

# **New Venture Survival: Ignorance, External Shocks and Risk Reduction Strategies**

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## **Abstract**

Mortality risk for the new venture is a function of the ignorance prevailing in consumption, production and management technologies. Mortality risk declines over time as ignorance decays due to information search and dissemination processes. Risk reduction strategies can be utilized to shift the mortality risk curve of the new venture to a lower level and external shocks can also affect the new ventures survival chances.

## **Introduction**

Starting new business ventures is generally acknowledged to be a high risk activity. The risk of failure for new ventures have been estimated at 40% in the first year and rising to 90% over ten years (Timmons, 1990). But, as often pointed out, such failure rates may be overstated, perhaps including disappearances of new firms' trading names through mergers, takeovers, or the simple adoption of a new trading name. Indeed a new business might well disappear within a few years as a direct consequence of the entrepreneur's plan to harvest the venture within that period, which has been called "death by success".<sup>1</sup>

Whatever the definition of new venture failure, the mortality rate of new ventures is expected to be higher than that for established (older) businesses.<sup>2</sup> Stinchcombe (1965) introduced the concept of 'liability of newness' whereby young organizations face greater risk of mortality than do established firms. Stinchcombe argues that greater mortality risk arises from the costs of learning new tasks, the necessity to invent new roles and the conflicts such roles present, the absence of formal structures, and the lack of stable links with customers.

Lack of organizational inertia (Hannan & Freeman, 1984) and the lack of organizational stability to engender customer trust (Hannan & Freeman 1989) are also cited as reasons for the greater mortality risk of new businesses. The tendency for mortality risk to

decline as the business ages has also been supported by Carroll and Delacroix (1982), Carroll (1987), and Halliday, Powell & Granfors (1987). The liability of newness was separated from the 'liability of smallness' by Freeman, Carroll & Hannan (1983), and Bruderl & Schussler (1990) distinguish between the liability of newness and the liability of adolescence.<sup>3</sup>

The recent 'population ecology' approach to new venture failures, espoused by writers such as Hannan & Freeman (1984, 1989), postulates that new ventures enter a Darwinian world to which they cannot adapt if they are unsuited to their business environment. In this view, new firms which 'begin wrongly' are most likely to perish despite their attempts to change their course of action or behavior. When viewed from a distance and in aggregate it may certainly appear that organizations are subject to these natural laws, but closer scrutiny also reveals they are continuously making decisions which modify performance outcomes.

Strategic management must take the close-up view, and should consider not the existence of choice but the conditions that enlarge or restrict the breadth of choice. Even if organizations must follow these natural paths, they are extremely broad and allow the organization discretion in the direction and the speed of progress (Mintzberg, 1990). Van de Ven (1979), Astley (1984), Taylor (1982) and others argue that new firms can indeed make significant strategic choices (to adapt to their business environment) which significantly improve their chances of survival, and this presumption underlies the present paper.

Sandberg (1986) notes that there is an "...obvious stake and potential profit in understanding why new ventures fail, why they succeed, and how their performance can be improved..." and that "...the prediction of failure has been approached through the analysis of advance symptoms rather than of causes." This paper addresses Sandberg's call by seeking to understand why new ventures fail in terms of root causes.

We begin by establishing our definition of mortality risk, and what is meant by new venture failure. Second, we argue that the liability of newness is largely dependent on the degree of novelty of the new venture's product or service<sup>4</sup>. Novelty is viewed in three different dimensions, viz: to the market, to the technology of production, and to the managers. We argue that mortality risk increases with the degree of novelty in each dimension and with the number of dimensions in which the new venture is novel.

Third, we postulate that mortality risk of a new venture typically declines over time (if the venture does not fail), whatever its initial risk rating, as its novelty in each of the three novelty dimensions is eroded by information search and dissemination processes, allowing the firm to evolve into an established small or growth business. In effect, novelty declines as ignorance (which prevails in the minds of potential consumers, producers and managers) decays over time.

Fourth, we argue that the (typically) monotonic decline in mortality risk for a new venture can be disrupted by reversals in the decay of ignorance, by environmental shocks, and

by the failure of the new venture managers to make smooth transitions through specific stages of the firm's growth and maturation process.

Fifth, we argue that risk reduction strategies can be employed, most of which impact on one or more of the determinants of mortality risk in order to reduce the firm's mortality risk. A series of risk reduction strategies are enumerated and their impact on the determinants of mortality risk is considered.

Sixth, we specify the arguments in a mortality risk function and show schematically that mortality risk depends on several determinants of risk (including novelty in three technology dimensions) and that these in turn depend on risk reduction strategies which impact upon one or more of the determinants of risk.

Finally, conclusions are drawn. The framework developed here is compared with the 'Stinchcombe' approach, and found to represent a significant advance to the literature on the determinants of new venture mortality (or the liability of newness).

