Financial Engineering: An Islamic Approach

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I- What is financial Engineering:

Financial Engineering refers to the use of risk-management techniques to manipulate the risk profile faced by the firm. The tools of financial engineering are, therefore, risk management instruments, and its outcome is "financial innovation". Financial specialists borrowed the term "engineering" the natural sciences to indicate the extent to which they are trying to control variables at work in the financial process.

The term financial engineering was firstly used by London banks in early 1980's to refer to a new approach these banks started using to risk management. (F. Eng. Marshal P.6). They departed from traditional way of handling risk to a comprehensive approach where all finance risks to which the firm is exposed are carefully examined to see where they offset each other and where they reinforce each other. After identifying, measuring and determining the effect of these risks on the firm, then a "building block" approach is taken to manage these risks by selecting the instruments that are most suitable for this purpose. Because they draw a map of the risks faced by the firm and then effectively "piece together" tools in the right

"quantity" to serve a particular need of a particular firm it was called "engineering".

II- Motives for innovation in the realm of finance:

Why do experts resort to financial engineering and seek innovation in the process of risk management? They do;

a) As a response to frequent and unanticipated changes in regulatory and tax codes which changes the risk profile faced by the firm and forces agents to find ways to protect their pre-change positions or exploit opportunities created by the change.

b) To face unexpected cost increase or to reduce cost.

c) To lessen the constraints of regulation and accounting conventions. Certainly, the desire to improve profitability and to reduce cost is a major force in innovation.

III- The Concept of risk:

The importance of the study of risk emanates from the fact that decisions are always based on expectations about the future. The decision-maker takes these decisions to reach

an objective. However, such objective will only materialize if the course of events in the future matches these expectations upon which the decision was based. If the course of events deviates from that which is expected, then clearly the objective will not be reached. Causes of these deviations introduce risks.

The study of risk, therefore, is the most important aspect of the process of financial innovation because the whole purpose of innovation in the realm of finance is to control risk.

While risk analysis includes quantitative estimate of expected values and standard deviation, it also includes an unavoidable degree of subjective and judgmental aspects, which can't be quantified. Then we should not be misled by the use of the term "engineering".

IV- Three aspects to the study of risk:

a) Risk in the decision making process:

In every decision we take, we seek an outcome that will, hopefully, take place shortly or longly after that, decision has been taken. However, we know that there are always "forces" that may not allow the outcome to materialize the way we intended for it to be. Some of these forces are well known to us, others are mysterious and may remain beyond comprehension. But we know they are these. This aspect of risk is not new, rather humans have always been aware of it. For this reason, they could distinguish between events that are purely random and those that are the result of "cause and effect", and they tried to study these causes and how they influence the outcome. When they discover these causes, they will then have more control over the outcome, hence they maximize the area where they have such control. This is what gave rise to the importance of information about the decision we are to take. All this is well known to everyone to the degree that it can be considered part of the human nature.

b) Measurement of risk:

If these forces that cause the outcome of our decision to be contrary to our desire do exist, then surely these forces must be sometimes strong and sometimes weak. It is not

difficult to see that. However, developing a method that enable us to attach numerical values to risk, didn't take place until may be the 17th century, particularly on the hands of Pascal who pioneered probability theory.

Though probability theory originated as an attempt to excel in the games of chance, it soon became the platform for the study of risk. Out of it came the ability to attach a numerical value to these forces that cause the outcome to deviate from the desired path. Hence, we can compare the risk involved in smoking two packets of cigarettes a day, and that in travelling by train!…etc.

c) Risk as object to exchange contracts:

Now that we know the value of this "risk", it became possible to sell and buy such risk.

We know that goodwill is a valuable thing. However, it became possible to "sell" such goodwill only when it became possible to measure the commercial value of trademarks and company names via volume of sales and rate of profit. Though goodwill is intangible, but it is, still a thing with unmistakable value and substance. Risk is different. It is difficult to comprehend how risk can be an object of an exchange contract, for what is desirous is not

"risk", but compensation when ever strikes. However, in a contract where consideration goes up or down dependent only on the "size" of risk (or probability of a happening to take place), one cannot escape the conclusion that what is being exchanged for price is "risk".

