MUSHĀRAKAH AND *MUDĀRABAH* INSTRUMENTS: THEORY DEVELOPMENT TO ASSESS THEIR CHARACTERISTICS

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Abstract

Until very recently, equity financing is more in line with the spirit of Islam as compared with debt financing. As such, *mushārakah* and *mudārabah* are the preferred modes for Islamic investors. It is therefore a matter of a concern that even after four decades after Islamic finance captured the attention of investors around the globe, these two purest genres account only for a small percentage of Islamic financial industry. The paper examines more searchingly for the *reasons* why *mushārakah and mudārabah* occupy such insignificant place among Islamic financial products. This paper offers an analytical insight.

Keywords: Islamic finance; *mushārakah; mudārabah*; Rothchild-Stiglitz framework; heterogeneity
JEL Classification: P5

1. Introduction

The central question addressed in this paper is about one major challenge leaping off the page of virtually any narrative concerning the evolution of Islamic finance industry in the world. As any serious student would anticipate that challenge is this: why do the two of the purest Islamic capital-versus-noncapital instruments have remained such a small percentage of Islamic financial institutions' portfolio all over the world? Those two most authentic, pristine, channels are *mushārakah* and *muḍārabah* contracts. Many analysts and commentators have commented upon this, and this paper attempts to answer this industry experience.

While the specific characteristics of *mushārakah* and *mudārabah* will form the bulk of the rest of the paper, suffice to say that sharing profits as well as losses based on a pre-agreed profit-sharing *ratios* rather than pre-agreed profits in the contract is central to these two financing types. The paper describes the characteristics of *mushārakah* and *mudārabah*, especially the latter. Certain advantages could ensue in probing that question while emphasizing incentive-compatibility across transactors with economic diversity. Conventional neo-

classical economics have worked out a widely-used framework specifying pre-requisites to choices among risky outcomes. Central to that framework are the use of indifference curves, and the use of incentive-compatibility to provide the logic to the conclusions reached. We propose to use that framework with necessary changes to provide an analytical answer to this dilemma of the industry.

The original framework is from Rothschild and Stiglitz (1976). The concepts of 'fair-odds line', marginal rate of substitution, zero and non-zero rates of profits, and 'budget lines' are used with appropriate changes in this paper to stay in line with the institutional and incentives assumptions made in that work. Equilibria are established when neither the *rabb-al-māl* (capital provider) nor the *mudārib* (entrepreneur) has any material incentive to disturb any given *status quo*, earning 'zero-profits'. When the risk-pool is homogeneous, the informational regime is by assumption complete and an equilibrium is achieved such that all capital to be provided by the *rabb-al-māl* will be mobilized and absorbed by the *mudāribs*. When *mudāribs* differ in their opinion on loss probability as well as on when information is asymmetric, the loss probability difference is unknown to the *rabb-al-māl* but is known to the *mudāribs*, so that less than complete absorption of the capital in the economy will likely result.

The paper invokes agent heterogeneity and information frictions (adverse selection and moral hazards), the former is introduced in terms of differential loss probability. It establishes that in Islamic *murārabah* markets, the interposition of *mudārib* heterogeneity and information advantage will necessarily lead to *separating 'equilibria'* as the most likely competitive solution: pooling 'equilibria' will tend to phase themselves out. That said, separating 'equilibria' will require the establishment of both voluntary *signaling* and enforced *screening* to be well-articulated institutional features of the market, so that the problems posed by *hidden information* (adverse selection) and *hidden actions* (moral hazard) are substantively neutralized.

Next, the paper examines in depth the reasons why *mudārabah* is accorded such insignificant share in league tables of Islamic financial products. We do that by invoking agent heterogeneity and information frictions (adverse selection and moral hazards). Heterogeneity is introduced in terms of different loss probability. The paper establishes that, as in the conventional insurance markets, in Islamic *murārabah* markets too, the interposition of *mudārib* (entrepreneur) heterogeneity and information advantage will necessarily lead to *separating 'equilibria'* as the most likely competitive solution. Pooling 'equilibria' will tend to phase themselves out. That said, separating 'equilibria' will require the establishment of both voluntary *signaling* and enforced *screening* to be well-articulated in the institutional features of the market, so that the problems posed by *hidden information* (adverse selection) and *hidden actions* (moral hazard) are substantively neutralized, if not altogether eliminated.

The rest of the paper is divided into three sections. The next section is about concept development within the Rothchild-Stiglitz framework. The reader will find in the third section the logical development of the framework extended to Islamic finance. Relevant conclusions are drawn in the concluding section 4.

2. Concept Development

The objective of this section is to assess the trends in Islamic finance industry in terms of the quantitatively small take-up of the various Sharī'ah-compliant finance as well as other miscellaneous Islamic financial products. The section provides brief definitions of the various lines of financial products from secondary sources. This would support our claim that these two modes of financing occupy a small share of the capital market.

2.1 Definitions

Mudārabah instrument is a trustee partnership agreement. In it, two or more parties combine human and financial capital to share the risk of running an enterprise together, with the purpose of earning *halal* (permissible) profits. One of the two parties is called *mudārib* (the entrepreneur) who has the necessary skills, expertise and diligence but lacks capital. The second party called *rabb-al-māl* provides the required financing to the entrepreneur. This is congruent with all economic practices of all human societies. Such a capital provider may be an Islamic bank, a finance company or a private investor, as for example as happens in private placements by entrepreneurs, which has become very popular since the 1990s as a fund raiser. The management of the enterprise and the production work are the exclusive responsibility of entrepreneur. Profits generated are shared between the two parties according to a pre-agreed ratio, not fixed returns on capital provided. To create a balanced contract, if a loss were to occur (due to no fault of the entrepreneur), the capital provider will lose his capital, and the entrepreneur will lose the value of time and effort she invested in nurturing the business. Under a court's finding of any willful neglect by entrepreneur, the capital provider could sue for damages on grounds of neglect.

Mushārakah is a partnership or joint venture agreement whereby two or more parties contribute capital *and* management expertise to pursue earning *halal* (permissible) profits to be shared among them. All providers of capital are entitled to participate in management but are not necessarily required to do so, if one or more of them wish to opt out of full participation, he/she can do so with the agreement of rest of the members on terms to be mutually agreed. Profit is distributed among the partners in pre-agreed ratio while the loss is borne by each partner strictly in proportion to capital contributions. The capital of the company can be money or valuables such as merchandise or capital goods or inventories.

2.2 Why Have Mushārakah and Mudārabah Not Become Major Modes of Finance in Practice?

If personal circumstances or preferences prohibit going into entrepreneurship as a solo effort, partnership as embedded in the two instruments is allowed under the Islamic legal framework. That is one reason, as also the reason given after the landmark decisions of sovereigns in about five centuries ago, to

permit their citizens to engage legally in sole proprietorship, joint ventures and also as joint stock companies (starting from the days of the Columbus's joint venture with Queen Isabella of Spain, in the case of conventional partnership). Islamic teachings laud the principle of pursuing profits while exhorting parties to contract splitting exposure to risk-taking equitably. In the more than two-centuries old history of modern banking, the idea of sharing risk has been pushed back through financing arrangements, where the entrepreneur solely bears the risk and the financiers developed contracts that do without any risk-sharing, requiring payments for funding.