## **Mortality Risk**

In the context of new business ventures, we define mortality risk to mean the *a priori* probability that a firm will become insolvent and be unable to recover from that insolvency before being bankrupted or taken over by another firm such that the initial management team loses control of the venture. Thus new venture mortality refers to the involuntary departure of the venture team (not necessarily the business entity) from the market for reasons of insolvency. Conversely, we would not regard as a mortality the situation where a temporarily insolvent firm is able, in the nick of time, to gain additional funding from new investors and thus survive, albeit with diluted ownership shares for the original owners, as long as the original management team is still in control.

Mortality risk for firms is similar to mortality risk for humans. New firms begin life and proceed with a basic expectation that they will survive, while continually subject to the risk that an unanticipated event or combination of events will extinguish that life. Some environments harbor more threats to life than do others. Within the same general environment, some paths are more hazardous than others. Some new venture teams are less well-equipped than others to deal with life-threatening events that do materialize.

A new venture would not begin its life expecting to fail. Its business plan should show expected revenues exceeding expected costs, and the timing of the revenues (including loan and equity funding) and costs is such that the firm does not expect to become insolvent at any time. New firms may begin life with a positive expected net present value (ENPV) while simultaneously recognizing that some combinations of circumstances would result in negative ENPV and thus insolvency. In effect, this new venture is 'going with the odds' and gambling that the worst outcome(s) will not occur.

If all potential outcomes can be foreseen with known probabilities of occurring, the future of a new firm can be arrayed in a decision tree format (see, for example, Douglas, 1992). Some terminal branches may exhibit negative outcomes, these typically being combinations which involve the worst outcomes in one or more years. The sum of the probabilities of the terminal branches with negative ENPV outcomes is the venture's mortality risk, if all potential outcomes can be foreseen with known probabilities of occurring.

But mortality risk also arises due to business uncertainty. That is, not all potential outcomes can be foreseen with known probabilities of occurring. The demand and cost estimates and projections which underlie the cost and revenue figures in the new venture's financial budgets may be predicted with greater or lesser degrees of accuracy. If some adverse outcomes are not foreseen, or were not expected to be as bad, or not expected to happen as soon as they in fact did happen, they could force the new venture into insolvency and mortality.

Rapid growth of the new venture brings with it enormous risk of insolvency. This is particularly so where payments for materials and labor must be made concurrently while receipts for sales may lag by 30-90 days. If sales are increasing exponentially, the new venture might quickly find itself in need of bridging funds and/or new investors. If unable to gain such additional financing at short notice, the venture is prone to fail. Business mortality simply requires that, at any time, an unexpected fall in revenues and/or an unexpected rise in expenses be of such magnitude(s) that the firm becomes insolvent at that point of time and is unable to attract new debt, equity, or any other funding (including the tolerance of creditors) such that it cannot continue to operate as essentially the same business entity.<sup>5</sup>

## **Mortality Risk Depends On Novelty**

"New! New! New!" shout the advertisements. But how novel is it? The latest model of a particular automobile, for example, may be hardly novel at all, apart from modifications to sheet metal and the introduction of components which have been previously demonstrated effective in motor racing or on another model higher up the product line. It is useful for analytical purposes to consider the newness, or novelty, of the new venture's product or service in three separate dimensions, viz: novelty to the market, novelty in production, and novelty to management.

## **Novelty in Consumption**

Novelty to the market concerns the degree to which the 'consumption technology' of the new product is similar to that for any prior product known to consumers. Do potential customers know if the product exists, where it can be purchased, what it will cost to purchase and to operate, what it claims to be able to do for them, how it is used or consumed, why they may benefit from its use, and so on? For example, the personal computer was highly novel to the market when it was first introduced. Potential customers did not know how to use it, nor did they fully appreciate how it would serve their needs, and indeed many would

have been unsure whether they had any needs which it could serve at all (better than did existing products). Even if they recognize that the new product might serve their needs, consumers may exhibit 'quality risk aversion,' and stay with known products rather than risk their money on the new product which may not actually live up to their quality expectations or to the quality claims made by suppliers.<sup>6</sup> Similarly, 'switching' costs may deter product adoption if the extent of the future benefits of product use are not sufficiently clear to potential consumers.

Stigler (1961) introduced 'search' to describe the process by which consumers seek information about product availability, quality, and prices. He noted that advertising by sellers is equivalent to a vast amount of information search activity on the part of buyers. Even in established markets, ongoing advertising is required because information previously obtained (about seller identity, location, quality and price) becomes obsolete, and new consumers continue to enter that particular market in a more or less ignorant state.

For totally new products there is no existing stock of customer information about the product, and hence no (word-of-mouth) customer-to-customer information flow that moderates the need for advertising. To remove customer ignorance about such products will require extraordinary expenditure on informative advertising and other promotional support. More importantly for mortality risk, there is likely to be a relatively large variance around the expected value of that expenditure, since until the depths of ignorance have been plumbed, management may not have a solid idea of the magnitudes involved.

