# Measuring Risk and Profitability for the Islamic Financial Modes: The Experience of Sudanese Islamic Banks

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**Abstract:** The consequences of the lack of effective Islamic financing methods can be considerable and given the strong competition it is facing, may threaten the existence of Islamic banking. This paper is an empirical study of the efficiency of PLS and non-PLS methods in the banking industry in Sudan. It seeks to answer the following questions: Is it correct to say that most of the Islamic financial banks in Sudan (during 1993–1999) were heavily involved in short-term *murābaḥah* and *salam* rather than long-term investment financing (*muḍārabah* and *mushārakah*)? Was *mushārakah* more efficient than *murābaḥah* and *salam* in terms of profitability and risk? Financial ratios are applied in measuring performances to answer these questions. Statistical analysis is used to determine their significance according to the factors of profitability and risk. The results of this study indicate that the lack of knowledgeable bankers capable of selecting, evaluating and managing profitable projects is a significant cause for the paucity of PLS projects. The paper exposes the key issues involved in bad debt and general risk for the aforementioned methods, and demonstrates the need for bankers trained in feasibility studies skills to make up for the lack of efficiency in managing, controlling and following up *mushārakah* projects.

## I. Introduction

In recent years there has been significant growth in academic interest in Islamic finance. However, most of the literature has concentrated

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on comparing conventional and Islamic banking, without giving enough attention to practical examples of the techniques of interest-free banking. While this preference was perhaps acceptable in the early years, the expansion of Islamic banking practice across the world means that the studies must now focus in greater depth on that practice.

It is well known from the literature on Islamic economics that interest-free instruments must be deployed for the mobilization of financial resources in an Islamic economy. This means banks may carry out banking functions provided that, in doing so, they avoid the payment and receipt of interest. This practice already exists and is being constantly refined and modified to meet the rapidly changing needs of ever more sophisticated businesses. Almost all theoretical models of Islamic banking are based on PLS contracts, either *muḍ ārabah* or *mushārakah* or both, in which the supplier of the capital and the borrower share in the risks of the business, both when returns are positive (profit) and when negative (loss). This is the basis for what became known as 'interest-free Islamic banks'. In addition to PLS contracts, there are non-PLS contracts such as *salam* and *muḍārabah*. Without a doubt, the PLS contracts are generally accepted amongst most Islamic scholars, so long as the contracting parties adhere to the terms of their contract.

A problem, which poses a major difficulty for the Islamic scholars, is when to use the non-PLS contracts of banking. Are they to be implemented in exceptional circumstances since the PLS is implemented by default? This question is left for the present day scholars to deal with, and one that we will not attempt to answer, as it is outside the scope of this paper. Whether the question is answered or not, the reality is that there are a number of economic choices for both the Islamic bank and the customer when making business contracts between them. However, these may lead us to conclude that the range of contracts available to customers is widened. This is an example of the efficiency-enhancing characteristics of spectrum filling (Iqbal, 2002).

The assumption is made that both parties will be rational and choose a contract that favours both bank and customer. The customer's decision-type and method of investment used by the particular Islamic bank – will largely depend on the risk of the method and the projects

in which the bank's/customer's funds are invested, the returns which they expect to receive from those projects using this method, compared with returns from other projects of similar risk, and the bank's ability to achieve those returns (Pastor, 1999). Other factors relevant to the customer's decision include the time in which return on the capital, may be expected, and the bank's competence vis-à-vis the project to manage and control the investment. Generally speaking, profitability and risk are the dominant factors, as both parties are fundamentally geared towards maximizing profit and minimizing losses. Although one cannot deny that other factors may sometimes play a greater role, one also cannot deny that these other factors, directly or indirectly, affect the profitability and risk margins.

This paper attempts to answer three main questions. Firstly to determine, for the period of study (1993–1999) whether PLS contracts are dominant in the Islamic banking system in Sudan, in terms of using the largest percentage of the funds available. The second and third questions are directly related to one another: the performance of both the PLS and non-PLS contracts in terms of profitability and risk. We will answer three questions by referring to the practice of the Sudanese banks.

The evaluation of Islamic finance methods' performance is important for all parties: depositors, bank managers and regulators. In a competitive financial market, such evaluation provides signals to depositor-investors whether to invest funds in or withdraw them from the bank. Similarly, it highlights whether the banks managers should improve their deposit service, loan service, or both, to improve its finance. Bank regulators are also interested to know this for their purposes.

The rest of this paper is arranged as follows: Section II explains Islamic finance methods and risk management. Section III discusses the PLS and the efficiency of Islamic financing methods. A brief history of the banking sector is presented in Section IV, while Section V provides a brief account of the financial policies of the National Bank of Sudan for the period of 1990–1999. Section VI presents the developments and the state of *mushārakah* experience of the Sudanese banks. Section VII focuses on methods pursued in analysing the data and provides brief information about the sample banks chosen for this study. Section VIII reports the empirical results related to the efficiency of the Islamic

finance for each bank included in the sample, and lastly Section IX draws some conclusions and attempts some recommendations.

## II. Islamic Finance Methods and Risk Management

There are seven basic Islamic financing contracts. The concepts underlying them are relatively straightforward and can be compared to existing 'western' or conventional financial instruments. However, actual financing deals can become very complicated as some banks modify the structure to suit the requirements of specific investors. These deals may contain elements of more than one of the basic Islamic contracts. These methods affect both assets and liabilities on a bank's balance sheet and can be divided into two groups: the ones that are based on the PLS principle (core modes) and the ones that are not (marginal).[1]

The bulk of the assets of banks operating according to a paradigm version of Islamic Banking is represented by PLS transactions, *i.e.* mostly uncollateralized equity financing. These assets are far riskier than the ones represented by non-PLS transactions, which are collateralized commercial or retail financing operations.

It is most important to recognize the impact of PLS modes of financing on Islamic banks, especially the fact that when Islamic banks provide funds through their PLS facilities, there is a recognizable default on the part of the agent-entrepreneur until PLS contracts expire, barring proved negligence or mismanagement on the part of the agent-entrepreneur. In fact, a default of PLS contracts means that the investment project has failed to deliver what was expected, that is a lower or no profit, or loss. In this case, the lower profit or loss is shared between or among parties according to the stipulated PLS ratios (Errico, 1998).

Islamic banks therefore have a lower degree of control of the management of the enterprise they finance through the PLS contract. Credit risk related to financing through non-PLS modes is lessened by the possibility of collateralization, including mortgaging. The assessment of an appropriate level of the capital adequacy ratio for Islamic banks should be primarily based on systematic analysis of the underlining asset portfolio between PLS and non-PLS transactions (Errico and Farahbaksh, 1998). Although the PLS contracts perhaps present significant risks to Islamic banks, they also present the opportunity for high profitability. Accordingly, the assessment and

management of investment risk becomes more difficult in an Islamic environment than in conventional banking because of the following factors (Errico and Farahbaksh, 1998):

(i) PLS modes cannot be systematically made dependent on collateral or other guarantees;

(ii) Administration of the PLS modes is more complex compared to conventional financing;

(iii) The relatively weak legal framework supporting bank lending operation.

Another point to be added here is that the single market Islamization of the banking system, as happened in Sudan, may increase the level of competition. This greater competition, though driving firms to improve their efficiency, may also encourage them to orient their business towards activities, sectors, and/or clients of higher risk.

In order to safeguard invested funds and realize profits, Islamic banks depend more than conventional banks on a set of appropriate policies and adequate infrastructure for portfolio diversification, monitoring and control. They also need to rely on the existence of an adequate supply of trained banking staff skilled in investment and Islamic banking practices to implement these policies.

In sum, there is a need for risk analysis and risk management tools to provide agents with hedging instruments, especially Islamic banks. In conventional banks, interest rates play a key role in managing liquidity, pricing risk and allocating credit. In the absence of interest rates, the risk manager in an Islamic bank faces a greater challenge than the risk manager of a conventional bank of similar size. In addition to this burden, Islamic banks are unlikely to benefit from a critical mass of similar institutions with which the Islamic bank can be developed, thus requiring Islamic banks to hold higher levels of liquidity than conventional banks, with a consequent negative impact on their ability to compete.

The foreseen risks for Islamic banks can be distinguished into five classes as follows:

## 2.1. Customer risk

These may arise due to the customers' behaviour and financial capability, their credit-worthiness, the managerial competence and

efficiency of the customers, the guarantee offered by customers.

(i) The customer's behaviour: The relevant factors in assessing risk are lifestyle and manners, previous dealings and reputation, credibility and honesty. All of these factors have a significant bearing upon the customer's behaviour post-loan, on whether he will carry out the agreements entered into, or has signed the agreement without intending to carry it out. Of course the bank would not like to deal with someone whose behaviour is classed as 'bad' (Khalid, 1987).

(ii) The customer's credit-worthiness: The capital offered by the customer. This is found out through publications such as annual reports and shareholders' bulletins. Profitability and liquidity ratios can also give indications of the amount of capital (Ahmed, 2003).

(iii) The managerial competence and efficiency of the customer: This relates to the customer's dealings with money and operations (Ahmed, 2003).

(iv) The guarantee: A written guarantee from the customer can solve any of the problems faced by the investment. Such a guarantee needs to be something that is easy to sell and easily convertible to cash (Khalid, 1987).

## 2.2. Activity risks

These may differ according to the kind of project agricultural or industrial production or commercial services etc., which differ in the conditions affecting them. For example, agricultural activities are affected by weather conditions, natural disasters and the availability of natural rural sources of production. On the other hand, industrial activities may be affected by and dependent on the availability of skilled labour as well as on the availability of (imported) raw material. Both of these require hard currency, a lack of which impacts on productivity as well as the prices of their products. Commercial activities are affected by the competition as a result of the entry of competitors and by storage and distribution – problems that the Sudan particularly suffers from (Taha, 1989).

## 2.3. General circumstantial risks

General circumstantial risks may be divided into economic and political and legal risks

(i) Economic situations change regarding things like goods that are sold and bought quickly and those that remain hard to sell (Hawary, 1982). Such changes have nothing to do with the relationship between the banks and the customers. Competition, in a broad meaning of the word, is a part of these risks. It can arise from the introduction of new substitutes in the market and introduction of new technology by the producers, from changes in customers' preference (market trends). Other risk areas include money invested being riskier than that which is owned and invested by the owner, the rise in prices for international money transfers, the weakness of the construction and the lack of energy and the transfer to a type of consumerism.

