MODELING AN EXIT STRATEGY FOR ISLAMIC VENTURE CAPITAL FINANCE

Tariqullah Khan and Boulem BenDjilali

Without clear exit routes, venture capital cannot be provided efficiently. In this paper, we present an incentive compatible exit strategy for Islamic venture capital finance. Micro enterprises, which avoid interest or need risk spreading, may find the model useful. The model is also of general relevance.

Introduction

Micro-finance has recently attracted great policy and academic interests due to its potential role in poverty alleviation. Among the Muslim population a large segment of micro enterprise owners are sensitive to the religious prohibition of interest. How effective micro-finance can be provided to such segments of the population? This is an important question. During the past three decades interests in the financial contracts compatible with the Islamic law have renewed. As a result now there are public and Islamic private commercial and investment banks, mutual funds and insurance companies and other non-banking institutions offering financial services. A capital market is also emerging and regulatory frameworks are being developed. Thus the feasibility of providing financial services in compliance with the Islamic law is now being widely recognized.

The salient features of Islamic finance can be summarized here: Islamic law prohibits interest-based lending and the financing of gambling types of transactions, and production, financing and trading unethical goods and services. Funds can be raised on profit-loss sharing basis. Equity participation, temporary equities, credit sale, leasing and other suitably designed modes replace interest-based finance constitute the alternatives to interest. Financial engineering to design new products and instruments must comply with the Islamic legal requirements. Debt cannot be traded, rescheduled or discounted for interest. However, debt can be swapped for goods and services.

Prohibition of interest is the central premise of global Islamic finance. The two parent alternatives principles offered are deferred trading-based debt finance and risk capital. Several researches cover these two parent principles and their various variants. One area of current interest is the provision of venture capital finance to micro enterprises as going concerns. Al-Suwailem (1998) suggests that venture capital can be based on *Mush*ª*rakah*. However, initial public offerings (IPOs) and other exit routes are extremely important in venture capital finance[1] . Venture capital investors plan exit strategies before making investment decisions[2] . In this paper we model Islamic venture capital finance when there are no IPO and other exit prospects. Section two describes the contract. Section three models the exit strategy. Some implications are summarized in section four.

The Contract

The entrepreneur has a project and some amount of resources B to assign to it. The capital requirements of the project are much larger than B. The entrepreneur avoids interest-based funds and is also averse to permanent partnership arrangements. The capital deficiency of the project's funding requirements K can be covered by the venture capitalist. But the venture capitalist looks for a clear exit strategy before making a decision to invest. In addition to the project, there is also an alternative investment opportunity, namely, the *Mur*^{a}*ba*Ê*ah* market, which the entrepreneur and the venture capitalist both can equally access for placing B and K respectively.

The case represents the common challenge of providing seed money to such micro-enterprises, which opt for Islamic finance but which do not have prospects of IPOs and other forms of exits. Although these firms avoid interest-based finance but they are motivated to have independent and permanent control on ownership[1] . To overcome this dilemma, the firm (entrepreneur) and the venture capitalist (investor) will sign a partnership contract with a put option for redemption[2] . This means that the partnership contract will contain an option whereby the investor is contractually bound to periodically offer to the entrepreneur to buy certain proportions of the investor's shares in the partnership. However, the entrepreneur is not contractually bound to buy these shares. In case the entrepreneur does not buy, some outside parties will buy the shares.

Since the redemption is only a put option, the model discussed below is based on a critical assumption. We assume that an entrepreneur unlike a typical manager prefers to invest his/her savings in the growth of the enterprise rather than keeping these savings outside. Keeping the savings outside shall signal that the outside investment opportunities are superior to the enterprise. This will adversely reflect on entrepreneurial efficiency. However, in the initial stages of the startup firm, the entrepreneur would prefer some risk-sharing arrangement as it spreads the risk. Therefore, the promoting role of venture capital is essential due to an infant entrepreneur's attitude towards risk. Gradual acquisition of ownership is expected to improve entrepreneurial risk profile[3] . Hence, the venture capital will be redeemed like a debt but instead of being based on interest, the contract will be based on profit sharing.