Mortality risk is expected to increase with increased novelty in consumption. Potential customers are less likely to adopt a product for which they do not see a clear need, or which does not seem to offer a satisfactory solution to their known needs, or which seems to involve quality risk and/or switching costs. The innovator must foresee expenditures on advertising to inform and persuade potential consumers that this new product does indeed serve their needs. Note that a product is less novel to the market if it is readily seen to be a satisfactory solution to a long felt need, despite this need never having been served previously.

## **Novelty in Production**

Novelty in production concerns the extent to which the production technology of the new product or service is similar to existing production technologies. The difficulty of manufacturing the new product, relative to making other products, is a major indicator of the novelty in production. For example, car windscreens in which two layers of glass 'sandwich' a layer of plastic, were quite novel in production compared to the previous plate glass technology. Similarly, lightweight plastic components to replace machine parts which have traditionally been made of metal, are novel in production. One might anticipate relatively high costs of retooling, operator training, prototype development and durability testing for such novel products, as well as unanticipated budget over-runs due to problems with the new product's durability, longevity, aesthetics, and so on.

Mortality risk increases with the novelty of the new product in production because novelty will probably require greater expenditures on prototype development and testing to ensure that the product works in the ways intended. Changes in materials or processes, as compared with similar products/processes in the past, each bring with them additional developmental expenditures and a relatively large variance (both anticipated and unanticipated) around planned budgets. Expected savings of production time and/or materials may well provoke and justify pursuit of such innovations, of course, quite apart from the demand impact of the new technology. That is, an innovation which is expected to reduce production costs without changing the nature of the product at all, is novel in production but not novel in consumption.

## **Novelty to Management**

Novelty to management concerns the extent to which managers of the firm have prior knowledge and experience in the management technology for this (or any similar) product. Management technology refers to the way in which human and financial resources are managed to maximize the efficiency of producing and marketing the product. Management 'best practice' would define the state-of-the-art management technology.

Novelty to management is the absence of management competency in the context of this particular new product. It is the antithesis of 'stick to your knitting' and is exemplified by management trying to manage a production process and the marketing of a product in which they have little or no prior experience or expertise. Note that the same product may not be as novel to some managers as it is to others. We are concerned with the relationship between the new product or service and the prior knowledge and experience of those particular managers who will be responsible for managing that new product's manufacture and marketing.<sup>7</sup>

When the new product or service is novel to management, managers will be more likely to waste resources, follow false leads, and otherwise make mistakes in the management of its production, financing, and marketing. Thus the cost of producing, financing, and marketing the new product will have a greater expected value and a greater variance for novice managers than it would have with managers who are more knowledgeable and experienced in the management technology of this particular (type of) product. Thus, mortality risk increases with novelty of the new product to management.

Management competency must include financial management competency. Since the failure of so many new ventures is attributed to insufficient funding (because costs were higher, or revenues lower, than expected) it is almost axiomatic to advise new ventures to begin with substantially more capital funding than they think they will need. This is particularly so when the firm is subject to rapid growth pressures. Good advice might be to fund for the worst scenario, after re-thinking that scenario to ensure that it includes all of the things that could go wrong, including negative shocks, actually going wrong.

New ventures should thus begin with access to a line of credit substantially larger than they expect to need for the most likely scenario. Similarly, they should organize access to funds well before they expect to need the funds, since last-minute desperation for funds (in response to an unexpected negative shock, for example) may make those funds harder to obtain. 'Over-funded' and 'ready too early' in this way, they are then more likely to survive unanticipated financial setbacks. Such foresight is an integral component of management competency. Conversely, the lack of this information (as to when and how much funding will be required) to management must contribute materially to mortality risk.

Other pertinent aspects of financial management competency may include the decision to lease rather than buy productive assets, which tends to conserve what funding the venture does have for a longer period, and thus more likely allow the firm to overcome any unanticipated revenue setbacks or cost over-runs. It is similarly cash conserving to hire consultants rather than to employ specialists if the services of the full-time employee would be under-utilized when the firm is first new. It may also be sound financial management to initially operate from a 'home office' or to share a 'serviced' office. Taking out insurance against the worst outcomes may also indicate sound financial management, assuming it reflects an assessment of the information on the costs and risks involved.

The information required to manage competently must be expected to vary with the complexity of the industry and with the competitiveness of the market. Some production processes are no doubt harder to manage than others, due to greater (or lesser) regulation and legislation impacting on that industry. Further, the technical difficulty of some production process is greater than others, and the vulnerability to expensive mistakes will be greater in some industries. Similarly, more competitive markets will require managers to seek more information about customers, competitors, suppliers, employees and stockholders than they need to in less competitive markets.