(ii) The political and legal risks. In any country these two factors affect the situation at differing levels. Without doubt, political stability greatly reduces these risks. Also fiscal and monetary pricing policies have very obvious effects. The laws that enable control of imports and exports, affect the performance of government in various realms. The national economic strategy and regulations and policies on investment laid down by the National Bank of Sudan (Sudan Central Bank) restrict and will affect banking operations too (Taha, 1989).

## 2.4. Operational risk
Bad management leads to problems for the projects being financed. Losses are usually incurred as a result of poor investment decisions, which may derive from a mix of factors, including a volatile operating environment, weak internal governance (notably mismanagement), and limited market discipline. Such losses are reflected not only in depreciation of the value of the depositors' wealth, but also in a decline in banks profitability. If not corrected in good time, such decline can jeopardize the bank's soundness. This, in turn, can progressively reduce the banks' role as financial intermediaries and inhibit the mobilization of private savings towards investment (Errico and Farahbaksh, 1998).

## 2.5. Financial risk
The change in the financial position of the company or the corporation and its failure to pay will affect a kind of risk (Ahmed, 2003).

## III. PLS and the Efficiency of Islamic Financial Methods

A well-developed, efficient banking sector is an important prerequisite for saving and investment decisions to promote rapid economic growth. It is the means by which a country's most profitable and efficient projects are systematically and continuously funded (Islam, 2003).

The efficiency of the Islamic financial services' industry has long been a focus of banking research. The amount of attention that banking efficiency research has received is understandable. Its findings have obvious implications for bank managements who seek to improve operating performance, and for policy makers who are concerned about banking competition and bank safety and soundness. Research that shows a positive relation between finance and growth prompts additional studies to focus more narrowly on the banking system.

The widening of the range of financial contracts available and differences in the modus operandi of conventional and Islamic banks have the effect of enhancing competition between alternative banking models, which is expected, and the effect of increasing the efficiency of the financial system. It enables Islamic religious beliefs to be reflected when catering for the financial needs of Muslims in accordance with their faith (Iqbal, 2002). Given the number and range of options available, feasibility studies became especially important and must be used efficiently as the supply of funds is limited, which mainly depend on analysing social economic, technological, financial and commercial marketing data.

Society needs to mobilize savings from savings-surplus units in the economy towards savings-deficit units in the economy. Consequently, allocative efficiency is achieved when funds are channelled into desirable projects. More funds should flow into projects with higher profitability and lower risk (hence, higher value) and vice versa. Another concept of efficiency is the 'full-insurance' type, wherein particular instruments enable participants to hedge or transfer the whole or part of the various risks to other willing participants.

A profit-sharing system is more efficient than an interest-based system insofar as the Islamic banks should be more interested in the productivity of the project than the credit-worthiness of the borrower, and accordingly direct finance towards more productive projects. In this way, instead of going to the low-return projects of more credit-

worthy people, resources should go to high-return projects even if the credit-worthiness of the borrower is lower. The system in that sense is more efficient in allocating resources. Since the return of Islamic banks depends on the success of the project, they may also take part in the management of the project. In particular, being specialized in the area of finance and investment, the banks' expertise can be expected to improve the profitability of the project (Iqbal, 1997). While traditional efficiency measures are usually considered good indicators of banks' performance, other factors related to the assessment of financial institutions should be considered. One of the most important of such factors is risk. Thus, not only is it desirable that financial institutions be efficient, but also that they be secure. However, the interrelationship between risk and efficiency for banking firms has received little attention in the banking literature (Pastor, 1999).

There are many respects in which risk, usually measured through loan losses or problem loans, are related to efficiency. Some researchers find a negative relation between cost efficiency and loan losses in bankrupt banks (Pastor, 1999). There is no doubt that bad debt rates can be an indicator of managerial inefficiency, especially in PLS methods, and failing to get the funding from it can be seen as a sign of this inefficiency.[2]

The provisions for non-performing loan losses (PLL) arise from two main causes: internal and external factors. The first is associated with poor risk management, risk aversion, risk policy *etc*. The second is associated with the general economic circumstances in the region, where the banks are doing their business. While banks can reduce PLL by improving their management or modifying their risk policy, they are not able to reduce the PLL due to external factors. So the risk management efficiency measure should be calculated by removing the effect of external factors so that it is not attributed to managerial inefficiency (Pastor, 1999). Bankers have come to realize that banking operations are affected by managerial efficiency of the bankers themselves. The financial consequences of the lack of Islamic finance techniques, because of the managerial efficiency, can be considerable and may threaten the existence of the Islamic banking system.

More emphasis needs to be placed on bad debts arising from PLS methods, especially PLS contracts. The bank shares in profits, and is liable to any financial loss. There is no serious problem with this

arrangement, if the bank is permitted, and is competent, to monitor the business operations of the firm. However, proper monitoring mechanisms have yet to be devised for PLS contracts, which do not provide any control rights to the financier, *i.e.* the Islamic bank (Pastor, 1999; Dar, 2000).

Regarding, profitability and performance, survival of a firm and the accomplishment of its goals are entirely dependent on its profitability. Continuous losses reduce the firm's capital, drain its assets and leave it vulnerable to lenders and creditors. In this study, the bank's profitability and performance ratios are measured by the reported profit and return on capital per method. Strong profit enables the bank to boost its capital through the right method and signals to investors, creditors and clients that the bank is viable.

As regards to *muḍārabah*, it is worth explaining the main reasons given by Dar and Presley (2000), for the paucity of PLS contracts, notably *muḍārabah*.

First, PLS contracts are inherently vulnerable to agency problems, because entrepreneurs have disincentives to put in effort and incentives to report less profit compared to the self-financing owner-manager. But if this is so, it should apply to *mushārakah* as well as *muḍārabah*. However, for the Sudanese banks, as we have seen and as we will see from the coming analysis, this is not true. Sudanese banks rely heavily on *mushārakah* but not *muḍārabah*.

Second, Islamic banks and investment companies have to offer modes of financing that are less risky than *muḍārabah* or *mushārakah*, given strong competition from conventional banks and other financial institutions, which are already established and hence more competitive. We will show later the risks of *mushārakah*.

Third, equity financing is not feasible for funding short-term projects due to the ensuing high degree of risk (i.e. the time diversification effect of equity). This makes Islamic banks and other financial institutions rely on certain other debt-like modes, especially mark-up, to ensure a certain degree of liquidity.

Islamic banking and implementing PLS contracts as a dominant method of financing meet in many ways. It follows that banks have a role to play in encouraging the customer to use and prefer such contracts to improve the banks' performance. This role could be played in a variety of ways.

### IV. A Brief History of the Islamic Banking Sector in Sudan

The evolution of Islamic banking in Sudan can be divided into four stages. The first stage commenced in 1977, when the first Islamic bank, Faisal Islamic Bank, Sudan (FIBS), which was similar to its Egyptian counterpart, was established in Khartoum (Wilson, 1984). By 1983, three more banks had opened: Tadamoun Islamic Bank, Sudan (TIBS), Sudanese Islamic Bank (SIBS), and Islamic Co-operative bank (ICOBS). However, during this period Islamic banks were operating in an environment dominated by conventional banking.

The second stage started in September 1983, when the whole financial system began to be converted to the Islamic model. That year saw the establishment of the Al-Barakah Islamic Bank of Sudan and the Islamic Bank of Western Sudan (IBWS) (Wilson, 1997). This period was characterized by political and environment crises, which led to structural changes in the country.

The third stage started after the downfall of Numairi's government in 1985, and ended with the military coup of 1989. During this period, many of the traditional banks reverted to their conventional practices. Islamic banks were forced to operate in an extremely hostile environment characterized by negative media coverage, lawsuits and heavy regulations. However Islamic banking expanded rapidly in the mid 1980s, accounting for up to one-third of bank deposits, which gave scope for all the rival institutions to win business. At that time, the economy was experiencing modest growth, and the competition between the providers of Islamic finance meant that bank depositors enjoyed reasonable returns and good services by Sudanese standards, while borrowers faced less risk than those funded by conventional banks. Since the late 1980s, the Sudanese economy has deteriorated, partly due to natural disasters such as drought and floods, but also because of incompetent government and financial mismanagement. This resulted in high external debt, and a structural adjustment programme imposed by the IMF that was unsuccessful. In this difficult situation, the Islamic banks have done well to survive (Wilson, 1997).

The fourth and the final stage started in 1989, when the whole economy was transformed in order to conform to Islamic law (Bashir, 1999). The single market, coming from the Islamization of the banking system, has substantially increased the level of competition in the Sudanese banking system. This greater competition, by driving firms

to improve their efficiency, may also encourage them to orient their businesses towards activities, sectors, and/or clients of higher risk.

## V. General Characteristics of the Financial Policies of the National Bank of Sudan, 1990–1999

The objectives of a central bank in an Islamic economy do not differ fundamentally from is conventional counterpart. Ensuring the stability of the currency has been noted in the history of Islamic scholarship on economic matters. However, the real difference between the two types of central banks is in the instruments that each can deploy to achieve their common objectives (Khan, 2002).

The profit sharing ratios in an Islamic financial system could be used by the central bank as an instrument of credit control. In particular, the investment share ratio could be used to regulate the level of economic activity, while the partners share ratio could be used to control the money supply.

A central bank should co-operate with other authorities to achieve balanced economic growth and development, characterized by an equitable distribution of income and growth. Therefore, a central bank may pursue up a policy that decides the distribution of the Islamic banks' funds according to the need in different sectors of the economy – industrial, commercial, agricultural, *etc.* Accordingly, the Bank of Sudan, as a central bank, issues a set of regulations and financial policies to realize its annual objectives. The extension and enforcement of these regulations concerning financing contracts are set to monitor and control money supply and demand, to direct the available funds to certain sectors according to the economic policy, to protect the depositors, to reduce uncertainties arising from the present structure of property rights that tend to discourage private investment, and to fund small producers.

One notices that the policies of the Bank of Sudan concentrate on financing certain sectors like the agricultural sector more than on contracting out these funds. However, there are some regulations that control the finance contracts. For instance, the Bank of Sudan operationalizes three regulations: setting the first instalment percentage and the capital sharing percentage in *mushārakah*, setting the minimum ceiling for the partner to invest within any *murābaḥah* project; setting the maximum permissible profit margins for *murābaḥah*.