We assume that the project yields an expected return of R_t in period t with the probability d and loss L, (1-d). Naturally, R_t depends on the total amount invested by the investor K, and the entrepreneur B, i.e., (K+B) as well as on d. The function R_t increases as the amount invested in the project increases, at a decreasing rate. Moreover, R_t also increases as d increases. The investor is assumed to be able to observe ex-post, whether a project will succeed or fail, but the investor does not know the actual realized return. In other words, the function R_t (., .) is common knowledge to both the entrepreneur and the investor; d varies across entrepreneurs and is known only to the entrepreneur himself. On the other hand, the investor knows the cross-sectional distribution F(d) of d's in the pool of fund applications. Each entrepreneur possesses an initial endowment B. The investor enters the contract with an amount K, which is assumed to be large with respect to B. The investor studies the probabilities ds across projects and then chooses to enter into the contract or not. In other words, he associates his "entering" probability p to the project and accepts to enter into the project with probability p or refuses with probability 1-p. Let k denote the fraction of the profit sharing ratio accruing to the investor. Let r_t indicate the percentage from the entrepreneur's profit that will be transferred to the financial institution and that enables the entrepreneur to buy the shares of the financial institution. That is, r_t allows the transfer of ownership gradually from the financial institution to the entrepreneur. Investors compete on four factors:

1. The entering probability π.
2. The size of the investor's participation K.
3. The investor's profit sharing ratio k.
4. The fraction of the entrepreneur's profit ratio that will be transferred to the investor at the end of each period that permits the purchase of investor's shares r_t.

Hence the venture capital contract can be defined as a four dimensional vector.

$$C = (\pi, K, k, r_t) \qquad (1)$$

Where the values of p, K, k and r_t have to be specified by the contract. The objective of the investor is to invest in the risk of the start-up firm. To derive the expected profit of the entrepreneur and the investor, we construct the following probability trees.[1]

The expected gross wealth R_t varies from one period to another depending on the economic environment such as the demand elasticity of the good produced by the project, and other political and economic factors. In addition, the probability of success d varies also from one period to another for the same reasons. However, for the sake of simplicity of exposition, we have taken d to be the same across time. From Fig.1, the expected profit of the entrepreneur at the end of the first period is the equal to

$$E(P^e_1) = \pi[\delta(1-k)(1-r_t)R_1(\delta,B+K)-(1-\delta) \quad L_1]+(1-\pi)(1+q)B \qquad (2)$$

Where denotes the fraction of the loss born by the entrepreneur.

From Fig. 2, the expected profit of the investor at the end of the first period is equal to:

$$E(P_{I.F.I}) = \pi[\delta k(1+R_1) R_1 - (1-\delta) \quad L_1]+ (1-\pi) K (1+q) \qquad (3)$$

is the fraction of loss borne by the investor.