Thus, there is no absolute quantum of information required by managers in order for them to be regarded as 'competent' managers. Greater information is needed in some industries and in some markets to achieve the same degree of competency, or to reduce novelty to management by the same amount as in a less complex and less competitive market. Accordingly, mortality risk depends indirectly on the particular industry and market in which the firm operates, but this dependence enters the mortality risk framework through the additional requirement it places on the need for management information.

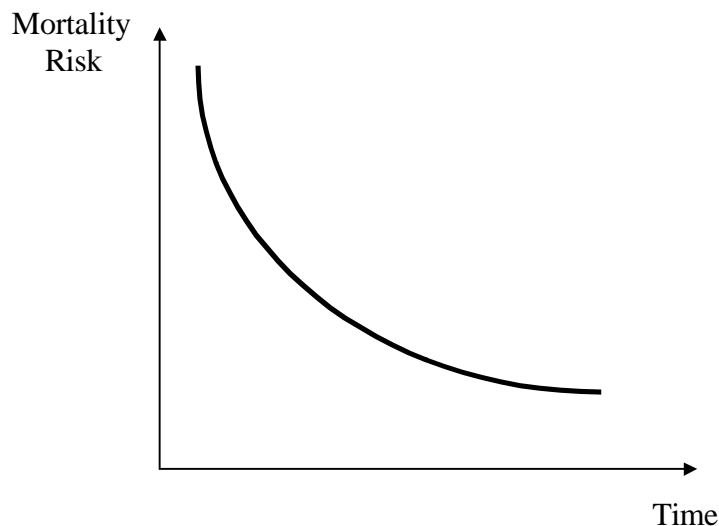
## **Risk Declines Over Time for Each Category**

Building upon the preceding section, we now argue that the mortality risk of new ventures declines over time because consumers, producers, and managers learn the new technology of consumption, production, and management, respectively. Thus, mortality risk declines from its initial level over time as consumers gather information and learn how to benefit from purchase of the product, and as producers learn how to best manufacture the product at desired quality levels, and as managers learn how to best manage the marketing and production processes (and the associated human and financial resources).

The decay of ignorance can be represented by a 'learning curve' for each technology. The learning curve for managers might be steeper than the learning curve for producers, for example, if the managers can learn the new management technology faster than the producers can learn the new production technology. We should perhaps expect both these to be steeper than the learning curve for consumers, who are typically more numerous and fragmented, and thus do not benefit from the interchange of information to the same degree that teams of producers or managers might.

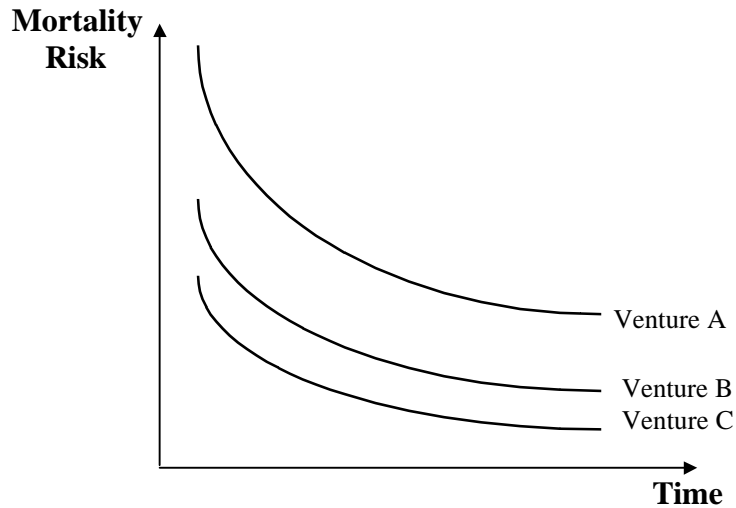
In Figure 1 we show a learning curves which represents each dimension for a hypothetical new product. The curve indicates the decline in ignorance due to the accumulation of information and experience in one or more of the three technologies, as time passes, other things being equal. Movement along the curve is expected to take place as the parties gradually accrue information and experience about their particular technologies. This learning process is a passive, osmotic, learning by doing process, rather than the result of deliberate strategies to accelerate the learning process.<sup>8</sup>

**Figure 1: Decline of Ignorance**



The decline in the mortality risk for a new venture is some composite function of the learning which has occurred in each technology dimension. The 'mortality risk curve' for each new venture is thus negatively sloped with respect to time. In Figure 2 we show a series of mortality risk curves for several new ventures with various initial degrees of novelty in consumption, production, and management. We might call these the 'pure' mortality risk curves unadulterated by risk reduction strategies or external shocks.<sup>9</sup> It is this 'pure' mortality risk curve that is offered by the 'population ecologists', with little explanation of the causes of mortality risk and its decline and no opportunity through strategy to alter a firm's course.