Table 1: Minimum Percentages of the Capital Sharing of the Customers in *Mushārakah* Projects in Sudanese Banks, 1993-1999

| Year | Sector Financed | The Percentage of the Minimum Capital Provided by the Partner |
|---|---|---|
| 1993-1994 | Internal trading | 50% of the good's price |
| | Priority sectors | 20% |
| | Non-priority sectors | 50% |
| 1995 | Internal trading | 55% |
| | Priority sectors | 20% |
| | Cooperative sector for production purposes | 15% |
| | Cooperative sector for non-production purposes | 25% |
| 1996 | Internal trading | 60% |
| | Priority sectors | 25% |
| | Export Cooperative sectors for the production purpose | 20% |
| | Cooperative sector for the non production purpose | 30% |
| | Professionals | 15% |
| | Small producers | 10% |
| 1997 | Internal trading | 75% |
| | Priority sectors and export cooperative sectors for production purposes | 40% |
| | Cooperative sector for non-production purposes | 50% |
| | Craft makers | 30% |
| 1998 | Internal trading | 70% |
| | Priority sectors | 36% |
| 1999 | All sectors | Percentages were left to the individual banks |

*Source*: National Bank of Sudan, *Financial and Credit Policies for the Period* 1990-1999.

Overall for the period 1993–99, as Table 1 depicts, we see a gradual increase of the minimum percentage of the capital share of customers in *mushārakah* projects. For instance, for internal trade,

it comprised 50%, 55%, 60%, and 70% for the period beginning 1993. For the priority sectors during the same period, it was 20% for three years, which then increased to 25%, and then up to 40%. It should be noted that the same gradual increase in regard to financing the production sector. This may indicate an intent to discourage customers from asking for funds using *mushārakah*. It may indicate also that *mushārakah* is preferred by the customers. For that reason and in order to control money supply and demand, the central bank issued such policies. However, more formal statements of Bank of Sudan's start with a number of guidelines or rules, one for which is the Bank's duty to encourage *mushārakah* contracts.

*Murābaḥah* was regulated by using a policy that set the minimum ceiling for the partner to invest. Then another policy, the maximum profit margins policy, was added in 1995. Tables 2 and 3 depict both the increase in the first instalment percentages as well as the decrease in the maximum profit margins percentages for *Murābaḥah*.

Table 2: The Minimum Ceiling for the Partner to Invest within any
*Murābaḥah* Project in Sudanese Banks 1993-1999

| Year | Sector Financed | The Minimum Percentage of the *Murābaḥah* First Advance Instalment |
|------|-----------------|-------------------------------------------------------------------|
| 1993 | Priority sectors | 25% |
| 1994-1995 | Cooperative sector for the production purpose and craft makers sector; | 15% |
| | Cooperative sector for the non production purpose; | 35% |
| | Priority sectors | 25% |
| 1996-1998 | — | — |
| 1999 | All sectors | 25% |

*Source*: National Bank of Sudan, *Financial and Credit Policies for the Period* 1990-1999.

Table 3. *Murābaḥah* Profit Margins in Sudanese Banks 1993-1999

| Year | Sector financed | The maximum profit margins |
|------|-----------------|----------------------------|
| 1995 | Priority sectors | 36% |
|      | Craft makers | 25% |
|      | Small producers | 15% |
|      | Cooperative sector for the production purpose | 25% |
|      | Cooperative sector for the non production purpose | 36% |
| 1996 | Agricultural Industrial and Export sectors | 30% |
|      | Other priority sectors | 36% |
|      | Professionals | 20% |
|      | Family producers | 15% |
| 1997 | Priority sectors | 35% |
|      | Small producers | 30% |
| 1998 | Agricultural Industrial and Export sectors | 45% |
|      | Other priority sectors | 40% |
|      | Professionals and craft makers | 35% |
|      | Small producers | 30% |
|      | All permissible sectors | 20% |

*Source*: National Bank of Sudan, *Financial and Credit Policies for the Period* 1990-1999.

In general, tables 2 and 3 indicate the goals of these policies, one of which is to discourage the customers from using *murābaḥah* and to persuade them to move to other finance methods. That is more obvious when we see that the use of *murābaḥah* or *salam* in the internal trade was prohibited during this period (BOS, 1990–1999). However, as we will prove later, this policy did not meet with much success. One can notice that 1999 was the first year that these policies were left to the negotiation between the bank and the customer in these finance methods as well as the marketing of banking services (Ahmed, 2003).

## VI. *Mushārakah* in Sudanese Banks
Partnership financing can be short or long-term. Short-term financing is arranged to provide working capital of one production period

ranging between 3 and 12 months. The long-term financing covers financing of capital assets extending over a period of more than one year. It can also be continuous or diminishing. In a diminishing partnership, the share of the bank in the project diminishes through repayment leaving the project to be wholly owned by the client at the termination of the financing contract.

The following types of *mushārakah* contracts are observed operated in the Sudanese Islamic banks:

(i) *Mushārakah* partnership of certain financial transactions. In this type of *mushārakah* the bank pays up to 40% of the capital of a given project, which is most likely to be a short-term, internal trade type project.

(ii) *Mushārakah* through sharing the operational capital. This type of *mushārakah* takes place when the customer has in his possession an asset, be it a company or factory of some kind, but does not have sufficient funds for the day-to-day expenses. The bank provides the customer with financial support for the day to day running of the business, and in return earns a share of the company's profit.

(iii) Declining *mushārakah*. The bank collaborates with a customer who invests less than the bank in a certain project. Once the business is up and running the bank takes a larger share of the profits and while gradually reducing its ownership in the company in favour of the customer. This continues until the customer becomes the sole proprietor of the business.

(iv) Continuous *mushārakah*: This refers to circumstances where both parties, the bank and the customer (whose share in the company is usually not below 25%), collaborate specifically for long-term projects. The amounts of their capital invested in the projects are reflected by share values, whether in a public or private limited company.

The Islamic banks in many Muslim countries have occasionally used this partnership financing scheme to provide working capital for the enterprises. Most banks have relied principally on the mark-up mode. Sudanese Islamic Banks (SIBs) are the exception in that they have mainly used the partnership financing mode in a variety of cases and done so with considerable success. SIBs play a great role in

assisting poor families. SIB regards the family as a productive unit. For increasing family income, it finances small enterprises usually located in the house-premises. For this purpose, SIB operates Productive Families Branches in residential areas (Akhtar, 1997).

Some of the important features common in these cases are:

(i) These projects were of three months' duration.

(ii) The projects were located within a distance of 0.5 to 4 kilometres from the bank. Hence, it was easier for the bank to follow up and monitor operation of the projects.

(iii) The projects involved relatively small amount of bank investment.

(iv) The bank financed the working capital while the client financed fixed capital and operational cost of the project like labour, meals, electricity, and rent.

(v) The bank accepted the storage of material, personal guarantee, and depositing of regular sales proceeds in place of requiring physical collateral.

It is important to note that the arrangements mentioned at (iv) and (v) above effectively solved the intractable problems of equity and physical collateral faced by small entrepreneurs.

Regarding partnership financing in the agricultural sector, the rural development departments of SIBs have successfully utilized the partnership financing scheme in the agriculture sector. From their side, SIBs provides a comprehensive package of inputs and services on real cost basis through various instruments These instruments include co-farming, co-irrigation, lease of machinery, and agricultural and marketing services (Akhtar, 1997). SIBs implemented a number of projects at different places in Sudan with substantial benefits to themselves and farmers. The bank provided machinery and other service inputs in these projects, while farmers provided land and operating expenses. SIBs have also utilized extended versions of the scheme in the agriculture sector. In some cases, they have put together a tripartite partnership consisting of a farmer, bank and an expert. The farmer supplied land and labour, the bank provided working capital,

while the expert provided management and supervision. Usually 30% of the net profit is reserved for the expert and the remaining profits are distributed between bank and farmer on the equity share basis.

Another version of the scheme is setting partnership in marketing. The goal here is to help farmers to fetch good prices for their crops, which are often low at harvest time. At that time the bank buys the crop by paying 50% of the obtaining price and stores it under its supervision, when prices rise to some reasonable level, the crop is sold. Of the profits, 50% goes to the farmer by way of management fees while the other 50% is divided equally between bank and partners.

## VII. Method and Data: Bank Selection Criteria and Data Description

Data was collected from nine of the twenty-two banks in Sudan for which data are accessible. All of the nine banks differ in various ways, which is of benefit to the study. The banks range from small to big, from those of great repute to less known banks, those that specialize in the agricultural and industrial sector to those providing services for all sectors.

The nine banks are Faisal Islamic Bank Sudan (FIBS), Barakah Bank Sudan (BBS), Tadamoun Islamic Bank Sudan (TIBS), Premises Bank Sudan (PBS), Saudi Sudanese Bank (SSB), Animal Sources Bank Sudan (ASBS), Islamic Shimal Bank (ISBS), Umm Durman National Bank (MNBS) and National Workers Bank (NWBS).

It was not possible to gain access to the data of the other remaining banks due to two reasons:

(i) Some of the banks were unable to provide us with data of their finance methods for the whole period of study; and

(ii) Current information on the banks' bad debts as reported to central banks regarding classified methods is not easily accessible to researchers.

The performance of the nine banks was looked at in two ways: for each bank individually, and then for all the banks together, considering them as representing the whole banking industry. The results show that there is no significant difference between five of the nine banks, nor in the overall results of the banks when taken together.

This paper closely studies the results for the four banks for which there were significant differences, to measure the efficiency of the Islamic finance methods and the lack of PLS performance. Thereafter, we will look at the overall performance of the nine banks together. The four banks are Barakah Islamic Bank (BIBS), Premises Bank Sudan (PBS), Tadamoun Islamic Bank Sudan (TIBS) and National Workers Bank (NWBS).

First, a survey of 16 banks shows the following:

(i) All of these banks are using *murābaḥah* and *mushārakah*;

(ii) 85% of these banks are using *salam* and *muḍārabah*;

(iii) 15% of these banks are using other methods.

The proportion of funds allocated to the different methods can be seen in table 4.

Table 4: Total Funds in Sudanese Banks by Method in 1999

| Method | Fund quantity (millions Sudanese dinars) | % |
|---|---|---|
| *Murābaḥah* | 36,203 | 49 |
| *Mushārakah* | 22,717 | 31 |
| *Salām* | 3,727 | 5 |
| *Muḍārabah* | 3,024 | 4 |
| Other | 8,048 | 10 |
| **Total** | 7,3720 | 100 |

The National Bank of Sudan published the distribution of funds among the different methods in 1999, the end of the period studied (BOS, 1999). Table 4 shows the percentage of *muḍārabah* in 1999 was only 4%, which is quite small when compared with the other methods. We will therefore compare *mushārakah*, *murābaḥah*, *salam* and the other methods, including *muḍārabah*. This comparison involves:[3]

(i) The proportions of funding in these methods;

(ii) The proportion of profitability in these methods;

(iii) The proportion of risks associated with these methods;

(iv) A comparison of the relationship between risk and profitability;

(v) The timescale of profitability and bad debts (the time taken to incur either or both) after taking due account of inflation.

