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Abstract

Islamic banking in Malaysia, despite its recent start, has seen very rapid growth. This growth however has been uneven. While short-term trade financing has always been dominant and grown rapidly, Mudarabah financing by Islamic banks in Malaysia has reduced to insignificantly amounts. Yet, Mudarabah which is based on profit and loss sharing has always been considered to be at the core of Islamic financing and in tune with the shariah's injunctions against interest based financing.

The paper addresses why this has been the case. Using conventional finance theories it is shown that Mudarabah financing has serious agency problems, lacks the bonding effect of debt financing and can induce perverse incentives. Following an analysis of these problems in Part I. Part II compare: Mudarabah with conventional debt and equity financing within a risk-return framework. Using scenario analysis, it is shown that for a 'borrower' faced with the alternative of using Mudarabah, debt or equity financing, Mudarabah would be best in a risk-return framework. For a financier faced with the same three alternatives however, Mudarabah financing would be the worst. Expected returns would be the lowest while risk highest among the three alternatives. This has to do with the structure of Mudarabah financing where strict interpretation of the Shariah requires the financier to absorb all losses, but profits to be shared. It is argued that this inequality in the distribution of risk and returns has caused Islamic banks to reduce Mudarabah financing.

Part III proposes an alternative financial arrangement under Mudarabah. Using the principles of mezzanine and vertical-strip financing, currently in use in venture-capital and other high risk financing like Leveraged Buyouts (LBOs), it is shown that a more equitable distribution of risk and returns can be achieved. The proposal requires the mudarib (borrower) to 'reimburse' the financier in the event of certain outcomes. This reimbursement will be in form of the Mudarib giving up part of his equity to the financier. While this reduces the agency problems and the downside risk faced by the financier it does not eliminate all such risk. Thus, both parties will be required to be responsible and cautious in undertaking new projects.

Part IV concludes with an evaluation of the proposed arrangement in the context of the Shariah.

Islamic Banking in Malaysia, despite its recent start, has seen very rapid growth. This growth however has been uneven. While short term trade financing has always been dominant and grown rapidly, Mudarabah type Financing by Islamic banks in Malaysia has reduced to insignificant amounts. Yet, Mudarabah financing which is based on profit and loss sharing has always been considered to be at the core of Islamic financing and in tune with the Shariah's Injunctions against Interest based financing.

The Shariah's prohibition of conventional debt financing rests on the inherent inequity of such lending. The lender is not exposed to any of the project/business risk yet receives a fixed return regardless of outcome. Thus the emphasis on a more 'equitable' profit and loss based system. Despite this congruence, there has been a steady decline in the proportion of Mudarabah type financing by BIMB (Bank Islam Malaysia Berhad) the country's largest Islamic Bank. For the latest fiscal year 1994, Mudarabah constituted a mere 0.33 % of the bank's total customer financing.

Objective and Justification of Study

This paper examines why Mudarabah has declined in importance as a financing vehicle. In addressing this, an evaluation is made of Mudarabah financing in the light of conventional finance theories and identifying the underlying problems. An alternative financing arrangement for Mudarabah is then proposed to overcome the identified problems. Aside from being a new and unique attempt, such an analysis can be useful to both the Islamic and conventional finance theorist. It is hoped that with attempts such as this, the current dichotomy between Islamic jurists whose frequent abstraction from practical realities and finance professionals who have to grapple with contemporary issues can be bridged.

The paper is divided into four parts. Part I examines Mudarabah financing in the light of conventional finance theories and identifies the underlying problems of Mudarabah. Part 11 compares Mudarabah with conventional debt and equity financing within a risk-return framework. Part III proposes an alternative financial arrangement for Mudarabah financing. Part IV evaluates the proposed Mudarabah arrangement and concludes.

Mudarabah; An Overview

In Mudarabah financing, one party, the Rab-Ul-Mal or financier, provides the capital, while the other party, the Mudarib, provides the entrepreneurship and effort to run the business. The

underlying contractual relationship is that of a partnership, with the Rab-Ul-Mal as the silent or sleeping partner. Profits derived from the business or investment are shared by the two parties according to a predetermined profit-sharing ratio (PSR). This could be, say, 70:30, or 80:20, with the larger portion accruing to the Mudarib. In the event of losses, the Shariah stipulates that all losses must be borne by the financier. Any party may terminate the Mudarabah agreement at any time. Finally, in a Mudarabah arrangement, the financier is not allowed to interfere in the running of the business. Thus, a Mudarabah arrangement looks very much like an equity investment by a shareholder in a public listed company. In fact, Islamic banks consider Mudarabah financing to be the equivalent of equity financing.

However, for reasons cited below, given the features and the underlying Shariah law, Islamic bank Mudarabah financing is really a hybrid. It is neither equity nor debt because it has to a Mudarib, the financing that he gets from an Islamic bank is like conventional equity for the following reasons: (i) there are no "Fixed" annual payments that are due (unlike interest); (ii) payments made to the Islamic banks come from profits, much like dividends -- they need be paid if and only if there are profits; (iii) the Islamic bank cannot foreclose or take legal action if there are no profits and therefore nothing to be shared; and (iv) like equity, using Mudarabah financing does not increase a firm's risk the way debt financing does through increased financial leverage.

On the other hand, Mudarabah financing can appear to the Mudarib as a conventional debt for the following reasons: (i) It represents a "fixed" claim by the Islamic bank on his company, being the initial amount plus whatever accrued profits (or losses) that are due to the bank. (ii) Like debt, Mudarabah financing is terminal, that is, the arrangement can be ended either by mutual prior agreement or by one party. The Mudarib can end the relationship by repaying the principal and accrued profits to the Islamic bank.

So, unlike equity which represents an unlimited and perpetual claim on the company, Mudarabah, despite the features that make it seem like equity, represents a fixed and terminable claim, much like debt, hence the earlier, argument that Mudarabah is really a hybrid in the conventional sense.

PART I: DEBT, EQUITY AND MUDARABAH – THE AGENCY PROBLEM
The Agency Problem Of Equity Financing

If Mudarabah is a hybrid in the conventional sense, what does it imply about the extent of its agency problems? An agency problem is really an incentive problem that arises from conflicts of

interest among parties to a transaction or financial arrangement. The agency problem of equity arises from the divergence between managers who is in the firm and equity holders who own it. This often leads to a divergence in objectives. While an equity holder's objective would be firm value maximization, managers being utility maximizes might want to increase benefits that accrue to them and not that of shareholders.