FIG 1: Entrepreneur's Perspective of Project Outlays

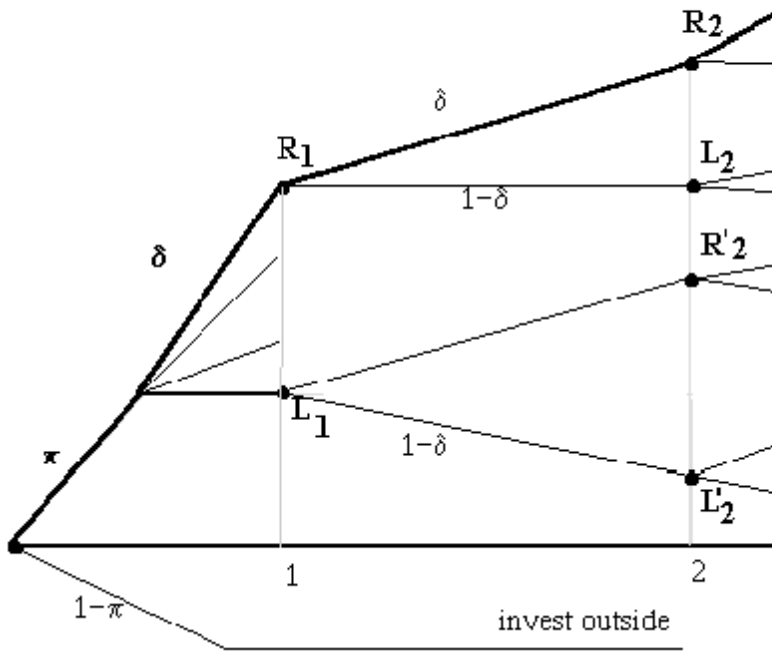
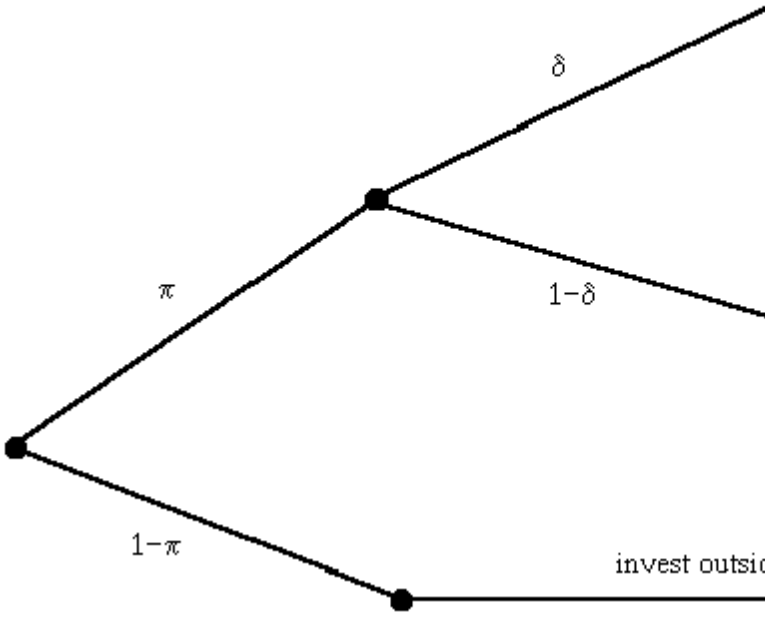


FIG 2: Investor's Perspective of Project Outlays



The Exit Strategy

We continue with the assumption that a redeemable venture capital partnership starts operations with a capital contribution by the entrepreneur equal to an amount B, and a capital contribution by the investor equal to an amount K. Compared to K, B, is a small amount. Hence, K can be re-written as K = NB; N being a real number. Consequently, the project needs B+K = B+NB = (1+N)B amount of capital in each period. With respect to profits and re-invested profits, we consider two hypothetical cases. In the first case the enterprise yields a constant stream of periodically (yearly) calculated profits. In the second case the profit yields are assumed to be different in different reporting periods.

Constant Stream of Profits

We assume that the enterprise yields profits equal to P_1 for all periods. In period t_1, the entrepreneur's share in profits would be:

$$Sh_1 = \frac{P_1}{N+1}$$

Similarly, if the joint nature of the enterprise is contractual entrepreneur in profits in period $_6$ can be written as

$$Sh_6 = \frac{P_1}{N+1}\{1+5\frac{P_1}{(N+1)B}+10\frac{P_1^2}{(N+1)^2B^2}+10\frac{P_1^3}{B^3(N+1)^3}+5\frac{P}{(N+1}$$

$$= \frac{P_1}{N+1}\left[1+\frac{P_1}{B(N+1)}\right]^5$$

Given this pattern, we can deduce that at period j, the share c

$$sh_j = \frac{P_1}{N+1}\left[1+\frac{P_1}{(N+1)B}\right]^{j-1}$$

We assume that the share of the entrepreneur in total profit buying-out the ownership shares of the financ ier. If we d contribution in period j-1 and sh_{j-1}, the entrepreneur's re-inv entrepreneur's total capital contribution in period C_j can be w

$$C_j = C_{j-1} + sh_{j-1}$$

Similarly, $C_{j-1} = C_{j-2} + sh_{j-2}$ and so on. Hence, equation form.

