

A Multidisciplinary Perspective on the Evolution of Corporate Investment Decision Making

by

Michael J. Dempsey
School of Accounting & Finance
Griffith University

Abstract:

This paper offers a multidisciplinary perspective on the evolution of corporate investment decision-making theory and practice since the middle of the 20th century. To this end, perspectives from across the Finance, Management Accounting and Strategic Management disciplines are provided. Additionally, the paper considers the current potential for integration across our understandings from these disciplines. Accordingly, the article should be of interest to students and educators who wish to reconcile their understanding of corporate investment decision-making across financial, accounting, management and strategic perspectives.

1. Introduction

A firm defines its productive identity by its investment choices. In the early 1900s, the study of such investment choices was dependent on writers who were content to articulate actual experiences of institutional arrangements and industrial investment. From the 1950s, however, the emerging belief in Management Science stimulated a perceived need for a more theoretically rigorous approach. In such context, corporate investment decision-making began to be addressed more cogently across distinctive Finance, Management Accounting and Strategic Management literatures.

Distinctive approaches to the issue of understanding and improving investment decision-making processes have consequently been advanced across these disciplines. Thus, we can characterize contributions which have emphasized an economic theoretical perspective (finance), case study observations in an attempt to describe resource allocation behaviour (management accounting), and empirical field-based observations of the characteristics of success in an attempt to develop a qualitative-strategic approach to investment decision-making (strategic management). We might say that finance research specializes in the attempt to understand investment decision-making in terms of the workings of a micro-economic cost of capital (the “god in the machine”), management accounting research often specializes in documenting how capital appears to be allocated throughout the firm in practice via the mechanism of the firm’s capital budgeting systems (both formal and informal), while strategic management research focuses on identification of the key strategic investment decisions that are consistent with the firm’s niche in the market place.

More recently, the positive economic foundations of financial investment – for example, the capital asset pricing model – have been challenged. Furthermore, a number of articles have been forthcoming under the heading of “behavioural finance”, wherein market forces are the ultimate outcome of individual and distinctly “human” psychology, behaviour and attitudes. Such a foundation hypothesis would mark a departure from the Modigliani and Miller framework of “rational economic man” to a framework which accommodates “irrational man”. It might therefore be reckoned that we are at an opportune time to reflect on the various contributions to our understanding of corporate investment activity as they have been advanced from the mid 1900s.

In order to synthesize these different perspectives on investment decision-making, the remainder of the article is arranged as follows. In the next section, we consider the prevailing approach to corporate investment decision-making as it existed prior to the advent of the economic equilibrium conditions of Modigliani and Miller in the late 1950s. The subsequent section assesses the trend of contributions as they derived from the Modigliani and Miller foundation in the domain of Finance. The two subsequent sections assess the parallel contributions to corporate investment decision-making as revealed in both the Management Accounting and Strategic Management literatures. The penultimate section considers more recent developments across the disciplines, as well as the potential for integration across our understandings from these disciplines, before the final section concludes the article.

2. Corporate Investment Decision Making Prior to the 1950s

Since the early 1800s, accounting systems have been used to monitor the consequences of investment decisions and to report results of operations to interested parties. From the 1950s, however, they began to be used more extensively to actively control investment decision-making (Johnson, 1994). Prior to this time, managers were more likely to believe that their *experience* must recognize the well-run *processes* combined with satisfied customers which would make their companies competitive and profitable. Although these managers would not generally have used discounting appraisal methods in their investment decision-making, the concept of, and the mathematical apparatus for Net Present Value calculations were nevertheless familiar to textbook writers by this time. For example, Fisher's (1930) standard economic text considers the choice between alternative investments on the basis of discounted earning streams, with examples of choosing between the allocation of land between farming, forestry and mining (p. 133). It is even pointed out that the undesirable time shape of the highest discounted earning stream can be remedied by lending out some of the proceeds in earlier years and consequently being paid back with interest in later years. Nevertheless, Fisher is at pains to emphasize that the choice is being analyzed under *unrealistic* assumptions of certainty. With regard to the appropriate discount

rate under conditions of general *uncertainty*, he considers:

To attempt to formulate mathematically in any useful, complete manner the laws determining the rate of interest (return) under the sway of chance would be like attempting to express completely the laws which determine the path of a projectile when affected by random gusts of wind. Such formulas would need to be either too general or too empirical to be of much value. . . We must, therefore, give up as a bad job any attempt to formulate completely the influences which really determine the rate of interest. (p 316)

In the absence of a formal model of risk, Fisher recognizes that risk and return are closely correlated, and states:

But evidence that in general risk tends to raise the commercial rate of interest is abundant. The proposition is a matter of such common observation that no special collection of facts is necessary. Every lender or borrower knows that the rate of interest varies directly with risk. A bird in the hand is worth two in the bush. The principle applies not only to the explicit interest rate in loan contracts, but also to the implicit interest which goes with the possession of all capital. Where there is uncertainty whether income saved for the future will ever be of service, but the certainty that it can be of service if used immediately, the possessor needs the possibility of a very high future return in order to induce him to save. (p. 382)

Application of probability theory to an assessment of risky outcomes was also quite familiar at this time. Nevertheless, mathematicians distinguished naturally between the problem of predicting outcomes under *risk* - when the probabilities might be difficult to estimate - and the problem of predicting outcomes under *uncertainty* - when the possibilities themselves are difficult to estimate. Among theoreticians, typical problems with the reduction of uncertainty to probability distributions were in fact well recognized, to the extent that enthusiasm for the potential applications of probability to economic issues had been more or less extinguished as economists acknowledged the insurmountable problems (discussed by McGoun, 1995). Put simply, the modeling of uncertain future cash flows in terms of probability density functions did not at this time answer a need among managers in their bid to face uncertainty.