**Figure 2: A Venture's Mortality Risk**



We should expect pure mortality risk to decline to approach some minimum level over time, other things being equal. In principle, this benchmark level would be the mortality risk of the most-secure established firm with a similar product in the same or similar industry and market context. This benchmark level of risk should be understood to be a moving target, shifting as macroeconomic and other environmental conditions change. The pure mortality risk curve for a new venture with a low degree of novelty in each technology dimension might be expected to begin at a lower risk level (than it would for a more novel product, other things equal) and exhibit a generally flatter slope which nonetheless presumably approaches the benchmark level sooner than do the mortality risk curves of new ventures with more novel products. The risk curves for more novel products would, in general, lie above and be steeper, such that they also converge on the minimum mortality risk level for the most secure established firms in that industry and in that particular market, other things being equal.

## **Reversals and Shocks to Mortality Risk**

Although we suggest a continuing decline in mortality risk as time passes, our analysis also suggests several potential reasons for an increase in the mortality risk of a new venture as it ages. First, with regard to the technology of consumption, consumers may learn something unfavorable about the product which 'turns them off'. Learning that a new product is carcinogenic or has otherwise undesirable effects in consumption would certainly inhibit customer demand, perhaps to the point of bankrupting the business.

Unexpected external shocks to consumption, such as negative publicity about the country of origin, such as followed France's nuclear testing, may lead to a boycott of that country's wines, for example. Similarly, the Chernobyl incident generated a negative shock

for European wines and a positive shock for Australian wines, including wines which had only recently ventured into the European market.

As producers learn the technology of production they may undertake exploratory variations in the production process in search of lower materials costs, faster production speed, higher output quality, and so on. If the change in the production process produces a significant and unintended negative variation in product quality, the market reaction may be so strongly adverse as to threaten the venture's continued survival. As an example, in markets for food, health, and medical products, a negative variation in product quality may be life threatening, and the market may lose confidence in the new venture's ability to avoid such mistakes in the future.

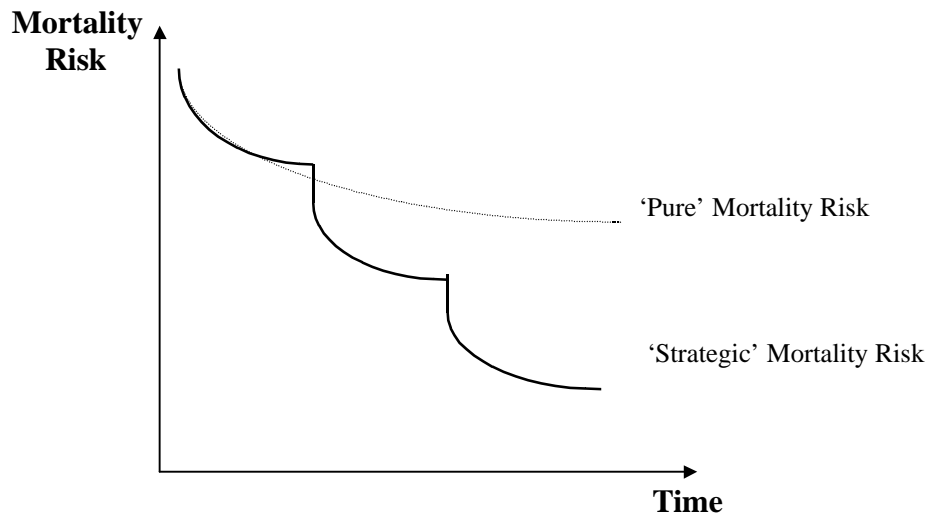
Concerning the technology of management, the firm may suffer a reversal with the loss of a particular manager or other employee, such that the business needs to rediscover some trade secrets or other information critical for the management, marketing, or production process. Alternatively, actions of a manager may be so bizarre or unethical that the market may lose the market's confidence in the firm's ability to prevent that manager or another manager acting in a similar way in the future. In banking, for example, one can envision clients withdrawing their deposits because of an action taken by the bank (or by bank personnel) which would threaten the security of one's deposits if it were allowed to happen again.

New ventures pass through a series of stages as they grow and over time, and may be unable to negotiate smoothly through the transitional periods. In the worst outcome the venture would fail, for example, due to the inability of the entrepreneur to change leadership styles from the hands-on style which is necessary in the start-up phase, to the more detached and delegative style needed as the firm grows to become a larger more complex business entity. In our terms, such managers have failed to learn the technology of management which is necessary to take the firm safely through the various stages of growth of the new venture. By failing to delegate responsibilities, for example, they increase the mortality risk of the business, because the business has grown to the point where the old style of centralized management is no longer appropriate.