$$C_n = C_1 + \sum_{j=1}^{n-1} sh_j$$

Where, C_1 = B. Equation (6) shows that the entrepreneur's c n can be expressed in terms of his previous shares

As the share of the entrepreneur in total profits increases and that of the financier decreases every year, due to the change in fractional share in ownership, the relationship between the profit P_1 and the period j is important. For the project to belong to the entrepreneur in period j, the necessary condition is that his profit-share should be equal to the total profits of the project. In other word, we must have the following equality in period j.

$$\frac{\frac{P_1}{N+1}\left[1+\frac{P_1}{B(N+1)}\right]^{j-1}}{P_1}=1$$

which leads to

$$\left[1+\frac{P_1}{B(N+1)}\right]^{j-1}=N+1$$

Taking log both sides we get,

$$(j-1)\ \text{Log}\left(1+\frac{P_1}{B(N+1)}\right)=\text{Log}\,(N+1)$$

Hence

$$j-1=\frac{\text{Log}\,(N+1)}{\text{Log}\left[1+\frac{P_1}{B(N+1)}\right]}$$

Equation (7) shows that time needed for the entrepreneur to take over the project under redeemable venture capital and under the profit conditions cited above is inversely related to the amount of profit yield. In other words, as P_1 increases the time needed for the project to pass under the ownership of the entrepreneur decreases. In addition, computing the derivative of equation (7) with respect to P_1, we get:

$$\frac{d(j-1)}{dP_1}=\frac{-\text{Log}\,(N+1)}{\text{Log}\left[1+\frac{P_1}{B(N+1)}\right]^2}\cdot\frac{1}{P_1+B(N+1)}$$

Equation (8) is negative which shows the inverse relationship between the time period j and the profit P_1. As P_1 increases, the time period needed for the entrepreneur to take over the project decreases less than proportionately. Over time, the contribution of the entrepreneur increases, which of course, induces him to increase his effort level and increasing his productivity and consequently increasing the profits. This is so because the entrepreneur is taking more risk by profit retention more and more from one period to another. This increase in profit as a result of the increase in productivity through the increase in entrepreneur-ship will have a positive effect in reducing the length of time j as shown by equations (7) and (8). As P_1 increases as a result of an increase in productivity, the denominator of the right hand side of equation (7) increases and hence the right hand side of equation (7) decreases, that is j decreases.

Depending on the motivation for acquisition of ownership, the entrepreneur is expected to improve his effort level, minimize the non-pecuniary expenditures (e.g., on expensive office furniture etc.), improve his savings and may even seek to mobilize finance from other sources for quickly completing payments and getting ownership. Thus, it can be expected that the incentive for ownership will work as a deterrent against moral problems. With the passage of time, the financier's capital contribution to the project diminishes so that the entrepreneur becomes the sole proprietor of the project with respect to the specific financier. The entrepreneur may have similar redeemable venture capital relationship with other financiers too.

As the financier's ownership of the project decreases, its cash flow improves because, the venture capitalist does not only share in profits but also recovers its principal capital in somewhat an amortizing form. With recovery of its initial capital contribution and its own share of profits, the venture capitalist can start a new project with another entrepreneur. The financier therefore, becomes a source of generating new projects and a promoter of new entrepreneurs. Subject to conditions of equation (9) below, the financier's share in projects can be maintained until the entrepreneurs become self-supporting and be able to enter into competition.

$$P_1 = B(N + 1)[(N + 1)^{\frac{1}{j-1}} - 1]$$

Equation (9) shows the relationship between the profit P_1 and the period j needed for the entrepreneur to take over the project entirely according to the principle of redeemable venture capital and under the conditions cited above.