In its mild form this divergence could be in the form of increased pay and fringe benefits or perks that managers give themselves from corporate resources. A more acute form of the agency problem could be in the form of extreme wastage, efforts to entrench themselves and their interest through the use of such instruments as golden parachutes, issuing of poison pills, or even the acceptance of negative net present value (NPV) projects that harm the corporation over the longer term but enhance management's position in the short term.

The Agency Problem of Debt Financing

The agency problem of debt financing really arises in two forms: First in the form of "Levered Equity as a Call Option on the firm" and second in the form of "Moral Hazard". "Levered Equity as a Call Option on the firm" refers to the resulting payoff to an equity holder when he combines his equity with debt financing. Since equity represents a residual claim whereas debt a 'fixed' claim on a firm's assets, an equity holder who uses large amounts of debt to finance a project gets to keep all accumulated value beyond the 'fixed' claim of the debt holder. Should the project be successful, this residual value that accrues to equity holders alone could be really large. On the other hand should the project fail the equity holder's loss is limited to the amount of his equity. The payoff to such a situation resembles the payoff to a call option.

Since leveraging their equity with debt can potentially enable them to reap huge profits while limiting their downside risk, the incentive for equity holders who use borrowed funds would be take on high risk, high return projects. This incentive to take on very risky projects is the Moral Hazard problem. It happens because equity holders get to keep everything beyond debt-service requirements if a project succeeds but would lose only their equity if it fails. The smaller the proportion of equity to debt the more acute would this agency problem be.

The Agency Problems of Mudarabah Financing

Having outlined the agency problems of conventional equity and debt, we now examine the agency problems associated with Mudarabah financing. As Mudarabah has the features of both

debt and equity and the Shariah prohibits the Rab-Ul-Mal from interfering in the business but requires him to absorb all losses, it can be shown that the agency problems of Mudarabah will be higher than debt or equity.

Does Mudarabah have the agency problem of equity? Yes. Because, profits will be shared and profits are revenues less costs, the Mudarib will have every incentive to increase those costs that accrue to him as benefits. For example, every one dollar increase in fringe benefits or perks that the Mudarib provides for himself from the business will mean a one dollar increase in his utility. Though profits would reduce as a result by one dollar, his share of the profit (if any) would be less - perhaps 70 cents. (Assuming PSR of 70/30). Thus, it will always be in the Mudarib's interest to keep increasing his benefits until the marginal utility from increased benefits equals the reduction in his share of profits. If we brine into this the reality of taxes (where fringe benefits are not taxable or at least at a lower rate) and the fact that the Rab-Ul-Mal can-not interfere in the business and therefore cannot put in place the internal controls that conventional equity holders can, it is clear this type of agency problem would remain in Mudarabah.

In addition to the benefits problem just described, there is another more serious kind of problem with Mudarabah that does not exist with conventional equity. This has to do with cost allocation. Imagine a company that resorts to Mudarabah financing to finance a single project or to establish a new subsidiary. Then the Islamic bank that Provides the financing has claims to only the profits earned by the project or subsidiary, not that of the overall company. Since the profits to be shared will depend on costs, the company will have all the incentive to allocate as much overhead and other costs to the Mudarabah financed project or subsidiary. Aside from allocation of overheads, the company could also use full-costing as opposed to incremental costs as 'it really should. Furthermore, if the subsidiary does any transaction with other divisions of the same company, then transfer pricing could also be used to reduce profits in the Mudarabah financed subsidiary. In each case, profits will be siphoned from the Mudarabah financed unit to other units. This shuffling of profits from one unit to another does not happen in conventional equity financing since equity has an unlimited and perpetual claim on all the company's assets.

As Mudarabah financing constitutes a fixed and terminal claim as does debt, much of the agency problems of debt remain in Mudarabah. Levered equity as call option on the firm remains, albeit in a slightly altered form. Though the profit potential is slightly diminished (since 30% of profits goes to Rab-Ul-Mal), the downside risk is now also smaller, as the Rab-Ul-Mal absorbs all losses. Overall, levered equity as call option on firm remains very much intact. And as such, so does the

Moral Hazard problem. The incentive to take on risky projects would be even greater in Mudarabah than debt financing since Rab-Ul-Mal absorbs all losses.

In concluding on the agency problems associated with Mudarabah financing, it is quite clear that compared to either conventional equity or debt, Mudarabah financing in its current form will have much higher agency problems[1].

PART II: MUDARABAH, DEBT & EQUITY – A RISK-RETURN ANALYSIS

Having established the agency problem associated with Mudarabah financing we now examine Mudarabah, debt and equity financing in a comparative risk-return framework. Using a hypothetical example and scenario analysis we look at the payoffs to both the 'borrower' and financier under each of three financing techniques. Such an analysis could be useful in determining.

Suppose there is a company, XYZ Corporation which is currently 100% equity financed. The current market value of the company is $4.2 million. Assume that the company is now faced with undertaking a new investment, the total initial investment of which is $1 million. The company wants to set aside $0.2 million from internal funds as its stake in the new project. The remainder $0.8 million is to be financed with external financing. With the new project, the company's financial situation would be as follows:

- $4 mil. of company value in current line of business or existing projects.
- $0.2 mil. of company value invested in new project.
- $0.8 mil. of new external financing.

As such, the new total value of the firm would be $5 million2. The current shareholders' stake in the company is still $4.2 million. How should the company finance the $0.8 million external funding? Let us say the company has the following three alternatives:

i)   Raise $0.8 mil. of equity by issuing 800,000 shares at $1 each.

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[1]*For a further elaboration and indepth discussion of agency problems – see; Obiyathulla Bacha, 1995 "Conventional Vs Mudarabah Financing: An Agency Cost Perspective".*

[2] *Note: Total value of firm = value of equity + value of external financing.*

ii)   Borrow $0.8 mil. at 10% interest per year.

or

iii)   Arrange for Mudarabah financing of $0.8 mil.. with a standard profit sharing ratio (PSR) of 70/30.

In order to examine the resulting payoffs to each alternative for the company and the provider of the new financing, we need to make three additional assumptions.

a)   The new project has a one year economic life. That is, the outcome would be known in one year following investment[3]

b)   There are five (5) possible scenarios of overall economic performance[4]. Each economic scenario has an equal 20% probability Of Occurrence.

c)   The percentage returns for the company's existing projects and the new project under each economic scenario is as shown in Table I below[5]. The percentage returns are assumed independent of the financing alternative,

Table 1: Expected (%) Returns From Existing and New Project

Econ. Scenario	Probability	Value = $4 mil. % Return to Current Projects	Value = $1 mil. % Return New Proj.
1	.20	24	40
2	.20	18	30
3	.20	12	20
4	.20	6	10
5	.20	-12	-20

Given this information set, we are now ready to determine the payoffs to both par-ties under each of the three earlier mentioned financing modes. We begin with an analysis of the first alternative - Equity Financing.