The Qurãn states, "Allah has made buying-and-selling permissible, but *ribā* impermissible": [2:276]. Buying and selling legally-permitted goods is all about pursuing legitimate returns while embracing risks equitably is enshrined in contracts. *Mushārakah and mudārabah* contracts are the most authentic financing products in Islam, because returns qualified by risks provide their bedrock. One of the first tests of genuineness in Islamic financing is about the proportion it accords to *mushārakah/mudārabah*. The available evidence emphatically suggests that about ninety percent of Sharī'ah-compliant financing as of late 1990s used to be on *murābaḥah* (sale on deferred payment basis) or joint-venture (Iqbal et al., 1998).

More recently, the percentage share of these contracts *mushārakah/ muḍārabah* in the total funding provided by banks during the six-year period ending in 2011 averaged about 7 per cent whereas the corresponding percentage owing to *murābaḥah* (a third form) is as high as 85 per cent (Goud, 2012). A long-term evaluation of the operation of Islamic Bank of Bangladesh (IBBL) over about a quarter century shows the following. Over the first three years, *mushārakah/mudārabah* had accounted for some 15 per cent of banking finance whereas during the latest two decades that percentage shrank practically to almost single digits (Belal, Abdelsalam & Nizamee, 2010). In general, *mushārakah* and *mudārabah* accounts account for less than a tenth of the financing provided by Islamic banks worldwide (Iqbal & Molyneux, 2005). The sub-total is found to range anywhere between 9.7 and 7.8 per cent (Goud, 2012).

For those in the know, such isolation of variable-returns products in Islamic finance is readily understandable, though regrettable. The underlying argument is all about incentive-incompatibility.

For a financing structure to work economically and sustain interest over time, sufficient incentives of participant *interest-groups* need to be dovetailed. Otherwise, the contract will soon slacken off. A simple sale contract between a buyer and a seller takes place only if there is synchronization of needs and an agreement on price.[1] In the event of a default of a conventional debt contract, the accumulation of arrear interest is itself a deterrent to default. In a *murābahah*-based sale contract for deferred payment, such a deterrent is itself less effective in the absence of a penalty clause. However, it provides less protection to the

[1] The remainder of this paragraph borrows heavily from Dar (2007).

financier as they cannot benefit from the proceeds of the penalty, which are paid out to designated charities. This less favorable treatment of the financier may result in higher pricing of Islamic financing products based on *murābahah*. *Murābahah* makes the incentives of the providers and the users of capital substantively compatible. This is largely the message of Table 1.

2.3 Comparative Incentive-Compatibility among Different Islamic Financial Products

Table 1 contains summary statistics on a variety of Sharī'ah-compliant financial products. Whereas for *murābahah*, the deficit relative to *ribā*-based regime is passed off as being only marginal, for *mushārakah* and *mudārabah*, the deficits are said to be significantly less. For three other financial products, the incentive-compatibility are said to be only moderately less compared with (roughly) equivalent conventional banking systems.

Table 1: Incentive features of some of the Islamic financing products

Modes	Residual rights	Control rights	Incentive Compatibility	Remedial measures
Murābaḥah	Fund user	Fund user	Marginally less	Penalty clause, buyer undertaking
Ijāra wa iqtina ʿ	Fund user	Financier	Moderately less	Undertaking from financier
Salam	Financier	Fund user	Moderately less	Parallel *salam*
Istiṣnā ʿ	Shared	Shared	Moderately less	Parallel *istiṣnā* ʿ
Muḍārabah	Shared	Fund user	Significantly less	Strong monitoring and supervision
Mushārakah	Shared	Shared	Significantly less	Strong monitoring and supervision

Source: Hassan and Lewis (2007).

Several explanations have been offered as to why *murābahah* is so ubiquitous, pervasive and durable. The motives include, (i) capital protection while generating Sharī'ah-compliant profits through making financing available; (ii) risk transfer through an internal market; (iii) hedging against the undermining of the environment of financing integrity arising from informational frictions; and (iv) other means. Also, in any modern economy, partnership tends to be the most common form of business form because of the ease with which partnership can provide capital. In addition, the laws provide easy exit from partnership to sole ownership, if the parties desire to go that way.

2.4 Why Should We Care if Proportion of Mushārakah/Mudārabah is Small?

The small size of *mushārakah/mudārabah* as a percentage of Sharī'ah-compliant financing raises questions about the genuineness of Islamic finance in economic life. This arises mainly on two grounds. First, by restricting to a small percentage share, the most original and authentic mode of finance in Islam presents Islam's these two financing models as an apologist.

Second, compared with *murābahah*, which is the fastest growing segment in the Islamic finance industry, *mudārabah/mushārakah* have the potential of rendering careers in business and entrepreneurship more broadly-based, and thus leveling the playing field of investment.

Murābahah can of course be readily tailored to scale up with regard to a whole range of physical, income-generating assets such as diagnostic laboratories, private hospitals, dentists' clinics, beauty-parlors, all manner of testing (soil, water, etc.), cyber-cafes, desktop-printing shops, engineering consulting firms, fire-advisors' businesses, etc. These are well outside and beyond the oft-quoted space of real estate and vehicle purchases. That contract can cast a wide net in terms of how many categories of businesses it could serve well.

That said, these *murābahah*-favorite business categories mostly feature relatively high entry barriers due to specialization and the associated human-capital requirement. They are heavily skewed towards specialized services and imply a narrow demographic base. They will of necessity ride the crest of an expensive kind of human capital accumulation, which in any case will be limited in number. No matter how exuberant, the problem surrounding such growth will still leave Islam's implementation record removed from the bona-fide *maqāsid al-sharī'ah*. The latter are much more likely to prefer financing of a larger, direly under-capitalized mass of small and medium enterprises in production, manufacturing, and trade. In many economies, with only one percent of businesses being *outside the fold of* tiny, small or medium enterprises, these statistics actually represent the very heart of a financing problem that needs to be pointed out. Most entrepreneurial units typically struggle on account of a mismatch between the availability of business skills and capital. *Murābahah* does not reach a large number of needy people. All this will undoubtedly amount to a strategy of obliging the top of the ladder investors. Given the dominance of *murābahah* type contracts, the typical spectacle of Sharī'ah-compliant financing appears to be incongruous with transforming the entrepreneurship in the economy that could advance socio-economic objectives and mandates of societies.

Provisioning of capital is among the most strategically important action driving economic growth in any economy. The provisioning of capital via the *rabb-al-māl* mode is akin to supplying blood in a body. Without effective coupling of capital, and technical, organizational, managerial and human-resources skills (of entrepreneurs) no income-generating project can bear fruit. Even so, the centrality of capital in the development process is inescapable as is well known and acknowledged by all economists, including the Islamic economists. Modern

economic analysis suggests that almost two-thirds of a dollar of GDP in an average economy is the result of capital injection to production process: labor input accounts for almost the rest of the productivity.

Of course, the compact between the two partners would need to be framed by the goals set and constraints to be faced by a business as agreed to by both the financier and the entrepreneur. The savings that the financiers bring aboard will have involved conscious postponement of consumption by today's owners over many past periods. The opportunity cost of today's capital in terms of past sacrifice can be very significant. Today's capital is the prospective mainspring of all future streams of income for the *rabb-al-māl*. While one always expects one's endowment of capital to perform financially, the opposite, however, may no doubt could happen, thus introducing asymmetric expectations.