## **Risk Reduction Strategies**

In effect, risk reduction strategies allow the new venture to shift its mortality risk curve to a lower curve, at a given point in time. It would then move along that lower curve as time passes and the consumption, production, and management technologies become better understood by the process of information diffusion in each technology dimension. In Figure 3 we show a mortality risk curve which illustrates several step-downs as risk reduction strategies are employed at particular points in time.<sup>10</sup>

**Figure 3: Decline of Ignorance**



The vertical distance between the pure mortality risk curve (that would result if the firm undertook no risk reduction strategies), and the 'strategic' mortality risk curve that results from invoking risk reduction strategies, demonstrates the reduction in mortality risk which has been achieved by strategic action. When we consider that a new firm must borrow funds at a risk premium that is equal to its risk of default on the loan, then the vertical distance between the curves at any point in time is an indication of the reduction in the new firm's cost of capital.<sup>11</sup>

A risk reduction strategy may either provide new information to consumers, producers or managers, which abruptly reduces their ignorance, or it may serve as a catalyst to accelerate the rate of decay of ignorance in one or more of the technologies. Thus, risk reduction strategies are expected to reduce the variability of potential cost and revenue outcomes, and perhaps also increases the expected value of profits. While the cost of risk reduction strategies will typically reduce the firm's margins (or 'upside' risk), the main point of a risk reduction strategy is to truncate the 'downside' risk and consequently avoid the financial failure of the firm.

Risk reduction strategies include insurance, advertising and promotion, education and training, poaching experienced and educated employees from other firms, over-capitalizing, raising funds too early, licensing rather than manufacturing, leasing rather than buying assets, refusing to grow too quickly, forging marketing agreements with established firms, buying a franchise rather than starting an independent business, hiring consultants when needed (rather than full-time accountants, lawyers and other specialists), casual rather than permanent staff, operating from home or sharing office expenses to keep overheads down, and so on. We shall briefly consider some of these under headings relating to how they reduce risk by impacting upon the novelty in consumption, production, and/or management.

## **Risk Reduction Strategies Impacting on Consumer Ignorance**

Attempting to break into a market with a new product bearing a new brand name confers additional mortality risks, as compared to an established firm broadening its product line to include the same new product. Informative advertising, and perhaps personal selling, must be undertaken to disseminate information. Persuasive advertising must be undertaken to overcome the reluctance of potential customers to bear quality risk or switching costs. Thus, information dissemination to potential customers can be seen as risk reduction activity because it serves to better inform them about the technology of consumption.

An alternative (or concurrent) risk reduction strategy may be to seek a marketing agreement with an existing firm, which would market the product either under their brand name or under their corporate umbrella more generally. Existing brand names and corporate logos confer information about the probable quality of the product, the quality of the service and/or warranty associated with the product, and so on. Marketing a new product under the brand name and/or corporate logo of an existing and well-respected firm will thus serve to reduce ignorance in the market place, and allow the new venture to avoid substantial marketing costs. Thus, the new venture may seek a marketing agreement with a firm which has an appropriate 'gap' in its product line, and simply manufacture and sell the product to that other company which in turn packages and markets the product as if it held all rights to it. This should serve to assure the consumer (to some extent) that the product is probably worth a trial because an established firm would not be expected to risk loss of equity in its brand name by endorsing an inferior product.

Licensing the intellectual property to an existing firm (rather than the new firm manufacturing and marketing the product itself) also serves to minimize the mortality risk consequences of consumer ignorance, since the greater part of the financial risk is shifted to the licensee, who must invest in the advertising outlays to inform and persuade the market that the new product serves their needs.

## **Risk Reduction Strategies Impacting on Producer Ignorance**

The manufacturing process which culminates in the production of the new product or service will require the prior assembly of raw materials, productive assets, personnel, and information, which cost money to purchase, hire, lease, rent or otherwise acquire. Much of this outlay may need to be made 'up front' which exposes the new venture an increased risk of financial failure if some cost and revenues are incorrectly anticipated. Licensing production rights to, or contracting for manufacture by, an established firm (rather than attempting to manufacture the product itself) is a means by which the new venture can reduce mortality risk. This strategy will avoid most of the major outlays (including learning expenses) which

are necessary with a manufacturing strategy, and thus insulates the new venture from financial ruin to some large extent, other things being equal.

Education and training programs for production personnel, and hiring (or poaching from other firms) experienced technologists, will also reduce producer ignorance, as well as catalyze the learning process in that technology dimension.

## **Risk Reduction Strategies Impacting on Management Ignorance**

Management education and training, and/or the poaching of managers with required skills and experience from other firms, will directly diminish ignorance of best practice management technology. Successful entrepreneurs typically display management and business skills which include the ability to recognize market opportunities, the ability to mobilize people and resources, other leadership and people skills, and expertise in manufacturing, marketing, human resource development, and financial management. Such skills can be learned and/or further developed via formal business education programs or short courses. To the extent that managers learn something new and pertinent to the situation at hand, management ignorance is reduced, which should in turn allow the downside risk of profit outcomes to be reduced, which in turn causes a downward shift of the mortality risk curve.