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[3] *This is simplifying assumption. As will seen in Part III, when project life is lengthened, given probabilities the number of permutations of possible outcomes increases substantially.*

[4] *The five economic conditions can be thought of in the following order, very good, good, normal, bad and very bad.*

[5] *Note that the correlation of returns (existing and new) is 1.0. The returns were set as such in order to eliminate "diversification benefits" from the analysis.*

New Project Financed with Equity

Regardless of whether new equity is offered in the form of rights to existing shareholders or issued to a new set of equity holders, the returns to new and old equity will be the same. This is due to the fact that equity has a perpetual and residual claim on all assets. Thus, the return to both sets of equity holders, current and new can be determined as follows;

$$R_{EF} = \frac{V_0}{V_F} \; x \; R_{oi} + \frac{V_N}{V_F} \; x \; R_{Ni} \; \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots.(1)$$

where:

R_{EF}	=	% return from using equity financing for New Project.
V_0, V_N, V_F	=	are Value of Old (Current) Investment, Value of New Project and Value of Firm respectively.
R_{oi}	=	% return from old project under ith. scenario.
R_{Ni}	=	% return from New Project under ith scenario.

Using Equation 1, the return to equity holders under each scenario would be as shown in Table 2 below:

Table 2: Percentage Returns Using Equity Financing

Econ. Scenario	% Ret. To Current & New Equityholders
1	27.2
2	20.4
3	13.6
4	6.8
5	-13.6

New Project Financed With Debt

What if the new project is financed with debt instead of equity? Since the returns to the debtholder (creditor) is fixed, unlike the earlier case, there will be a divergence in the returns received by the current equityholders and the debt financier. The debt financier's returns will be limited to the interest (and principal) *regardless of* the outcome of the project. Thus, going back to the scenario provided in Table 1, the debtholders return will be 10% under each of the five scenarios. What would the XYZ Corp. equityholder's returns be? Their returns would equal the return from the existing *and* new project under each scenario less the principal and interest due to the debt financier. The equityholder's return would therefore be given by;
where;

$$R_{DF} = \left[[V_O\,(\,+\,R_{oi}) + (V_N\,(1 + R_{Ni})] - \theta] - V_{FI} \right] x\,\frac{1}{V_{FI}} \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots.(2)$$

R_{DF}	=	% return to equityholders of XYZ with debt financing of new project.
$V_O\;R_{OI}\;V_N\;and\;R_{Ni}$	=	are as previously defined.
θ	=	Amount due to debt financier; principal + interest amount.
V_{FI}	=	Initial Value of Firm ($4.2 mil).

Using Eq. 2, the resulting returns to equityholders from using the debt financing alternative is shown in Table 3 below. The right most column also shows the % return to the debt financier.

**Table 3:   Percentage Returns To Equity and Debt Holders
              with Debt Financing Of New Project.**

Scenario	% Ret. To Equityholders	% Ret. To Debtholders
1	30.48	10
2	22.38	10
3	14.29	10
4	6.19	10
5	-(18.10)	10

New Project Financed With Mudarabah Financing

We now consider the third alternative available to XYZ Corporation, that is financing the new project with Mudarabah financing. What would the returns to the company's equityholders and Rab-Ul-Mal be? We will once again use the scenarios and possible payoffs of the existing and new project shown in Table 1. Despite the often stated argument that Mudarabah is equity financing we will see here that there is a huge divergence in the returns to the Mudarib and the Rab-Ul-Mal, This divergence results from the characteristics of Mudarabah financing. In our example here; the current equityholder of XYZ Corp. will get the following sources of returns when Mudarabah is used;

    (i)   All the returns from the existing projects.

    (ii)   All the returns earned in the new project from their portion of financing
           (The $0.2 mil. that they put up for new project).

    (iii)   70% of the returns from the Mudarabah financed portion of the new project.
           (Since PSR is 70 / 30).

The Rab-Ul-Mal on the other hand only gets 30% of the profits earned from the Mudarabah financed portion of the new project- Yet, he bears 100% of any losses incurred in the new project.

Given these differences, in order to arrive at a generalized model of returns, we need to make one more denotation. V_N which is the value of the new project is denoted as;

$$V_N \quad = \quad \delta + \lambda$$

where; $\quad \delta \quad = \quad$ the equityholders' investment in the new project
$\qquad\qquad\qquad\qquad\quad$ ($0.2 mil. at time of initial investment).

And $\quad \lambda \quad = \quad$ the amount of Mudarabah financing in the new
$\qquad\qquad\qquad\qquad\quad$ project ($0.8 mil. initially).

Thus, the percentage returns to XYZ equityholders from using Mudarabah financing for the new project would be;

$$R_{MF} = \left[\left((V_O \bullet (1 + R_{Oi}) + (\delta \bullet (1 + R_{Ni}))\right) + \left[\left((\lambda \bullet (1 + R_{Ni}) - \lambda) \bullet \pi\right] - V_{FI}\right] x \frac{1}{V_{FI}} \quad ....(3)$$

s. t. = for $V_N \geq \$0.2 \ mil.$; $R_{Ni} \geq 0$

where;

$\quad R_{MF}$ = % return to equityholders of XYZ with Mudarabah financing of new project.

$\quad \pi$ = the % of profits to be received by the Mudarib given by PSR (70% in this case)

Note, the constraint in Eq. 3; for any new project value greater than $0.2 mil. the minimum value for R_{Ni} cannot be less than zero. This is because in Mudarabah financing the Rab-Ul-Mal absorbs all the losses. The maximum loss that the Rab-Ul-Mal can absorb however, will be given by the amount of his investment of $0.8 mil. Only when losses are greater than this amount would the owners of XYZ Corp. begin losing.

What would the Rab-Ul-Mal's percentage returns be? Using the same notations, his returns would be as:

$$R_{RAB} = \left[\left((\lambda \bullet (1 + R_{Ni}) - \lambda) \bullet (1 - \pi)\right] x \frac{1}{\lambda} \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots(4)$$

Where ;

R_{RAB} = % return to Rab-Ul-Mal

$(1 - \pi)$ = Rab-Ul-Mal's share of PSR

Note: Since the Rab-Ul-Mal absorbs all losses, when $R_{Ni} < 0, \pi$ in Eq. 3 will = 0, thus $(1 - \pi) = 1$ in such a case[6].