For such reasons, a sound basis for investment decision-making was identified not with mathematical proofs, but with the application of proven principles based on experience. Textbook writers' recommendations and prescriptions at this time were inevitably substantiated by the evidence of experience. We might say that theory at this time was the distillation of experience as interpreted by the writer. The major corporate finance textbook prior to the late 1950s was published by Dewing (1919 and 1953) who advanced "principles of judgment" on the basis of his observations and experience. Dewing established the tone of his study of corporate investment decision-making with the opening passage to his text:

Four main motives have led men to expand business enterprises. On the whole they are not economic, but rather psychological; they are the motives incident to the struggle for conquest and achievement - the precious legacy of man's "predatory barbarism." Primarily a man measures the success of a business by increased size, and secondarily by increased profits. . . The race-old instinct of conquest becomes translated in our twentieth century economic world into the prosaic terms of corporate growth. Business expansion is the spirit of a modern Tamerlane seeking new markets to conquer. It is a pawn for human ambition. The second motive, less significant, one is led to believe, is the creative impulse. . . It is a commonplace of psychology, current since the brilliant introspective studies of the elder Mill and Reid, that somewhere in the mental structure of all of us lies the impulse to build, to see our ideas take form in material results. . . The third motive is the economic. My own observation is that the vast majority of businessmen who plan enlargements, consolidations, and extensions of their business are not actuated primarily by the impulse to make more money, although they unquestionably place this motive uppermost when they need to present plans for enlargement to directors and stockholders. Since increased profits have so obvious and direct an appeal, and since no other motive can sufficiently justify the investment of other people's money, it is natural to place the motive of increased profits foremost. And it appears foremost in every business manager's mind when he attempts to justify a business policy which may have been in the first instance subconsciously prompted by less obvious and more basal motives. The fourth motive is the

satisfaction in taking speculative chances. . . All men enjoy the game they think they can play. (Vol. 4, p. 4)

Dewing's argument was that the problem of investment decision-making was essentially that of determining whether or not economic circumstances called for an *expansion* or a *contraction* of the firm. Reflecting the more labour-intensive conditions of his day, Dewing considered that the production of a manufacturing establishment was a direct result of a relatively constant factor in the form of fixed capital investment and a variable factor in the form of human labour, the whole administered by an intangible economic value called entrepreneurial ability. The firm was judged to be in equilibrium when its investment strategy was at the point of decreasing returns with expansion (Dewing's law of "balanced return").

Dewing's text progresses to discuss the financial problems incident to obtaining money for extensions, with special reference to the sources of new capital. Nevertheless, Dewing's understanding of entrepreneurial activity is not divorced from an understanding of what he terms the "humanity of business". His text emphasizes repeatedly that motives other than the economic are at play, and that the reasons for men's actions can but seldom be reduced to simple prerogatives. "The impelling springs of human action are difficult to fathom." In Dewing's world, business managers remain as human beings, and their solutions of the difficult problems of business expansion cannot be dissolved easily into economic elements nor forecasted readily in accordance with any canons of economic expediency.

3. The Financial (Cost of Capital) Approach to Investment Decision Making

In the late 1940s and 1950s, the high prestige of the natural sciences began to encourage the belief that the modeling of investment decision-making and resource allocation problems could be identified with the elaboration of optimization models and the general extension of techniques from applied mathematics. In a scientific world, the logical structure of decision-making implied that practicing managers were likely to make more optimal decisions when supplied with a richer set of *positive* theories that provided a better understanding of the consequences of their choices (Whitley, 1986). Thus the environment of

the late 1950s was set for fundamental changes in financial theory. The outcome was the "economic science" of Modigliani and Miller (MM) (MM 1958, 1959, 1963; Miller and Modigliani, 1961; Miller, 1977) and their followers from the late 1950s which offered a rigorously mathematical arbitrage and cost of capital foundation.

Against such a background, the intuitive normative approach contributions of early writers could be largely ignored. Brennan (1995) singled out Dewing's contribution as, "detailed institutional fussiness" (p. 11); and Smith (1990) in his "The Theory of Corporate Finance: a *Historical Overview*", also singled out Dewing for dismissal while requiring only a single paragraph to account for corporate finance theory prior to the late 1950s:

The finance literature through the early 1950s consisted in large part of ad hoc theories and institutional detail, but little systematic analysis. For example, Dewing (Financial Policy of Corporations, 1919; 1953), the major corporate finance textbook for generations, describes the birth of a corporation and follows it through various policy decisions to its death (bankruptcy). Corporate financial theory prior to the 1950s was riddled with logical inconsistencies and was almost totally prescriptive, that is, normatively orientated. The major concerns of the field were optimal investment, financing, and dividend policies, but little consideration was given to the effects of individual incentives, or to the nature of equilibrium in financial markets. (p. 3)

