Financing of Entrepreneurial Ventures

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Abstract

Entrepreneurs with zero startup capital can launch new ventures through kind-financing from input-suppliers by offering higher input-prices at time t+k; and, through kind-offering at lower prices at time t+k to output-buyers who make advance payments at time t. Interests of entrepreneurs, input-suppliers, and output-buyers get intertwined through such arrangements. All parties (entrepreneurs, input-suppliers and output-buyers) joined through kind-financing, kind-offering, and advance-payments have vested interests in the success of the new-venture (and they contribute through their expertise). This improves efficiency thereby generating a higher level of output than the one generated under cash-financing and spot-selling. The value of outputs generated through kind-financing will be greater than the value of outputs owed to kind-suppliers; and, the quantity of outputs generated through advance-payments will be greater than the quantity of outputs owed to advance payers. All types of ventures (new-ventures, growing-ventures, and advanced-ventures) gain through kind-financing and forward-selling.

I. Types of Contingency Deals in the Real Sector

Through kind-financing and through forward-selling, the entrepreneurs can optimize their objective functions. Kind-financing appears to be universally superior to cash-financing for introduction, maintenance, and growth of all types of ventures (new-ventures, growing-ventures, and advanced-ventures). Under kind-financing, principals, agents, and employees have common interest in promoting the growth of their joint-ventures. The benefits of improved efficiency and stability with kind-financing outweigh the tax-benefits of cash-financing for both input-suppliers and input-buyers. Through kind-financing, entrepreneurs decrease the leverage ratio which, in turn, increases the confidence level of the public and the regulatory agencies in the new-ventures. If the weighted average of the expansion-rate and contraction-rate equals the expected rate of return during each time period, then net-venture values at each point in time would be identically zero. However, if the former exceeds the latter at any point in time, then the net venture-value will be viably positive. Positivity of the venture-value at time-h (rather than time-0) should be the venture adoptability criterion.

Markets for various goods and services appear to be segmented; and, market participants prefer to reside in their chosen habitats without making comparisons with other habitats. When markets are compartmentalized, the risk-reward tradeoff hypothesis is severely compromised. Due to efficiency gains, returns per unit of risk for entrepreneurs, kind-financiers, and output-buyers are greater under kind-financing and forward-selling than those under cash-financing and spot-selling. Some entrepreneurs may strictly prefer cash-financing while others may strictly prefer kind-financing irrespective of the level of cost differentials between cash-financing and kind-financing. Uncertainty, perception, and subjective measurements initiate market participants in selecting their habitat (preferred-habitat). As such, one cannot label market participants as rational or irrational. Rationality or irrationality in behavioral sciences is a

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subjective relative term. Buyers and sellers (without being labeled as rational or irrational) can execute trades in various ways to optimize their objective functions:

1. Price-paid at time t (spot market at time t) and the commodity-received at time-t (spot market at time t).

2. Price-paid at time t+k (spot market at time t+k) and the commodity-received at time t+k (spot spot market at time t+k).

3. Price-paid at time t+k (future) and commodity-received at time t+k (future) with the price, quantity, and quality set at time t (spot). Forwards, futures, and options [pertaining to the purchase and sale of the underlying item at a later date] are examples of such transactions. The gasoline-users that had traded such contracts did better during the price-hikes of 2008.

4. Price-paid at time t (spot) and the commodity-received at time t+k (future) with the quantity and quality of the commodity set at time t (spot). Advance ticket-buyers (concert, travel, or special events) pay the price at time-t and receive the services at time t+k.

5. Price-paid at time t+k (future) and commodity-delivered at time t (spot) with the price set at time t (spot). For example, workers (with stocks and stock options as part of the compensation package) deliver at least a part of their work-time at time t (spot) and receive the compensation at time t+k (future). Such contingency deals are more prevalent in employee-owned corporations than in the traditional corporations (private or public).