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[6] When $R_{Ni} < 0$, the Rab-Ul-Mal absorbs all of the projects losses, meaning, he also absorbs the loss on the $0.2mil., XYZ equityholder financed portion. Thus, in such a case, Eq. 4 would rewritten

as; $R_{RAB} = \left[\left((\lambda \bullet (1 + R_{Ni}) - \lambda) + (\delta \bullet (1 + R_{Ni}))\right) \bullet (1 - \pi)\right] x \frac{1}{\lambda}$ or

$R_{RAB} = \left[\left((\lambda + \delta \bullet (1 - R_{Ni}) - \lambda) \bullet (1 - \pi)\right] x \frac{1}{\lambda}$

Table 4 below shows the percentage returns to each of the parties as result of Mudarabah financing. The returns were derived for values of Table 1, using Eq. 3 and Eq. 4 respectively.

Table 4:   Percentage Returns To Mudarib and Rab-U-Mal
**   with Mudarabah Financing of New Project**

Scenario	% Ret. To Mudarib	% Ret. To Rab-Ul-Mal
1	30.10	12
2	22.57	9
3	15.05	6
4	7.52	3
5	-11.43	-25

Equity and Debt Vs. Mudarabah - An Evaluation

Having examined the payoffs to each of the three financing alternatives, we now evaluate each technique from the viewpoint of both the borrower (XYZ Corp. Equityholders) and the financier. Table 5 below summarizes the earlier returns and provides the mean and standard deviation of returns for each alternative.

Table 5: Comparison Of Percentage Returns
Panel A - % Returns to XYZ Corp. Equityholders (Borrower)

Scenario	Using Equity	Using Debt.	Using Mudarabah
1	27.2	30.48	30.10
2	20.4	22.38	22.57
3	13.6	14.29	15.05
4	6.8	6.19	7.50
5	-13.6	-18.10	-11.43
Mean	10.88	11.05	12.76
σ	14.00	16.67	14.25

Panel B - % Returns to Financier

Scenario	Providing Equity	Providing Debt	Providing Mudarabah
1	27.2	10	12
2	20.4	10	9
3	13.6	10	6
4	6.8	10	3
5	-13.6	10	-25
Mean	10.88	10	1.0
σ	14	0	13.34

Table 5 provides a number of interesting pointers regarding what the preference of a rational borrower and financier would be. Examining Panel A, it is clear that a 'borrower' would *always* prefer Mudarabah financing over either equity or debt. This is because with Mudarabah financing of the new project, overall returns would be the highest. Though the std. deviation is marginally higher than that of equity, in terms of a risk-return framework[7], Mudarabah provides the highest risk-return ratio. Using debt on the other hand would be the least attractive. Debt financing increases financial leverage, this has two effects on a firm. First it increases financial leverage, this has two effects on a firm. First it increases the volatility of returns and second, the mean or expected return increases. Both of these are evident in Panel A when compared to equity. In terms of a risk-return ratio, using debt financing would be the most alternative to the borrower.

This raises an interesting question. If rational borrowers should prefer Mudarabah over debt or equity financing, why then has Mudarabah become less popular among Islamic banks?   The answer lies in Panel B. From a financier's viewpoint providing Mudarabah financing is the least attractive. This is clearly evident from the substantially low mean return which is approximately a tenth of what a financier could earn by providing debt or equity. Yet, despite the very low returns that a financier would earn from Mudarabah, the std. deviation or risk he has to bear is much higher than debt financing and only marginally lower than equity. Compared to a debt financier,

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[7] *Risk return as in slope of* $\dfrac{E_r - r_f}{\sigma}$ *; taking rf to be say 3% would yield the highest slope under Mudarabah. (0.685 versus 0.563 for equity and 0.483 for debt).*

the Rab-Ul-Mal gets a much *lower return* but takes on much *more risk.* While it may be argued that a Rab-Ul-Mal stands to profit from potential upside gains, it should be noted that he also faces the most downside risk since he absorbs all losses. Compared to a provider of equity capital, the Rab-Ul-Mal again earns *much lower* returns but has only **marginally** lower risk. Furthermore, when it comes to sharing in profits. the Rab-Ul-Mal gets a smaller share compared to the equity financier even for the same amount of financing. For each dollar of profit earned, an equity financier earns one dollar multiplied by his percentage stake. For example, if his investment constitutes a 10 percent stake then he earns $1 x .10 = 10¢ on every $1 profit. For the same investment that provides a 10% stake, a Rab-Ul-Mal with a 70/30 PSR will earn only 3¢ not *10¢. ($1 x 10 x 30).* **Yet, the Rab-Ul-Mal absorbs 100% of losses if any!** Clearly, from a risk-return viewpoint, a rational financier would prefer to provide debt or equity financing rather than Mudarabah.

If we add on to the risk-retum analysis our discussion on agency problems in Section 1, Mudarabah financing becomes an even more unattractive proposition. It is now easy to see why Islamic banks would be reluctant to provide Mudarabah financing and why its role as a financing technique has reduced over time. The experience of Bank Islam Malaysia Berhad (BIMB) with Mudarabah has not been good. Neither have other Islamic banks in other Muslim countries including the Islamic Development Bank (IDB). Aside from the lower returns and higher risks, the Rab-Ul-Mal would have to contend with much more agency problems. It appears that all the odds are staked against the financier in favour of the "borrower". Based on our analysis thus far, Mudarabah's decline may be due more to supply side restraint than reductions in demand. Essentially, under current arrangement, rational bankers would not be willing to provide Mudarabah financing.

PART III: A PROPOSED FINANCING STRUCTURE FOR MUDARABAH

We have thus far established two points. First, that Mudarabah financing, given its features has more agency problems. Second, that Mudarabah as a financing proposition is unfavourable compared to debt or equity from a financier's viewpoint. Any proposal for financing structure must therefore be able to address and help overcome these two issues. Additionally, it must be practical. The proposal must be workable in contemporary business environments.

That Mudarabah has serious agency problems and is unfavourable to a financier are not mutually exclusive. Any financial arrangement that lacks proper controls w I 11 have aggravated agency problems which in turn would also disadvantage the financier. As a means of 'introducing some controls in Mudarabah, Islamic economists have suggested among other things the imposition of fines for late payment, the black listing of delinquent borrowers and the confiscation of property if outright negligence is Proven. Though all of these suggestions have been shown to be in conformity with the Shariah, there is a problem with these methods as a control mechanism. The problem being that, they are ex-post. That)S, these methods kick in after a bad outcome has occurred, they do not provide the control mechanism to *prevent* an undesired outcome. Part of this has to do with Shariah's injunction against the interference in business operations by the financier. Given the problems associated with Mudarabah and the lack of adequate controls, Islamic banks have chosen the easier way out which is to reduce the amount Of Mudarabah financing.

