law compliant currency swap and foreign currency debt:

Figure [23] is an architectural diagram of an Islamic asset securitization (Ijara Sukuk) based swap. The architecture is modular in a sense that each part of the contract can exist as a standalone financial contract by itself. Suppose Dubai Chemicals needs 923 million Malaysian Ringgits and Malaysian Chemicals needs 1 billion AED. With the current spot conversion rates between AED/Ringggit both amounts are equal. Following are a step wise details of the transaction.

1. In order to raise funds, both Malaysian Chemicals and Dubai Chemicals form SPV entities and issue Sukuks. Malaysian Chemicals transfers 923 million ringgit worth of assets to the Malaysian Chemicals Sukuk SPV, while Dubai Chemicals transfers 1 billion AED worth of assets to the Dubai Chemicals Sukuk SPV. These assets can be real assets, such as their office buildings, land, equipment etc.
2. Both SPVs issue Sukuk investment certificates.
3. Investors buy the Sukuk certificates to invest.
4. SPV forward the investment funds from investors to the corporations as a payment for the assets. Dubai chemicals exchanges 1 billion AED for 923 million ringgits with Malaysian chemicals at the spot rate exchange rate.
5. Both companies lease back the assets from the SPV.
6. Dubai Chemicals sub-leases the leased assets of Malaysian Chemicals (which Malaysian Chemicals had leased back from Malaysian Chemicals Sukuk SPV). Similarly Malaysian Chemicals sub-leases the leased assets from Dubai Chemicals, which Dubai Chemicals had leased from Dubai Chemicals SPV.
7. Both companies pay periodic rentals in foreign currency on the subleased assets to each other, which are then distributed to the Sukuk certificate holders. The purpose of subleasing is to transfer the periodic rental obligation while the usufruct of assets can be kept with the original Sukuk issuers. The rental rates can be derived from the options pricing theory, as done in the internal search exercise.
8. The principal amount of the Sukuk is returned by the two corporations to their SPVs, when the term of the Sukuk finishes. The securitized assets are returned to the two corporations. Both companies had extended purchase undertakings to buy back the assets after five years from their SPVs at the face value of the Sukuk or market price of the assets. If the assets do not have a deep enough market to ascertain their correct price, the issuing entities can sign a Salam agreement (purchase undertaking) to buy back the assets at their face value. Similarly the SPVs may sign undertakings to sell these assets at their face value to the corporations. Both companies sign managing contractor agreements to manage the Sukuk assets.
9. Principal amount is returned to the Sukuk holders by the SPV when the term of Sukuk finishes.
10. At the end of five years, both companies share equally any loss due to devaluation of one currency relative the other. For example, if at the end of five years,

Malaysian ringgit devalues relative to AED, Dubai Chemicals will give Malaysian Chemicals half of the aggregate devaluation amount.

Following are some benefits of this security:

- Both corporations incur lower cost of capital because of comparative advantage in raising funds domestically.
- Both corporations hedge against currency exchange rate fluctuations, by sharing equally the losses incurred due to relative currency devaluations.
- Since financial transactions are backed by real assets, they comply with the Islamic Finance law.
- The purchase undertakings ensure Principal protection for the investors.
- Options pricing theory gives an alternate mechanism to find correct rental amounts.