II. Market Segmentation and the Breakdown of Risk-Reward Trade-Off

The conventional theories of risk-reward trade-off, equalization of rewards per unit of risk across all transactions, and market efficiency become insignificant in the presence of compartmentalized markets. Segmented markets (coupled with government interventions that block the process of adjustments) exist for every transaction category: spots and forwards, long-term deals and short-term deals, risk-preference and risk-aversion, and others. Contingency based contracts reduce the level of risks by improving the level of efficiency; and they deliver higher rewards to input-suppliers and input-buyers (such that the rewards per unit of risk under contingency transactions are greater than the same under spot transactions). Contingency markets and spot markets may be segmented such that some economic units may prefer the latter over the former; and as such the contingent-transactions may continue to deliver higher returns to input-sellers and input-buyers. For new-ventures, uncertainty, agency costs, and fierce competition from advanced-ventures lower the probability of receiving seed-money from cash-granting firms. Kind-financing can be viewed as synthetic stock-financing, while cash-financing can be viewed bond-financing. New-ventures are aggressively relying on contingency-deals from input-providers with surpluses. Such deals reduce costs, increase revenue, and manage risks for new-ventures and input-providers with surpluses. Even in the absence of surpluses, input-providers are finding it profitable to become surrogate partners through kind-financing. While enhancing employee-loyalties, such contracts eliminate operational-risks and agency-problems. Decrease in the leverage ratio decreases the tax-benefits for the firm while increasing the same for the government and the public. Contingent kind-financing invites accelerated levels of guidance, scrutiny, and supervision from input-suppliers. The initial net venture value at time-0 could be

negative, yet the net venture values during the subsequent time periods could be positive. The decision criterion should be based upon the net venture value at the optimal holding time period rather than the initial time period.

Contingent kind-financing is superior to cash-financing in that the former intensifies the bondage between output-suppliers and input-suppliers. New-ventures and expanding-ventures could have cash-financing, kind-financing, or mix-financing. Stock-payments and stock-options (that tie up the interests of principals, agents, and employees) have experienced accelerated growth. Under contingent kind-financing, an entrepreneur pays higher input-prices (albeit at a later date when the venture succeeds) than the cash-financing; yet the overall cost is much lower and overall revenue is much higher. This is due to the fact that interest payment is virtually zero; and, the input-costs plus the interest payments under cash-financing far exceed the input-costs under contingency-operations. Moreover, the input-suppliers would help the entrepreneur produce better quality, expand the consumer base, and charge an acceptable set of higher prices. Contingency-financing is easily convertible to cash-financing, as the input-shares could be bought out at any time; however, cash financing cannot be easily converted into kind-financing since creditors are rarely input-suppliers. Cash-financing is a leverage-increasing strategy, while contingency-financing is a leverage-reducing conservative strategy. Contingency counterparties are essentially business partners. Entrepreneurs appear to focus solely on cash-financing overlooking a desirable alternative - the kind-financing; this paper demonstrates that the kind-financing is easier, quicker, and superior. The strategic decisions (venture-acceptance or venture-rejection) should not be based on the net venture-values estimated at time-0.

There are two ways to meet the capital requirements for an entrepreneur: conventional method of outright borrowing and dynamic method of striking contingency deals with various factors of production. The former is borrowed-cash-financing and the latter is contingency-kind-financing. A new entrepreneur (founder of a new-venture) may attempt to raise seed-capital and sustaining-capital from various sources: friends, families, banks, nonbank financial institutions, venture-capitalists, angel-capitalists, risk-preferring individual investors, government agencies (federal, state, and local), and world-agencies (world-bank, IMF, and other agencies of the U.N.O.). A quality business plan (and quality presentation) is a pre-requisites for raising the desired capital. With an outstanding business-plan, an entrepreneur can strike contingency-deals with input-suppliers [land-lord, regular-labor, skilled-labor, lawyers, accountants, raw-material suppliers, utility-suppliers, insurance companies, pension funds, tax-authorities]. Input suppliers would be rewarded at a much accelerated rate contingent upon the success of the new-venture. There are numerous input-suppliers that may have excess inventories (of goods, services, and time); and they may be willing to strike contingency-deals (with the entrepreneurs) in an expectation of higher potential rewards in the future (their excess inventories are virtually worth "nothing" in the marketplace at the present time anyway). The entrepreneurs will be utilizing kind-financiers' goods and services without making any payments upfront. If k is the vested time-period, and if the expectations of the entrepreneurs are realized, then all of the input-owners will receive payments in excess of their respective market rates.