Different Streams of Profits

In this case, we assume that the profit yield in each period is different, i.e., P_1, P_2, ... P_j are different. The entrepreneur's capital contribution in period j depends on his initial contribution (B) to which he adds a part of his profits-share of the previous period. In other words, we assume the following relationship between his total capital contribution in period j and his profit-share in period j-1.

$$C_j = B + sh_{j-1} \qquad (10)$$

Following this pattern, we can compute the capital contribution and the profit- share of the entrepreneur in each period.

In period 1: $C_1 = B$ $\qquad sh_1 = \frac{P_1}{N+1}$

In period 2: $C_2 = B + \frac{P_1}{N+1}$ $\qquad sh_2 = \frac{P_2}{N+1} +$

In period 3:

$$C_3 = B + \frac{P_2}{N+1} + \frac{P_1 P_2}{B(N+1)^2} \qquad sh_3 = \frac{P_3}{N+1} + \frac{P_2 P_3}{B(N+1)^2} +$$

Following this pattern, we can deduce the following formula for the entrepreneur's profit-share in period j.

$$sh_j = \frac{P_1}{N+1} + \frac{P_1 . P_2}{B(N+1)^2} + \ldots + \frac{\prod_{k=1}^{j} P_k}{(N+1)^j \; B^{j-1}}$$

Equation (8) can also be rewritten as:

$$sh_j = \sum_{k=1}^{j} \frac{\prod_{n=1}^{k} P_{j+1-n}}{(N+1)^k \; B^{k-1}}$$

where ? and ?denote, respectively, the sum and product sigr

It is worth noticing that the entrepreneur does not reinvest all his previous capital contribution in the current period. For instance, in period 2, his contribution was $B + \frac{P_1}{N+1}$; and his profit-share was equal to $\frac{P_2}{N+1} + \frac{P_1 \; P_2}{B(N+1)^2}$; the new capital contribution in period 3 is equal to his profit-share in period 2 plus the amount B. Hence, the difference from his second period contribution $\frac{P_1}{N+1}$ will be left to him to use it either for his own consumption, saving or to start another project etc. As we can notice, it is difficult to get from equation (12) an exact formula that could help us know the length of time needed for the entrepreneur to take over the project. Given this difficulty, we assume that the profits yield in all periods is equal to P_1[30]. From equation (12) the profit share of the entrepreneur in period j becomes equal to:

$$sh_j = \frac{P_1}{N+1} \{ 1 + \frac{P_1}{B(N+1)} + \frac{P_1^2}{(N+1)^2 \; B^2} + \ldots + \frac{}{(N+}$$

$$sh_j = \frac{P_1}{N+1} \{ \frac{1 - [\frac{P_1}{B(N+1)}]^j}{1 - \frac{P_1}{B(N+1)}} \}$$

Given the initial capital contributions of the financier and of the entrepreneur and the expected profit P_1, which is assumed to be the same from period one to period j; equation (13) gives us the ability to compute the profit share of the entrepreneur. A necessary condition for the entrepreneur to own the project at 100% at the end of period j, is that his percentage profit share $\frac{sh_j}{P_1}$ must equal to one. Hence, from equation (10), we get

$$\frac{sh_j}{P_1} = \frac{1}{N+1}\left\{\frac{1-\left[\frac{P_1}{B(N+1)}\right]^j}{1-\frac{P_1}{B(N+1)}}\right\} = 1$$

which implies

$$\frac{1-\left[\frac{P_1}{B(N+1)}\right]^j}{1-\frac{P_1}{B(N+1)}} = N+1$$

Simple algebraic manipulations lead to

$$j = \frac{\text{Log}\left(\frac{P_1}{B} - N\right)}{\text{Log}\frac{P_1}{B(N+1)}}$$

Equation (14) gives the length of time needed for the entrepreneur to get over the project. The length of time j depends on three factors, a) the capital contribution of the financier, b) the capital contribution of the entrepreneur and c) the expected profit in each period assumed to be the same across periods.