How should we structure Mudarabah financing such that it has the necessary controls to reduce the agency problems without the financier's interference in the business and still provide him with 'better' returns within a risk-return framework? The answer may lie in some of the more sophisticated financing structures of conventional finance. While there may not be a direct solution, since conventional instruments are either debt or equity, many of the underlying principles of such financial arrangements could be used for our task. One financial arrangement in conventional financing where there are serious agency problems and where much research has been carried out to seek solutions is the LBO or Leveraged Buyout. An LBO is quite simply a highly leveraged transaction. Usually it is the acquisition of a company using mostly debt financing. Often very little equity is employed, typically in the 5 % range with the remainder constituting various forms of debt. Management owns (or is given) a small portion of the equity with the rest coming from a small group of equity investors. (LBO specialist firms/or venture capitalists would provide the equity financing and raise the needed debt financing thru issuance of high yield bonds).

Using debt and equity in its normal form would expose the **financiers** to huge incentive problems. Aside from using several control features like negative pledges[8] etc., the key has been two innovations: first the use *of vertical strip financing* and second equity *-kickers.*

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8 *A negative pledge is a legal indenture requiring management not to take on any additional debt or any other obligation.*

Vertical Strip Financing

Unlike traditional financing where equityholders own equity and debtholders the issued bonds. in vertical strip financing "Strips" are issued instead to *both* debt and equityholders. Each stripholder is entitled to some portion of equity *and* debt. Since in an LBO, the proportion of equity is very small compared to debt, the agency problems of debt would be accentuated- It is to avoid this that vertical strip financing is used. Since everyone including management are stripholders the problem of levered equity as call option and the moral hazard Problem is minimized. In fact there will be no incentive or opportunity for management to 'appropriate' wealth from debtholders to equity, since first there is no such division and second, as with everyone management too holds strips. An important point to note about, vertical strip financing is that since a strip is part equity and part debt, vertical strip financing is in many ways similar to Mudarabah. Recall that our evaluation of Mudarabah in Part I showed Mudarabah to have the features of both debt and equity.

Mudarabah Vs. Vertical Strip Financing

If Vertical Strip Financing, an innovation aimed at reducing agency problems is similar in overall structure to Mudarabah, why is it that the agency problems are much greater in Mudarabah? This has to do with two key differences.

(i)   Vertical strip financing has the control feature of conventional debt. Debt has a "bonding effect"[9] in that the compulsory debt servicing requirements "bind" managers to ensuring the constant generation of cash flows, thereby imposing discipline. Because of the absence of any compulsory payments the bonding effect is missing in Mudarabah.

(ii)   The second key difference lies in the "equity" portion of vertical strips. Conventional equity represents a claim on *all of a company* 's assets. Mudarabah's claim on profits are only applicable to the financed project not all assets. Thus, once again in vertical strip financing unlike Mudarabah, management would have no incentive to transfer (or siphon) wealth from one set of assets to another.

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[9] *See Jensen (1986)*

Equity Kickers

Equity Kickers are an innovationo that have become increasingly popular in transactions like LBOs and in Venture Capital Financing. In an LBO, equity-kickers are often provided as "sweeteners" to investors in the high yield bonds issued. Typically an equity-kicker would be a provision built into the financing contract that would be triggered by certain outcomes. For example, should management of the LBO firm be unable to meet debt payments within a stipulated time, the contravention might trigger the equity-kicker. That is, management would have to provide some predetermined percent of equity to the debtholders. This 'penalty' effectively reduces the amount[10] of equity held by management while providing an equity stake in the company to debtholders.

The equity-kicker provision therefore has two major impact. It firstly ensures that management (who own the equity) will be very careful and discipline in their decisions since any losses incurred that might result in contravention would be costly to them directly. Second, financiers – especially debtholders need not be helpless in the face of value destruction by management. With equity comes voting power and with sufficient equity the ability to replace boards and or top management.

PROPOSED MUDARABAH ARRANGEMENT

The Mudarabah arrangement proposed here attempts to use the underlying principles of vertical strip and equity-kickers outlined above. Simply put, the one big difference between the proposed arrangement and existing Mudarabah arrangements by Islamic Banks, would be the introduction of an "equity-kicker". Except for this difference everything else is the same. Yet, it will be evident that with this one difference much of the agency problems can be reduced and Mudarabah can be made more attractive for the financier.

Essentially, the proposed financing arrangement calls for the provision of an equity-kicker clause whereby in the event of losses In the Mudarabah financed project, the Rab-Ul-Mal absorbs the losses but is "reimbursed" for the amount of losses thru issuance of new equity by the Mudarib to him. The total (accumulated) equity that the Rab-Ul-Mal receives in reimbursement would be *capped* at a percentage equal to the proportion of Mudarabah financing value at the time of initial

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[10] *Even if new equity is issued to debtholders, the resulting dilution would still be costly to existing equityholders.*

financing. Though it may appear that with such reimbursement the Rab-Ul-Mal would still suffer losses if the Mudarabah financed project turns out to be bad. Nor is he guaranteed any "fixed return".

To examine how this proposed Mudarabah arrangement will work, we work through the earlier example. We will examine the returns to the equityholders of XYZ Corp. (borrowers) and the Rab-Ul-Mal under the current Mudarabah arrangement and the proposed one. Recall that in the earlier example, the value of the firm was initially $4.2 mil. (Since it is 100% equity financed, value of equity is also $4.2 mil.). The company wants to -undertake a new project worth $1 mil.. It sets aside $0.2 mil. of current equity to the new project and uses $0. 8 mil. of Mudarabah financing. To this earlier example we now make two changes:

(1) We extend the life of the project to three years. (As opposed to one year)
(2) With extended life, to reduce the number of permutations, we have 3 possible economic scenarios each year. (Instead of 5)

Finally, for clarity we only examine the new project, the company's current projects worth $4.0 mil. is held constant.

Table 6 below shows the three scenarios, their probabilities and the percentage return to new project under each scenario.

Table 6

Scenario	Prob.	% Returns
1	.333	40
2	.333	20
3	.333	-20

Based on these percentage returns the mean return and std. deviation of the new project would be 13.33% and 24.94% respectively. Since Mudarabah financing is SO.8 mil. and equity value Is $4.2 mil; total firm value with new project would be $5 mil., Thus, the maximum reimbursement of equity that the Rab-Ul-Mal could get, given our earlier rule would be capped at 16%. Figure 1, in appendix shows the possible outcomes at the end of project life. Since there are 3 possible scenarios per year, there would be a total 27 possible outcomes for project value at the end of year 3. Notice that there are 7 outcomes under which end value of project would be lower than $1

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mil, meaning a loss is incurred. It is under such outcomes that the proposed equity kicker will be triggered. With the exception of these 7 loss making scenarios, there will be no difference in returns to either- party under existing Mudarabah arrangements and the proposed one.