A second phenomenon at this time which contributed to the need for a more detached scientific assessment of investment, was the rapid spread of the multidivisional form of business organization. The outcome was often a situation where decision-making responsibilities were being increasingly delegated to divisional managers. Although corporate management might ultimately hold formal authorization for expenditure, its technical knowledge of divisional functions and needs was generally less than those of the divisional managers themselves, so that they were often ill-equipped to argue against their demands. In consequence, divisional managers often held substantial influence over the capital invested in their divisions (Scapens, 1982). By imposing *financial* criteria, however, management was able to establish a common language when it came to justifying expenditures, and could bring the framework of discussion into its own area of scientific expertise. It

began to be believed that such financial criteria could be used to establish practices which would ensure that individual operating performances were being integrated effectively with regard to the overall use of the firm's capital resources. Before expenditure could be authorized, divisional managers were required to present assessments of operating performance in terms of capital employed and to demonstrate that consequent returns on investment overcame "hurdle" financial rates of return (Johnson, 1994). The decisive change was that accounting systems were being used actively to control processes, rather than used simply to report the results of processes.

Against such background, teaching in graduate business schools after the 1950s actively began to feature and promote the concept of "scientific financial management" with the use of accounting-based management information tools (Johnson and Kaplan, 1987). Economic models of business and psychological models of individual behaviour also came into vogue. The study of real business problems faced by real business people now often represented only a small contribution. Real case-studies could seem ambiguous, open-ended, and altogether too indeterminate as subjects for analytical inquiry (the Harvard Business School MBA actually distinguished itself by holding to a case study orientation to education in business administration). In contrast, financial criteria offered M.B.A. students the appearance of a ready "management-science tool kit" for investment analysis that was generally applicable (cf Whitley, 1986).

In a scientific world, it was necessary that the stock markets should also be scientific. Prior to the 1950s, the equity stock markets had been regarded with more than a fair degree of suspicion: they were capricious, capable of abrupt bouts of optimism and depressions - bull and bear moods - their vicissitudes being capable of bestowing sudden wealth as well as ruin. Nevertheless, the foundations of MM neo-classical finance theory embraced a view of "efficient capital markets". The efficient market hypothesis (EMH) asserted that in financial systems in equilibrium, financial capital circulated to achieve those rates of return that are most attractive to investors, and that in accordance with this principle, prices of securities observed at any time "fully reflected all information available at that time", so that it was impossible to make consistent economic profits by trading on such available information (for example, Fama, 1976; Weston, 1989). Put another way, the paradigm stated that the firm's value reflected the present value of the firm's

expected future net cash flows capitalized appropriately, including expected cash flows from future investment opportunities. "Correct and meaningful" markets implied that "the market knew best" and, that the underlying economy was likely to be served better by financial deregulation and a general hands-off attitude to financial market activity. In such context, activities surrounding leveraged buy-outs, junk bonds, merger and take-over activity were deregulated.

The variant of the model that came to dominate financial economics to the extent of being labeled the "paradigm" was the Capital Asset Pricing Model (CAPM) (cf Ross, 1978; Ryan, 1982). As summarized by Jensen (1972), the CAPM relies on several major assumptions (all asset holders are single period expected utility of wealth maximisers who choose their asset portfolios on the basis of the mean and variance of expected returns; they can borrow or lend an unlimited amount of money at an exogenously given risk-free rate of interest; they have identical subjective estimates of the means, variances and covariances of returns on all assets; they are price takers, so that asset markets are perfectly competitive; the quantity of assets is fixed so that there are no new issues and they are perfectly divisible and liquid with no transaction costs; and, finally, there are no taxes). Given these assumptions, the price of an asset in equilibrium is determined as a function of the risk-free interest rate, the mean expected return on the market of all risky assets, and the covariance of the particular asset's return with such market portfolio return (Sharpe, 1964; Lintner, 1965). In defense of the model approach in Finance, Fama (1976) stated:

Looking at the model in these terms, the student who is newly exposed to scientific research is often tempted to conclude that the model has no value. To draw such a conclusion is to forget what modeling is all about. The first purpose of a model is to improve understanding of some real world phenomenon. If the phenomenon is a complicated one, like the adjustment of stock prices to new information, then to abstract from unimportant and potentially confusing details and to focus on the important aspects of the problem, we must impose some simple structure on the world. Since the structure is simplified and is thus not a completely realistic view of the world, we call it a model. (p. 168)

At the same time as the basic conceptual models of efficient capital markets were being tested against data banks of historical capital market

price movements, the theoretical implications of the models for business financial decision-making were also being clarified. It followed that the firm's key financial decisions must be understood on the basis of providing the firm's investors with a rate of financial return that at least matched their opportunities elsewhere. In other words, investors' required expectation of financial return represented the firm's *cost of financial capital*. On such a basis in a world of perfect markets, the market value of a firm was pronounced independent of both the firm's capital structure and its dividend policy and the financial objective of management was reduced to that of identifying those investment opportunities where the expected cash flows, discounted by the market opportunity cost of investment capital employed, produce a positive Net Present Value (NPV) (MM, 1958). When corporate and personal taxes were introduced, it was suggested that firms should never pay dividends and strive to have 100% debt in their capital structures (MM, 1963; Farrar and Selwyn, 1967; Brennan, 1970). Such stylized pronouncements did not always appear relevant to actual practitioners. Distinctly "behavioural" characteristics of the market - financial "distress", shareholders' "preference" for dividends, the "signaling" property of dividends, the "agency" problem – began to be invoked so that the theory could be aligned more satisfactorily with observed practice.