The conventional models focus on cash-financing, while this paper introduces kind-financing. Kind-financing and kind-trades [swapping bonds for bonds, stocks for stocks, bonds for stocks, and other hybrid trades] are not a rarity in the financial sector. In fact, the financial swap volume has grown from $865 billion in 1987 to over $500 trillion in 2008. The authors

covering various aspects of financial-swaps [Flavell, 2002; Hull, 2009; Walker, 2003] primarily emphasize the risk-management aspect of such trades. Paradoxically, such coverage is lacking in the venture-financing literature [Adelman, 2008; Camp, 2008; Conneighton, 2003; CRMPG-III, 2008; EPA, 2008; Gladstone, 2008; Gompers 2002; Hoagland 2002; Leach, 2008; NSF, 2002; Smith 2008; Stancill 2008; Timmons, 2007; US-SBA-SBIR, 2008]. This paper attempts to fill this void.

III. Cash-Financing and Kind-Financing

In the housing sector, interest-costs are zero for house-buyers who pay the full amount in cash. The interest costs for individuals who make larger amount of down payments are lower than the same for those who make lower amounts of down payments. Individuals making higher down payments (or full payments) are no better off than the individuals making lower down payments. Individuals making lower down payments receive tax-deductibility benefits and use their savings wisely for investments in other sectors. In fact the former group may be better off than the latter group if all other factors are taken into account. Of course, if markets are efficient (which at times may not be possible under distortions created by interventions), then the combination of earning-rate and cost-rate for both sets of individuals would be identical. Some travelers choose to pay in advance by purchasing tickets prior to the travel-date, while others choose to purchase the tickets on the travel-date. Generally, the spot ticket-price is greater than the price paid in advance. Adjusting for the time-value of money and all other factors that influence the decision making process (as to why some individuals pay in advance, while others choose to pay on the spot) and assuming market efficiency (which at times may not be possible under distortions created by interventions), the satisfactions derived by both groups of individuals would be the identical. The same risk-reward principle applies with respect to all sectors, including the input sector – the sector in focus herein. The opportunity-cost of the input-supply could be zero or positive depending upon the supply and demand conditions at a particular point in time. If the inputs are in excess supply, then they have zero opportunity costs (the inputs are not in demand and hence their market value is zero). If the inputs are in shortage, then a positive opportunity-cost does exist. Accountants, lawyers, and other service-providers that have plenty of free time would be willing to provide kind-financing at a lower contingency-fee, while others with no free time would be willing to provide kind-financing at a higher contingency-fee.

Cost-Side: Case-1 (cash-financing):

An entrepreneur borrows funds and pays out market rates to input suppliers; the total cost (Z_t) at time t is:

$$Z_t = \beta_t\Omega_t + z_{1t}M_{1t} + z_{2t}M_{2t} + z_{3t}M_{3t} +...+ z_{nt}M_{nt} - \gamma_{tf}$$

z_{jt} = market price of input M_{jt} at time t (j=1,2,3,...,n) under cash-financing

M_{jt} = quantity of input M utilized at time t (j=1,2,3,...,n) under cash-financing

Ω_t = amount of funds borrowed at time t under cash-financing

β_t = capital cost rate under cash-financing

γ_{tf} = cost-reduction due to economies of scale and positive spillover effects under cash-financing operations

Cost-Side: Case-2 (kind-financing):

An entrepreneur signs contingency contracts with input-suppliers; the contingency-based total cost (S) at time t is:

$S_t = \beta_t \theta_t + s_{1t}M_{1t} + s_{2t}M_{2t} + s_{3t}M_{3t} +...+ s_{nt}M_{nt} - \gamma_{tc}$

s_{jt} = market price of input M_{jt} at time t (j=1,2,3,...,n) under kind-financing

M_{jt} = quantity of input M_j utilized at time t (j=1,2,3,...,n) kind-financing

θ_t = funds borrowed under contingency operation

β_t = capital cost rate under kind-financing (same as cash-financing)

γ_{tc} = cost-reduction due to efficiency gain through multiparty cooperation among employees, input-suppliers, principals, and agents (along with the traditional economies of scale and net positive spillover effects) under kind-financing operations