Consider in contrast the situation of the *mudārib*. The entrepreneur's claim to the prospective profits stems from his business skills in general. For a manufacturing concern, such skills will run across the whole gamut of production process from ideas through the prospective product positioning to picking a path towards operational success from an intelligent analysis of the competitive scenarios and finally to efficient transformation of all inputs into a profitable proposition. The entrepreneur is potentially irreplaceable in any productive economic activity as he/she brings to the table a repertoire of specialist skills, capabilities and expertise, which at times could be unique. There can be no denying the unique contribution that a good *mudārib* can potentially make to the success of a project. Recent evidence of world economic recovery after the Global Financial Crisis attest to the fact that jobs are created by the entrepreneurial activities of innovative persons.

2.5 Rabb-al-māl Deserves Priority in Policy Formulation

Having stated that, it is still imperative to consider at least three dimensions of the comparative situation of the entrepreneur and the financier before one is able to absorb the incentives/disincentives that characterize them.

First, capital owned by a financier is like a general-purpose vehicle. It is a malleable resource. As long as capital is in the form of unencumbered money, it represents a liquid form of buying power ready to be deployed in any productive sector for procuring goods or services or for paying for their transformation into any pre-set blueprint that an entrepreneur has prepared for socially useful products or services. Like all general purpose vehicles, capital faces the prospect of potentially profitable deployment across real sectors of an economy without the encumbrances of any significant adjustment or *menu* costs.

In contrast, the same is in general not true of the *muḍārib*; if not in its entirety, then certainly to a degree. Unless the economy offers the services within well-defined markets of the full array of technological, managerial, logistical, information-technology skills, an entrepreneur has to agree to supply all or a part of what is required from the diverse array of competencies in entrepreneurship. It is impracticable for any one person or well-knit team to wrap their heads

around such diverse skills and capabilities for anything but a *given production sector of interest*. This suggests strongly a state of relative immobility: the entrepreneur's skills are not intrinsically mobile across sectors. At a further remove, this suggests that the *mudārib* is exposed to non-negligible *adjustment* or *menu* costs when he/she has to change the sector of involvement. The main point is that a general purpose resource has an advantage that is denied to a more sector captive, specialized, resource of a *mudārib*.

Second, owners of capital would likely enjoy greater negotiating leverage compared with the owners of sector-specific resources and skills. Whereas capital is likely to be universally in demand across several sectors or industries, the *mudārib's* services are unlikely to face equally brisk demand regardless of the sector of interest. Once again, one sees capital's generalized advantage to be contrasted with a disadvantage associated with relatively anemic demand across sectors and industries for services of *mudāribs*.

Third is the existence of information asymmetry. Asymmetric information comes in two varieties. There is adverse selection, something what Debraj Ray has called *hidden information* (Ray, 1998). Hidden information is about an economic agent actively seeking to create more positive, favorable, congenial perceptions about the prospective value of contribution(s) to an enterprise. There is no doubt that relative to the *rabb-al-māl*, the informational balance is very clearly with the *muḍārib*. We make a fuller presentation about the various aspects of informational asymmetry in the next section. What the *rabb-al-māl* brings to the equation suffers from not even a small measure of adverse selection (*hidden information*) or moral hazard (*hidden action*). The *rabb-al-māl* must simply deliver the amount of money committed to investment. Only when financier honors this commitment, one can monitor this fully and in a costless manner. That commitment, whose fulfillment takes places at the 'input' stage, will need to be honored to the last dime.

In contrast, the payoff in any transaction is often bound up with the *output.* Output is typically far less easily amenable to contractual formulation to everyone's satisfaction than *inputs* (entrepreneurship and finance). The entrepreneur's true contribution will be to the output although that output is not very clearly *contractible*, which becomes a decisive factor in the present context. Given the role of hidden information and hidden action in it, the output-producing process becomes an important source of uncertainty in the life of an enterprise. This introduces the important idea that the *mudārib* is potentially susceptible to engage in an adverse selection activity when a *murārabah* contract is signed.

Before going any further, one further relatively minor point needs to be covered. One should be aware that the following analysis is more relevant to pure types of *murārabah* than to *mixed mudārabah*. The assumption in this paper is that many of the individual *mudāribs* could all be relatively young people with professional qualification or unique ideas, but without much cash resources to start an enterprise. Their ability to put up collateral in cash or cash-equivalents may be too trivial or narrow. It may become absolutely impracticable for such *mudāribs* to front-load the deal by pledging something of economic value to financiers.

2.6 Indifference Curve Analysis

In modern economics, the first use of indifference curves under asymmetric information was in analyzing welfare effects of insurance contracts. There are important differences between using indifference curves in discussing insurance markets and markets for Islamic partnership contracts. The transactions are monetary and two-way in nature in insurance: premium is paid by the insured with the expectation that *someday* they will be traded off for an indemnity to be paid by the insurance company. The equilibrium in insurance markets is said to take place when premiums paid into the plan is equal to the indemnity paid out. Premiums paid appear as debit entries on customers' books of accounts but as credit entries on insurers' books. Indemnities appear as credit entries on customers' books of accounts but as debit entries on insurers' books.

This brings about incentive-compatibility of the insured *versus* the insurer. *Prima facie*, it could be said that analogous conditions to *premiums* and *indemnity* do not exist in the Islamic risk-sharing partnership contracts. At least, such a characterization would be entirely inconsistent with the profiles and attributes that *mushārakah* and *muḍārabah* possess. Secondly, then how can one conduct indifference curve analysis when discussing the choice of a method for trading between different states of outcome across a range of uncertainty?

3. Model Development

Consider a *mudārabah* market where each potential *rabb-al-māl* faces two states of the world.

A profit result, in which case the wealth is w+P; and

A loss result, in which case the wealth is w-L.

A state diagram is often used in the analysis implied here of risky bundles of economic outcomes. Before joining the *mudārabah*, we assume that the *rabb-al-māl*'s wealth endowment is equal to w. After a *mudārabah* contract is agreed, the *rabb-al-māl's* wealth endowment is changed as follows:

$$\Pr(1\text{-}p) = W + P$$

$$W_t = \text{----------} \qquad (1)$$

$$\Pr(p) = W \square L$$

The probability of a loss occurring in any given year is assumed to be *p*. Therefore, the foregoing assignment essentially states that the wealth endowment in the event of a profit is W+P, where P is the profit that accrues to the *rabb-al-māl*. In the event of a loss, the endowment is changed to W-L, where L is the loss that accrues to the *rabb-al-māl*. Here, the parameters merely describe the *murārabah*

contract, with both profit and loss being shared between the *rabb-al-māl* and *mudārib* based on the profit and loss sharing ratio agreed beforehand. We choose to look at the economics of dealing in risky bundles through the filter of the *rabb-al-māl*. We also assume that all *arbāb-al-māl* (plural of *rabb-al-māl*) in an economy with Islamic finance being available are identical in all essential respects. This then suffices for the use of the model for a representative *rabb-al-māl*. Denote the probability of an accident as p that an accident could precipitate a loss. A *murārabah* contract is assumed to exist primarily due to the initiative of the *rabb-al-māl*. Parties will buy into a *murārabah* contract if the expected utility of such a contract exceeds the utility of keeping the financier's capital under his sole control:

$$(1 - p).\ U(W + P) + p.\ U(W - L) > U(W) \tag{2}$$

A *rabb-al-māl* will take on new *murārabah* proposals for implementation, subject to the availability of his capital, as long as the ratio of the probability of profitable and loss-making events is compatible with the *actuarially fair odds*.[2]

What level of deployment of capital would maximize the expected utility of the *rabb-al-māl*? In the model itself, both the odds of a profit or loss and the amount of the profit/loss could be admitted to be variable. In the context of answering this question, we fix the odds, and we ought to be able to do so without any loss of generality. It would be easy to treat the quantity of capital that any given *rabb-al-māl* would deploy on the basis of *mudārabah* as given. Before proceeding any further, we reformulate the foregoing equation by replacing both P and L as more appropriate profit (or loss) functions, as follows:

$$E\,(U) = ((1 - p).\ U(\mathrm{W} + \mathrm{f}\,(\mathrm{K.L}) + p.\ U\,(W - f\,(K,\ L)) \tag{3}$$

Where f(K,L) merely represent the underlying production function, embodying the arguments of capital and labor-services. On purpose, we omit from the profit function the other variables, such as the price of the product in question, etc., are uncertain, in order to reduce notational clutter. We intend to do this without any loss of generality.