In effect, the agenda in Finance became that of recognizing and understanding corporate activity in terms of its *divergence* from the Modigliani and Miller propositions – "look(ing) at finance through the eyes of MM" (Ross, 1988, p. 133). In his review article, Brennan (1995) stated:

The shift is away from attempts to *prescribe* normative rules for decision-makers that would assist decisions that are optimal from the point of view of shareholders and towards attempts to *describe* more realistically the way that decisions are actually made. (p. 17)

Hence the new theory emphasizes the decisive role of individually motivated agents, both those within the corporation and those with whom the corporation must deal. Such agents are non-robotic individuals, who hold aspirations and motivations in the context of institutions which provide incomplete contracts. Newly recognized features of the opportunity set include the informational endowments of agents, their discretionary powers, and the nature of the implicit and explicit contracts that link their actions to their rewards. Newly

recognized aspects of reward include perquisite consumption, control benefits and other non-pecuniary benefits, reputation, and effort aversion. In these lights, Finance continues to model directly the belief that investors' concerns and corporate financial decisions are different sides of the same investment coin, which come to be reconciled every day in the pricing of securities in the markets.

Miller (1977) defended the rational financial framework that he had helped to establish, stating:

Why then do economists keep trying to develop models that assume rational behaviour by firms? They are not, I insist merely hoping to con their business school deans into thinking they are working on problems of business management. Rather they have found from experience that - not only in finance, but across the board - that the rational behaviour models generally lead to better predictions and descriptions at the level of the industry, the market and the whole economy than any alternatives to them. Their experience, at those levels, moreover, need involve no inconsistency with the heuristic, rule-of thumb, intuitive kinds of decision-making that they actually observe in firms. It suggests rather that evolutionary mechanisms are at work to give survival to those heuristics that are compatible with rational equilibrium, however far from rational they may appear to be when examined close up and in isolation. (p. 272)

Notwithstanding the reluctance of practitioners to accord with a literal interpretation of the NPV investment criterion, researchers across Management Accounting, Finance, and Scientific Management disciplines by the mid 1970s generally had been won over by a belief in its efficacy. From a management accounting perspective, King (1975) observed that researchers who voiced their doubts that "effort extended in attempting to follow the ideal of the scientific models will be worthwhile" appeared to be in a minority. A great deal of activity grew up around surveying and documenting the extent to which capital budgeting decision-makers used, or did not use, the various techniques for analyzing potential investments. The implication was always that the use of NPV revealed "sophistication", whereas the use of methods such as payback and accounting rates of return revealed either ignorance of better methods, or irrationality in refusing to adopt better methods. Northcott (1991) comments on the "visible relief" when this gap between

the new methods (NPV analysis and other “sophisticated” support tools) and observed practice was observed to be closing (as reported by Pike, 1983; Klammer and Walker, 1984; Scott and Petty, 1984; Pike, 1988). The researchers at this point appear to have seen a vindication of their own role as academics - that due to themselves, practitioners were now making more rational decisions based on the sophisticated methods taught at their classes. For example, Pike and Wolfe (1988) noted “with encouragement” both that capital budgeting procedures were becoming more formalized and that companies had shown notable improvements in their financial and risk analysis methods. So much so, that they were able to voice hope for “their eventual whole-hearted adoption” (p. 81).

4. The Management Accounting (Organizational Context) Contribution to Corporate Investment Decision Making

From the 1970s, management accountants such as Hopwood (1974, 1983) and Scapens (1990) began to debate that a theory could be meaningfully *prescriptive* for an individual only in so far as the context of its assumptions was *descriptive for the individual* of the actual organization context within which such decisions were assumed to take place. These authors accordingly called for research to be constituted with direct regard to the organizational context of actual decision-making. Case-study management accounting research in the area of capital budgeting from the 1970s has tended subsequently to see investment decision-making as a *process* of investigation which occurs at many points in the organization, and which is spread out over time, from “triggering” and “recognition” of a problem through to a fuller “definition” of an investment proposal, as it is eased through the system to formal appraisal and ultimate acceptance by higher management (Bower, 1970; Hopwood, 1974; King, 1975; Petty, Scott and Bird, 1975; Ross, 1986; Mukherjee and Henderson, 1987; Butler, Davies, Pike and Sharp, 1993). The process typically is seen to involve readily available information, precedent, general strategic considerations, and environment factors, together with qualitative judgements of technical, production and marketing staffs, against which a manager’s belief about future profitability might depend rather simply on optimism and confidence in the economy. For these reasons, a number of writers considered that although financial criteria such as NPV, payback, IRR and ARR, might constitute a framework on which to formalize investment

decisions, the techniques were unlikely to determine the decision outcomes in any material manner (Bower, 1970, p. 45; Hopwood, 1974, p. 135), although the numbers nevertheless ensured that decision-makers were able to “account” for their decisions. In this perspective, financial figures are called for when the project has the required backing of a sponsor with “reputation”, and when they are called for, the numbers are likely to be sufficiently exposed to manipulation that they merely reflect the aspirations and commitments of the project sponsors (Mukherjee and Henderson, 1987).