In order to determine the amount (or percent) of equity that would have to be given the Rab-Ul-Mal two things would first have to be determined; (i) the end dollar- value of the project under the scenario and (ii) the portion of the project's end value that will accrue to the 'borrowers' and the Rab-Ul-Mal. Should the value accruing to the Rab-Ul-Mal be less than $0.8 mil, the equity kicker will be triggered. The Mudarib will have to provide equity whose total current amount **equals** the 'loss' to Rab-Ul-Mal. The first column of Table 9 and Table 10 show the portion of project end value that will accrue to the borrowers and Rab-Ul-Mal under current Mudarabah arrangement. These were derived as;[11]

$$V_{Nm} = \delta \, x V_{Ni} - \left[\left((\lambda \, x \, V_{Ni} \,) - \lambda \right) \right] \bullet \pi \quad \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (5)^{[12]}$$

$$V_{NRAB} = \left[(\lambda \, x V_{Ni}) - \lambda \right] \bullet (1 - \pi) \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (6)^{[13]}$$

where;

V_{Nm}	=	End Value of New Project to Mudarib.
V_{NRAB}	=	End $ Value of New Project to Rab-Ul-Mal.
$\delta, \lambda, V_{Ni,}$ and λ	=	as previously denoted

Table 7 shows the 7 scenarios under which the project's end value would be less than $1 mil, It shows the portion that would go to Rab-Ul-Mal under current arrangement, the resulting shortfall and therefore the amount of reimbursement, the resulting total firm value and the percent of total equity that will have to be given to Rab-Ul-Mal under our proposed arrangement. Table 8 builds upon Table 7 and shows the adjusted end project values that will accrue to Rab-Ul-Mal and the borrowers. (Last 2 columns).

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[11] *These are values determined under current Mudarabah arrangement. Following the determination of these values, the amount of reimbursement is determined as the shortfall to the Rab-Ul-Mal, given his initial financing of $0.8 mil.*

[12] *When V_{Ni} is < $1.0 mil., $V_{Nm} = \delta$; value of project to Mudarib will be $0.2 mil., since he takes no loss.*

[13] *When V_{Ni} is < $1.0 mil., $\pi = 0$, since Rab-Ul-Mal takes all losses. This is consistent with equations 3 and 4.*

The last two columns of Tables 9 and 10 show the adjusted end dollar values accruing to each party and the resulting percentage returns. The percentage returns to each party under the current Mudarabah and the proposed arrangement makes an interesting comparison. Except for the 7 scenarios under which adjustment is needed, the returns are the same under either arrangement. The impact of the adjustment shows up on the overall mean return and std. deviation of returns. Notice in Table 9 that for the borrowers, the mean return *reduces* (approx. 30 %) while the std. deviation increases (approx. 35 %). In Table 10, for the Rab-Ul-Mal, the mean return under the proposed arrangement increases (by 55%) while std. deviation *reduces* by Approx. 35%. This result should not surprising. What is essentially happening under our proposed arrangement is an effective transfer of "benefits" from the borrower to the financier. That the Rab-Ul-Mal's returns increased simultaneously with reduced risk (std. deviation) means substantial increase in his utility in a risk-return framework.

PART IV: PROPOSED MUDARABAH FINANCING STRUCTURE:
AN EVALUATION

Having described and examined how the proposed Mudarabah arrangement would work, we are now ready to evaluate the proposal. The evaluation will be done in 3 ways, first, how does the proposed Mudarabah compare with conventional equity and debt, second, does it solve the two problems that were raised earlier (agency problems and disadvantage to financier) and third, does it confirm with the Shariah?

A first factor in evaluating any financing technique should be applicability - that is, would it work? As was mentioned earlier, equity kickers are used extensively in transactions like LBOs and Venture Capital financing. Thus its functionality need not be doubted. Though clearly workable, an Islamic bank might want to know if potential clients might still be interested in the proposed form of Mudarabah. It will be evident from our subsequent discussion that eventhough the proposed form provides advantages to the financier; it retains many of the inherent advantages of Mudarabah to a borrower.

The proposed arrangement makes Mudarabah more congruent with conventional equity. For the Rab-Ul-Mal, the equity kicker provision enables him to have a "claim on all of the firms assets" which is also "perpetual"; in the event of project losses. Furthermore, with the acquisition of equity, the Rab-Ul-Mal can influence the borrowing company in policy decisions - and to some extent protect his interest. This is very much like a conventional equity holder's position.

When we compare the proposed method to conventional debt financing, we see a number of interesting features. The proposed arrangement has the "binding effect" of debt but without the "leverage" effect. Debt is binding since borrowers **must pay** debt service payments or risk bankruptcy and so incur personal loss. (Lose their employment). Our proposed Mudarabah has a binding effect in that should there be losses, the equity kicker will be triggered and new equity has to be issued to the Rab-Ul-Mal. The issuance of new equity will have a dilution effect on the value of equity. Management who normally also hold equity position will thus see their *personal wealth* being eroded. Though there is this possibility of being hurt personally, the overall company's risk does not increase. By risk here we mean the leverage impact and the risk of bankruptcy.

Unlike the case with debt, where an increase in debt increases the risk of bankruptcy, the proposed arrangement does not increase the risk of bankruptcy. This is because in the event of losses, it is equity that has to be given to the financier not debt service payments which are in cash form. The issuance of new equity though hurtful to current equity holders does not impact the firm s liquidity nor solvency in any way. If current management as equity holders stand to lose, why should they want the new form of Mudarabah? While loss in personal wealth is possible, the proposed Mudarabah *is no more hurtful* than an outright equity issue to finance the new project.[14] Thus, it will be no less attractive than equity financing.

We now turn to an evaluation of the proposed Mudarabah arrangement in terms of the two problems that were isolated in Part II. To recap, the two underlying problems of current Mudarabah arrangements were (i) it has more agency problems than conventional equity or debt and (ii) that it is disadvantageous to the Rab-Ul-Mal. We now ask whether in its proposed form, the arrangement would be fairer to the financier and whether the agency problems would be lower. The issue of fairness to the financier was addressed in Part III. Recall from Tables 9 and 10, that with equity-kickers, the Rab-Ul-Mal's mean returns increased with a simultaneous reduction in std. deviation. Thus, in a risk-return framework the Rab-Ul-Mal would indeed be much better of under the proposed arrangement. In effect, he stands to get a *higher return for taking on less risk. This* was achieved, through a 'reallocation' of returns from Mudarib to Rab-Ul-Mal and of risk from Rab-Ul-Mal to Mudarib. There is no reason to doubt that the Rab-Ul-Mal would be better off under the proposed arrangement.