For the time being, we are using the role, incentives and effects on the *rabb-al-māl* as defining the focal point of this analysis. The expected utility would be maximized when the first-order condition with respect to the foregoing equation is equal to zero:

$$\frac{\partial E(U)}{\partial K} = (1 - p).\ U_k'(K, L) - p.\ U_k'(K, L) = 0 \tag{4}$$

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[2] In terms of the terminology of the insurance-market literature, actuarially fair odds correspond to a situation in which the insurer ends up with zero profits, as the premia paid by the insured exactly equals the indemnity paid against the policy.

That implies the following: $(1-p).U_k'(K,L) = U_k'(K,L)$

That further implies $\frac{p}{(1-p)} = \frac{(1-p)}{p} = 1$

This finally implies that the expected utility from forming *mudārabah* would be maximized when the partnerships are being formed along the actuarially fair-odds line.

The easiest situation to set up is a 2-state set up with $p_1 = p$ and $p_2 = 1- p$. An interesting way to represent preferences in this case is with a standard consumer model over two goods, consumption in state 1 and consumption in state 2. As usual, an indifference curve is given implicitly by setting utility to a fixed value and treating one variable (say x2) as a function of the other (x1). Individuals maximize E [u (x)] = pu (x1) + (1 − p) u (x2)

$$E[U(x)] = p.U(W-L) + (1-p).U((W+P)^{IC}(W-L)) = \overline{U} \tag{5}$$

where, the superscript of 'IC' is meant to convey the fact that (W+P) is being assumed to be a function of (W-L).We formally substitute x1 for (W-L) and x2 for (W+P).

Differentiating this condition implicitly once gives the condition:

$$-\frac{dx_2^{IC}}{dx_1} = MRS_{X2}^{X1} = \frac{p}{1-p}U_{X1}'/U_{X2}' \tag{6}$$

Along the 45-degree line of a graph putting x1 against x2, where x1 = x2, then $U_{X1}' = U_{X2}'$. Along such a line, marginal rate of substitution between (W-L) and (W+P) will be equal to $\frac{p}{1-p}$ the odds-ratio, no matter the curvature of the utility function. This is one of the implications of expected utility theory, as applied to the two-state diagram.

The characteristic of the risk-pool is important to the outcome in terms of the *inter-personal* distribution of the *payoff* and any possibility of externality. The first thing that needs to be examined is about the homogeneous risk pool: this is the base case. The base case also provides an opportunity to look at the individual elements of the state diagram. It is to the examination of such a base case that we now turn our attention.

3.1 Integrity of Using State-Diagram from Mainstream Economics

Before proceeding any further, addressing the validity of implanting analytical construct(s) from microeconomics is helpful. One could argue that, whereas certain similarities and analogues may exist between the competitive equilibria in insurance markets in the presence of heterogeneity and incomplete information, the symmetry in the Islamic *murārabah* markets however breaks down at certain crucial junctures. For example, in the insurance markets, incentive-compatibility arises from the insured paying premiums into a pool, in anticipation of a *quid pro quo* in the form of the payment of the indemnity in the event of an accident.

Whenever the premium is set at a higher level than the actuarially fair premium, the degree of insurance coverage chosen by individuals is lower.

In fact, the algebraic formulation of the 'fair-odds' line specifically includes both the (i) the probabilities of the loss and non-loss events; and (ii) the expected utility associated with the payment of the premiums and the indemnity. The institutional set-up of the *murārabah* match-up does not include such a hard-wired dove-tailing of material incentives. Arguably, implanting the diagram containing fair-odds line, and indifference curves that intersect only once giving rise to the *single-crossing property* may be illegitimate.

Further discussion is needed. First, it is incontrovertible that the *rabb-al-māl* and the *muḍārib* in Islamic economics will be interested to pool their resources *only and solely* with a desire to bring into better alignment their respective income or consumption or utility levels across two states of nature namely the occurrence of loss and the occurrence of profit. In short, the very proposition of the *mudārabah* is about trading between two collections of economic prospects with different degrees of potentially measurable uncertainty, which is called *risk*.

The mainstream microeconomics witnessed vigorous development of analytical constructs that are especially relevant for grasping the drivers and policy implications arising from the trade-offs in such risky bundles (Cutler & Zeckhauser, 1998). This has been especially so since the conventional economics has been prodded by the discovery of the pervasiveness of incomplete information (in the sense of some information being hidden, selectively) and the challenges it entailed for much of the neo-classical economic analysis. In the analytical development, therefore, we have to depend necessarily on the constructs that have been used in the conventional microeconomics texts to probe the achievement of equilibrium under agent heterogeneity and under asymmetric information. Crucially, in doing so, one has to diligently bear in mind the role of the institutional differences between conventional risk markets and Islamic *murārabah* markets. Not every aspect of the expected-utility theory or the definition of risk-aversion/risk-neutrality would readily fit into a discussion of choices to be made in an Islamic economy. This parameter is adhered to very consciously in the writing of this paper.

Secondly, in seeking to *improve* the distribution of wealth amid riskiness, both the *rabb-al-māl* and the *mudārib* are parting with what is valuable to both; for one it is general-purpose money and for the other his work skills. But even the *mudārib* agrees to take the lids off from his commercial code of proprietary secrecy in operational matters when he agrees to pool resources with the investor because she has access to capital that would bring the output to reality as well as the profit share. It is the *mudārib* who is informationally advantaged to some extent.

The entrepreneur may also be possessed of specialized or highly specialized technical or process-related skills (windows technology of Bill Gates). Being willing to train employees in the *murārabah* will be tantamount to his being willing to share from his cache of *trade secrets.* That said, that particular effect may also mean partial, even substantial, neutralization of the

mudārib's own competitive differentiation in future as the number of potential competitors swells through copycat replications (China syndrome). Erosion of one's own essential competitiveness in informal markets, with loose *intellectual property rights protection,* for technical or even business skills, will often be channeled through informal training programs. There is a lot of evidence for that. For instance, Nathan Rosenberg of Stanford University has argued that scientific prowess is partial to publicity and assiduously seeks disclosure, publication, and dissemination. In sharp contrast, technical or process-related, or technological, prowess is publicity-shy, assiduously avoiding disclosure, duplication, free replication, and copying (Rosenberg, 1973).

Scientists who stumble upon ground-breaking discoveries in areas of pure or natural science set great store by publishing quickly hoping that their craft will achieve the status of a classic. In contrast, innovators, who are after big payoff that follows commercialization, set great store by stealth, secrecy and successful rapid patenting of the essence of the technical or process innovation before the competition has even a wind of what is going on. In general, the more proprietary the technical or process related skill that the *muḍārib* brings to bear during the course of implementation of the business plan of the partnership enterprise, the more valid is the argument made in the previous paragraph.