Input-suppliers in the spot market assume zero risks, since the price for the inputs supplied is received on the spot instantaneously. However, input-suppliers through the contingency markets assume considerable risks (input prices will be paid much later and that too only if the venture meets its target). Since contingent input-suppliers are taking additional risks (they will receive full-payments only if the venture is able to attain its targets), the contingent input-prices will be higher than the spot input-prices. The cost relationship between financing-models and contingency-models can be described as

$[s_{1t}M_{1t} + s_{2t}M_{2t} + s_{3t}M_{3t} +...+ s_{nt}M_{nt}] > [z_{1t}Mt_{1t} + z_{2t}M_{2t} + z_{3t}M_{3t} +...+ z_{nt}M_{nt}]$

$s_{1t} > z_{1t}$, $s_{2t} > z_{2t}$, $s_{3t} > z_{3t}$, ..., $s_{nt} > z_{nt}$, due to the fact that

$z_{it} = s_{it} - E(L_{sit})$

$E(L_{sit})$ represents expected loss on risky contingency-contracts. When markets are efficient, the contingent input-price per-unit of risk would be identical to the spot-price per unit of risk (which approaches zero). Let

σ_{sit} = riskiness of contingency-deals measured by the standard deviation of contingent input price variations.

$\sigma_{zit} \rightarrow 0$ is the riskiness of spot-deals measured by the standard deviation of spot input price variations.

$[s_{it}/\sigma_{sit}]$ = input-price per unit of risk under contingency-contracts

$[z_{it}/\sigma_{zit}] = z_{it}\ (\sigma_{zit} \rightarrow 0)$ = input-price per unit of risk under spot-transactions

$[s_{it}/\sigma_{sit}] = [z_{it}/\sigma_{zit}]$

For the existence of risky contingency-contracts, the expected contingency-based input-price (s_{it}) must be greater than the generic borrowing-based input-price. However, the efficiency-gains under contingency-transactions (γ_{tc}) is greater than the same under spot-transactions (γ_{tf}):

$\gamma_{tc} > \gamma_{tf}$

since $\gamma_{tf} \rightarrow 0$ and,

$\Omega_t > \theta_t, \quad \beta_t\Omega_t > \beta_t\theta_t, \ \beta_t(\Omega_t - \theta_t) > 0,$

since $\theta_t \rightarrow 0$ (entrepreneurs heavily rely on kind-financing)

Furthermore,

$$[\beta_t\theta_t + s_{1t}M_{1t} + s_{2t}M_{2t} + s_{3t}M_{3t} + ... + s_{nt}M_{nt} - \gamma_{tc}]$$

$$< [\beta_t\Omega_t + z_{1t}Mt_{1t} + z_{2t}M_{2t} + z_{3t}M_{3t} + ... + z_{nt}M_{nt} - \gamma_{tc}]$$

due to the fact that

$$\beta_t(\Omega_t - \theta_t) + (\gamma_{tc} - \gamma_{tf})$$

$$> \{[s_{1t}M_{1t} + s_{2t}M_{2t} + s_{3t}M_{3t} + ... + s_{nt}M_{nt}] - [z_{1t}Mt_{1t} + z_{2t}M_{2t} + z_{3t}M_{3t} + ... + z_{nt}M_{nt}]\}$$

Thus the cost level under kind-financing is less than the same under cash-financing. The entrepreneurs will be indifferent between financing-deals and contingency-deals if

$$\beta_t(\Omega_t - \theta_t) + (\gamma_{tc} - \gamma_{tf})$$

$$= \{[s_{1t}M_{1t} + s_{2t}M_{2t} + s_{3t}M_{3t} + ... + s_{nt}M_{nt}] - [z_{1t}Mt_{1t} + z_{2t}M_{2t} + z_{3t}M_{3t} + ... + z_{nt}M_{nt}]\}$$

The entrepreneurs will prefer financing-deals to contingency-deals if

$$\beta_t(\Omega_t - \theta_t) + (\gamma_{tc} - \gamma_{tf})$$

$$< \{[s_{1t}M_{1t} + s_{2t}M_{2t} + s_{3t}M_{3t} + ... + s_{nt}M_{nt}] - [z_{1t}Mt_{1t} + z_{2t}M_{2t} + z_{3t}M_{3t} + ... + z_{nt}M_{nt}]\}$$