Insurance and cash conservation were discussed earlier in the context of financial management competency. These are, of course, mortality risk reduction strategies which may obviate financial ruin in the aftermath of unexpected cost and revenue shocks. We treat the decisions to conserve cash and to insure against external shocks as having their impact upon mortality risk via the risk reduction strategy of management education rather than as a direct risk reduction strategy that is independent of management information. Such decisions certainly require information (albeit estimates) of future costs and revenues, with particular reference to their expected magnitudes, variances, and timing. On the basis of such information received, competent financial managers will either insure and conserve cash balances, or not.

Licensing or contracting manufacture to an established firm shifts the consequences of management ignorance to the licensee, and avoids the new firm having to learn much of the management technology.

## **Combination Risk Reduction Strategies**

It is obvious from the above that some strategies reduce mortality risk by avoiding the consequences of ignorance in more than one technology. Allowing another firm to manufacture and market under license, for example, obviates the need to know how to produce, market, or manage the production and marketing of, the new product, as far as the new venture is concerned.

## Determinants of Mortality Risk

Based on the foregoing, we propose that mortality risk depends positively on the degree of novelty in the technology of consumption, production, and management. In turn, novelty in these three technology dimensions depends negatively on the passage of time, due to passive diffusion of information, or learning by doing, in each dimension. The rate at which information diffuses should be expected to differ in consumption, production, and management, so the mortality risk function should have separate terms relating to the osmotic learning rate in each of the technology dimensions. Novelty in each dimension will also be impacted negatively by risk reduction strategies, and may be positively or negatively impacted by unexpected shocks in any of the technology dimensions.

We also expect that mortality risk depends on the technological complexity of the particular industry into which the new venture enters. It may be more risky, other things being equal, to start a new venture in the health or medical field, than it would be to start a new venture in electronic consumer durable goods, for example, due to the profusion of legislative and regulatory obstacles in the former. We also expect it to be more risky to enter a 'more-competitive' market (i.e., where at least some firms already know the management technology and competitive pressures serve to keep margins low and induce highly competitive marketing behavior) as compared to a less-competitive market. Thus, for a given industry, a new venture may face more stringent competition from incumbent businesses in one geographic region, or product niche, than it would in another. These considerations enter the mortality risk function via the additional demands they place upon management technology in more complex industries and more competitive markets.

The proposed concept of new venture mortality risk and its determinants can be expressed in general terms as follows:

$$R = f(Nc, Np, Nm, ESnn) \tag{1}$$

where

- R = mortality risk;
- Nc = novelty in consumption (+);
- Np = novelty in production (+);
- Nm = novelty in management (+);
- ESnn = external shocks that do not impact by reducing novelty (+/-).

and the signs in brackets represent the expected direction of impact on mortality risk given an increase in that specific independent variable.

In turn, novelty in each of the technology dimensions can be expressed as

$$Nc = f(C, Lc, RSc, IC, MC, ESc) \tag{2}$$

$$Np = f(P, Lp, RSp, IC, MC, ESsp) \tag{3}$$

$$Nm = f(M, Lm, RSm, IC, MC, ESsm) \tag{4}$$

where C = the initial state of novelty to consumers (+);  
P = the initial state of novelty to producers (+);  
M = the initial state of novelty to managers (+);  
Lc, Lp, Lm = the learning rate at which ignorance decays in each dimension (-);  
RSc, RSp, RSm = risk reduction strategies which actively reduce novelty in each of the technology dimensions (-);  
IC = industry complexity (+);  
MC = market competitiveness (+); and  
ESc, ESp, ESm = external shocks to each of the technology dimensions (+/-).

The specific form of these functions is an empirical question. The terms might be additive and/or multiplicative in their impact on mortality risk. We should probably expect that some risk reduction strategies, such as entrepreneurial education, would have a direct effect on reducing the ignorance of managers, plus an indirect (perhaps multiplicative) impact on the learning rate in each dimension, as education acts as a catalyst to the learning process. There is much scope for future research.

## Conclusion

This paper has extended the literature on the 'liability of newness' and entrepreneurial risk by explaining mortality risk in terms of the novelty of the new venture in three pertinent dimensions. The analysis allows us to explain why mortality risk declines over time in a coherent framework, as distinct from the *ad hoc* explanation provided by prior authors. Indeed, the main reasons for the liability of newness enunciated by prior authors appear to fit within the novelty dimensions introduced in this paper. Stinchcombe's (1965) first three reasons (new roles, conflicts, and social interactions among relative strangers) are problems which arise due to novelty to management, and his fourth reason (lack of stable links to customers) arises due to novelty in the market. Hannan & Freeman (1989) cite the absence of trust placed by customers, which is a problem due to novelty to the market. Hannan & Freeman's (1984) contribution that organizational inertia reduces mortality risk because routines become increasingly established and 'follow a learning curve' (see Bruderl and Schussler (1990) p.531) clearly concerns novelty to management.

Our framework not only includes these earlier explanations, but admits a wider range of determinants of the liability of newness by starting from an examination of what is meant by 'new'. Our framework is more complete and provides additional analytical power. It would seem it is able to house the entire range of risk reduction strategies, and is also robust enough to explain why mortality risk sometimes rises against the downward trend.