As long as information relating to the loss and profit probabilities, and the distribution of expected profits and losses in the relevant events are available, the constructs of indifference curve, fair-odds line and incentive-compatibility, are all applicable with necessary changes. Of course, there will be one major difference between competitive equilibria between conventional insurance markets and the Islamic *mudārabah* markets. In the former, given that individuals are risk averse and insurance companies are risk neutral, the first best is characterized by full insurance. By assumption, insurance companies will enter into the industry as long as positive profits can potentially be made by selling insurance. The impulse towards less-than-full insurance will be undercut by competition until the zero-profit equilibrium is reached. In contrast, under the analysis conceived in this paper, the *landmark* evolutionary stage in market's development is about a full subscription of the *rabb-al-māl's* capital by the *muḍāribs*.

A sample of *mudāribs* could either be identical in terms of the individual probability of loss. Or the sample could harbor heterogeneous probability of loss. The issue needs to be framed diagrammatically in the interest of greater clarity. The underlying issues run the gamut from actuarially fair odds to incentives compatibility, all of which can be handled diagrammatically. The ratio of the probability of profit occurring compared with a loss is akin to the relative prices of two commodities being compared. Odds are actuarially fair when the likely return and risk are being traded at a rate equal to the ratio of the probability of profit *versus* loss occurring.

3.2 When the Risk Pool is Homogeneous

The domain of risk-pool includes all the *mudāribs* in the economy. The *mudāribs* could arguably be all identical in terms of their trade-related competencies, that

is, equally knowledgeable, shrewd, diligent, customer-friendly, well-tuned to the state of the market, and with identical leadership qualities. This would be a case of the *rabb-al-māl* facing a group of *mudāribs* with identical probability of loss. It is already assumed that all losses are equal to L. The loss probability (p) and the amount of the loss (L) are the only two variables in the present analysis. We shall want to keep L fixed in the following analysis. Fixing L is without loss of generality. We only need one free parameter here, either p or L: we will be using p below. There will be an initial endowment with coordinates of (*W, W - L*). This initial endowment is represented by the point E in Figure 1 below. The fair-odds line extends with slope equal to the odds ratio between the loss and no-loss states.

A *rabb-al-māl* will optimally allow full subscription of his entire capital, as long as profit rates offered by the *mudāribs* and the probabilities of occurrences of profit or loss do not fall shy of the rate commensurate with actuarially fair-odds line. Following from the Von Neumann Morgenstern expected utility property, the highest indifference curve tangent to the fair-odds line has slope at its point of tangency with the fair-odds line, which is where it intersects the 45^0 line. At this point, wealth is equalized across states.

In Figure 1, the loss probability is shown on the vertical axis and the residual probability of profit on the horizontal axis. By initial assumption, both the *mudārib* and the *rabb-al-māl* have identical utility functions. Each indifference curve is about how either the *mudārib* or the *rabb-al-māl* trades between a state of risk-i.e., a pecuniary loss¾and a state of return¾i.e., a profit. The *rabb-al-māl* will presumably face a multiplicity of demand for his capital, because by assumption there is a shortage of capital, the economy suffers from a scarcity of capital, and therefore capital-owners enjoy a sought-after status in the economy.[3] The full employment of all available capital in the economy is therefore also an imperative. Situations of the full subscription of the *rabb-al-māl's* capital (in other words, the full coverage of capital provisioning) corresponds to points on the 45-degree line while situations of incomplete coverage lie to the right of the bisetrix (where W1 >W2).

The expected value of the loss in any given year could alternatively be represented by present value of future tax credits expected to materialize due to those losses, given the so-called loss-carry forward allowed universally in most tax codes. It bears repetition that losses racked up in the given year under discussion are by assumption being represented by present value of expected future tax credits receivable against them. This institutional assumption underlies this paper.

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[3] Of course, both the mudārib and the rabb-al-māl will have mouth(s), including his own, to feed. By assumption, the former only has business skills which do not translate readily into command over food: if he does not have savings from past periods, the pressure upon the mudārib to team up with a rabb-al-māl and start up a murābahah will be immense. In contrast, the rabb-al-māl has cash resources on hand. He can just go to the market and buy what he needs, paying down with cash: he is not desperate for a mudārabah deal.

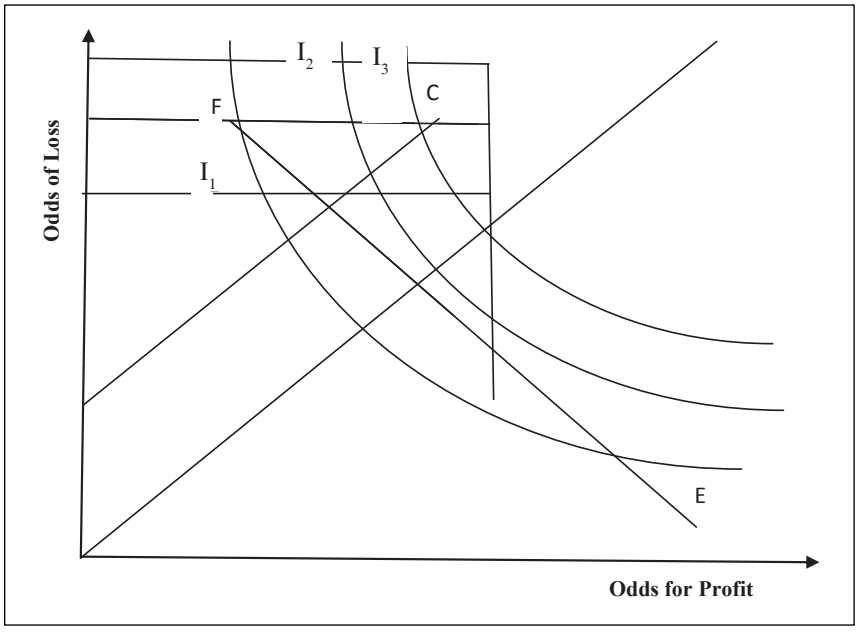

Figure 1: A two-state analysis of *mushārakah*/*muḍārabah* contract equilibria

Each investment project will be about trading expected losses in terms of expected profits. The indifference curve for risk is about the marginal rate at which expected loss is traded into units of expected profits¾the marginal rate of substitution between losses and profit. The 'actuarially fair-odds line' is the budget line. A budget line identifies the best budget constraint available to the agents (both the *rabb-al-māl* and *muḍārib*) for trading risk into returns. Put it differently, the budget line is about marginal rate of transformation of risk relative to returns. The slope of an investment project's budget line would be different from others, of course. A budget line would have a steep slope if either the underlying enterprise or its *mudārib* is inherently more risky: it takes a larger amount of losses (expected future tax credits) to translate into a given amount of expected profit. A new enterprise in an industry with significantly greater start-up difficulties or with high failure rates would exemplify such higher risks. In contrast, certain genetic, personality or background traits arguably predispose certain human beings to taking undue risks and thus more risky behavior.

The ratio of the probability of loss to unity minus the probability of profit occurring is equal to the slope of the line representing the actuarially fair odds: this is the ratio $^{p}/_{(1-p)}$. When the slope of the budget line is equal to the slope of the indifference curve, the risks and returns are evenly balanced.[4] The capital of the *rabb-al-māl* would be fully placed into investment: the number of the

[4] In the insurance literature, such a situation is said to lead to zero profit for the marginal insurer, given full and free entry into the markets.

mudāribs looking for capital will be equal to the number of *murārabah* contracts that *arbāb-al-māl* are looking to enter into. For enterprises in a particular industry, the probability of the occurrence of loss in any given year of operation will be given. Given such a probability, the budget line corresponding to actuarially fair odds will represent an equilibrium. This will be a situation of full subscription of the capital that all the *arbāb-al-māl* put together will wish to bring on the market.