The entrepreneurs will prefer contingency-deals to financing-deals if

$\beta_t (\Omega_t - \theta_t) + (\gamma_{tc} - \gamma_{tf})$

$> \{[s_{1t}M_{1t} + s_{2t}M_{2t} + s_{3t}M_{3t} +...+ s_{nt}M_{nt}] - [z_{1t}Mt_{1t} + z_{2t}M_{2t} + z_{3t}M_{3t} +...+ z_{nt}M_{nt}]\}$

IV. Revenues at Time t+k and payments to kind-suppliers and kind-buyers

On the production-side, the entrepreneurs will be helped by their contingency-partners (input-sellers) in producing better quality (δ), selling larger quantities (Φ), and obtaining higher prices (λ), obtaining economies of scale, and deriving externality benefits. The input-sellers have vested interest in the new venture to make it survive and prosper.

$[\lambda_{tc}\ \delta_{tc}\ \Phi_{tc}] > [\lambda_{tf}\ \delta_{tf}\ \Phi_{tf}]$

$\lambda_{tc}\ \delta_{tc}\ \Phi_{tc} = [\lambda_{tc}\ \delta_{tc}\ \Phi_{tc}]_{ks} + [\lambda_{tc}\ \delta_{tc}\ \Phi_{tc}]_{kb} + [\lambda_{tc}\ \delta_{tc}\ \Phi_{tc}]_{e}$

$[\lambda_{tc}\ \delta_{tc}\ \Phi_{tc}]_{ks}$ = kind-suppliers' share of revenue under kind-financing and forward-selling

$[\lambda_{tc}\ \delta_{tc}\ \Phi_{tc}]_{ks}$ = kind-buyers' share of revenue under kind-financing and forward-selling

$[\lambda_{tc}\ \delta_{tc}\ \Phi_{tc}]_{e}$ = entrepreneur's share of revenue under kind-financing and forward-selling

$[\lambda_{tf}\ \delta_{tf}\ \Phi_{tf}]_{fs}$ = cash-suppliers' share of revenue under cash-financing and spot-selling

$[\lambda_{tf}\ \delta_{tf}\ \Phi_{tf}]_{e}$ = entrepreneur's share of revenue under cash-financing and spot-selling

Entrepreneur's share of revenue under kind-financing and forward-selling will be greater than that under cash-financing and spot-selling:

$[\lambda_{tc}\ \delta_{tc}\ \Phi_{tc}]_{e} > [\lambda_{tf}\ \delta_{tf}\ \Phi_{tf}]_{e}$

λ_{tc} = product-price under contingency kind-financing

δ_{tc} = product-quality under contingency kind-financing

Φ_{tc} = product-quantity under contingency kind-financing

λ_{tf} = product-price under cash-financing

δ_{tf} = product-quality under cash-financing

Φ_{tf} = product-quantity under cash-financing

V. Profit-Optimization

Profit-functions under cash-financing (Π^f) and contingency-kind-financing (Π^c) can be defined as:

$$\Pi^c = [\lambda_{tc}\, \delta_{tc}\, \Phi_{tc}] - [\beta_t\, \theta_t + s_{1t}M_{1t} + s_{2t}M_{2t} + s_{3t}M_{3t} +...+ s_{nt}M_{nt} - \gamma_{tc}]$$

$$\Pi^f = [\lambda_{tf}\, \delta_{tf}\, \Phi_{tf}] - [\beta_t\Omega_t + z_{1t}Mt_{1t} + z_{2t}M_{2t} + z_{3t}M_{3t} +...+ z_{nt}M_{nt} - \gamma_{tf}]$$

The optimization of the objective function (U) involves two steps. First, an entrepreneur chooses the optimal financing path (cash-financing or contingency-kind-financing):

$$U = \max(\Pi^f, \Pi^c)$$

Contingency-kind-financing path would be chosen if

$$[\lambda_{tc}\, \delta_{tc}\, \Phi_{tc}] - [\beta_t\, \theta_t + s_{1t}M_{1t} + s_{2t}M_{2t} + s_{3t}M_{3t} +...+ s_{nt}M_{nt} - \gamma_{tc}]$$

$$> [\lambda_{tf}\, \delta_{tf}\, \Phi_{tf}] - [\beta_t\Omega_t + z_{1t}Mt_{1t} + z_{2t}M_{2t} + z_{3t}M_{3t} +...+ z_{nt}M_{nt} - \gamma_{tc}]$$

