THE IMPACT OF BLOCKCHAIN ON RISK MITIGATION IN ISLAMIC FINANCE: A NEW MECHANISM TO MITIGATE GHARAR RISKS.

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Abstract - The purpose of this paper is twofold: to explain the Islamic modes of finance nature-related features of risk, and investigate the use of blockchain technology in managing risk in Islamic finance. The major result is that the nature of manageable risks in Islamic and traditional finance exhibits similarities in many aspects. Nevertheless, the Islamic joint ventures and sales-based modes of finance are facing special type of risks. The most outstanding and unmanageable risk is related to Gharar . The paper emphasized that the traditional risk mitigation tools are unable to manage the special risk in the form of Gharar. Finally, the paper summarizes the potential contribution of blockchain technology in mitigating risks in the Islamic mode of finance (specially Gharar risk) and highlights its efficiency.

Keywords - Blockchain, Risk Management, Gharar, Sharia Rule.

I. INTRODUCTION

The Islamic law of contract, focuses on the certainty and credibility, so, the transparency required in all types of legal transactions, which is considered invalid in case of there is a lack of transparency from both or one participant, offer and acceptance , existence, ownership, possession of subject matter come as basic components of the valid contract, certainty of agreed price, time and place of delivery, subject matter specifications, all are conditions that create less uncertainty, and eliminate any level of ignorance, this forbidden ignorance and uncertainty known in Islamic jurisprudence as "Gharar", by the side with "Riba" considered as the two main prohibitions in Islamic commercial law, this create the special characteristic of Islamic financial system as a famous ethical finance, widely used in both Islamic and non Islamic societies,.

The great extend of the communication technology in banking industry, increased the efficiency of the provided services, Blockchain considered as the greatest effective tool might use in banking transactions, Islamic banking institution as well intend to provide proper banking services, to achieve the customer satisfaction in the current fierce competition, so Islamic fin-tech emerged as a current issue in many researches and scientific conferences, as an approach to develop the quality of provided service, supporting the required integration for Islamic finance industry in global markets. And attract more seekers for Islamic financial services. This objective needs more effort and adjustment to the tools and methods used in Islamic financial institutions, to achieve the attractive level of financial performance. Risk management is one aspect usually discussed regarding the weakness of Islamic finance, for the modes types that adopt real productive activities rather than providing cash, which are considered risky modes, facing high rate of non-performing debt.abd defaults, due to the violations of Sharia[1] conditions of valid contract, that come from the potential uncertainty, as special type of risk in Islamic modes of finance, it has been defined as "Gharar[2]" risk in Islamic jurisprudence.

The Blockchain Technology:
The blockchain is a distributed database with the ability to be managed; it is a continually growing list of named records (blocks). Each block contains a timestamp and a link to the previous one. The Blockchain was designed in a way that it can preserve the stored data and prevents it from modification, that is, when the information stored in the block, this information cannot be later possible to modify. The Blockchain consists of four main components(Sutardja Center for Entrepreneurship & Technology,2015), [1]

The Blockchain Areas of Uses:
Blockchain properly used in many areas related to trade activities:

Registering property : with the Blockchain all types of properties can be registered, including tangible and intangible

Transaction documentation: open distributed digital record allow everyone to record the transactions details

Intermediation function: the Blockchain can play as a mediator in service providing process , as bank in money transfer and broker in trade transactions and so on [2]

[1] It is derived from the religious precepts of Islam, particularly the Quran and the Hadith. In Arabic, the term Shariah refers to God's immutable divine law and is contrasted with fiqh, which refers to its human scholarly interpretations

[2] *Gharar* is an Arabic word that is associated with uncertainty, deception and risk

Blockchain can make the process more transparent, increasing trust on all sides and reducing bureaucracy. Self-executing contracts or "smart contracts" can assure all required steps have been executed before money is transferred, released from escrow, or repaid to the bank, or before any titles are transferred. The distributed qualities of Blockchain mean parties would no longer be reliant on a single "source of truth" (typically a lawyer), increasing trust, lowering costs, and speeding up transactions.

Risk in Islamic mode of finance

In Islamic finance, the first systematic discussion on risks was produced by Elgari , who defined the concept of mukhatarah (risk) as "the situation that involves the probability of deviation from the path that leads to the expected or usual result" and "the likelihood of loss, he linked the risk to the Gharar elements in contractual relation,[3] which is proper link, as uncertainty increases the risk level, especially in trade transactions, while certainty mitigate the risk, the valid contract in Islamic point of view supposed to be clear without any ignorance, that may cause any injustice or deception .