Some Implications

A number of implications of the model are clear. First, the model clarifies the critically needed exit path for the Islamic venture capitalist. It also allows the micro enterprise to retain and re-invest its share in profits to the extent of 100% internal ownership. This is only representative of a situation of such funds for which the firm is not ready to offer permanent ownership. Our allowance for retention and re-investment of profits by the entrepreneur is expected to introduce efficiency in the firm. As the entrepreneur has the opportunity to re-invest in the firm, his decision to invest outside will signal the superiority of the outside investment opportunities. The increase in his ownership stake in the firm will have efficiency incentive.

Second, by providing an exit strategy, the financiers' promoting role is enhanced in our model. In the parent principle of Islamic risk capital, once a contract is signed, the financier takes permanent stake in the firm unless it finds another buyer. In the present case, the financier systematically gets out from maturing projects and takes up stakes in infant projects. Thus the financier shares the risks of infant and gives up ownership stakes of projects, which mature and become familiar with risk and acquire assets by re-investing their profits. Such a promoting role by the financial institutions is highly needed in the developing countries.

Third, the proposed arrangement combines the prime merits of the parent principles of Islamic finance. The merit of the asset-based finance is that it facilitates the acquisition of assets. The merit of risk capital is that it links the financiers' interests with the outcome of projects, thus introduces efficiency. The proposed redeemable venture capital facilitates the acquisition of assets but through profit sharing. Finally, exit strategy of the model has a general validity. It can be used by all those micro enterprises which seek risk spreading, but which do not have IPO and other exit prospects.

Fourth, the contract can be formulated in the light of micro-finance experiences to combat incentive problems such as "group lending[1]" so that finance users can monitor each other's performance, "continuous contracts" to reward good clients and other incentive compatible features of contracts.

References

Al-Suwailem, Sami (1998), "Venture capital: A Potential Model of *Mush*ª*rakah*" *Journal of king Abdul Aziz University*

Banerjee, Abhijit V. (2002), "*The Uses of Economic Theory: Against a Purely Positive: Interpretation of Theoretical Results*" MIT Working Paper 02-24

BenDjilali, Boulem and Khan, Tariqullah (1995), *Economics of Diminishing Musharakah*, Jeddah IRTI

Cumming, Douglas J (2002), "Contracts and Exits in Venture Capital Finance" paper presented to ABN AMRO Bank Conference on Venture Capital Exit Strategies, Amsterdam March 2002.

Khan, M. Fahim (1992), *Human Resource Mobilization through the Profit-Loss-Sharing based Financial System*, Jeddah: IRTI

Khan, Tariqullah, (1995), "Demand for and Supply of PLS and Mark-up Funds of Islamic Banking - Some Alternative Explanations", *Islamic Economic Studies*, Vol. 3 No. 1 IRTI.

Smith, D. Gordon (2001), "Control Over Exit in Venture Capital Relationship" paper presented to the Annual Meeting of European Financial Management Association, Lugano, Switzerland, June 2001.

Notes

[1] See, Cumming (2002).

[2] See, Smith (2001).

[3] The model is also consistent with the reviving traditional theory of finance according to which firms prefer debt finance due to its redeeming nature and harmony with internal ownership. Furthermore, the case is also reminiscent of the Islamic and nationalist sentiments in Muslim countries against foreign control.

[4] There could be three contractual forms of venture capital redemption: mandatory redemption (the investor must sell to the entrepreneur and the entrepreneur must buy), call redemption (the entrepreneur must force the investor to sell to it) and put redemption (the investor must offer its stake to the entrepreneur); see, Smith (2001). BenDjilali and Khan (1995) argue that the last form is more compatible with the Islamic law as it is not binding legally on the entrepreneur to buy from the investor. If such a purchase is made binding it will imply that sharing and sale contracts are combined in one contract. The Islamic law does not allow this. The present paper is also based on the same premises.

[5] See for example, Khan (1992) and Khan (1995).

[6] The probability distribution attached to the project is taken discrete and simple (binomial distribution) for the sake of simplicity. Moreover, the probability distribution attached to the project varies from one period to another depending on the economic environment of that period.

[7] See, Banerjee (2002) on the application of these in micro-finance.