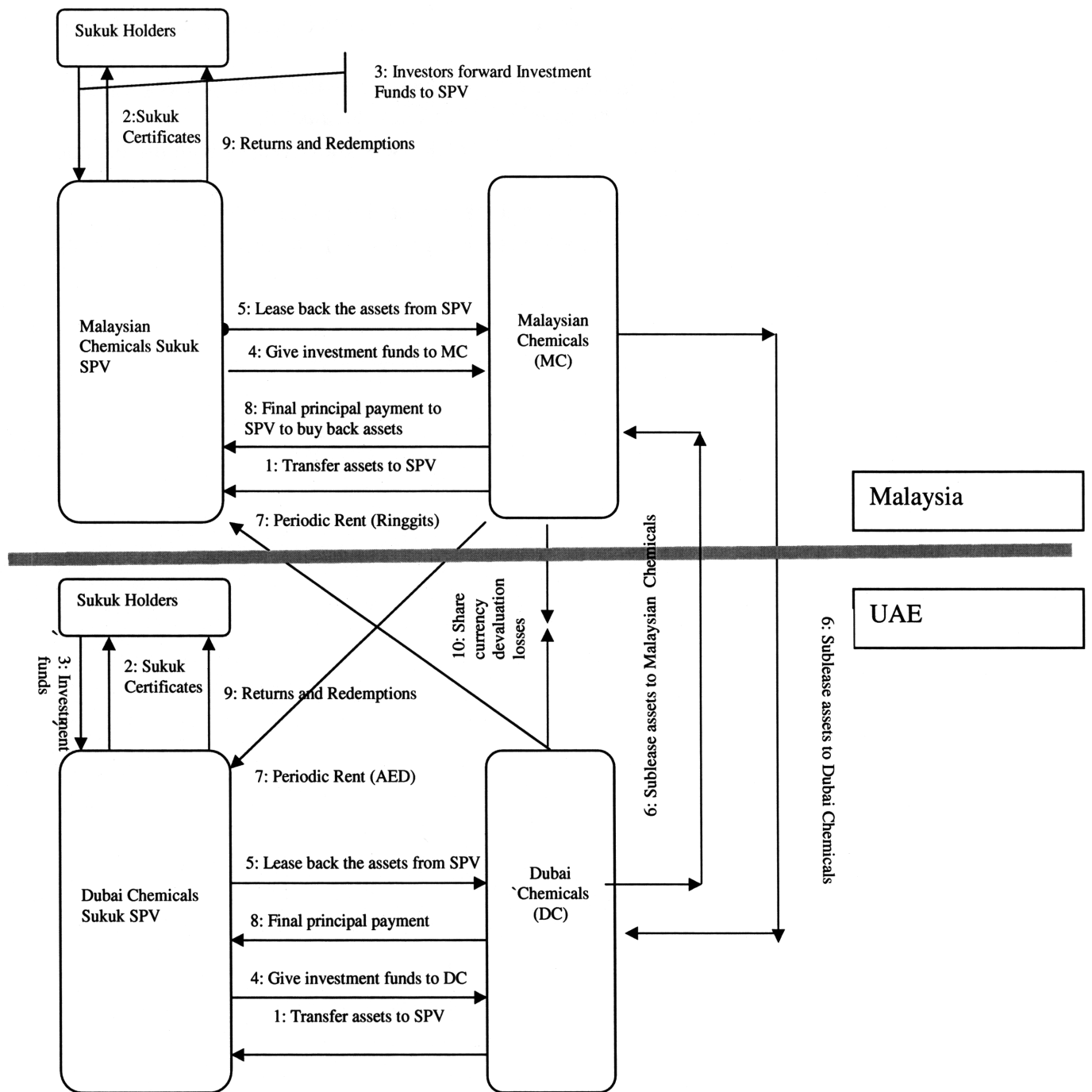


Figure 23: Architecture of Islamic Law compliant foreign currency debt and currency exchange hedge product.

5 Conclusion:

Many thought leaders in the Islamic Finance have termed the current state of Islamic Finance industry as dismal, because participants in this captive market are given products that are worse in quality but cost more than their conventional counterparts²³. Consumers of Islamic Finance products consider them to be just conventional products with Arabic names, in which interest is renamed as rent. Product development process in Islamic finance has been ad-hoc, haphazard and transaction based. Currently, most of the instruments in Islamic finance are either from classical times, which do not cater to the financing needs of present day or are very similar to conventional financial products.

Nevertheless, Sukuks have attained impressive growth and market penetration. This success can be attributed to the fact, that among all the available products, Sukuks meet the needs of all the stake holders in Islamic Finance in the best manner. Sukuks provide liquidity to the capital users, safe and Islamic law compliant investment product to the capital providers, and easy to understand and regulate instrument to the regulatory authorities. The success of Sukuk indicates that till some ground breaking work occurs in the Islamic financial law, asset backed securities will remain the best direction for future product development.

In this research, it is shown that even Sukuks have considerable flaws in their structure regarding their compliance with Islamic law. Purchase undertakings, embedded murabaha agreements and guaranteed rental income benchmarked against LIBOR make Sukuk very similar to secured debt. Such problems indicate that the product design methodology for Islamic financial products is flawed. For a better lot of products in Islamic finance, the product development process needs to be improved.

Product design and development is a very well researched and mature area in the engineering discipline. Successful product development strategies have been applied to countless products such as iPods, airplanes, bridges, cars, space shuttles etc. In this research the best practices of product development in the engineering are borrowed and a template for developing products in Islamic finance is developed. While the proposed template may not be the best one; in the absence of any formal product development process in Islamic finance, this template may prove to be quite useful.

To test the effectiveness of this template an asset-securitization based, Islamic law compliant cross-currency swap is developed. During this test, some parts of the template were more useful than others. The systematic concept search method proved to be most useful. Using this method, alternate ways to properly price the rents on secured assets were found. The resulting product meets all the important needs of the two corporate entities requiring the swap. The product is easy to implement and roll-out by design. This is due to the fact that Islamic law scholars, regulatory authorities and capital providers are very familiar with asset securitizations and Sukuks and they can easily understand the

²³El-Gamal, Mahmoud A, *Limits and Dangers of Shari'a Arbitrage*, 4th International Conference on Islamic Economics, Leicester, UK , 13-15 August, 2001.

proposed product because it is just an extension to existing asset securitizations. This exercise shows that improving the product development process may be the key to the future success of Islamic Finance.

6 Appendix

Instrument	Sukuk Istithimaar (Investment Sukuk)
Issuer	Saudi Basic Industries Corporation
Issue Size	SR 8 Billion (\$2.15B)
Date of Issue	11 th July, 2007
Coupon	3 month SAR SIBOR plus 38 bps
Payment Schedule	Quarterly payments
Authorized paid up capital	US \$6.67B
Identified Assets	47-right limited rights and obligations in contracts underlying SABIC's marketing business. The Sukuk constitutes undivided beneficial ownership in the Sukuk Assets and will be issued on an unsecured and unsubordinated basis. (70% of the SABIC's marketing business. Rest 30% of rights of the SABIC's marketing business had previously been transferred for a similar \$800M sukuk issued in 2006)
Lead Arranger / Sole bookrunner	HSBC Saudi Arabia
Lead Counselor	Clifford Chance, Baker and McKinzie
Purpose of Issue	To finance part of SABIC's capex program
Ratings	Sukuk is not rated on the date of issue. (Issuer rated A+)
Term	The sukuk will expire in July 2027. However holders have a put option to sell the sukuk at a pre-determined purchase price at the end of every five years.
Purchase Price	The purchase price of the sukuk will be as follows: <ul style="list-style-type: none"> • 90% of the face value at the first fifth year date • 60% of the face value at the second fifth year date • 30% of the face value at the third fifth year date
Denomination	SAR 10,000, subject to a minimum holding of SAR 50,000
Extra Amount	On every fifth anniversary of the Sukuk, each Sukuk holder will be entitled to extra income - upto 10% of the aggregate face value of the Sukuk, which will come from a special reserve.

Table 2: Term sheet of the SABIC Sukuk