V- An Islamic Approach to risk:

A Muslim investor (natural or legal person) are no different from other non-Islamic investors.

They are both risk averse. Therefore they would spare no effort to calculate risk and make sure they are fairly rewarded, in their investment, for the amount of risk they bear. Risk is avoided because it threatens to reduce the value of investment.

One can distinguish between a Muslim and non-Muslim investors, not in the fact that they both face risk (or try to avoid it) but in the fact that their risk profile is different. This is because such profile includes, for the Muslim investors, the risk of earning non-permissible income in the risk of non-Muslims earning, if such earning happen, they must be disposed-off by the investor which effectively means that the value of his investment will be reduced. It can then be considered a risk.

VI- What gives rise to innovation in Islamic finance?

Financial Engineering is a means to innovate. We do need innovation in Islamic finance for reasons that may not very dissimilar to conventional banking. They are:

a) Regulatory constraints:

Shari'ah restrictions that need to be abided by in financial transaction plays a role similar to tax and regulatory constraints in conventional finance. The main part of *Shari'ah* restrictions in the realm of finance is the prohibition of *Riba* and other transaction involving *Gharar*. Such prohibition forced Muslims to develop new forms of contract and modes of transactions for the purpose of avoiding interest. Murabaha presents an interesting case of financial innovation. Banks are financial intermediaries. They have to be able to master assets and liabilities. Because most of bank's liabilities are short-term funds, it has to be near liquid in its assets. Yet for it to be Islamic, it has to engage in "trade" where money is not exchanged for money (as is the case in conventional banks) but goods and services. It goes without saying that the bank will no longer be a financial

intermediary if it engages in production and storage of goods and commodities.

Murabaha was developed to be a sale-cum-financial contract. This was done by introducing several elements into the classical form of Murabaha so that this contract lends it self easily to banking needs. Most important of which is what is called "order to purchase" and "promise to purchase".

b) Risk created by avoidance of interest :

Once a new form of contract is developed for the purpose of avoiding interest (e.g. Murabaha) a new set of risks are created which may be different from standard credit transactions. For example:

(1) A Murabaha transaction is effectively a sale contract it includes a buyer-seller relationships not borrower–lender. Hence risk of the commodity will have an effect on the transaction.

(2) Credit transactions in convential finance are based on the concept of time value of money. Indebted party must compensate the creditor as long

as the loan is not paid off. Compensating penalties, rescheduling of loans as well as prepayments are all part of every day banking activities.

While time value of money is not ignored in Islamic finance, two conditions are imposed on the calculation of such value:-

(i) That it is in a contract of exchange (sale hire,…) not Loan.

(ii) That it is considered only at the time of orignating the contract. At no stage after that it can be considered.

This means that in all debt based modes of finance (such as Murabaha and Istisna), the bank can only run after a delinquent client in court rooms and arbitrations committees, but will not be compensated for forgone earnings. Any such earning falls within the definition of *Riba*. In fact, this is the Quranic *Riba* (*Jahilliah Riba*) is which no disagreement amongst scholars have ever arise about.

This means that Islamic banks are at a disadvantage because borrowers will find it to their benefit to delay payment.

c) Risk and Gharar:

There is a fundamental difference between the concept of risk and that of gharar. Gharar is the contractual uncertainty in exchange transactions. While a contract impeded with gharar is void from Shari'ah point of view, the same cannot be said about risk. Risk is a natural thing, which exists in every situation. It can't be avoided. While gharar is a special risk created by the structure of the contractual arrangement between two parties. For example, lending money to a non-credit worthy individual (or selling him on Murabaha basis) is risky, but it is not gharar. On the other hand, selling an object for two prices one for cash and the other from differed price leaving the matter to be decided by the buyer after sales has been effected is void because it is gharar. But it may not be very risky.

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