

Competition among Management Paradigms: An Economic Analysis

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Abstract

There is a lively debate about essentiality vs. excess in the proposal and development of new ideas. This paper addresses this issue analytically: it uses a stylized theoretical model to show that even if choices concerning the development or use of new management paradigms are privately efficient, the social efficiency of the resultant equilibrium is far from assured. On the supply side, private incentives to invest in developing new paradigms exceed expected social gains. And on the demand side, decentralized choices by very many users will fail to internalize the intertemporal externality associated with cumulative knowledge development. Even worse, the two mechanisms, while distinct, can feed on each other.

COMPETITION AMONG MANAGEMENT PARADIGMS: AN ECONOMIC ANALYSIS

Calls for new paradigms to replace old ones that have presumably wandered over the hill have recently been sounded in a number of spheres of management. But economic analysis of competition between an old management paradigm and a new one—or, more generally, among different paradigms—has hitherto been lacking. This paper attempts to shed some light on the issue by analyzing the welfare implications of inter-paradigmatic competition. On the basis of theoretical modeling, it concludes that even if choices concerning the development or use of paradigms are privately efficient, the social efficiency of the resultant equilibrium is far from assured. On the supply side, private incentives to invest in developing new paradigms exceed expected social gains. And on the demand side, decentralized choices by very many users will fail to internalize the intertemporal externality associated with cumulative knowledge development. Even worse, the two mechanisms, while distinct, can feed on each other.

Section I briefly describes the debate about the variety and turnover of management ideas that motivated this paper. Section II discusses and uses the existence of relatively large markets for management ideas to help guide the choice of a theoretical frame. Section III sets up the basic theoretical apparatus. Section IV establishes the supply-side concern about excessive incentives to invest in new management paradigms. Section V extends the one-shot model introduced in Section III to two periods, and exposes the demand-side concern about failure to internalize the potential for *cumulative* knowledge development. Section VI concludes.

I. Motivations

The analysis laid out in the next two sections of this paper is, in principle, generic in its applicability rather than specific to a particular domain of intellectual enquiry. Most of the discussion in this paper is nevertheless framed in terms of competition among *management* paradigms, for two reasons. First of all, management is a field in which there is already a lively debate about essentiality vs. excess in the proposal and development of new ideas. Second, management is also a field in which there actually exists a large market for ideas driven, to a first approximation, by pragmatic considerations and is therefore especially congenial to the surplus-maximizing economic perspective adopted in this paper. These two reasons are expanded on, respectively, in this section and the next.

The lively debate about essentiality vs. excess in the development of new ideas about management is what actually triggered the writing of this article. To begin with the essentialist perspective, while there are many examples of calls for paradigm-shifts in management, only one will be cited at some length—so as to give readers a flavor for the sorts of rhetorical devices that are employed. An appropriately prominent example is provided by a special issue of the *Strategic Management Journal* in 1994 that explicitly focused on the search for new strategy paradigms. The guest editors, C. K. Prahalad and Gary Hamel (1994, p. 15), concluded their introductory paper for the special issue with the following assertions (among many others):

Recognizing that the strategy field needs a new paradigm is a critical first step....During the last decade the I/O [industrial organization] paradigm seems to have held sway and emerged as the dominant paradigm in the

literature, crowding out other approaches....The emerging competitive landscape and the logic of success in the complex competitive environment, however, transcends the scope of the theoretical lens provided by I/O....What is an appropriate theoretical lens to the study of strategy, appears to us as a premature question....There is no need to limit variation in approaches at this time.

In this view, which emphasizes discovery, the development of new management ideas is essential.

However, assertions of essentiality can be, and have been, countered with assertions of excessiveness. Thus, attempts to track “hot” management ideas over time, as in Figure 1,¹ can be read as indicating more commotion than progress. In fact, the *Harvard Business Review* featured, in the same year as the *SMJ* special issue, Nitin Nohria and James Berkeley (1994) asserting that “The adoption of off-the-shelf innovations [for managers] continues at a disturbing rate.” In this view, the use and, by backwardation, the development of new management ideas absorb excessive energy.