For the purposes of this paper, data were gathered for the sample banks, comprising the total available funds of these Islamic banks, distributed through various financial methods, their profits and non-performing debts during the seven years between 1993 and 1999. The data are assembled from the banks' annual reports and from financial and from administrative reports produced by the banks' internal investment sector.

Before presenting the findings, it may be useful to render brief information about four of the major Islamic banks covered in this study:

The Barakah Islamic Bank was established on 26/02/1984. At the time of its opening ceremony, held on 14/03/1984, the bank had 42,575 million dollars of nominal capital of which 200 million dollars was paid capital. Currently the Barakah bank has over twenty branches throughout Sudan.

The main objective of the Sudanese Premises Bank, a specialized governmental institution established in 1967, was to fund private Sudanese land-owners through the issue of short-and long-term loans. However, in 1990, the bank began to offer current and saving accounts to the general public. Currently, the bank owns two companies and has eleven branches in Sudan. The bank, which uses all Islamic financial methods except *salam* to finance its customers, had a nominal and paid capital of 500,000,000 Sudanese dinars.

The Tadamoun Islamic Bank, the second Islamic bank to be established in Sudan, was founded in 1981 with a nominal capital of 50 million dollars of which 20 million dollars was paid capital. The Tadamoun Bank owns three companies and currently has around twenty branches in Sudan.

The National Workers Bank was founded in 1987 with nominal capital of 100 million Sudanese dinars, and the paid capital was 26.5 million dinars. Ten years later the bank had ten branches in Sudan.

## VIII. Reporting the Empirical Results

This section presents the findings from the statistical analysis of this empirical study for each individual bank in the sample by investigating whether PLS contracts are practically dominating the Islamic banking system in Sudan. In addition, the results regarding the measurement of the efficiency of Islamic financing methods in Sudanese banks in terms of profitability and risk for the period 1993-1999 is investigated. Financial ratios are applied in this investigation and in measuring these performances, while F-test is used in determining their significances.

### 8.1. Barakah Islamic Bank Sudan

The statistical analysis (see Appendix Table A1) shows that there is no significant difference in the non-performing debt of the methods in our research, nor in either of the 'debt rates' of the methods. It should be stated that the mean difference is significant at the .05 level.

Table 5: The Percentage Distribution of Fund Ratio of the Different Financing Methods

| Year | Mushārakah | Murābaḥah | Salām | Other |
|---|---|---|---|---|
| 1993 | 0.13 | 0.70 | 0.05 | 0.12 |
| 1994 | 0.14 | 0.70 | 0.05 | 0.11 |
| 1995 | 0.76 | 0.19 | 0.01 | 0.03 |
| 1996 | 0.39 | 0.46 | 0.14 | 0.01 |
| 1997 | 0.15 | 0.63 | 0.14 | 0.09 |
| 1998 | 0.11 | 0.75 | 0.11 | 0.03 |
| 1999 | 0.19 | 0.74 | 0.01 | 0.06 |
| Average | 0.27 | 0.60 | 0.07 | 0.07 |

**Table 6: Return of Equity and Debt Equity Ratios for the Islamic Finance Methods**

|         | Mushārakah | | Murābaḥah | | Salām | | Other | |
|---------|------|------|------|------|------|------|------|------|
|         | RER  | DER  | RER  | DER  | RER  | DER  | RER  | DER  |
| 1993    | 0.49 | 0.05 | 0.29 | 0.03 | 0.20 | 0.15 | 0.12 | 0.67 |
| 1994    | 0.50 | 0.06 | 0.30 | 0.04 | 0.20 | 0.16 | 0.12 | 0.49 |
| 1995    | 0.35 | 0.04 | 0.30 | 0.47 | 0.20 | 1.81 | 0.12 | 0.66 |
| 1996    | 0.35 | 0.09 | 0.30 | 0.02 | 0.20 | 0.02 | 0.12 | 0.65 |
| 1997    | 0.35 | 0.09 | 0.30 | 0.20 | 0.20 | 0.01 | 0.12 | 0.08 |
| 1998    | 0.35 | 0.15 | 0.30 | 0.24 | 0.20 | 0.07 | 0.12 | 0.32 |
| 1999    | 0.35 | 0.00 | 0.30 | 0.31 | 0.20 | 0.92 | 0.12 | 0.75 |
| Average | 0.39 | 0.07 | 0.30 | 0.19 | 0.20 | 0.45 | 0.12 | 0.52 |

This implies that there is no difference in financial performance in regards to risks. however, what the analysis does highlight is the significant difference in the profits and profit rates of the methods. According to this analysis, *mushārakah* is the best method in terms of profitability, as its profit rates are 39%, followed by *murābaḥah* at 30%, and then by the *salam* and the other methods whose profit rates are 20%.

The superior profitability of *mushārakah* may lend the 'decision maker' to focus on this method and in turn direct the bank to be financed by it, regardless of the moral hazards it entails. The analysis should also prompt the 'decision maker' to investigate the problems that give rise to the lack of financial performance of the other methods. Although *mushārakah* is most profitable, Table 6 shows that most of the funds were financed using *murābaḥah* in all seven years of the study, except for 1995.

As regard to the performance of the debt compared with the profit of the methods, it is clear that there is a match between the debt and profit of *mushārakah*: whenever one increases the other does also and vice versa. This financial activity agrees with the economical principle that states that there should be proportionality between profit and risk. According to Table 6 such financial activity does not occur in *murābaḥah*, *salam* and the other methods. In addition, the Table also shows that *mushārakah* profits had both a stable and average profit at the same time, whilst *murābaḥah* profits were fluctuating and the other methods had below average profits.

### 8.2. The Sudanese Premises Bank

The statistical analysis (see Appendix Table A2) shows that there is no significant difference between *mushārakah* and *murābaḥah* in terms of the amount of profits in the case of the Sudanese Premises Bank. However, there exists a significant difference between *mushārakah* and the other methods, namely in the risk taken by *mushārakah* as *mushārakah* has lowest risk rate. *Mushārakah's* financial performance is better than all of the other methods, except *murābaḥah* since there is no difference between them.

Table 7: The Percentage Distribution of Fund Ratio of the Different Financing Methods

| Year | Mushārakah | Murābaḥah | Salām | Other |
|------|-----------|-----------|-------|-------|
| 1993 | 0.48 | 0.31 | 0.00 | 0.17 |
| 1994 | 0.65 | 0.28 | 0.00 | 0.05 |
| 1995 | 0.39 | 0.47 | 0.00 | 0.08 |
| 1996 | 0.49 | 0.28 | 0.00 | 0.15 |
| 1997 | 0.50 | 0.36 | 0.00 | 0.09 |
| 1998 | 0.33 | 0.48 | 0.00 | 0.15 |
| 1999 | 0.53 | 0.33 | 0.00 | 0.10 |
| Average | 0.48 | 0.36 | 0.00 | 0.11 |

Table 8: Debt Equity Ratios (MDER) for the Islamic Financing Methods

| Year | Mushārakah | Murābaḥah | Salām | Other |
|------|-----------|-----------|-------|-------|
| 1993 | 0.05 | 0.04 | 0.00 | 0.04 |
| 1994 | 0.01 | 0.05 | 0.00 | 0.10 |
| 1995 | 0.02 | 0.05 | 0.00 | 0.33 |
| 1996 | 0.03 | 0.06 | 0.00 | 0.31 |
| 1997 | 0.02 | 0.05 | 0.00 | 0.22 |
| 1998 | 0.03 | 0.05 | 0.00 | 0.04 |
| 1999 | 0.01 | 0.08 | 0.00 | 0.13 |
| Average | 0.02 | 0.06 | 0.00 | 0.17 |

Table 7 shows that *mushārakah* had the highest fund ratio between years 1993 and 1999, except for the two years 1995 and 1998, when it was second to *murābaḥah*. The lowest percentage of *mushārakah* during this period was 33% of the total fund. The descriptive analysis in Table

8 shows *mushārakah* to have the lowest risk, which agrees with the empirical results. The average risk for *mushārakah*, *muḍārabah* and other methods are 2%, 6% and 17% respectively.

The time scale of the methods' profits, as shows in Table 9 and 10 adjusted for inflation, shows the fluctuations of *murābaḥah* profits.

**Table 9: Profit Timescale (adjusted for inflation) for Islamic Financing Methods**

| Year | *Mushārakah* | *Murābaḥah* | *Salam* | Other |
|------|------|------|------|------|
| 1993 | 97,774 | 33,066 | 0 | 12,956 |
| 1994 | 14,616 | 14,025 | 0 | 591 |
| 1995 | 16,420 | 26,900 | 0 | 2,280 |
| 1996 | 898 | 803 | 0 | 208 |
| 1997 | 5,109 | 2,270 | 0 | 731 |
| 1998 | 16,418 | 4,880 | 0 | 888 |
| 1999 | 8,510 | 7,676 | 0 | 501 |
| Average | 22,821 | 12,803 | 0 | 2,594 |

**Table 10: Debts Timescale (adjusted for inflation) for Islamic Financing Methods**

| Year | *Mushārakah* | *Murābaḥah* | *Salam* | Other |
|------|------|------|------|------|
| 1993 | 3,650 | 2,153 | 0 | 1,131 |
| 1994 | 3,886 | 10,983 | 0 | 3,211 |
| 1995 | 2,500 | 8,300 | 0 | 8,700 |
| 1996 | 955 | 998 | 0 | 2,648 |
| 1997 | 888 | 1,450 | 0 | 1,480 |
| 1998 | 328 | 834 | 0 | 253 |
| 1999 | 109 | 1,002 | 0 | 457 |
| Average | 1,759 | 3,674 | 0 | 2,554 |

As can be seen from tables 9 and 10, compared to the other methods, which had below average profits, *mushārakah* profits were decreasing during the first half of the period of study but increasing during the second half. This is a clear indication that the bank was taking measures to improve its financial performance with

*mushārakah.* A further indication of this is that when the debt time scale of these methods is adjusted for inflation it shows a consistent decrease in *mushārakah* debt. However, it is necessary to add here that it is clear from the numbers that for a number of years estimated figures are depicted for profit, which may not be accurate. As these results show the good financial performance for *mushārakah*, it will be worthwhile pausing here to review the background about *mushārakah* in Sudanese banks.