The framework also suggests answers to recurring questions, such as "Why do new ventures fail?" They fail because of ignorance in one or more of the three technology dimensions which is not, or perhaps cannot be, removed in a timely manner by risk reduction strategies. Is all entrepreneurship equally risky? No, it is more risky if the venture is more novel in consumption, production, and/or management, if the passive learning rates are slower, if fewer and/or less-effective risk reduction strategies are utilized, if the industry is

more complex, if the market is more competitive, and/or if negative shocks cannot be insured against. Is mortality risk negatively related to return for new ventures? Not necessarily – an entrepreneurial venture with a product that is highly novel to the market, but utilizing appropriate risk reduction strategies, may be less risky than a 'copy-cat' business venture where the consumption, production, and management technologies are each well known, and yet the rate of return to the entrepreneurial venture may be higher. Similarly, a copy-cat new business, where the principal has neither the requisite management abilities nor sufficiently positive entrepreneurial attitudes to make a total success of the new venture, may face a higher risk of mortality than would a well-prepared entrepreneur with a product which is highly novel in both consumption and production.

This framework allows us to argue that an entrepreneur with extraordinary entrepreneurial abilities and attitudes may capture a 'rent' (extraordinary profit), as a result of those abilities. First, an entrepreneur with an exceptionally high tolerance for risk bearing might take up profit opportunities that are too risky for other investors due to their higher degree of risk aversion (risk-return trade-off). Put another way, the more risk-averse would decline the investment opportunity because it does not promise a rate of return sufficiently high to induce them to undertake mortality risk of the magnitude involved in that new venture.

Finally, to the extent that the exceptional entrepreneur can reduce mortality risk further than can any other potential manager (by virtue of his/her extraordinary entrepreneurial abilities and attitudes) he/she could reduce risk to a level which is acceptable to him/her but unacceptable to all other potential exploiters of the new venture opportunity. Alternatively, he/she would be prepared to pay more for the right to exploit the intellectual property than would any other potential exploiter.

## Footnotes

<sup>1</sup> See Carroll & Delacroix (1982), p. 170.

<sup>2</sup> Old and established firms also undertake new ventures, of course. Indeed it is fundamental to strategic marketing that firms constantly seek out and exploit new business opportunities. We believe the concepts introduced in this paper may also be applicable to new ventures undertaken by older firms.

<sup>3</sup> The 'liability of adolescence' concept notes that there is an initial period during which new firms have a virtually zero risk of failure, since their owners have committed startup funds to market research, prototype development, and other information gathering activity, and the firm cannot fail (go bankrupt) until this initial funding is used up. See Footman & Levinthal (1988), Bruderl & Schussler (1990) and Shepherd, Crouch & Carsrud (1997). We will not address the liability of adolescence in this paper.

<sup>4</sup> Throughout this paper 'product' should be taken to mean the output of a production process, and thus refers equally to a physical product or an intangible service, as applicable.

<sup>5</sup> Note that mortality risk is quite different from business risk or investment risk. It is concerned only with survival, not the variance of profits around expected levels, except insofar as this would jeopardize solvency. For a discussion of various measures of risk, see Balzar (1994).

<sup>6</sup> To the extent that the product's price is relatively low, quality risk is less important, because the consumer can ascertain the true quality at relatively low cost by buying the product. Quality risk becomes a more significant barrier to adoption of a new product at higher price levels. See Schmalensee (1982).

<sup>7</sup> An issue related to 'novelty to management' is novelty to competitors. By definition, first movers will be introducing a product which is novel to the market and novel to management, but it may not be novel in production for other firms if they were also developing a similar product. Second and subsequent movers (including imitators) will face one or more entrenched rivals who have already learned much of the necessary 'management technology' for that product in that market, and should expect to experience a more hostile competitive environment upon entry than did the first mover. Offsetting this to some degree is the likelihood that the target market will better understand the consumption technology of the second and subsequent movers' products, thanks to the educational impact of the first mover's promotional efforts. In this paper we will subsume this element of novelty under 'novelty to management', since dealing with competitive actions and reactions is part of the technology of management.

<sup>8</sup> These curves assume the absence of external shocks, information setbacks, and risk reduction strategies, which will be discussed later.

<sup>9</sup> Note that the pure mortality risk curve may decline smoothly, or alternatively it may change gradient abruptly if rates of learning differ among the technologies and/or if learning is lumpy not continuous, and depending on the timing of the revelations which occur to consumers, producers, and managers.

<sup>10</sup> Note that positive shocks would have an impact similar to a risk reduction strategy, while negative shocks would cause the mortality risk function to shift upward.

<sup>11</sup> The new firm's cost of capital may also include an interest rate premium extracted by a lender who is able to monopolistically exploit the new firm's inability to source more than one offer of funding. This is conceptually separate from the risk premium.

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