INSERT FIGURE 1 ABOUT HERE

Both views continue to have impassioned supporters. For summary purposes, I will refer to the first, generally positive view of new management ideas as **Eureka** and the second, generally negative view as **BOHICA** (for “bend over, here it comes again,” a formulation derived from Micklethwait and Wooldridge, 1996). The differences between

Eurekans and BOHICANs can be parsed into very different perspectives on the variety and turnover of management ideas.

In regard to the issue of variety, i.e., the stock/influence of management ideas at a point in time, Eurekans point to the advantages of being able to choose off a large menu of ideas than a small one, especially in complex environments where “one size doesn’t fit all” (and especially when the fixed costs of idea development are low). Less frequently, they also argue that much of the variety that is apparent is cosmetic in the sense that it changes the wrappers on a more limited number of timeless truths about management in rhetorically useful ways (Eccles and Nohria, 1992). BOHICANs counter that a large number of overstated or mutually-contradictory ideas can lead to cycling, zigzags and other behavior that is costly (e.g., in the sense of “damaging sophisticated formal organization and management systems that corporations have evolved and which make management effective”—Hilmer and Donaldson, 1996), and that even cosmetic variety/repackaging can be confusing or distracting.

Matters are even more contentious as far as the turnover of management ideas is concerned. Eurekans cite several reasons for taking an optimistic view of the turnover of ideas:

1. The world is changing rapidly—some argue faster than ever before (e.g., Toffler, 1970 and d’Aveni, 1994)—and managers must change with it.
2. Managers know that any competitive advantage is ephemeral and so are constantly looking for the next bright idea (Economist, 1993)

3. Even without changes in the environment or competitive behavior, managers with limited cognitions must periodically reframe their mental models to avoid getting stuck (e.g., Levinthal and Gavetti, 1999)
4. The rapid peaking followed by dropoffs of ideas such as TQM reflects not their failure but successful internalization of their valuable elements (e.g., Lee and Skarke, 1996).

Once again, BOHICANS have standard counters:

1. The world isn't *really* changing faster than ever before (e.g., Eccles and Nohria, 1992).
2. Ideas whose usefulness depends on their not becoming widely known quickly may often be of limited usefulness (the game-theoretic critique)
3. Managerial susceptibility to ideas that turn over rapidly is driven by motivational rather than cognitive problems (which also serves as a rationale for pieces calling on managers to "take charge", e.g., Nohria and Berkeley, 1994).
4. Rapid peaking is followed not only by dropoffs but by reversals that suggest an element of excess in addition to being very costly (e.g., reengineering →growth→profitable growth→?)

The debate between these two perspectives has proved somewhat inconclusive to date partly because discussions usually cite one or two of the points listed above without considering their counters. But even when the debate is carefully and comprehensively joined (e.g., Pfeffer 1993 and 1995 vs. Van Maanen 1995a and 1995b in the context of organization studies), neither perspective clearly trumps the other, suggesting that the difficulties of settling it through purely verbal argumentation are, to some extent,

ineradicable. What would seem to be called for, therefore, is systematic analysis, rather than additional claims or counterclaims.

Careful empirical analysis of the variety and turnover of management ideas is much more complicated, however, than it would be in the case of, say, breakfast cereals, given the different natures of the “product.” It is harder to count ideas, especially when one considers the distinctive difficulties of distinguishing between mere variants and distinct varieties and accounting for the pattern of relationships among ideas over time. It is hard to obtain data on the performance of ideas since such information tends to be privately- and closely-held. And even when performance data are available, there are difficulties in inferring an intrinsic lack of efficacy from a record of failure: the problems may reside in implementation, rather than in the ideas themselves (e.g., Repenning 1999). Given these difficulties, this paper takes a theoretical approach (meant as a complement to rather than substitute for empirical analysis) that is elaborated and explained in the next section.²

II. Markets for Management Ideas

Section I of this paper began by citing two reasons for focusing it on the field of management: a lively debate about essentiality vs. excess in the development and use of new management ideas, and the actual existence of a large market for ideas in management driven, to a first approximation, by pragmatic considerations. Section I went on to focus on the first reason; this section will focus on the second.