On the basis of insights afforded by management organization specialists (e.g., Starbuck and Hedburg, 1977; Miller and Friesen, 1984; Pettigrew, 1985), Dent (1990) considered that the capabilities of the firm were defined by sunk costs, irreversible investments, as well as the characteristics of its personnel built up in the past, so that the strategies of the organization were determined by where it had been in the past and by what it had done. Further, once the firm’s strategic decisions were committed (which in practice tended to be non-regenerative, making no automatic claim on management) the firm’s “big” investment decisions were then effectively committed (Ansoff, 1987). From this point, organizations experienced “difficulty” in responding to change. In this view, the firm held only restricted volition over its choices. Investment decisions directed at re-aligning the firm’s competitive posture in terms of new competitive strengths and distinctive competencies, were noted to be the exception (Mintzberg, 1978, 1987). It could even appear that organizations had been selected more or less *deterministically* to their distinct niches in the first place, on the basis that their particular capabilities were valued.

In this context, a number of management authors recognized analogies between Kuhn’s paradigm shifts in science and a “new way of seeing the world” in firms, which duly entered the accounting literature (Hedberg and Jonsson, 1978; Dent, 1990; Dempsey, 1996). Such was the difficulty of achieving “paradigm shifts” in the firm that they were frequently contingent upon the arrival of new leaders who brought with them new interpretations. It required a new leader to rupture an organization’s belief in the efficacy of its past (Starbuck and Hedberg, 1977). It was observed, for example, that corporate turnaround strategies appeared generally with a change in top management even when the need for the turnaround was brought about by factors beyond the control of management (Slatter, 1984). Once the new “vision” was

accepted, however, *operating* activities would again be aimed at maximizing the profitability of current operations within the newly-accepted strategic framework. Such decisions aimed to enhance the efficient and effective scheduling of operations, supervision of performance, application of control actions, along with budgeting decisions at the margin of already committed investment activity (Davis, Dempster and Wildavsky, 1971).

For these reasons, researchers were exhorted not to be “blinkered” by the need to be overly “rational” within the terms of economic modeling (Northcott, 1991). Johnson (1994) made the distinction between continuous total-quality management “processes” and “management by accounting numbers”, advocating the former as the basis of competitive success. These views were supported by the observation that attempts to correlate positively the reported use of discounted cash flow techniques and superior firm performance had generally failed (the correlation even tending to be in the opposite direction: for example, Haka, Gordon and Pinches, 1985; Cooper and Petry, 1994). Based on their study of investment decisions from various perspectives in a wide range of UK and international companies, Butler, Davies, Pike, and Sharp (1993) also concluded that there was little hard evidence to support the view that increased attention to the computational aspects of investment decision-making led to improved performance, although managers seemed to believe that they led to softer measures of effectiveness such as improved evaluation and control of capital projects. It appeared that the numerous capital budgeting surveys (for example, Scapens and Sale, 1981; Pike 1983 and 1988) had only partially enriched the understanding of the role of financial measures such as DCF and risk analysis techniques in reaching investment decisions. In effect, the traditional emphasis in the literature on financial appraisal was being given undue prominence and was often far removed from the emphasis in the actual decision-making process within organizations.

5. The Strategic Management Context of Corporate Investment Decision Making

A general thesis of dissatisfaction with the emergent “cost of financial capital” paradigm methodology can be traced back to Steinbruner and

the Harvard Business School. Steinbruner (1974) in a general observation of decision-making stated:

If quantitative precision is demanded, it is gained, in the current state of things, only by so reducing the scope of what is analyzed that most of the important problems remain external to the analysis. (p. 328)

Such a line of thought was extended by Hayes and Abernathy (1980) and Hayes and Garvin (1982), followed by Hill (1985). A key concern of these contributions was that the logical consequence of the net present value (NPV) methodology was a bias to analyze the analyzable, so that a company would allow itself to sink slowly, but nonetheless inevitably, because at each stage, the only proposals that allowed for a convincing NPV-type analysis were the incremental ones (reduce staff, make certain savings, reduce perceived inefficiencies. . .) that went some way to shoring up the situation. The radical long-term view that was more difficult to quantify and which did not fit so neatly into a discounted cash flow analysis was ignored. Hayes and Abernathy (1980) stated:

We believe that during the past two decades American managers have increasingly relied on principles which prize analytical detachment and methodological elegance over insight. . . based on experience. Lacking hands-on experience, the analytical formulas of portfolio theory push managers even further toward an extreme of caution in allocating resources.

Hayes and Garvin (1982) went even further, blaming the growing use of discounted cash flow methods for the relative decline in the performance of Western business. They observed that as such investment evaluation methods had gained wider use in investment decision-making, so the growth of capital investment and research and development spending in the US had slowed; and they believed that this was not a coincidence. They claimed that their own observations suggested that US firms were repeatedly requiring pre-tax hurdle rates of 30% or more before committing to investment proposals. For Hayes and Garvin, the problem of unrealistically high discount rates was compounded by the fact that benefits such as increased worker skills and capabilities, new products, and a different cost structure were harder to document in advance and so did not fit neatly into a present-value analysis.