A comparison done by Wasiuzzaman and Gunasegavan, resulted that , liquidity and operational risks were highly significant in affecting profitability (performance) the risk in Islamic mode of finance comes from the potential violation to the condition of valid contract, due to less transparency [4]. This classify the Islamic mode of finance as risky compare to conventional one, that's strongly affected by the wider trust space.

Febianto attempted to answer the question: Why are Islamic banks reluctant to indulge in Mudaraba and Musharaka financing? And why risk in both contract higher? He investigate the risk elements in both contracts, and how the risk that connected to the principle of profit and loss sharing creates extra risk levels, the main conclusion of the study was that risk management can give Islamic banks guidance on how to manage risk attributed to profit and loss sharing arrangements through Mudaraba and Musharaka contracts. Febianto indicated that this guidance can motivate Islamic banks to be more participative in profit and loss sharing arrangements, especially on their asset side [5]. Although this couldn't apply specially in Mudaraba , in the case of bank as capital provider, similar in Musharaka , it is observed that bank contributes in management, but less than client contribution,

Sundararajan and Errico agreed with this argument where Islamic financial institutions with Islamic banking institutions as a major part can be riskier than conventional financial institutions due to the specific nature of contract risks, namely, the unrestricted number of ways to finance a project using either profit and loss sharing or nonprofit and loss sharing contracts. Another factor that renders Islamic financial institutions riskier than its companion is might be due to the nonstandard practices in each type of contract[6].

Gharar as risk in Islamic finance

The concept of Gharar in Islamic finance refers to a specific type of risk, where the concept of risk in Islamic financial transactions is a broader concept, that includes acceptable risk to yield and profit entitlement. These risks give legitimacy to financial transactions and can be classified as risk that can be managed by risk mitigation tools. As risk sharing is of the principles of the Islamic financial system.

The assumption of business risk is a precondition for entitlement to any profit over the principal. The important Shariah maxim: "Al Kharaj bi-al- Daman[1]" or "Al Ghunm bil Ghurm[2]" is the criterion of legality of any return on capital, meaning that one has to bear loss, if any, if he wants to get any profit over his investment. Profit has to be earned by sharing risk and reward of ownership through the pricing of goods, services or usufruct of goods. Investment in the Islamic context is not merely a financial or monetary transaction in which transfer of funds is the only activity. Investment, both by banks' depositors and the financial institutions, will be considered only if it is a part of real activity or is itself a real activity.

In all economic activities there some commercial risk and one has to bear that risk for the validity of the profit or earnings. In other words, the return on invested funds that plays a productive role in any business is a factor in the willingness and ability to cause "value addition" and bear the risk of a potential loss in the business. Reward should depend on the productive behavior of the business, where funds are used, implying that interest, lotteries, gambling, etc, are prohibited, because return in respect of them either does not accept the business risk or is based on pure luck, chance or hazard.

The risk management in Islamic finance intends to mitigate the Gharar features, as the exactly meaning of special risk, that indicates any potential action occurs from contract parties to violate the conditions of the contract, which is usually unmanageable, and observed clearly in Islamic modes of finance, These risks represent the main reasons for the high risks observed in Islamic operations relatively, despite the traditional tools used to reduce risks, such as "Rahn,"[3] "Daman"[4] and "Kafalah"[1], however, the rate

[1] Al-kharaj bi al-daman refers to benefit from a certain thing is in return for the liability that accompanies that thing.
[2] Islamic legal principle means returns are justified by taking risks
[3] An arrangement whereby a valuable asset is placed as collateral for debt. The collateral may be disposed in the event of default
[4] contract of guarantee

of debt default is significantly higher in Islamic financial operations, this requires innovating modern tools to address these risks, which is risk that cannot be manage by traditional means used in Islamic banks.

Blockchain as a tool to avoid Gharar

The Blockchain technology involves a new features to the financial transactions, it creates a transparent environment to business, while no chance to any immoral actions may affect the justice values that supposed to be exist between people in their interaction, this will never be perfectly possible without this new technology, the reason behind this assumption is that all participant deal in a disclosure contracts, Blockchain technology has unique characteristics that may revolutionize many sectors of financial services, including individual investor payments, institutional payments, capital market and equity services, trade finance and insurance. The impact of this technology is not limited to the huge savings that can be achieved through the use of this technology only in the operations of the support institutions, but also in the substantial gains of transparency that may have a very positive impact from the audit and regulatory perspective. It may also have a long-term impact on the global economic system, which will restructure the markets, the experience of customers and the advantages of products.