Borrowed-cash-based business operation would occur if

$$[\lambda_{tc}\, \delta_{tc}\, \Phi_{tc}] - [\beta_t\, \theta_t + s_{1t}M_{1t} + s_{2t}M_{2t} + s_{3t}M_{3t} +...+ s_{nt}M_{nt} - \gamma_{tc}]$$

$$< [\lambda_{tf}\, \delta_{tf}\, \Phi_{tf}] - [\beta_t\Omega_t + z_{1t}Mt_{1t} + z_{2t}M_{2t} + z_{3t}M_{3t} +...+ z_{nt}M_{nt} - \gamma_{tc}]$$

The point of indifference occurs when

$$[\lambda_{tc}\, \delta_{tc}\, \Phi_{tc}] - [\beta_t\, \theta_t + s_{1t}M_{1t} + s_{2t}M_{2t} + s_{3t}M_{3t} +...+ s_{nt}M_{nt} - \gamma_{tc}]$$

$$= [\lambda_{tf}\, \delta_{tf}\, \Phi_{tf}] - [\beta_t\Omega_t + z_{1t}Mt_{1t} + z_{2t}M_{2t} + z_{3t}M_{3t} +...+ z_{nt}M_{nt} - \gamma_{tc}]$$

Second, the entrepreneur optimizes the profit function associated with the selected business operation path. The empirical observations unequivocally indicate that a contingent kind-financing would be unambiguously superior to a cash-financing. Employee-owned corporations with kind-financing are proving to be superior to privately or publicly-owned corporations with cash-financing. Family-owned small motels and ethnic-restaurants (in the heart of the cities and along the highways) with largely kind-financing have proven to have a much higher survival rate and growth rate. The necessary conditions for profit maximization emanating through the contingency-based business-operation path ($\Pi^c = [\lambda_{tc}\, \delta_{tc}\, \Phi_{tc}] - [\beta_t\, \theta_t + s_{1t}M_{1t} + s_{2t}M_{2t} + s_{3t}M_{3t} +...+ s_{nt}M_{nt} - \gamma_{tc}]$) are given by:

$$\partial\Pi^c/\partial\Phi_{tc} = 0,\ \partial\Pi^c/\partial\delta_{tc} = 0,\ \partial\Pi^c/\partial M_{1t} = 0,\ \partial\Pi^c/\partial M_{2t} = 0,\ \partial\Pi^c/\partial M_{3t} = 0, ..., \partial\Pi^c/\partial M_{nt} = 0$$

and the sufficient conditions are:

$\partial^2\Pi^c/\partial\Phi^2_{tc} < 0,\ \partial^2\Pi^c/\partial\delta^2_{tc} < 0,\ \partial^2\Pi^c/\partial M^2_{1t} > 0,\ \partial^2\Pi^c/\partial M^2_{2t} > 0,$

$\partial^2\Pi^c/\partial M^2_{3t} > 0, ..., \partial^2\Pi^c/\partial M^2_{nt} > 0$

VI. Valuation

In the conventional cash-financing models, a venture is launched only if its expected net value at time-0 is nonnegative. In the kind-financing model, proposed by this paper, the production operations, cooperation, and distributions are a multi-stage process where the viewpoints of all units (employees, principals, and agents) at each instant in time are taken into account in an interactive and productive manner (by altering the strategic courses in order to improve the venture's growth and viability). Therefore, a venture may be launched even if the net venture value at time-0 is negative, but has the promise of altering the outcome subsequently with the joint efforts of principals, agents, and employees. Under cash-financing, a company has to go through a lengthy bankruptcy procedure under the situation of continuous losses, while under kind-financing, bankruptcy process is moot since all the concerned parties are working in unison (during good times and otherwise). Efficient business operations under kind-financing and healthy business environment will produce positive venture values.