Such views were subsequently picked up and extended by non-finance academic specialists such as by Hill (1985) who argued that the key differences in the approach to investment decision-making by Japan and West Germany were, first, they avoided the delusion that in an imprecise environment, numbers are precise and thereby reliable, and that by using numbers, the risk is thereby reduced; and, two, they accepted that to run a successful enterprise, it was necessary to take risks. Hill concluded his text in the following manner:

Investment decisions such as Nippon Electric Company's twenty year 'incubation period' of its computer and semiconductor business, Honda's persistence in using its motorbike profits to bring its clean-engine vehicle to market, or Japanese car manufacturers' entry into the four-wheel vehicle market in the environment of the early 1980's, could and would not be justified on any quantitatively financial analysis. (p. 207)

Porter (1980, 1985) recognized that the firm's value derives fundamentally from what customers are willing to pay, which must be achieved either by offering lower prices than competitors for equivalent benefits or by providing unique benefits. Thus the firm is called on to determine the selection of product mix that it will produce and the markets to which it will sell. The destiny of the firm is to discover its equilibrium position in the context of competitors and an advancing economic and technological environment. Conceptual frameworks such as the "Boston Consulting Group Matrix" and the "SWOT" analysis assisted such strategic outlooks.

Grounded field research by Carr, Tomkins and Bayliss (1994) - of companies in the motor-components industry and which contrasts UK and German approaches - substantiated the above strategic emphasis, suggesting that quantitative accounting control systems may fail entirely to connect with the kind of successful investment decision-making that is required to bring real success. These authors observe that the more impressively successful managers - as encountered more typically in the German companies investigated - talk about having a *thorough knowledge* of the business, and the perceived direction of markets, technologies and competition, and have little doubt that much of this cannot be encapsulated in NPV calculations. For the more successful firms, the strategic investment debate is recognized as involving so many uncertainties and complexities, that it is almost bound to be

qualitative, and not necessarily quantitative. The company might have "foresight" of the gains to be made but often has difficulty in judging any kind of payback period, let alone a meaningful NPV. One Chief Executive, who had a strong financial background yet insisted on placing little emphasis on the role of finance in the strategic decision-making process, is quoted:

Finance is not enough; it must be paired with intuition and intimacy with products, markets and customers. US and UK managers sit too much in their offices over their figures. . . . When I talked of intuition it was not just out of the blue. Intuition is the very last thing when you know everything. You have to have every kind of information about your competitors, but the rest is intuition. (p. 107)

Fairly crude depictions of potentially large benefits against potentially large loss scenarios are often the only message of an investment's cash-flow analysis, which management would be only too readily aware of. Reminiscent of the Harvard NPV criticisms, Carr et al summarized the successful companies:

Their argument was that, so long as progressive companies do not actually waste resources as a result of poor controls, more laggard suppliers would simply be forced to incur the same outlays at a later date, whilst missing the window of opportunity and securing ultimately fewer benefits from the same investments. The only other option for such laggard suppliers, surrendering market share, was merely a short-term "harvesting" strategy. Ultimately customers would not accept less than world standards and such laggard suppliers would be forced out of the vehicle component business altogether. A number of German Chief Executives perceived UK and also US suppliers in this light, blaming them for what they saw as a crude form of financial orientation. (p. 345)

Based on their continued follow-up learning processes with eight managers in four companies, Grundy and Johnson (1993) emphasized the sheer difficulty that managers have in "seeing" their decisions from the perspectives of academic definitions and of bridging their understandings of strategic, financial and organizational aspects of their investment decisions. The authors concluded that the variety and complexity of investment issues were such that broad, prescriptive approaches to linkages were unlikely to be useful to managers. It

appeared that once formal mathematical models reached a certain sophistication, they were all but unintelligible as conceptual frameworks to most practicing managers.

The "popular" Management literature has generally enjoyed repeating the Harvard School argument against the "hard numbers" approach to investment decision-making. For example, management consultants Peters and Waterman (1982) in "In Search of Excellence" objected to the dominance accorded to the quantitative analysis of high theory, and exhorted:

Analysis has no way of valuing the extra "oomph", the "overkill", added by an IBM or Frito-Lay (PepsiCo) sales force. Every time the analysts get their hands on Frito's "unreasonable" level of service their eyes begin to gleam and they proceed to show how much could be saved if only Frito would reduce its commitment to service. The analysts are "right"; Frito would immediately save money. But the analysts cannot possibly demonstrate the impact of a tiny degree of service unreliability on the heroic 10,000-person sales force - to say nothing of Frito's retailers - and, therefore, on eventual market share loss or margin decline. Viewed analytically, the over commitment to reliability by Caterpillar ("Forty-eight-hour parts service anywhere in the world - or Cat pays") or Maytag ("Ten years' trouble-free operation") makes no sense. Analytically, purposeful duplication of effort by IBM and 3M on product development makes no sense in quantitative terms. (p. 45)

Such sentiments continued to be replicated in the popular management literature. As one further example, Mito (1991) quoted the president of Honda Research and Development:

A project may *not* be profitable but if the idea is one that responds to people's needs, researchers should pursue it to its conclusion. Environmental pollution, toxic exhaust fumes, energy conservation - at first, problems such as these may seem insurmountable but no problem should be seen, in principle, as impossible to solve. How close researchers come to solutions depends on their organization's commitment to doing what is right - perhaps transcending short-term profits - and on the individual conviction that problems can be solved. Knowing that what they are doing contributes to a better world - that they are not just working in a vacuum - lifts the morale

of researchers and gives point to their work. Research carries a moral content. . . The driving force in the growth of enterprise is ideas. At the R & D centers, priority should be given to ideas. (p. 63)

6. More Recent Trends

In Finance, the need to understand and evaluate the points at which discounted cash flow analysis fails as a positive theory of investment decision-making has stimulated various research agendas. In the model-building tradition of Finance, one agenda continues to be that of developing quantitative models of investment decision-making that are more sophisticated and, hence, it is hoped, more realistic. Here, a principle focus has been with the need to comprehend the "option" value inherent in investment decision-making. There is the "option" value of deferral when a project is not immediately undertaken, as well as the "option" value of further investments contingent on the project when it is undertaken.

With regard to the option value of deferral, it is recognized that project approval is often not a "now-or-never" decision. In other words, if a project is turned down, it may be that it can be undertaken at a later date. It may be that a distinct "option" advantage actually accrues to deferment, such that "deferment" equates to "holding an option on the project." Dixit and Pindyck's (1994) text illustrates numerical applications of the technique with the option value of delaying the closing down of a steel works and delaying the developments of mining/petroleum reserves on the basis that the price of steel/copper/oil may increase in the future. The opportunity cost of exercising the strategic option by deciding not to invest is subtracted from the conventional "invest if the NPV is positive" rule. Nevertheless, in order to make progress, realistic complications, such as the impact of corporate inactivity while the firm waits for information some years down the line, are ignored. As these authors concede, the illustrations of the options approach as advanced have tended to be "simple and stylized" (p. 394).

When there are programs that are contingent on the current project, the current project may effectively offer "options" on such investment opportunities, which value must be attributed to that of the current

project. The NPV appraisal model has accordingly been extended with the exploitation of “real option” pricing theory aimed at capturing the *strategic* options inherent in investment undertakings (to the extent of being regarded as the new paradigm of investment decision-making, Brennan, 1995, p. 9). Nevertheless, it may again be remarked that illustrations of the techniques as a practical prescription are not as yet general. As acknowledged by Pinches (1998): “Advances in real options have been dramatic, but many challenges remain – especially in applying real option concepts and ideas to the capital investment decisions-making process employed by firms.” Pinches points out that implicit in the application of the real options approach to capital investment decision-making is the understanding that the concepts and approaches for valuing options on financial assets can be applied to valuing the strategic and timing options held by firms. Nevertheless, additional complexities exist with real options as are generally not present with options on financial assets. To give two examples: (1) real options held by firms are generally *far more complex* than financial options – this occurs especially in the areas of across-time strategic interdependencies and the compoundness of multiple options within the same capital project; and (2) ownership of real options is generally *nonexclusive* – which is to say, more than one firm may own or be able to develop the real option, which creates the obvious problem that the value of a real option may depend on the action of other firms in relation to the actions of the firm making the current investment decision. Recognizing these issues in valuing real options, Lander and Pinches (1998) conclude that it may be necessary to resort to other approaches, such a decision trees or influence diagrams, to effectively model real options. Cortazar and Casassus (1998) recognize the usefulness of software in incorporating the insights of real options. Nevertheless, it is fair to say that the application of real options to decision making in firms remains in its infancy. Such issues are further elaborated in commentaries provided by Ross (1995), Trigeorgis (1996), Brennan and Trigeorgis (2000).

The link of “real option” theory in Finance with strategic options offers an interface between Finance and Strategic Management. Almost for the first time, it appears that the distinctly strategic concerns of Strategic Management with regard to investment decision-making (as well as of the Management Accounting case-study literature in this area) are being consciously built into the quantitative models of Finance. Nevertheless, it cannot be denied that a tension remains between the traditional

quantitative focus of Finance and the more qualitative insights associated with the other disciplines.

Ultimately, the contention that, in some operational sense, NPV (as derived from discounted cash flow analysis) represents a prescription for decision-making because this is what the market capitalizes as equity, relies on the proposition that corporate and investment finance are two sides of the same investment coin that come together in the market place. That is to say, the firm's actions are immediately recognized and capitalized as market value by the firm's investment community. Yet, it is clear that an operational positive theory that brings corporate and investment finance together has yet to be devised.