Participants in an accredited network retain the same version of the ledger that contains the list of transactions. The ledgers are updated with the latest supported transactions. Complete transaction history visible to network members, allowing for review and tracking [7] this creates less uncertainty that Islamic valid contract trying to control with the validity conditions, that intend to create the required levels of transparency provided by the Blockchain, enhances fairness and ease of access to data within a network, transparent information removes intermediaries involved in the processes, increases efficiency, and reduces risks .This is exactly what the Sharia aims behind the prohibition of Gharar, since records on the Blockchain are time-stamped and secure, data manipulation and fraud are detectable and traceable on the ledgers. This provides trust and reliability for the transaction partners,

Islamic finance replaced sales, partnership and rent with lending interest-based, this replaces actual activities instead of providing money in finance , Islamic finance considers money as potential capital, there is no time value of money in Islamic finance, instead, there is time value of prices. For instant finance in Islamic perspective provided through the sale, with deferd payment in Murabaha and advance payment in Salam and Istisnaa, applying the Sharia rules regarding prohibition of Riba and Gharar, there are different conditions required to validate the contract, certainty in price guarantees the prohibiting of Riba, existence, possession and ownership guarantee the prohibition of Gharar, although this clear and specific rules it has been observed there is a possibility to create a contracts as a way to get the money, without real transaction, it considered as Ghrara in the Sharia point of view, in such cases, the contract considered invalid, this is a source of high risks may endured by Islamic banks, appears in a high rates of nonperforming loans.

The risk management in Islamic banks required a system. It is important to be an integrated and comprehensive system that identifies and quantifies the potential impact on the business, assets and revenues of the Islamic bank, and then evaluates and controls this potential risk. To achieve this, it is important to develop appropriate plans and tools, in order to avoid and control the risks. Credit risk means the client's failure to meet his obligations on time .this is negatively affects profits and returns, in many cases credit risk burns from the lack of transparency and uncertainty, Islamic banks should face those risks with new innovative products and services, to achieve a high level of banking services quality, through the application of the latest technologies.

Sometimes in Murabaha contract, the bank does not buy the item itself, but the client as agent execute the purchasing, on behalf of the bank, in such cases, it has been observed that client may fabricates the purchasing with fake documents, in order to take the money, the role of the bank is to pay the amount for the agreed profits, which is typically the interest loan, this considered as Gharar and validate the contract, for the less transparency in the operation. The Blockchain technology as a proper way of tracing the item, will be very useful in such cases, the reliability of transaction can simply conform, any fraud transaction, deception and dishonesty lead to future defaults in payment, could minimize to the lowest probability, execute of agency contract given to client, source of contract subject matter and payment all can verified and approved with the blockchain, thus it consider as a proper risk mitigation tool, , enable Islamic bank to avoid the main reason for default risk in Murabaha contract. As in most murabaha operations banks depend in the asset/good itself as a guarantee (Rahn), so the default risk increases if the pledge is missed, under value or any similar reasons.

Beside many possible risks “Gharar” that representing the valuation of rules, regulation and conditions governing the Murabaha valid contract ie: i) Customer did not purchase fresh assets/goods which has already purchased and now wants funds for

[1] Responbility of an entrepreneur

the payment to the supplier; involves "Bai al Inah"[1], so non-Shariah-compliant, ii) Goods/asset have been used by customer before offer and acceptance; do not exist when Murabaha is executed, so non- Shariah-compliant. In transit, the risk of destruction of goods before offer and acceptance without agent's negligence.

With Blockchain banks will be able to keep track of all goods/ asset details that required mitigating the risks, more effectively than the traditional tools used in Islamic banks, In Murabaha, Islamic banks have to face additional asset risk, greater fiduciary risks, greater legal risk and the Shariah compliance risk. To mitigate the legal risk, usually special care given to completing documentation for various contracts under the guidance of the bank's legal department. Adherence to the AAOIFI's Shariah Standards would enable the bank to get Shariah compliance. In this regard, the role of Shariah supervisory boards/advisors is of crucial importance in applying proper internal controls for Shariah compliance. Mistiming in documentation may lead to loss of income. Therefore, an Islamic bank must strengthen its internal Shariah control and risk management departments. Despite all these traditional tools still Murabaha classified as highest mode of finance in Islamic banks.