It is useful to begin this section by noting that while talk about markets for ideas is very common, management is one of the few fields in which a large market of this sort actually exists, and is growing very rapidly. To see this, it is helpful to identify and size

up proxies for the for-profit and nonprofit sectors in the management idea business: management consulting vs. MBA and (third party) executive education. As of the mid-1990s, revenues from management consulting in the United States amounted to about \$20 billion, compared to approximately \$5 billion for MBA and (third-party) executive education.³ Alternatively, one can compare the quasi-rents to people at the top of the two sectors. The annual compensation of a senior director or vice president at a leading consulting firm is an order of magnitude larger than earnings expected from leading (and relatively well-paying) business schools by academics tenured there. Annual growth rates in total employment have run at significantly less than 10% in recent years for U.S.-based management academics versus close to 20% for U.S.-based management consultants. And looking beyond these numbers, consultants probably play a more important role in writing books and contributing to (and even financing) practitioner-oriented journals than ever before, and are starting to make large investments in knowledge management that are reported to run into tens of millions of dollars at the largest consulting firms. The importance of the for-profit sector seems to be large *and* increasing.

These comparisons are likely to be controversial. Those who think that they overstate the importance of the for-profit sector are likely to argue that that academics invest more intensively or efficiently in the development and dissemination of ideas about management than do consultants. Those who think otherwise can counter that consultants are closer to practice and that their revenues are therefore subject to higher multiplier effects in their consequences for aggregate economic welfare. They can also

point out that excluding the self-generation of management ideas by the firms that use them understates the for-profit component of idea flow.

One probably does not have to settle this debate to agree that there is a significant for-profit component to the supply of management ideas—more so than in many other fields of intellectual enquiry. This is fortunate because for-profit development of ideas lends itself relatively readily to economic modeling.

Turning to the demand side, the adoption of management ideas can be expected, to a first approximation, to be driven by pragmatic criteria rather than aesthetic ones (of the sort that dominate in other fields, such as the arts). This is useful, once again, because choices based on pragmatic criteria are easier to evaluate within a purely economic framework.

Consequently, the model that is articulated and analyzed in the rest of this paper posits profit-maximization on both the supply side and the demand side of the market for management ideas. Note that inefficiency on either side of the market is ruled out so as to avoid building a presumption of inefficiency into the model's behavioral assumptions. It would be unsurprising if privately inefficient choices about the development or use of management ideas induced social inefficiency as well. But it would be rather more dismaying if even privately efficient choices could lead to socially inefficient outcomes. That is the possibility that is examined by the theoretical modeling effort. Analysis of the model identifies two mechanisms, one on the supply side and the other on the demand side, that might make this unfortunate possibility a reality. Using the terminology introduced in the last section, only BOHICANs will be cheered by what follows, but Eurekaans should pay attention as well.

III. Model Structure

Even the decision to take an economic frame on competition among ideas leaves the modeler with many degrees of freedom about levels or units of analysis. However, Thomas Kuhn's (1957 and 1970) original conceptualization of competition among paradigms and paradigmatic change has plausible claims to priority for reasons of both precedence and influence.⁴ It is therefore used to guide the modeling effort in this paper.

Kuhn originally offered his definition(s) of scientific research paradigms and his depiction of their evolution in the context of the fields of astronomy and physics. Broadly speaking, he defined paradigms as shared conceptual frameworks and approaches that set the parameters for “normal science,” for the scope and the limits of the scientific research agenda. And he argued that the history of science is marked by long periods in which the same paradigm rules and scientific research focuses on making progress within the framework that it sets, but that it is occasionally punctuated by paradigmatic changes—Kuhn called them scientific revolutions—that involve discontinuous jumps from the ruling paradigm to a new paradigm incommensurable with the one previously in place.