### 8.3. Tadamoun Islamic Bank Sudan

The statistical analyses in appendix (Table A3) and in tables 11, 12 and 13 show that *murābahah* was more profitable than *mushārakah*, which implies a significant difference in profitability between the two methods. In point of fact however, we cannot deduce that the financial performance of *murābahah* is better than that of *mushārakah* because in term of profit rates there is no significant difference between them. Similar result can be reached in regard to the risk.

**Table 11: The Percentage Distribution of Fund Ratio (MFR) Islamic Financing Methods**

| Year | Mushārakah | Murābahah | Salam | Other |
|---|---|---|---|---|
| 1993 | 0.62 | 0.24 | 0.09 | 0.09 |
| 1994 | 0.48 | 0.20 | 0.31 | 0.01 |
| 1995 | 0.51 | 0.45 | 0.04 | 0.01 |
| 1996 | 0.53 | 0.40 | 0.07 | 0.00 |
| 1997 | 0.35 | 0.42 | 0.03 | 0.20 |
| 1998 | 0.31 | 0.68 | 0.00 | 0.00 |
| 1999 | 0.51 | 0.41 | 0.00 | 0.08 |
| Average | 0.47 | 0.40 | 0.08 | 0.06 |

Table 11 illustrates how the majority of the funds were financed using *mushārakah*, during our period of study except for the years 1997 and 1998. The average fund ratios MFR for *mushārakah*, *mudārabah*, *salam* and other methods were 47%, 40%, 7% and 6% respectively.

Table 12: Return of Equity and Debt Equity Ratios for the Islamic Finance Methods

|  | Mushārakah | | Murābaḥah | | Salam | | Other | |
|---|---|---|---|---|---|---|---|---|
|  | RER | DER | RER | DER | RER | DER | RER | DER |
| 1993 | 0.02 | 0.25 | 0.45 | 0.16 | 0.02 | 0.00 | 0.00 | 0.01 |
| 1994 | 0.02 | 0.17 | 0.35 | 0.11 | 0.00 | 0.00 | 0.00 | 0.11 |
| 1995 | 0.02 | 0.15 | 0.33 | 0.04 | 0.01 | 0.00 | 0.00 | 0.11 |
| 1996 | 0.02 | 0.16 | 0.04 | 0.06 | 0.00 | 0.00 | 0.79 | 0.54 |
| 1997 | 0.01 | 0.30 | 0.02 | 0.07 | 0.01 | 0.00 | 0.01 | 0.00 |
| 1998 | 0.01 | 0.33 | 0.03 | 0.06 | 0.00 | 0.96 | 10.64 | 0.00 |
| 1999 | 0.00 | 0.29 | 0.03 | 0.09 | 0.00 | 4.27 | 0.00 | 0.13 |
| Average | 0.01 | 0.23 | 0.18 | 0.08 | 0.01 | 0.75 | 1.63 | 0.13 |

Table 12 shows an agreement between profitability and risk for *murābaḥah* compared with *mushārakah*, especially during the first three years, which indicates that although the bank was aware of the fact that *murābaḥah* was better; no measures were taken to improve the *mushārakah* contracts. Moreover, when comparing the debts and profits of the financial performance of *salam*, Table 12 highlights the weakness in managerial efficiencies.

Table 13: Methods' Profit Timescale (adjusted for Inflation) Islamic Finance Methods

| Year | Mushārakah | Murābaḥah | Salam | Other |
|---|---|---|---|---|
| 1993 | 9,182 | 89,474 | 1515 | 0 |
| 1994 | 5,487 | 37,846 | 553 | 0 |
| 1995 | 4,250 | 62,140 | 219 | 0 |
| 1996 | 3,723 | 5,743 | 141 | 316 |
| 1997 | 1,421 | 3,365 | 124 | 518 |
| 1998 | 797 | 6,634 | 0 | 13,481 |
| 1999 | 614 | 3,970 | 0 | 0 |
| Average | 3,639 | 29,882 | 364 | 2,045 |

Furthermore, the profit time scale for the methods adjusted for inflation shows in table 13, the fluctuation of *mushārakah* profit and the below average profits of the other methods. One can explain the

better performance of *murābaḥah* compared to the other methods by way of the guarantee with which *Murābaḥah* contains and not by managerial inefficiencies, which are low in all the methods.

### 8.4. National Workers Bank

The statistical analysis, as depicted in table A4 in the Appendix section, proves that there is a significant difference in profitability between *mushārakah* and *murābaḥah*, with the latter making more profit than the former and than other methods. *Murābaḥah* makes more profits then *salam* than other methods including *mushārakah*. In respect of the risk, the analysis proves that there is no significant difference between them. Based on what we have said ealier, *murābaḥah* is the best amongst all the methods in regards to financial performance.

**Table 14. The Percentage Distribution of Fund Ratio (MFR) for Islamic Finance Methods**

| Year | *Mushārakah* | *Murābaḥah* | *Salam* | **Other** |
|---|---|---|---|---|
| 1993 | 0.00 | 1.00 | 0.00 | 0.00 |
| 1994 | 0.00 | 1.00 | 0.00 | 0.00 |
| 1995 | 0.00 | 0.95 | 0.05 | 0.00 |
| 1996 | 0.00 | 0.97 | 0.03 | 0.00 |
| 1997 | 0.19 | 0.78 | 0.03 | 0.00 |
| 1998 | 0.28 | 0.72 | 0.00 | 0.00 |
| 1999 | 0.05 | 0.95 | 0.00 | 0.00 |
| **Average** | 0.07 | 0.91 | 0.01 | 0.00 |

Table 14 shows the distribution of the National Workers Bank funds through the methods it employs, where 70% was the lowest fund ratio of *murābaḥah* during the period of our study. In addition, *murābaḥah* attained 100% of the fund ratio in years 1993 and 1994. The average fund ratios (MFR) for *mushārakah*, *muḍārabah* and *salam* were 7%, 91%, and 2% respectively, so *Murābaḥah* dominates the fund in the bank. *Mushārakah* had the highest level of risk, as shown in Table 15.

Table 15: Debt Equity Ratios for Islamic Finance Methods

| Year | *Mushārakah* | *Murābahah* | *Salam* | Other |
|------|------------|-----------|-------|-------|
| 1993 | 0.00 | 0.02 | 0.00 | 0.00 |
| 1994 | 0.00 | 0.05 | 0.00 | 0.00 |
| 1995 | 0.00 | 0.04 | 0.00 | 0.00 |
| 1996 | 0.00 | 0.02 | 0.00 | 0.00 |
| 1997 | 0.12 | 0.18 | 0.00 | 0.00 |
| 1998 | 0.71 | 0.22 | 0.00 | 0.00 |
| 1999 | 0.65 | 0.22 | 0.00 | 0.00 |
| Average | 0.21 | 0.11 | 0.00 | 0.00 |

## 8.5. Aggregate empirical results on sample banks

As can be seen from table A5 in the Appendix section, the profit and risk analysis shows that there was a significant difference between the methods, that the significances levels were .038 and .042 respectively. Moreover *murābahah* makes more profit than *mushārakah*, and *mushārakah* more than *salam*. On the other hand *mushārakah* leads to more debts than the other methods and these other methods create more debt than *salam*. The analysis does not show other differences. That may indicate that *Murābahah* is the most efficient method, but we take a further step and test the difference between these methods in respect of profit rates (return of equity ratios) and debts rates (debts equity ratios). It should be stated that the mean difference is significant at the .05 level.

## 8.5.1. *Method's return of equity ratio (MRER) and method debt equity ratio (MDER)*

The profitability analysis shows there is no difference between the methods, which we are studying in respect of profit rates. Their significance is 0.166, which is bigger than 0.05. The significance of the profit rates of the methods studied is bigger than 0.05, approximately 0.298. We can therefore conclude that there is no difference between the profitability of these methods, namely *mushārakah*, *murābahah*, *salam*, and other methods. Similarly the risk analysis shows us that there is no difference between these methods in terms of risk rates that the F test shows the significance to be 0.472 (the mean difference is significant a the 0.05 level).

A common principle in economics is that scales move in the same direction when discussing profitability and risk, so that when there is high risk one should expect high profits and when there is low risk one should expect low profits. It was, accordingly, expected that some methods to demonstrate both high profitability and high risk, but this was not yielded by the analyses.

However, these results describe the rational movement of funds between the methods: whenever a method gives more probability of profit in some instances there will be a preferred economic choice. The reverse also holds: whenever a method gives less probability of profit in some instances the preferred economic choice will be converted to a new preferred method. Other things being equal, such statements can be used to describe the risk.

To conclude there is no difference between these methods both in profitability and risk. Therefore, the analysis represented is theoretical in nature and cannot describe the entire situation. It can however give us some indications.

### 8.5.2. *Method fund ratio (MFR)*

The analysis for the fund ratios difference shows us that there is difference between the methods, which we are studying. Their significance is 0.012. The significance of the fund ratios of the methods is 0.0, which indicates how big the difference is.

**Table 16. The Percentages of Fund Ratio of the Methods (MFR) in Nine Sudanese Banks**

| Year | *Mushārakah* | *Murābaḥah* | *Salam* | Other |
|---|---|---|---|---|
| 1993 | 0.54 | 0.33 | 0.04 | 0.09 |
| 1994 | 0.59 | 0.32 | 0.06 | 0.04 |
| 1995 | 0.49 | 0.23 | 0.07 | 0.21 |
| 1996 | 0.56 | 0.35 | 0.07 | 0.03 |
| 1997 | 0.34 | 0.39 | 0.06 | 0.21 |
| 1998 | 0.36 | 0.47 | 0.07 | 0.11 |
| 1999 | 0.44 | 0.37 | 0.03 | 0.16 |
| Average | 0.47 | 0.35 | 0.06 | 0.12 |

Table 16 shows the total fund distribution to *mushārakah*, *murābaḥah*, *salam* and other methods between 1993 and 1999.