Same misuse practices observed in Salam and Istisnaa contracts, and lead to violations of Sharia conditions ,client may use the advanced paid amount in different purposes, which is high risk potentially the Islamic bank might face, and with no doubt delivery of contract subject matter will be uncertain. There is also quality risk, low investment return or loss, which occurs when goods received are not of desired quality or unacceptable for the potential buyer. The bank might also not be able to market the goods in time, resulting in possible asset loss for the unsold goods and locking funds in the goods until they are sold, In order to manage and mitigate the above risks, Islamic banks need to take proper measures. In fact Islamic banks purchase only goods that have good marketing potential; they take proper security and a performance bond; they require from the prospective buyers a sufficient amount of earnest money in deposit and a binding promise to purchase these goods; they also insert a penalty clause in the Salam contract to protect themselves from a late delivery from the supplier; and they accomplish the responsibility of parallel Salam by purchasing similar goods from the market on spot to supply these to the buyer and recover the loss, if any, from the seller in the original Salam

Despite the traditional tools used by banks to mitigate the above mentioned risks, salam remain as high risk mode of finance , come from this particular kind of sale nature, which required higher level of transparency and integrity, otherwise great risk involved. The blockchain as open ledger can reject any transactions from the client's Salam bank account to any purposes rather than the related to the production of the agreed item in salam or istisnaa, such as, any consumption transactions, asset purchase, Islamic bank can required the necessary evidences to approve the transaction or reject the transaction if not within the project purposes, as most of the default in delivering the Salam or Istisnaa happens due to dishonor, and Gharar. It is a fact that Salam and Istisna'a transactions are very risky in nature as the customer has not any direct obligation of repayment in monetary terms but has an obligation to deliver certain commodity or asset at the specified time. Due to this reason, Islamic banks face some unique unmanageable risks.

In participation base mode of finance, Musharaka and Mudaraba, it considered as Gharar in case of the Mudarib invested out of the capital provider restrictions, while it is difficult for the capital provider to sharply follow the "Mudarib" who is managing the business, in such cases, the risk involved in the contract, getting higher and difficult to be managed, specially the risk endured by the capital provider. Same risks probably exist in Musharaka, while one of the partners, Musharakah contract is based on trust (amanah), where each partner is considered a trustee to one another like in the safe-keeping (wadiah) contract. The general principle in all trust-based contracts is that no liability except in the case of negligence or misconduct. Therefore, so long as the partner observes the terms and conditions of the contract, and does not get involved with negligence or misconducts, he shall not be liable for any losses of his partner's share of capital accordingly; there should not be any element of guarantee of capital nor profit in Musharaka as it violates the essence of the contract. If, however, capital is guaranteed in Musharaka contract and all profit is stipulated to one partner only, the contract is no longer considered as Musharaka, rather; it is ruled as a loan (qarḍ) contract. Hence any increase over and above the capital will be tantamount to Riba. This increases the risk probabilities strongly in both Musharka and Mudaraba contracts.

CONCLUSION

Islamic finance institutions, compared to conventional institutions, face extra risk, due to the differences in nature of the finance, the conventional

[1] The sale and buy-back transaction of assets by a seller. A seller sells an asset to a buyer on a cash basis and later buys it back on a deferred payment basis where the price is higher than the cash price. It can also be applied when a seller sells an asset to a buyer on a deferred basis and later buys it back on a cash basis, at a price which is lower than the deferred price.

institutions provide money, while the Islamic institutions involved in real activities, this make the difference in risk type, it considered as special type of risk unmanageable, unavoidable and void the operation, this required modern tools to manage this type of special risk, Gharar represents this risk and widely observed in most of non performed debt in Islamic institutions, the blockchain can provide a perfect mechanism to eliminate this risk, with more transparency and less uncertainty. Developing specific tools will minimize the Gharar risk, such as monitoring the transactions in the suggested bank accounts to the finance operations (opened specially for the operation) tracking ownership, existence, possession, and other components of valid sale, moreover the modern technical tools can give more space for bank to participate in managing the Musharaka operations, and Mudaraba monitoring, best ways to approve the client financial capability. The Islamic financial institution can use the blockchain technology to as an approach to initiate sufficient tools in risk mitigation .

The future work will focus on separately initiate mechanisms to mitigate the risk in Islamic modes of finance, with more focus on each mode risk nature , and the useful of blockchain technology

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