Point E in Figure 1 corresponds to a situation of no deals involving *mudārabah*. Each point to the northwest of E represents a specific *murārabah* contract uniquely identified by a certain investment by the *rabb-al-māl* and an uncertain profit or loss (loss when there is a loss). The segment EF represents the actuarially "fair" odds line. The net payout from an uncertain 'game' is actuarially fair if the expected monetary gain, whether in cash or in putative (notional) terms, equals zero. Corresponding to each outcome of actuarially fair-odds there is a budget line. The budget constraint that reflects the opportunities presented by an actuarially fair contract is called by an actuarist a *fair-odds line*. Along such a budget constraint, the expected value of all 'states' of income is equal, and no one group of *transactors* will be subsidized *ex ante* at the expense of any other group.

In the insurance literature, this line is called the actuarially fair-odds line, or the zero-profit (for the insurance company) line. Of those two expressions, the first one, the actuarially fair odds line is probably more appropriate. This line identifies a locus of the break-even budget constraints available to the *rabb-al-māl* and the *mudārib* for trading outcomes in the two (risky and good) states of affairs. The break-even is in a sense that it just brings the material interests of the two kinds of partners into the kind of alignment that makes it just worthwhile to team up.[5]

Trading income in the two states at a rate equal to the slope of EF leaves the *rabb-al-māl* and the *mudārib* with a harmonious balance: no new *mudārib* has any incentives for disturbing the *status quo* by offering the *rabb-al-māl* a more attractive profit rate. Starting from point E, any point to the south-west of EF entails combinations in which risk trades into return at a rate more preferential to risk-taking by the *rabb-al-māl*. There is always the supply of new candidates among *mudāribs* and are not spurned by the *arbāb-al-māl*. The underlying risk-return nexus is propitious for risk-taking. That said, such cannot be an environment conducive to the maintenance of equilibrium contracts (as any given profit ratio can always be undercut by a new aspiring *murārabah* contractee that attracts other *arbāb-al-māl* and still earns positive profits). In

[5] The one major difference between the terminology of the insurance markets and the Sharī'ah-compliant financial products markets is here. In the insurance markets, the fair-odds line always corresponds to situations of zero profit for the insurer, which is evocative of an unambiguous aura of 'fairness' in the match-up between premia paid and the indemnity in prospect. The corresponding analogue in Sharī'ah-compliant markets can only be envisioned more in the abstract, as the concept of zero profit is no longer relevant.

contrast, any point to the north-east of EF entails risk-return combinations that are skewed against risk-taking and it is therefore not feasible. So, given free entry and perfect competition in long-term equilibrium, the *arbāb-al-māl* and *mudāribs* find their equilibrium contract along the set of contracts on the EF line. This notion of equilibrium contract connotes only a preference among all the *arbāb-al-māl* and *muraribs* not to upend the *status quo*.

We can represent the preferences facing a proposed partnership enterprise with a map of indifference curves. Given risk-aversion by both prospective partners, the indifference curves are convex. Given any indifference curve, all the points to the northeast entail higher utility and all the points to the southwest entail lower utility. Equilibrium is on the highest indifference curve compatible with the expected 'budget constraint' provided this point also lies on the bisetrix, ie. point C. In C, the slope of the indifference curve is equal to the slope of EF.

Thus, when both the *arbāb-al-māl* and the *mudāribs* are risk averse, and there is complete information,[3] the first best is characterized by full utilization of capital open to *mudārabah*.[4] Whenever the marginal rate of transformation of risk into return is lower than the marginal rate of substitution of risk for returns, the appetite for risk remains relatively brisk, and the *arbāb-al-māls*' capital that is set aside for the *murārabah* format will begin to move toward fuller deployment in risk-sharing. Gradually, the supply of such a quantity of *mudārabah* funds will also be equal to the amount of the funds for which the *mudāribs* have effective demand.

The base case is unlikely to be an accurate description except in a minority of the cases. More realistically, the *mudāribs* are likely to be heterogeneous. A situation of incomplete information is typically in for the ride when the risk-pool is heterogeneous. The presence of agent heterogeneity typically triggers the advent of private information. We now turn to this aspect of the problem.

3.3 Heterogeneous Risk and Adding Private Information

The *mudāribs* could conceivably be divided into two groups. One of these groups comprises *mudāribs* who are more risk-prone and impulsive, impetuous and single-track in their information-gathering, insufficiently attuned to both the short- and the long-term factors concerning competitive obsolescence of the equipment and technologies used in the project(s) under study. When they buy supplies, they fail to spot opportunities in the market for bargains, and to buy economically, running unduly bloated purchase costs. They are naïve and gullible, credulous 'dummies' who would readily put their trust even in strangers. They may not be the best judge of readily concluding that 'an offer

[3] Complete information is said to exist when, in particular, principal-agent relationships do not labor under the weight of information frictions.

[4] Note that only the *murārabah*-specific portion of the capital of the *rabb-al-māl* seeking deployment is relevant to this paper. *Mushārakah* -specific capital is not of relevance here. As well, given complete information, it is the points on the fair-probabilities line that the *rabb-al-māl* will become agreeable to deploying the whole of the *murārabah*-only portion of his capital. This is intuitively acceptable.

may be too good to be true', and may fall unsuspectingly into a trap that may be deliberately sprang upon them. In short, some *muḍāribs* may have a mental make-up that makes them, even when they are entirely earnest, a loss-leader.

Let us assume that the other group is made up of *mudāribs* who are even-headed and thoughtful, comprehensively networked and thus have reliable access to a relevant and wide array of information, are prudent and methodical, take a decision *only* after due processes and much careful reflection. The two classes of *mudāribs* are set apart from each other. There is a category of *mudāribs* who are *prospective loss leaders*. There is a second category of *mudāribs* who are *prospective profit leaders*.

Under the watch of the first group of *mudāribs*, the *murārabah* is *more likely* to stumble into operating losses in the ventures they take up. The probability that the *murāribāh* in question turns up a loss for any given unit of time is higher than elsewhere in the economy, allowing for the specific characteristics of the sector of interest. Whereas under the watch of the second group of *mudāribs*, the probability that the *mudārib* in question will turn up a profit for any given unit of time is higher than elsewhere in the economy.

Full deployment of capital of the *rab-al-māl* will necessarily involve trading profit income between occurrence of profits to be shared, and losses to be split. Equilibrium will be impracticable without the *rab-al-māl* being able to sort out the loss-leaders from the profit-leaders. The former need to be crowded out compared with the profit-leaders. Within each industry, the *rab-al-māl* ought to offer capital to the profit-leaders at a relative profit discount compared with the loss-leaders: profit ratios offered need to allow for an 'industry-effect'. It is necessary to introduce the industry of origin as a qualifier because industries fundamentally differ in terms of the risk-return nexus: an explicit *industry effect* is an allowance that needs to be made when it comes to profit differentials among economic agents with different characteristics, such as susceptibility to losses.

In addition, we admit private information into the discussion. This means that we assume that individual *mudāribs* know their risk type but this information is not known to the *rab-al-māl*. This assumption makes intuitive sense, too. Private information without heterogeneity is not meaningful; if everyone is identical, there is no private information.