According to Table 16 *mushārakah* had the biggest share of the fund with an average of 47% from the overall funds of the nine banks. On the other hand, the *murābaḥah*, *salam* and other methods achieved 35%, 6% and 12% respectively. It might be claimed that the sources used in this Table are limited in nature and not representative enough of the situation being researched. However, when compared to officially released statistics by the National Bank of Sudan that are included in Table 5, one can very clearly see a strong correlation between the two results bearing in mind that the statistics covers almost 50% of the total capital of the entire industry and includes 9 out of the 26 banks in Sudan. The only difference is that whilst the National Bank of Sudan's statistic covers one year, those included here cover the period between 1993 and 1999. It should be added here that the data provided in this paper cannot be obtained from the National Bank of Sudan for the period 1993–1999. In addition, most of the Sudanese banks do not show records by which they can give out separate data for profits and bad debts per method of finance.

As table 16 shows, apart from two years (1997–98), *mushārakah* held the largest amount of funds. It must be noted here that whilst the vast majority of Islamic finance banks and banking operations have been dominated by the PLS system around the world, in Sudan, the opposite has occurred whereby *mushārakah* has been the dominant method in the nation-wide banks. There are many reasons why *muḍārabah* does not play as large a part as *mushārakah*. One of them is because *muḍārabah* in Sudan works mainly on trade.

The relative proportions of these different types of Islamic assets will, of course, have implications for a bank's medium and longer term liquidity. The asset structure also has implications for income, with higher income associated with *mushārakah* than *murābaḥah*. The asset structure and composition will also have consequences for bank risk. If problems arise with *muḍārabah* these will have to be sorted out in a relatively short period or else the asset will be written off. Non-performing assets based on *mushārakah* may cause problems for years, and there will be much less pressure to make provisions until the date of maturity of the assets approaches. This, however, means that problems may accumulate, ultimately threatening the financial viability of the Islamic bank itself unless appropriate action is taken.

Table 17 on another level shows the profitability of the methods. By contrast, it shows that *mushārakah* had the lowest average profitability during the time when the other methods had the highest profitability.

**Table 17: The Percentage Distribution of Return of Equity Ratios for Islamic Financing Methods in Nine Sudanese Banks**

| Year | Mushārakah | Murābaḥah | Salam | Other |
|---|---|---|---|---|
| 1993 | 0.09 | 0.22 | 0.25 | 0.16 |
| 1994 | 0.11 | 0.17 | 0.27 | 0.09 |
| 1995 | 0.20 | 0.26 | 0.17 | 0.08 |
| 1996 | 0.15 | 0.13 | 0.19 | 0.51 |
| 1997 | 0.14 | 0.14 | 0.12 | 0.13 |
| 1998 | 0.15 | 0.15 | 0.16 | 0.44 |
| 1999 | 0.13 | 0.18 | 0.14 | 0.23 |
| **Average** | 0.14 | 0.18 | 0.19 | 0.23 |

Table 17 further shows that the averages of their profitability are 14%, 18%, 18.5% and 23% for *mushārakah*, *murābaḥah*, *salām* and other methods respectively. The reason why *murābaḥah* is greater than *mushārakah* may be because its profits are more guaranteed compared with *mushārakah*. As mentioned before, *murābaḥah* is the selling of collateral by covering the cost price with a fixed and known profit margin. The bank usually takes some guarantees from the customers and these guarantees can be cheques. The consequences for giving RD/bounced cheques to banks as stated by Sudanese criminal law in 1991 are imprisonment until the cheque is fully paid (Article No 179, 1991 Sudanese Criminal Act). It is for that reason that many customers were put in prison. This is seen as a pressure on *murābaḥah*. Because of the problems associated with it the National Bank placed profit ceilings upon *murābaḥah* projects that banks are forbidden to go over (BOS 1990–1999). For the same reason they are also planning to set a limit to the amount of funds that can be given over to *murābaḥah* use.

The other methods are also justified by the results, as are all different ways that increase profitability and reduce risk. We cannot find a justification for the high profitability of *salam* when compared with *mushārakah*. This is not because of an agricultural disaster – something that did not occur in Sudan in this period – but because

the agricultural season usually does not begin on time and there is not enough investment, as well as the fact that, as banks complain that the *salam* given to the farmers is not being used for crop growing. The *salam* and their non-payment were the reasons for the prosecution of some of the farmers. It was expected therefore that the profitability of the *mushārakah* will be at least slightly higher.

Table 18 describes the risk rates for the Islamic Financing methods in relation to arrears and bad debts, which depicts that the other methods had the highest risks, which is in line with the principle that there is a proportional relationship between profit and risk. The average for the other methods is 22%. Nevertheless this is because of the extraordinary and odd result in the year 1996. At the time, *salam* was the lowest risk with an average of 7% while *mushārakah* and *murābahah* achieved 11% and 9.5%.

**Table 18: Debt Equity Ratios for Islamic Financing Methods in Nine Sudanese Banks**

| Year | Mushārakah | Murābahah | Salām | Other |
|---|---|---|---|---|
| 1993 | 0.12 | 0.05 | 0.11 | 0.08 |
| 1994 | 0.04 | 0.13 | 0.03 | 0.12 |
| 1995 | 0.05 | 0.08 | 0.05 | 0.04 |
| 1996 | 0.10 | 0.05 | 0.01 | 1.28 |
| 1997 | 0.17 | 0.09 | 0.05 | 0.07 |
| 1998 | 0.10 | 0.12 | 0.10 | 0.02 |
| 1999 | 0.19 | 0.15 | 0.14 | 0.05 |
| Average | 0.11 | 0.09 | 0.07 | 0.24 |

One way to solve the moral hazard problem with *Mushārakah* is to increase project monitoring and enforce restrictive covenants. Sudanese banks have paid little attention to developing their project appraisal capabilities. The moral hazard problem makes it desirable for the banks to monitor the performance of the projects they finance. No doubt, this entails additional costs but the benefits in terms of final declared profits more than offset those. In spite of this, the banks have been reluctant to do that because the entrepreneurs tend to resist it. They have instead chosen the easier way out, *i.e.* fixed return modes.

Debts rate is usually an indication of the managerial efficiency especially for those projects which depend on following up, management

and control, notably *Mushārakah* projects. Management is defined as initiation of projects (demand and feasibility studies, project proposals *etc.*) and implementation of these proposals by active involvement in the production process. Control on the other hand is defined as the right to ratify the initial proposals and supervise the projects either through internal monitoring or external mechanisms (Dar, 2000). Accordingly, strengthening the managerial efficiency of these banks is strongly advised.

Table 19: Return of Equity and Debt Equity Ratios for the Islamic Financing Methods, for Nine Sudanese Banks

|  | *Mushārakah* | | *Murābaḥah* | | *Salām* | | Other | |
|---|---|---|---|---|---|---|---|---|
|  | RER | DER | RER | DER | RER | DER | RER | DER |
| 1993 | 0.09 | 0.12 | 0.22 | 0.05 | 0.25 | 0.11 | 0.16 | 0.08 |
| 1994 | 0.11 | 0.04 | 0.17 | 0.13 | 0.27 | 0.03 | 0.11 | 0.15 |
| 1995 | 0.20 | 0.05 | 0.26 | 0.08 | 0.17 | 0.05 | 0.25 | 0.12 |
| 1996 | 0.15 | 0.10 | 0.13 | 0.05 | 0.19 | 0.01 | 0.22 | 0.56 |
| 1997 | 0.14 | 0.17 | 0.14 | 0.09 | 0.12 | 0.05 | 0.13 | 0.08 |
| 1998 | 0.15 | 0.10 | 0.15 | 0.12 | 0.16 | 0.10 | 0.44 | 0.02 |
| 1999 | 0.13 | 0.19 | 0.18 | 0.15 | 0.14 | 0.14 | 0.29 | 0.06 |
| Average | 0.14 | 0.11 | 0.18 | 0.09 | 0.19 | 0.07 | 0.23 | 0.15 |

The proportional relationship between profit and risk for these methods with the exception of *mushārakah* was stable, with constant profit returns also as being higher than the risk. This indicates to us about the managerial efficiency in following up these projects, as *mushārakah* requires two main actions: exceptional feasibility studies and constant re-appraisal. It appears therefore, from what has been mentioned previously, that the level of re-appraisal is low as can be seen in Table 19. The same happened to *salam* and the other methods. By contrast *murābaḥah* did see a proportional relationship between risk and profit, especially over the last four years of the period of study.

After dividing the numbers into the currency index (table 20 and 21), this study found that the average profitability of the *mushārakah* were the highest followed by *murābaḥah*, which is consistent with the results depicted in table 18, but more accurate. Similarly, this study found the same results with the risk averages. Moreover *mushārakah*

was the highest performing in 1994–1996. *Murābaḥah* on the other hand had fluctuating profits, while *salam* had a constant but low average profitability level. The year 1996 saw the least profit for the *salam* method due to that year's agricultural season. With regard to the other methods, they saw a gradual increase in their average profitability between 1993 and 1998. The average profit margin did decrease however in 1999. The timescale for these methods, when comparing their performance in covering their bad debts over time, shows high fluctuations, which do not conform to the profitability over time. *Salam* was the lowest bad debt method and again it had a constant but low average bad debts level.

Table 20: Breakdown of Profits (adjusted for inflation) for Islamic Financing Methods for Nine Sudanese Banks

| Year | Mushārakah | Murābaḥah | Salam | Other |
|------|------------|-----------|-------|-------|
| 1993 | 328,697.08 | 465,724.21 | 64,240.88 | 86,697.08 |
| 1994 | 343,878.00 | 282,719.08 | 86,172.69 | 15,512.00 |
| 1995 | 529,278.00 | 329,915.00 | 62,378.00 | 88,717.00 |
| 1996 | 398,885.85 | 207,183.11 | 59,021.27 | 71,756.94 |
| 1997 | 245,604.72 | 275,382.77 | 36,447.73 | 136,210.93 |
| 1998 | 317,329.56 | 433,014.29 | 65,321.66 | 288,614.18 |
| 1999 | 265,883.25 | 300,807.23 | 22,198.87 | 161,364.84 |
| Average | 347,079.49 | 327,820.81 | 56,540.16 | 121,267.57 |

Table 21: Debts (adjusted according) to the Index Numbers for Islamic Financing Methods in Nine Sudanese Banks

| Year | Mushārakah bad debt | Murābaḥah bad debt | Salam bad debt | Other bad debt |
|------|---------------------|--------------------|----------------|----------------|
| 1993 | 413,572.99 | 101,788.32 | 27,854.01 | 45,094.89 |
| 1994 | 131,022.30 | 205,419.06 | 7,862.45 | 22,603.92 |
| 1995 | 124,712.00 | 94,000.00 | 19,792.00 | 43,146.00 |
| 1996 | 278,388.45 | 78,215.71 | 4,462.24 | 180,776.91 |
| 1997 | 295,168.13 | 178,718.62 | 15,441.93 | 80,789.72 |
| 1998 | 220,208.12 | 345,488.74 | 38,844.72 | 16,148.97 |
| 1999 | 384,002.83 | 259,607.28 | 22,216.51 | 32,737.09 |
| Average | 263,867.83 | 180,462.53 | 19,496.27 | 60,185.36 |

### IX. Summary and Conclusion

The study found that the majority of the banks advances have been financed using *mushārakah*, that 47% of the Sudanese banks' fund has been financed using *mushārakah*, the percentages for *murābaḥah* and *salam* methods are 35% and 6% respectively. The profit average for *mushārakah*, *murābaḥah*, *salam* and other methods was 14%, 18%, 18.5% and 23%, while the average risk was 11%, 9.5%, 7% and 15% respectively. So it does not seem that *mushārakah* performanced particularly well.