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[14] *Even in the worst case scenario of 100% loss on the new project, the amount of equity that would have to be given the Rab-Ul-Mal will not be any greater than the increase in equity, if equity financing had been used for the new project.*

In terms of agency problems it is logical that these problems will be much less under the new arrangement. Recall that equity had two types of agency problems (a) increases in fringe benefit. wastage and lack of cost control and (b) siphoning of profits/funds from some assets to others (Mudarabah financed project to others). It was argued that this second problem would be much more serious in existing Mudarabah. This had to do with incentive effects. Since the Rab-UI-Mal had to absorb all loses it was always in the borrower's interest to allocate "more costs" to the Mudarabah financed project.

Doing so would move profits away from the Mudarabah project to other assets whose profits would not have to be shared However, with the provision for equity-kickers, it will make no sense for rational borrowers to engage in such siphoning. Any losses incurred on the Mudarabah financed project would mean giving away equity to Rab-UI-Mal equivalent in amount to the losses. Since this is common equity, it will entitle the Rab-UI-Mal to a claim on *all the assets,* including the one-. to which profits were moved to!.

The agency problems of debt are again in two forms. (i) Levered Equity as a call-option on the firm and (ii) Moral Hazard. There are two equivalent ways to see how these problems will be reduced under the proposed form. The fact that the Rab-UI-Mal absorbs all loses was the cause of the acute Moral Hazard problem. (The incentive to take on high risk projects). Once again, the fact that if losses are incurred, new equity will have to be given to the Rab-UI-Mal thereby causing dilution and lower equity value (and personal losses) will act to discourage unnecessary risk taking. Borrowers will clearly think much more carefully when investing in high risk projects. A more rational risk averse behaviour will be the result. Yet, we need not worry about excessive risk averseness since it will still be in their interest to undertake good viable projects. This is because the borrower would be no worse off under the proposed Mudarabah then with conventional equity financing. Thus, any project that is viable with conventional equity financing will be viable under the proposed Mudarabah. In fact, such a project would be even more attractive since Mudarabah provides leverage.

A second way of thinking about why the agency problem of debt will be less is to think in terms of levered equity as call option. Recall the earlier argument that with levered equity the downside risk is limited while upside potential is unlimited.[15] In the example we had seen the maximum the borrower could lose is the $0.2 mil. equity. However, notice in Table 9 under the proposed arrangement that the total loss could be more than the $0.2 mil. For the seven loss scenarios of that table, the end project value is actually negative. The negative value arises from the fact that on top of loses, reimbursement is made to the financier. If one thinks in terms of a diagram, the payoff is not cut-off to be horizontal at -$0.2 mil. but instead continues to slope downward beyond -$0.2 mil. In essence, *this makes the proposed Mudarabah more like equity. A* thought that may arise here is, is it fair to require reimbursement on top of the loss made by the investor (borrower)? The answer is, it is as fair as equity financing is.

It is, *Profit and Loss sharing* in the true sense. Not only is the borrower able to share in the profits *but is also required to share in* the losses! This is exactly as conventional equity is. Yet, investment. in equity such as common stock is *halal.*

Given these arguments, it is quite clear that with the proposed Mudarabah arrangement, agency problems will indeed be lower.

As final evaluation, we examine the proposed Mudarabah arrangement in the light of the Shariah. To do so, we will examine the proposal in the light of the relevant Shariah injunctions. One of the underlying principles of Islamic Financing is that returns should not be fixed or guaranteed. The Rab-Ul-Mal in the proposed Mudarabah does not in any way get fixed returns neither is there any guarantee against losses. His returns are not fixed since they are tied to project end values. He is *not guaranteed against losses* even with the proposed equity-kicker. In fact he will make losses if the project makes losses - although it will be much less than under existing Mudarabah. The reason he will make losses has to do with two factors, first, he is receiving new equity in a firm whose value has fallen. (Because of the losses). Though 'compensated' for losses, *he is getting progressively more equity in a firm with reducing total value.[16]* The second reason for why losses are still possible has to do with the fact that there is a cap on his maximum possible reimbursement - in this case 16 %. To see how loss is still possible, let us take an extreme case; suppose the $1 mil. invested in the new project ends up being $0.2 mil. at end of year 3, then the

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15T*he maximum possible loss equals the total of equity but potential profit is unlimited.*

[16]*This would not be the case if the reimbursement is in cash. But requiring cash reimbursement will make it no different from conventional debt.*

investment has resulted in a loss of $0.8 mil. The total value of firm is now $4.2 mil. since a loss was incurred, the Rab-Ul-Mal will have to be compensated to the tune of $0.8 mil. However, the maximum equity that can be given him is 16% of total firm value. Thus, he would receive 16% of the firm, which will be $0.67 mil.. worth of equity. As a result the Rab-Ul-Mal stiil losses $0.13 mil.[17]

The Shariah also has injunctions against the interference in the business by the financier. By interference here, it is meant getting involved in operational details. Under the proposed arrangement though the Rab-Ul-Mal could end up owning equity in the firm, he need not be interfering in the operations of the firm - in the same way that stockholders don't interfere. Should there be cumulative losses and the Rab-Ul-Mal own a sizeable portion of equity, he would still only be influencing policy decisions - not operational details. Thus, the proposed arrangement cannot be considered to be in violation of the non interference injunction.

The one Shariah requirement that would not be met by the proposed arrangement is the requirement that in Mudarabah, the financier should absorb all the losses. Any proposal that seeks to overcome the problems of existing Mudarabah would invariably come up against this injunction. In fact a case can be made that much of the agency problems and the preserve incentives of Mudarabah arise due to this injunction. The underlying logic for why the Shariah requires the financier to absorb all losses is that the borrower is deemed to have already suffered losses. He has earned nothing from all his efforts and faces reputational damage, thus requiring him to pay (even partly) for the losses would be to penalise him several times over.

Though this would make perfect sense in business settings of the old days, given today's widely different business environment such a requirement could be the cause of widespread abuse. In today's world of specialization, delegation, instant communication and legal anonymity, it will be very difficult to make a case that a borrower especially a corporate one has "lost" sufficiently in terms of expended effort that they should not be made responsible for losses.