V_t = net value of the new-venture's expected cash flows at time t (t = 1, 2, 3,...,h-1, h, h+1, ..., n)

G_t = gross value of the new-venture's expected cash flows at time t
(t = 1, 2, 3,...,h-1, h, h+1, ..., n)

K_t = gross value of the new-venture's expected capital investments at time t
(t = 1, 2, 3,...,h-1, h, h+1, ..., n)

$V_t = G_t - K_t = 0$ (t = 1, 2, 3,...,h-1, h, h+1, ..., n)

$K_h = K_0(1+Y_1)(1+Y_2)(1+Y_3)...(1+Y_h)$

$K_n = K_0(1+Y_1)(1+Y_2)(1+Y_3)...(1+Y_n)$

Using time-0 as the pivotal point, the conventional venture-valuation models provide the following criterion for a new-venture's acceptability and rejectibility,

$V_0 \in (-\infty, 0)$, then the new-venture should not be undertaken

$V_0 \in [0, +\infty)$, then the new-venture should be undertaken

However, the use of time-0 as the pivot-point may lead to regrettable decisions. It is time-n or time-h (rather than time-0) that should be the focal point of time for decision making. This paper looks at the venture-values at all phases (every time-period during the holding horizon) to determine the acceptability or rejectibility of a venture:

0 = time when the venture is acquired or started by the entrepreneur

h = time when the venture is taken-over (friendly or hostile) by other entrepreneurs
n = terminal time period

{1, 2, 3, ..., h-1} intermediate points between the undertaken (start or acquisition) and overtaken

{1, 2, 3, ..., n-1} intermediate points between the initial time-period and the expiration of the product-life

Under the assumption that the entrepreneur will sell the venture (voluntarily or involuntarily) to other entrepreneurs at time-h:

$V_h \in (-\infty, 0)$, then the new-venture should not be undertaken

$V_h \in [0, +\infty)$, then the new-venture should be undertaken

Under the assumption that the entrepreneur will continue the venture until the end of the product-life:

$V_n \in (-\infty, 0)$, then the new-venture should not be undertaken

$V_n \in [0, +\infty)$, then the new-venture should be undertaken

$V = V(e, c, p, q, r)$

E = expansion rate, C = contraction rate, p = expansion probability, q = contraction probability, and R = opportunity cost rate.

$e = 1 + E$

$c = 1 + C$

$r = 1 + R$

$e = g(x_1, x_2, x_3,..., x_n; y_1, y_2, y_3,..., y_n; z_1, z_2, z_3,..., z_n)$

$c = s(x_1, x_2, x_3,..., x_n; y_1, y_2, y_3,..., y_n; z_1, z_2, z_3,..., z_n)$

$p = p(x_1, x_2, x_3,..., x_n; y_1, y_2, y_3,..., y_n; z_1, z_2, z_3,..., z_n)$

$q = q(x_1, x_2, x_3,..., x_n; y_1, y_2, y_3,..., y_n; z_1, z_2, z_3,..., z_n)$

$r = y(x_1, x_2, x_3,..., x_n; y_1, y_2, y_3,..., y_n; z_1, z_2, z_3,..., z_n)$

x_i = economic variables that affect the values of E, C, p, q, R, and the optimal time to acquire or be acquired-by other new-ventures

y_i = policy parameters (constantly varied by regulatory agencies) that affect the values of E, C, p, q, R, and the optimal time to acquire or be acquired-by other new-ventures

z_i = natural states or human-made conditions that affect the values of E, C, p, q, R, and the optimal time to acquire or be acquired-by other new-ventures

The impacting-variables could be e-expanding or e-diminishing, c-expanding or c- diminishing, p-expanding or p-diminishing, q-expanding or q-diminishing, y-expanding or y-diminishing, h-expanding or h-diminishing, and n-expanding or n-diminishing.