The statistical analysis has shown that the *mushārakah* method in two out of nine banks had higher profitability and lower risk compared to other methods. Likewise, *murābaḥah* was better in another two banks only because it had a higher profitability significant. The analysis has shown no differences between the methods for the remaining five banks. This indicates that lack of knowledgeable bankers in selecting, evaluating and managing profitable projects is a significant factor. Our analysis did not identify any differences in the performances of these methods in the overall fund for the nine banks taken together.

When the same tests were conducted on all nine banks, the following results were found:

(i) The majority of the banks' funds have been financed using *mushārakah*, that 47% of the Sudanese banks' fund has been financed using *mushārakah*; the percentages for *murābaḥah* and *salam* methods are 35% and 6% respectively. The profit average for *mushārakah*, *murābaḥah*, *salam* and other methods were 14%, 18%, 18.5% and 23%, while the average risks were 11%, 9.5%, 7% and 15% respectively. So it does not seem that *mushārakah* has a good performance.

(ii) Six out of the nine banks give *mushārakah* methods the largest proportion of funding. Out of these six banks, the one that gave the highest funding, the Islamic Shimal Bank gave *mushārakah* 64% whilst the lowest funder, Faisal Islamic Bank gave 41%.

(iii) Three out of the nine banks gave the largest proportion of their funds to *murābaḥah*. Those banks are the National Workers Bank, Al-Barakah Bank and the Saudi Sudanese Bank. The average percentages for *murābaḥah* are 91%, 59.5% and 50.7% respectively.

(iv) The bank that gave the lowest average proportion of funds to *mushārakah* (9%) was the National Workers Bank.

(v) The bank that gave the lowest average proportion of funds to *murābaḥah* was the Umm Durman National Bank, which gave 18%.

As to the challenges facing the Sudanese Islamic banks, it may be worthwhile to mention the report by the investment department of Faisal Islamic Bank, which recommended improving the performance of *mushārakah* by:

(i) Improving the contract conditions which can minimize risk and give more authority to following up these projects (FIBS, 1989). Although, the bank is taking an equity share in the business being supported, it has no interest in sitting on the board of the company or exercising its voting rights at the company annual general meetings or other shareholders' meetings. Islamic banks maintain low profiles, and are best regarded as sleeping partners. Although losses are made, the business being supported will be required to provide a satisfactory explanation (Wilson, 1984).

(ii) To carry out as many short-term operations and projects as possible (FIBS, 1989).

There are two advantages of using this strategy:

(a) A broader portfolio diversification, which can reduce risk for a given return or increase return for a given risk;

(b) The ability to participate in new risks, including new projects.

These help money circulation as well as allowing for continual re-appraisal of projects.

The main problems of *mushārakah* is, then, the bad debts that simply delay the process of pay back both to the investor and to the bank. The problems faced by *mushārakah* are mainly risk. The report proves that the problem of delay is the biggest problem that *mushārakah* faces, seeing as these loans are not paid off in time, rather they accumulate.

Concerning the risk there are three points that can be considered;

(i) The moral commitment by the bank to facilitate and to finance the small producers and poor families as we have seen before. This leads to the bank not asking for sufficient guarantees and ignoring the credit-worthiness of the customer. As an alternative they ask for personal guarantors.

(ii) The regulations for *mushārakah* in Sudan do not allow any of the partners to takeout any kind of guarantee against the other partner. The only situation that allows a form of guarantee to be taken is that in respect of mismanagement and fraud.

(iii) The partnerships do not have a great deal of control for some operations, such as animal export, which may lead to the delegating of responsibility by the bank to the other partner and allowing the other partner to do whatever he or she wishes to do.

There is no doubt that bad debt rates for these methods can be an indication of managerial inefficiency, especially in *mushārakah*, and failing to get funding from it can be seen as a sign of this inefficiency. Perhaps it is necessary to concentrate more on *mushārakah* bad debts. The bank shares in profits and is liable to any financial loss. There is no serious problem with this arrangement if the bank is able, and is allowed, to monitor business operations of the firm.[4] However, proper monitoring mechanisms are yet to be devised for PLS, especially in the case of *mushārakah*, which does not provide any control rights to the financier (Dar and Presley, 2000).

Another challenge that Sudanese banks must address is their size. Many of them are extremely small and cannot remain serious players in the market as it continues to expand and attract large international banks. In order to remain competitive in a global sense, Islamic banks have to reach mutual understandings to merge or cooperate. They also have to take fundamental strategic decisions about the type of banks they wish to become. The best future prospects may well be in specialization.

## NOTES

1.    These seven contracts are *muḍārabah*, *mushārakah* as PLS Methods. *Murābaḥah* (cost plus financing), *ijārah* (leasing) and *ijārah wa'iqtinā'* (financial lease),

beneficient loans (qarḍ ḥasan), deferred payment sale (bayʿ muʾajjal) and purchase with deferred delivery (bayʿ salam) as non-–PLS Methods.

2.  If we wish to consider banks' efficiency controlling by risk, only those loan losses arising from internal factors, such as risk management inefficiency or bad management, should be considered, while risk generated by adverse local business conditions (bad luck) should be excluded.

3.  For the purpose of this study the profitability and risk are calculated by the following criteria:
    Method return of equity ratio (MRER) = Method's profit / equity capital
    Method debt equity ratio (MDER) = Method's debt/equity capital.
    Method fund ratio (MFR) = Method's fund /Total capital equity.

4.  The staff must regularly visit the projects and check bookkeeping, marketing of products, account receivable and collection procedure. These arrangements tend to ensure the safety as well as the profitability of the bank's investment. The bank must constantly watch its interest by focusing on the overall performance of the project.

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## Appendix: Statistical Analysis Results

Abbreviation

| RER | Return of Equity Ratio |
|---|---|
| DER | Debt Equity Ratio |
| Prorate | Method return of equity ratio (MRER) = Method's profit / equity capital |
| Debtrate | Methods' debt equity ratio (MDER) =Method's debt/equity capital. |
| 1 | *Mushārakah* |
| 2 | *Murābahah* |
| 3 | Salām |
| 4 | Other Methods |

**Table A1. ANOVA between Islamic Finance Methods for Barakah Islamic Bank Sudan**

ANOVA

| | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| PRORATE | Between Groups | .283 | 3 | .094 | 75.083 | .000 |
| | Within Groups | .030 | 24 | .001 | | |
| | Total | .313 | 27 | | | |
| DEBRATE | Between Groups | .948 | 3 | .316 | 2.292 | .104 |
| | Within Groups | 3.308 | 24 | .138 | | |
| | Total | 4.255 | 27 | | | |

PRORATE

| | N | Mean | Std. Deviation | Std. Error | 95% Confidence Interval for Mean | | Minimum | Maximum |
|---|---|---|---|---|---|---|---|---|
| | | | | | Lower Bound | Upper Bound | | |
| 1.00 | 7 | .39141951 | .070799408 | .026759661 | .32594098 | .45689804 | .349997 | .499980 |
| 2.00 | 7 | .29856731 | .003781262 | .001429183 | .29507023 | .30206440 | .289992 | .300000 |
| 3.00 | 7 | .19995182 | .000075255 | .000028444 | .19988222 | .20002142 | .199793 | .200000 |
| 4.00 | 7 | .12497277 | .000021296 | .000008049 | .12495307 | .12499246 | .124947 | .124997 |
| Total | 28 | .25372785 | .107709535 | .020355189 | .21196245 | .29549325 | .124947 | .499980 |

*Note*: The mean difference is significant at the .05 level.

### Table A2. ANOVA between Islamic Finance Methods for the Sudanese Premises Bank

ANOVA

|  |  | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| PRORATE | Between Groups | .862 | 3 | .287 | 2.800 | .062 |
|  | Within Groups | 2.463 | 24 | .103 |  |  |
|  | Total | 3.325 | 27 |  |  |  |
| DEBRATE | Between Groups | .116 | 3 | .039 | 10.114 | .000 |
|  | Within Groups | .092 | 24 | .004 |  |  |
|  | Total | .208 | 27 |  |  |  |

Multiple Comparisons
Dependent Variable: DEBRATE
LSD

| (I) NUMBER | (J) NUMBER | Mean Difference (I-J) | Std. Error | Sig. | 95% Confidence Interval Lower Bound | Upper Bound |
|---|---|---|---|---|---|---|
| 1.00 | 2.00 | -.03327436 | .033046542 | .324 | -.10147907 | .03493036 |
|  | 3.00 | .02346384 | .033046542 | .485 | -.04474087 | .09166855 |
|  | 4.00 | -.14442080 | .033046542 | .000 | -.21262551 | -.07621609 |
| 2.00 | 1.00 | .03327436 | .033046542 | .324 | -.03493036 | .10147907 |
|  | 3.00 | .05673820 | .033046542 | .099 | -.01146651 | .12494291 |
|  | 4.00 | -.11114644 | .033046542 | .003 | -.17935115 | -.04294173 |
| 3.00 | 1.00 | -.02346384 | .033046542 | .485 | -.09166855 | .04474087 |
|  | 2.00 | -.05673820 | .033046542 | .099 | -.12494291 | .01146651 |
|  | 4.00 | -.16788464 | .033046542 | .000 | -.23608935 | -.09967993 |
| 4.00 | 1.00 | .14442080 | .033046542 | .000 | .07621609 | .21262551 |
|  | 2.00 | .11114644 | .033046542 | .003 | .04294173 | .17935115 |
|  | 3.00 | .16788464 | .033046542 | .000 | .09967993 | .23608935 |

*Note*: The mean difference is significant at the .05 level.