Without such connection, the NPV of a firm's project cannot translate into an equivalent market value for the firm's shareholders as owners. A realistic appraisal of the interaction of corporate and investment finance must therefore recognize the technical difficulties that investors have in monitoring what managers are doing. The issue of information asymmetry implies that personal (as opposed to shareholder) success, perquisites, short (as opposed to long) term success, thereby come to influence a manager's decision-making. Such issues of information asymmetry have been recognized in numerous contributions; for example, Harris, Kriebel and Raviv (1982), Sherfin and Statman (1984), Antle and Eppen (1985), Statman and Caldwell (1987), Dye (1988), Trueman and Titman (1988), Emmanuel, Otley and Merchant (1990), Chaney and Lewis (1995), Welker (1995), and Arya, Fellingham and Glover (1998),

The outcome that managers consequently choose amongst potential investment opportunities within a *psychological* framework, represents a more recently acquired agenda in Finance - founded on the "prospect theory" contributions of Kahneman and Tversky (1972, 1979, 1982, and 1982 (with Slovic)) and Tversky and Kahneman (1981, 1986, 1992) and "regret theory" of perhaps notably Bell (1982) and Loomes and Sugden (1982). Notwithstanding that the "institutional-behavioural" reality of investment decision-making has long been central to Management Accounting case study research, "Behavioural Finance" represents a recent agenda. The goal of Behavioural Finance is, in effect, to provide an understanding of the behaviour of investors and managers and their interaction in companies and securities markets (cf Statman, 1995, 1997). Such a qualitative assessment of investment behaviour clearly

represents a radical departure for modern finance theory. Nevertheless, the award of the 2002 Nobel Peace Prize in Economics to Daniel Kahneman (for integrating insights from psychological research concerning human judgment and decision-making under uncertainty) and Vernon Smith (for having establishing laboratory experiments as a tool in empirical economic analysis) has served to signal behavioural finance as coming of age in Finance.

Following from the above work, prospect and regret theory are now foundational to the study in Finance of the role of varying attitudes to risk: the “framing” of the problem, cognitive errors, self-control and regrets in financial decision making; and has extended to questions such as, Why do investors and decision-makers hate to realize losses? Why do managers hate to terminate projects? Why do investors prefer stocks of good companies? Why do investors like cash dividends? What determines expected returns? What kind of securities do investors like? It appears that the predictions of prospect theory and regret theory can help to explain manager and investment behaviour (reviewed in Shiller, 1999). Such focus in Finance on a more realistic appraisal of “behavioural” decision-making – with its emphasis on the distinctly human attributes of investment decision-making - offers an interface between Finance and case-study Management Accounting.

In Strategic Management itself, the work of Kay (1993) served to emphasize the firm’s investment decision-making in the context of the firm’s “reputation” and “strategic linkages based on trust”. It follows that the firm’s investments should not be assessed independently of how they contribute to these two dimensions of firm success. “Reputation” and “Trust” have been variously recognized as constituting not only key outcomes of the investment decision of the firm, but as constituting key elements of the investment decision-making process itself. So, for example, Mukherji and Nagarajan (1996) extend the concept of trust to investment decision-making, Chami and Fullenkamp (2003) relate trust to efficiency within the firm, while McAulay (1996) explores how reputation extends the potential for negotiation and action in investment decision-making (cf also, Tinsley, O’Connor and Sullivan, 2002). Dempsey (1996) has gone so far as to suggest that an almost identical framework of “reputations based on past performances” and “commitment and trust relationships” might be applied as a framework for recognizing and understanding corporate investment activity in preference to a framework of traditional cost of capital equations. So,

again, we observe that the Strategic, Management and Finance literatures are embracing complementary research agendas.

In Management Accounting, research continues to explore the integrity and application of the NPV methodology. Thus case study research continues to emphasize the difficulties inherent in practical application of formal, quantitative systems of investment analysis to the firm's strategic goals (for example, Slagmulder, 1997; Carr and Tomkins, 1998; Seal, 2001). In connection with this, the literature continues to highlight the gaps between NPV theory and practice (for example, Arnold and Hatzopoulos, 2000). The Management Accounting literature also continues to monitor and critique research into adaptations of NPV as management performance indicators - for example, the EVA (Economic Value Added) measure of value proposed and commercialized by Stern, Stewart & Co - which serves to highlight the attributes and essential nature of the NPV methodology (as, for example, Biddle, Bowen and Wallace, 1997; Chen and Dodd, 1997).

7. Conclusion

The insights of the Finance, Management Accounting and Management disciplines with regard to corporate investment are clearly capable of informing one another. What one discipline is capable of ignoring in regards to investment decision-making, the other disciplines may illuminate. Moreover, more recent developments across the research agendas of these disciplines in the area of investment decision-making indicate increasingly strong inter-relationships between their agendas.

Nevertheless, it is possible that an integrated model of investment behaviour across the disciplines must remain unattainable. To see this, consider that the distinctive skills of mathematics, case-study and empirical field-based observations are capable of functioning more or less independently – so that, in consequence, the disciplines differ in their philosophical outlooks. Thus, for example, while financial and strategic models prefer to abstract or generalize their findings, Management Accounting's case-study focus recognizes that everyday corporate investment decision-making is rarely an example of such neat theory, being more likely the outcome of an on-going refinement of operations for that particular firm by its particular inter-locking participants. Or, again, we might observe that while Finance seeks

mathematical rigour, and thereafter seeks practicality, Strategic Management seeks first to generalize practice from past experiences, and thereafter seeks to justify with supporting theory. As just one outcome, we have observed that while real options theory has been invoked in Finance to align the NPV decision-making models with a more strategic agenda, the NPV method so designed with its mathematical sophistication and precision remains almost certainly impractical for practicing management.

Thus we conclude that while our understanding of corporate investment decision-making must continue to be nourished by the interplay of the various disciplines that it invokes, it appears that such disciplines will continue to preserve their particular concerns, methodologies and other distinctive dimensions.

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