$V_k > Vk\text{-}1$ if $dV_k = \frac{\partial Vk}{\partial e} de + \frac{\partial Vk}{\partial c} dc + \frac{\partial Vk}{\partial p} dp + \frac{\partial Vk}{\partial q} dq + \frac{\partial Vk}{\partial y} dy > 0$

$V_k < Vk\text{-}1$ if $dV_k = \frac{\partial Vk}{\partial e} de + \frac{\partial Vk}{\partial c} dc + \frac{\partial Vk}{\partial p} dp + \frac{\partial Vk}{\partial q} dq + \frac{\partial Vk}{\partial y} dy < 0$

$V_k = Vk\text{-}1$ if $dV_k = \frac{\partial Vk}{\partial e} de + \frac{\partial Vk}{\partial c} dc + \frac{\partial Vk}{\partial p} dp + \frac{\partial Vk}{\partial q} dq + \frac{\partial Vk}{\partial y} dy = 0$

The necessary condition for ascending venture-values ($V_n > V_{n-1} > V_{n-2} >... V_3 > V_2 > V_1 > V_0$) is

$Y_k > p_k E_k + q_k C_k$, then $V_k > Vk\text{-}1 \quad \forall_k \in (0, n)$

for descending venture-values ($V_n < V_{n-1} < V_{n-2} <... V_3 < V_2 < V_1 < V_0$) is

$Y_k < p_k E_k + q_k C_k$, then $V_k < Vk\text{-}1 \quad \forall_k \in (0, n)$

for steady-state venture-values ($V_n = V_{n-1} = V_{n-2} =... V_3 = V_2 = V_1 = V_0$) is

$Y_k = p_k E_k + q_k C_k$, then $V_k = Vk\text{-}1 \quad \forall_k \in (0, n)$

However the stronger and sufficient condition for ascending venture-values ($V_n > V_{n-1} > V_{n-2} >... V_3 > V_2 > V_1 > V_0$) is

$[Y_1 Y_2 Y_3...Y_n]^{(1/n)} > [(p_1 E_1 + q_1 C_1)(p_2 E_2 + q_2 C_2)(p_3 E_3 + q_3 C_3)...(p_n E_n + q_n C_n)]^{(1/n)}$

for descending venture-values ($V_n < V_{n-1} < V_{n-2} <... V_3 < V_2 < V_1 < V_0$) is

$[Y_1 Y_2 Y_3...Y_n]^{(1/n)} < [(p_1 E_1 + q_1 C_1)(p_2 E_2 + q_2 C_2)(p_3 E_3 + q_3 C_3)...(p_n E_n + q_n C_n)]^{(1/n)}$

or steady-state venture-values ($V_n = V_{n-1} = V_{n-2} =... V_3 = V_2 = V_1 = V_0$) is

$[Y_1 Y_2 Y_3...Y_n]^{(1/n)} = [(p_1 E_1 + q_1 C_1)(p_2 E_2 + q_2 C_2)(p_3 E_3 + q_3 C_3)...(p_n E_n + q_n C_n)]^{(1/n)}$

VII. Concluding Remarks

The paper has demonstrated that kind-financing and forward kind-selling are superior to cash-financing and spot kind-selling. Kind-financing is akin to stock-financing, while the cash-financing is debt-financing. Likewise, forward-selling is risk-reducing, while spot-selling is risk-exposing. Contingent kind-financing eliminates moral hazards and agency-costs, enhances employee loyalty, and decreases operational-risks. Investors perceive the former as a less risky enterprise than the latter, and as such cash could be readily obtained should the need arise at any point in time. Input-suppliers help entrepreneurs expand their consumer base and curtail the interest costs. Net venture value can be negative at time-0, but this should not deter an entrepreneur from accepting the project as long as the venture values at the end of the holding value is positive. If the sum of the expected value of the business expansion rate and business contraction rate is higher than the desired rate of return during the subsequent periods, then the net venture value subsequently will be positive even if the initial value is negative (the venture should be adopted if the subsequent venture values are positive and rising). That means the adoption/rejection decision criterion should be based on the positivity or the negativity of the venture values at time-n (or time-h) and not at time-0. As the expected value of the expansion rate (that is, the sum of the expansion rate multiplied by the expansion-probability and the contraction rate multiplied by the contraction-probability) rises relative to the opportunity cost rate, the venture becomes more promising. Entrepreneurs succeed in tying up the interests of input-suppliers and output-buyers with their new ventures. Good management, improved economic conditions, kind-financing, and forward-selling could shift the ventures with negative values into positive domains during subsequent time periods.

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