ANOVA for Profit and Debt for The Sudanese Premises Bank.

|  |  | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| PROFIT | Between Groups | 2592524685.250 | 3 | 864174895.083 | 4.959 | .008 |
|  | Within Groups | 4182121057.714 | 24 | 174255044.071 |  |  |
|  | Total | 6774645742.964 | 27 |  |  |  |
| DEBT | Between Groups | 39402496299.000 | 3 | 13134165433.000 | 8.328 | .001 |
|  | Within Groups | 37849119595.714 | 24 | 1577046649.821 |  |  |
|  | Total | 77251615894.714 | 27 |  |  |  |

**Table A3. ANOVA between Islamic Finance Methods for the Tadamon Islamic Bank**

ANOVA

|  |  | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| PROFIT | Between Groups | 2592524685.250 | 3 | 864174895.083 | 4.959 | .008 |
|  | Within Groups | 4182121057.714 | 24 | 174255044.071 |  |  |
|  | Total | 6774645742.964 | 27 |  |  |  |
| DEBT | Between Groups | 39402496299.000 | 3 | 13134165433.000 | 8.328 | .001 |
|  | Within Groups | 37849119595.714 | 24 | 1577046649.821 |  |  |
|  | Total | 77251615894.714 | 27 |  |  |  |
| PRORATE | Between Groups | 13.026 | 3 | 4.342 | 1.094 | .371 |
|  | Within Groups | 95.290 | 24 | 3.970 |  |  |
|  | Total | 108.316 | 27 |  |  |  |
| DEBRATE | Between Groups | 1.959 | 3 | .653 | 1.011 | .405 |
|  | Within Groups | 15.498 | 24 | .646 |  |  |
|  | Total | 17.457 | 27 |  |  |  |

Multiple Comparisons
LSD

| Dependent Variable | (I) NUMBER | (J) NUMBER | Mean Difference (I-J) | Std. Error | Sig. | 95% Confidence Interval | |
|---|---|---|---|---|---|---|---|
| | | | | | | Lower Bound | Upper Bound |
| PROFIT | 1.00 | 2.00 | -21248.5714 | 7056.00138 | .006 | -35811.4425 | -6685.7003 |
| | | 3.00 | 3951.1429 | 7056.00138 | .581 | -10611.7282 | 18514.0140 |
| | | 4.00 | -3772.1429 | 7056.00138 | .598 | -18335.0140 | 10790.7282 |
| | 2.00 | 1.00 | 21248.5714 | 7056.00138 | .006 | 6685.7003 | 35811.4425 |
| | | 3.00 | 25199.7143 | 7056.00138 | .002 | 10636.8432 | 39762.5854 |
| | | 4.00 | 17476.4286 | 7056.00138 | .021 | 2913.5575 | 32039.2997 |
| | 3.00 | 1.00 | -3951.1429 | 7056.00138 | .581 | -18514.0140 | 10611.7282 |
| | | 2.00 | -25199.7143 | 7056.00138 | .002 | -39762.5854 | -10636.8432 |
| | | 4.00 | -7723.2857 | 7056.00138 | .285 | -22286.1568 | 6839.5854 |
| | 4.00 | 1.00 | 3772.1429 | 7056.00138 | .598 | -10790.7282 | 18335.0140 |
| | | 2.00 | -17476.4286 | 7056.00138 | .021 | -32039.2997 | -2913.5575 |
| | | 3.00 | 7723.2857 | 7056.00138 | .285 | -6839.5854 | 22286.1568 |
| DEBT | 1.00 | 2.00 | 67161.5714 | 21226.98182 | .004 | 23351.2342 | 110971.9087 |
| | | 3.00 | 92350.4286 | 21226.98182 | .000 | 48540.0913 | 136160.7658 |
| | | 4.00 | 90959.7143 | 21226.98182 | .000 | 47149.3770 | 134770.0515 |
| | 2.00 | 1.00 | -67161.5714 | 21226.98182 | .004 | -110971.9087 | -23351.2342 |
| | | 3.00 | 25188.8571 | 21226.98182 | .247 | -18621.4801 | 68999.1944 |
| | | 4.00 | 23798.1429 | 21226.98182 | .273 | -20012.1944 | 67608.4801 |
| | 3.00 | 1.00 | -92350.4286 | 21226.98182 | .000 | -136160.7658 | -48540.0913 |
| | | 2.00 | -25188.8571 | 21226.98182 | .247 | -68999.1944 | 18621.4801 |
| | | 4.00 | -1390.7143 | 21226.98182 | .948 | -45201.0515 | 42419.6230 |
| | 4.00 | 1.00 | -90959.7143 | 21226.98182 | .000 | -134770.0515 | -47149.3770 |
| | | 2.00 | -23798.1429 | 21226.98182 | .273 | -67608.4801 | 20012.1944 |
| | | 3.00 | 1390.7143 | 21226.98182 | .948 | -42419.6230 | 45201.0515 |
| PRORATE | 1.00 | 2.00 | -.16332585 | 1.065082260 | .879 | -2.36154760 | 2.03489589 |
| | | 3.00 | .00699238 | 1.065082260 | .995 | -2.19122936 | 2.20521413 |
| | | 4.00 | -1.61939651 | 1.065082260 | .141 | -3.81761826 | .57882523 |
| | 2.00 | 1.00 | .16332585 | 1.065082260 | .879 | -2.03489589 | 2.36154760 |
| | | 3.00 | .17031824 | 1.065082260 | .874 | -2.02790351 | 2.36853998 |
| | | 4.00 | -1.45607066 | 1.065082260 | .184 | -3.65429241 | .74215108 |
| | 3.00 | 1.00 | -.00699238 | 1.065082260 | .995 | -2.20521413 | 2.19122936 |
| | | 2.00 | -.17031824 | 1.065082260 | .874 | -2.36853998 | 2.02790351 |
| | | 4.00 | -1.62638890 | 1.065082260 | .140 | -3.82461064 | .57183285 |
| | 4.00 | 1.00 | 1.61939651 | 1.065082260 | .141 | -.57882523 | 3.81761826 |
| | | 2.00 | 1.45607066 | 1.065082260 | .184 | -.74215108 | 3.65429241 |
| | | 3.00 | 1.62638890 | 1.065082260 | .140 | -.57183285 | 3.82461064 |
| DEBRATE | 1.00 | 2.00 | .15023334 | .429538637 | .730 | -.73629084 | 1.03675751 |
| | | 3.00 | -.51339716 | .429538637 | .244 | -1.39992133 | .37312701 |
| | | 4.00 | .10300694 | .429538637 | .813 | -.78351723 | .98953111 |
| | 2.00 | 1.00 | -.15023334 | .429538637 | .730 | -1.03675751 | .73629084 |
| | | 3.00 | -.66363050 | .429538637 | .135 | -1.55015467 | .22289368 |
| | | 4.00 | -.04722640 | .429538637 | .913 | -.93375057 | .83929778 |
| | 3.00 | 1.00 | .51339716 | .429538637 | .244 | -.37312701 | 1.39992133 |
| | | 2.00 | .66363050 | .429538637 | .135 | -.22289368 | 1.55015467 |
| | | 4.00 | .61640410 | .429538637 | .164 | -.27012007 | 1.50292827 |
| | 4.00 | 1.00 | -.10300694 | .429538637 | .813 | -.98953111 | .78351723 |
| | | 2.00 | .04722640 | .429538637 | .913 | -.83929778 | .93375057 |
| | | 3.00 | -.61640410 | .429538637 | .164 | -1.50292827 | .27012007 |

**Table A4. ANOVA between Islamic Finance Methods for the National Workers Bank.**

ANOVA

|  |  | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| PRORATE | Between Groups | .327 | 3 | .109 | 11.037 | .000 |
|  | Within Groups | .237 | 24 | .010 |  |  |
|  | Total | .564 | 27 |  |  |  |
| DEBRATE | Between Groups | .215 | 3 | .072 | 2.522 | .082 |
|  | Within Groups | .681 | 24 | .028 |  |  |
|  | Total | .896 | 27 |  |  |  |

Multiple Comparisons
Dependent Variable: PRORATE
LSD

| (I) NUMBER | (J) NUMBER | Mean Difference (I-J) | Std. Error | Sig. | 95% Confidence Interval | |
|---|---|---|---|---|---|---|
|  |  |  |  |  | Lower Bound | Upper Bound |
| 1.00 | 2.00 | -.24386711 | .053140286 | .000 | -.35354327 | -.13419095 |
|  | 3.00 | -.08917192 | .053140286 | .106 | -.19884808 | .02050424 |
|  | 4.00 | .03639951 | .053140286 | .500 | -.07327665 | .14607567 |
| 2.00 | 1.00 | .24386711 | .053140286 | .000 | .13419095 | .35354327 |
|  | 3.00 | .15469519 | .053140286 | .008 | .04501903 | .26437135 |
|  | 4.00 | .28026662 | .053140286 | .000 | .17059046 | .38994278 |
| 3.00 | 1.00 | .08917192 | .053140286 | .106 | -.02050424 | .19884808 |
|  | 2.00 | -.15469519 | .053140286 | .008 | -.26437135 | -.04501903 |
|  | 4.00 | .12557143 | .053140286 | .027 | .01589527 | .23524759 |
| 4.00 | 1.00 | -.03639951 | .053140286 | .500 | -.14607567 | .07327665 |
|  | 2.00 | -.28026662 | .053140286 | .000 | -.38994278 | -.17059046 |
|  | 3.00 | -.12557143 | .053140286 | .027 | -.23524759 | -.01589527 |

**Table A5. ANOVA for the Islamic Finance Methods for Aggregated Data (Nine Sudanese Banks)**

ANOVA

|  |  | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| PRORATE | Between Groups | .029 | 3 | .010 | 1.059 | .385 |
|  | Within Groups | .222 | 24 | .009 |  |  |
|  | Total | .251 | 27 |  |  |  |
| DEBTRATE | Between Groups | .120 | 3 | .040 | .724 | .547 |
|  | Within Groups | 1.321 | 24 | .055 |  |  |
|  | Total | 1.441 | 27 |  |  |  |

**Table A6. The Index Number**

| Year | Index number |
|---|---|
| 1993 | 0.274 |
| 1994 | 0.5918 |
| 1995 | 1 |
| 1996 | 2.304 |
| 1997 | 3.3784 |
| 1998 | 3.9529 |
| 1999 | 4.591 |