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[17] *16% of $4.2 mil. = $0.67 mil., thus loss to Rab-Ul-Mal is $0.8 mil. - $0.67 mil. = $0.13 mil..*

CONCLUSION

This paper examined the problems underlying Mudarabah financing as currently practised. Analysis from a finance theory viewpoint identified two major problems areas. A new financing arrangement was proposed using equity-kickers to help overcome these problems. Though it is shown that the proposal is workable in the contemporary environment, a number of weaknesses remain. This proposed arrangement is by no means totally problem free. The metho~1 has a number of weaknesses. First, the proposal will work better for Mudarib companies that are public listed with their stocks being traded on an exchange. In determining percentage returns with reimbursement, this is an implicit assumption. When dealing with non public listed companies, problems with firm valuation and therefore the percentage of equity to be reimbursed could be a problem.

Second, though losses would trigger equity-kickers, a Mudarib who minimizes the reported profits in order to maximize his benefits could still get away. To check this, adjustable thresholds that trigger the equity-kickers may be required. However, such additions could turn out to be overly restrictive.

Finally, the fact remains that the proposed method does clash with the Shariah injunction that the Rab-UI-Mal should absorb all losses. Accommodating this requirement while trying to overcome the agency problems has thus far proven difficult. Perhaps this points to a possible direction for future research.

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TABLE 7:   END VALUE $ TO RAB-UL-MAL UNDER PROPOSED MUDARABAH

Scenario No.	$ Ret. To Rab.	Amt. To Be Reimbursed	Tot. Value Of Firm (+ 4 mil)	% Equity Given To Rab.
(9)	0.7168 – 0.8	= 0.0832	4.89	1.7%
(18)	0.6144 – 0.8	= 0.1856	4.768	3.89%
(21)	0.7168 – 0.8	= 0.0832	4.896	1.7%
(24)	0.6144 – 0.8	= 0.185	4.768	3.89%
(25)	0.7168 – 0.8	= 0.0832	4.896	1.7%
(26)	0.6144 – 0.8	= 0.185	4.768	3.89%
(27)	0.4096 – 0.8	= 0.3904	4.512	8.65%

TABLE 8:   **END $ VALUE OF EQUITY TO CURRENT**
                     Shareholders of XYZ Corp. Under Proposed Mudarabah

End Value of Proj.	Total Value Firm + 4 Mil.	Portion To Rab. Under Current Mudarabah	% Reimb. To Rab-Ul-Mal	$ Value of Reimbursement	$ Valur To Rab With Reimbursement	End Value Of Equity To XYZ Shareholders Under Proposed Arrangement
(9) 0.896	4.896 mil.	0.7168	1.7%	0.0832 mil.	0.8	4.096 mil.
(18) 0.768	4.768 mil.	0.6144	3.89%	0.1855 mil.	0.8	3.968 mil.
(21) 0.896	4.896 mil.	0.7168	1.7%	0.0832 mil.	0.8	4.096 mil.
(24) 0.768	4.768 mil.	0.6144	3.89%	0.1855 mil.	0.8	3.968 mil.
(25) 0.896	4.896 mil.	0.7168	1.7%	0.0832 mil.	0.8	4.096 mil.
(26) 0.768	4.768 mil.	0.6144	3.89%	0.1855 mil.	0.8	3.968 mil.
(27) 0.512	4.512 mil.	0.4096	8.65%	0.3904 mil.	0.8	3.712 mil.

TABLE 9
End $ Value of Equity and % Returns to Mudarib under Current and Proposed Mudarabah

	Current Mudarabah Arrangement			Proposed Mudarabah Arrangement	
Scenario	End Value of New Project ($ mil)	% Returns		End Value of New Project ($ mil)	% Returns
1	1.53	665%		1.53	665%
2	1.23	514%		1.228	514%
3	0.63	216%		0.6317	216%
4	1.23	514%		1.228	514%
5	0.97	386%		0.9721	386%
6	0.46	131%		0.4614	131%
7	0.63	216%		0.6317	216%
8	0.46	131%		0.4614	131%
9	0.20	0%		-0.104	-152%
10	1.23	514%		1.228	514%
11	0.97	386%		0.9721	386%
12	0.46	131%		0.4614	131%
13	0.97	386%		0.9721	386%
14	0.75	277%		0.7533	277%
15	0.32	58%		0.3155	58%
16	0.46	131%		0.4614	131%
17	0.32	58%		0.3155	58%
18	0.20	0%		-0.232	-216%
19	0.63	216%		0.6317	216%
20	0.46	131%		0.4614	131%
21	0.20	0%		-0.104	-152%
22	0.46	131%		0.4614	131%
23	0.32	58%		0.3155	58%
24	0.20	0%		-0.232	-216%
25	0.20	0%		-0.104	-152%
26	0.20	0%		-0.232	-216%
27	0.20	0%		-0.488	-344%

Mean Return % = 194.44
Std. Dev. % = 191.55

Mean Return % = 140.81
Std. Dev. % = 258

*   Returns based on equity investment of $0.2 million

TABLE 9
End $ Value of Equity and % Returns to Mudarib under Current and Proposed Mudarabah

	Current Mudarabah Arrangement			Proposed Mudarabah Arrangement	
Scenario	End Value of New Project ($ mil)	% Returns		End Value of New Project ($ mil)	% Returns
1	1.2186	52.33		1.2186	52.33
2	1.1245	40.56		1.1245	40.56
3	0.9363	17.04		0.9363	17.04
4	1.1243	40.54		1.1243	40.54
5	1.0438	30.48		1.0438	30.48
6	0.8826	10.33		0.8826	10.33
7	0.9363	17.04		0.9363	17.04
8	0.8826	10.33		0.8826	10.33
9	0.7168	-10.4		0.80	0
10	1.1245	40.56		1.1245	40.56
11	1.0438	30.48		1.0438	30.48
12	0.8826	10.33		0.8826	10.33
13	1.0438	4.56		1.0438	30.48
14	0.9747	10.33		0.9747	21.84
15	0.8365	30.48		0.8365	4.56
16	0.8826	21.84		0.8826	10.33
17	0.8365	4.56		0.8365	4.56
18	0.6144	-23.2		0.80	0
19	0.9363	17.04		0.9363	17.04
20	0.8826	10.33		0.8826	10.33
21	0.7168	-10.4		0.80	0
22	0.9363	17.04		0.9363	17.04
23	0.8365	4.56		0.8365	4.56
24	0.6144	-23.2		0.80	0
25	0.7168	-10.4		0.80	0
26	0.6144	-23.2		0.80	0
27	0.4096	-48.8		0.80	0

Mean Return % = 10.04   Mean Return % = 15.58
Std. Dev. % = 23.00   Std. Dev. % = 15.07

*   Returns based on $0.8 mil. of Mudarabah financing