Given the two risk types, 'h' and 'l', and the asymmetric information about these types, there are two possible classes of equilibria in the model. The first of these two is about pooling equilibrium. That is about a situation where the *rabb-al-māl* does not distinguish between risk-types, which are however for real. It is to this aspect that we turn first now.

3.4 Pooling Equilibrium

Figure 2 is drawn with the indifference curve corresponding to the high-risk ('h'-type) *mudāribs* being flatter compared with low-risk ('l'-type) *mudāribs*. The marginal rate of substitution (MRS) of the high-risk *mudāribs* is hereby being assumed to be lower compared with the MRS of the low-risk *mu□āribs*.

The certainty equivalent of the initial without-any-*mudārabah*-contract state is higher for 'l' than for 'h' types since the type l have lower odds of a loss. Because the probability of loss is lower for type l, type l would want to raise their *reservation profit ratio* in their prospective contracts signed compared with high-risk *mudāribs*. Likewise, the low-risk types will feel entitled to lower the *maximum* loss ratios in their prospective contracts compared with high-risk types. The incentive-compatibility constraint of the low-risk *mudāribs* will entail that they would likely demand higher profit ratio in the event of a profit, and a lower ratio of loss in the event of a loss, both compared with the high-risk *mudāribs*.

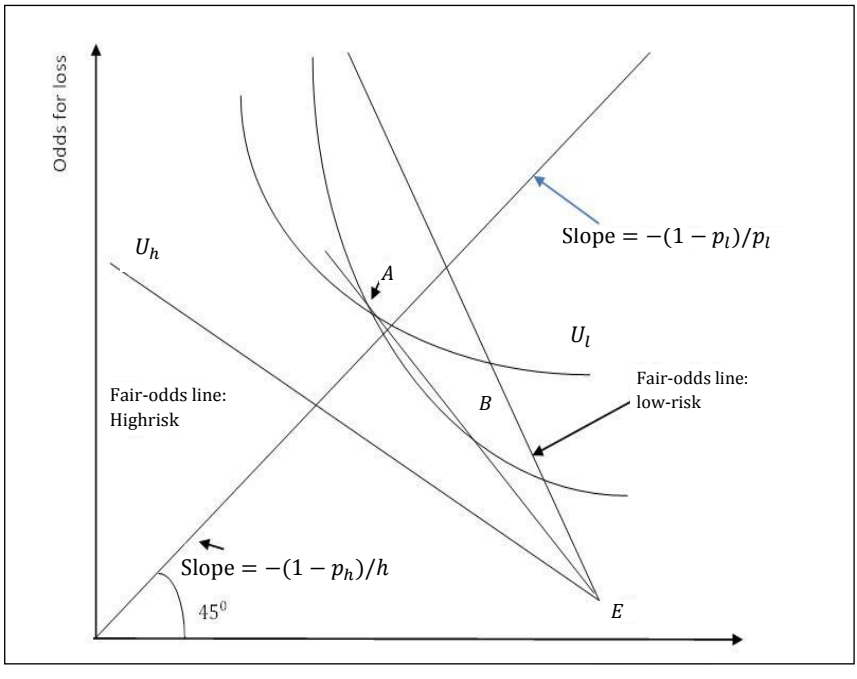

Figure 2

The two risk types result in two different fair-odds lines for the two classes of *mudāribs*. That said, there will also be an aggregate fair-odds line, which will be some kind of an average of the two type-specific fair-odds lines. In a pooling equilibrium, both types of *mudāribs* get away with the same type of treatment by the *rabb-al-māl*. The achievement of equilibrium requires a construct in which such a treatment lies on the aggregate fair odds line. The outcome of a pooling equilibrium would be represented by the point 'A', and that point must lie on the aggregate fair odds line. If the point 'A' lies above that line, it would be unattractive to the *rabb-al-māl* and so would not exist in equilibrium. If it lies below such a fair odds line, the underlying risk proposition would be so attractive to the high-risk segment of the *muḍārib* population as to swamp the volume of capital to be forthcoming from the *rabb-al-māl*.

So, at least for a while, there will be a tendency for some sort of pooled equilibrium, centered on the equivalent, in a Sharī'ah-compliant financing market, of the point A. But this pooled equilibrium will not be sustainable, and so a position like A would not ultimately exist in equilibrium.

The pooled equilibrium will be sustained fundamentally by the perception that the *mudāribs* and *rabb-al-māl* have identical probabilities for causing an outcome of loss, whereas this assumption will in reality be untrue. The reality shall often be that some *mudāribs* have safer hands for managing the money than others: the latter will be riskier partners to manage money with. If this latter perception is the more valid one, then this pooled 'equilibrium' will also lead to an implicit cross-subsidization of the riskier sub-sample of the population, at the expense of the safer sub-sample. Even if the *rabb-al-māl* were initially to be unaware of the differences between the two risk-types, thus leading, *pro tem*, pooling equilibrium to prevail in the markets, there will come a time eventually when the low-risk *mudāribs* will be able to disabuse *arbāb-al-māl* of the fallacious symmetry.

If all *mudāribs* have equal access (in both quantity and quality) to private information concerning their own risk-types, and if they reflect their private information fully in their contracting with the *rabb-al-māl*, then pooled equilibria are unlikely to exist in the *murārabah* market in a sustainable manner. This is because the low-risk type will have material incentives to stake claims for high reservation profit ratios, and also lower loss ratios *versus* 'h'-type *mudāribs*. Could they predictably carry the power of persuasion with the *rabb-al-māl*? We have already said that the latter is equally credulous lot when it comes to private risk information. But even so, that would not prevent the low-risk types from offering convincing arguments for why they *deserve* higher profit ratios compared with their higher-risk competitors. The main take-away from this discussion is that the issue of material incentives, unleashed by differences in incentive-compatibility between the high and low risk *mudārib* types, would likely create larger frequency of *contracting frictions* when it comes to pooling equilibria. On that basis, therefore, such pooling equilibria are more likely to be of interest as episodic, transitional, significance in *murārabah* markets.

The combination of heterogeneity and equal access to private risk information among the *mudāribs* would likely spawn beneficial externalities of *competitive disclosures* by the low-risk *mudāribs* preparatory to 'educating' the *arbāb-al-māl.* Cross-subsidizing of the high-risk *mudāribs* at the expense of the low-risk ones is likely to be the defining pitch of such competitive disclosures by the latter.

The systematic differences between the low- and high-risk *mudāribs* in terms of the underlying material incentives will render the incentive-compatibility constraint of the high-risk types binding. If separating equilibria are not enforced, whatever contracts will be acceptable to low-risk types will also be acceptable to the high-risk types. The challenge facing the policy-makers in Islamic economy is to devise and market *murārabah* contracts that could be offered to the low-risk *murārabah* types that would also not attract high-risk types.

3.5 Separating Equilibrium

In Figure 3, points 'Al' and 'Ah' are the points that correspond to the full-subscription of the *arbāb-al-māl*' capital for the two risk groups. The low-risk *mudāribs* ought to have higher wealth because their probability of experiencing a loss is lower.

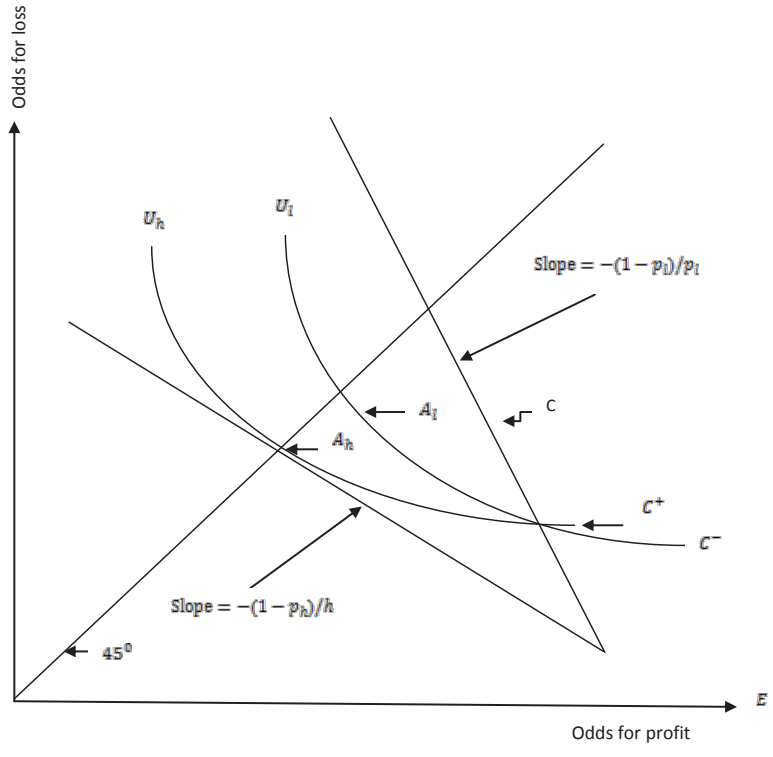

Figure 3: Separating equilibrium

The point labeled 'C' on the fair odds line for the 'l' group is where the indifference curve from the full-subscription point for the 'h' group crosses the fair odds line for the 'l' group. The indifference curve 'U_l' that intersects point 'C' is steeper than the corresponding curve for the 'h' group. The marginal rate of substitution corresponding to the 'h' group is smaller compared with the 'l' group. At 'C', one is at the best outcome one could offer to the 'l' types that would not also attract 'h' types: this is because 'C' does not admit any tangency between the fair-odds line for the high-risk types of *mudāribs*. The outcome C^+ on the figure would be strictly preferred by the 'l' types, because the point C^+ is closer to the full-subscription point than C.

The issue is that the outcome C^+ would also be preferred by the 'h' types, presumably for the same reason, which would create pressures for bringing the pooling equilibrium back in. The outcome of C- is one which would be rejected by 'h' types, but 'l' types would strictly prefer outcome C, the original outcome. So, any outcome like C- is dominated by C.

It would be neat if outcomes 'A_h' and 'C' could somehow be offered in the *muḍārabah* markets, and, in addition, type 'h' would always choose 'A_h' and type 'l' would always choose outcome 'C'. Both outcomes have the desirable property of lying on the fair odds line for the group whose capital requirements are being met. But the complicating issue is that because the percentage split is the same for both profits and also losses, and also because that split does not differentiate among entrepreneurs based on whether they are loss-leaders or profit-leaders, low-risk *mudāribs* are likely to be only partly covered, relative to high-risk ones. Compared with low-risk *mudāribs*, high-risk users of capital receive a certain amount of preferential treatment.

But if it were practicable to fully cover the capital needs of the low-risk *mudāribs*, it was not going to be practicable to inoculate them from the high-risk ones. The main problem is that preferences of high-risk *mudāribs* are binding and shape up as the constraint on the *murārabah* market. The challenge before the policy-makers is that the decision rules of capital allocation (that is, the sharing ratios for profits as well as loss) must maximize the well-being of low-risk *mudāribs* subject to the constraint that the high-risk ones can be weaned from the low-risk ones. This is the essence of separating equilibrium.[5]

Following this chain of argument, separating *murārabah* contracts are designed for two separate kinds of contracts tailor-made to reflect the different risk profiles of the two groups of *mudāribs*. As well, there is a need to ensure that the two groups find it in their interest to self-select into buying the contract tailor-made for it. The crucial issue is how to do both of those two things. The short answer is Sharī'ah-compliant variable-return schemes direly depend upon certain institutional, informational and behavioral structures, allowances and sanctions that make it imperative for both high- and low-risk agents to separate themselves in the way in which they sort out the *murārabah* contracts they sign up. Due to space limitations for this paper, just what those structures, allowances and sanctions can be is left as the subject-matter for a follow-up research.

We have invoked heterogeneity and information frictions among prospective participants, and established self-selection of mutually-exclusive types of *murārabah* and *mushārakah* contracts that would endure as *separating equilibria* a 'second-best' solution. Separating 'equilibria' will require the establishment of both voluntary *signaling* and enforced *screening* to be well-articulated institutional features of the market. This will be so that the problems posed by *hidden information* (adverse selection) and *hidden actions* (moral hazard) are substantively neutralized, if not altogether eliminated. However,

[5] High-risk *muḍāribs* are no better off for the harm they do to the low-risk group. One group loses but no group gains. This is the opposite of Pareto improvement—and potentially a large social cost.

the foregoing points at quite a formidable exercise. This paper is already long enough. It will be more appropriate to attempt the policy/interventions that are preparatory to any solution of the problem posed in this paper in the form of a research note to be written in the near future.

4. Conclusions

The main reason why *mushārakah and mudārabah* are the smallest portion of the Sharī'ah-compliant mix of financing modes currently used is because the incentives of the users of capital are not adequately aligned with those of the providers of the capital. Equity always represents hard-earned savings of some people. In a *murārabah,* agents who have typically been starved in their occupational careers of the access to capital are handed close access to it. This can be a compelling experience, triggering ambition and unseemly dispatch in getting to where ambition leads. In addition, it is these agents that enjoy a predictable cache of capability not possessed by other co-transactors. Many of the *mudāribs* have the virtue of informational advantage compared with the *rabb-al-māl*. The two factors, ambition and advantage, combine to result in a rather potent influence. The situation is made even more volatile in that some *mu□āribs* represent steadier and safer hands in which to put management of valuable businesses than others.

The apparent irreconcilability of incentives that is very much intrinsic to *mushārakah/mudārabah* can be moderated if there were some built-in features that could induce low-risk and high-risk *mudāribs* into *channels of self-selection* representing different terms and conditions of the *murārabah* that could be custom-made. In the language of microeconomics, what is needed is a separating equilibrium of *mudāribs* representing differences in risk types or in the proclivity to indulge in his informational advantage to advance his own financial interest to the exclusion of his partner's. However, such volitional self-selection does not come in a costless or easy manner. An institutional framework is needed in the Islamic Finance industry to stay the hands of entrepreneur to engage the financiers to reduce the risk of asymmetric information and incentive-compatibility. It is possible to devise such an institutional framework for the advancement of these core financing modes to become more acceptable as a means to spur financing to entrepreneurs.

The root causes of the high private costs of securing separating equilibrium have to do with (i) the barriers that wall-off islands of *private information* from the *public square*, (ii) the hierarchical nature of socio-economic institutions which impedes the equality of both the elites and the ordinary before the law and (iii) the preponderance of archaic, manual, methods for capturing economically relevant disclosures. All these difficulties create a kind of obstacle course in the economic setting. That in turn makes it especially difficult to intervene with some variant of *signaling/screening* combinations, which, as in other risky economic settings, have been deployed with good results. A detailed

account of the policy interventions must, however, be the subject of a future research.

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