What is of distinctive interest for our purposes is not Kuhn's definition(s) of a paradigm *per se* but the specific structure that he strives to impose on paradigmatic change in his original discussion of scientific revolutions. Watkins (1970, pp. 34-5) identified four theses embedded in that discussion that are worth repeating here because they will add useful structure to the modeling effort:⁵

T1. The paradigm-monopoly thesis: a paradigm brooks no rivals

T2. The incompatibility thesis: new paradigms are incompatible and incommensurable with old ones

T3. The no-interregnum thesis: there is no floundering between abandoning an old paradigm and embracing a new one

T4. The Gestalt-switch thesis: switches to a new paradigm are instantaneous and total⁶

The model developed in this paper takes these Kuhnian theses as its point of departure. But while Kuhn, followed by many others, adopted a sociological perspective on competition among paradigms, this paper takes an economic perspective, for the reasons described in the previous section.

Of course, some additional structure is required to specify completely the economic model that will be analyzed in the next two sections. Given the all-or-nothing characterization of choices among paradigms in T1-T4, little will be lost by making the “representative customer” assumption that there are many identical users with inelastic demand normalized, in the aggregate to unity. N unitary, profit-maximizing paradigm-developers compete to supply them. Developer i draws a paradigm with value-in-use v_i from the same distribution as all other developers, and at the same cost of c . The single paradigm with the highest value-in-use is the one that is adopted by all users, and the developer who drew the winning paradigm fully appropriates the surplus from its use (a provisional assumption that rules out the well-known welfare problems associated with incomplete appropriability). Also, let $V(1|N)$ denote the expected value of the highest of

the N draws from the distribution of paradigms value-in-use, $V(2|N)$ the second-highest of the N draws, and so on.

While this structure is (partially) sanctioned by Kuhn's theses, which have some claim to being treated as canonical, its relationships with prior work in the economics literature is worth specifying as well. The model set up here abstracts away from issues related to (a) variety by assuming no "horizontal" preference for diversity; (b) racing behavior by treating effort levels as fixed (and symmetric); and (c) the complexities of standardization dynamics, information cascades and other such connections among decisions by assuming that the best product—in the present context, paradigm—wins. Each of these assumptions embodies a deliberate stylization that is worth elaborating.

Product Differentiation. With a "horizontal" preference for variety, theoretical predictions about whether variety will be over- or undersupplied (relative to the social optimum) at equilibrium are very sensitive to the modeling assumptions employed (see Anderson, de Palma, and Thisse 1992). Instead of contributing another model to the already large stock of such work, this paper abstracts away from this known source of welfare problems to focus on the effects of competition to introduce product varieties in the stylized context of pure vertical differentiation. The attractiveness of this focus is enhanced by the fact that vertical differentiation has been studied rather less intensively than horizontal differentiation. Also note that results based on the assumption of paradigmatic monopoly in the market for ideas can be extended to allow for paradigmatic multiplicity if successful paradigms (or products) cater to distinct submarkets: then, the results that follow apply to each submarket.

Innovation Races. The literature on races to innovate is also large and, once again, while theoretical predictions are sensitive to the modeling assumptions, strategic interactions among competitors do have the potential to create welfare problems (e.g. Tirole 1989, section 10.2). Particularly noteworthy is the possibility that racing behavior may lead to overinvestment in innovation. This source of welfare problems is abstracted away from, once again, by assuming that effort levels are fixed, and symmetric as well (as are efficiency levels). Ways of advancing beyond these assumptions are discussed after the presentation of Proposition 1 in the next section.

Bandwagon Effects. Bandwagon effects have been analyzed in a number of different theoretical contexts: in the context of standard-setting, within the frame of information cascades, as the outcome of relative performance evaluation schemes, and so on. A key normative implication of such analyses in the present context is that an inferior paradigm may win out, even in the absence of strategic manipulation as a result of early historical accidents (Arthur 1989). Once again, this source of welfare problems is abstracted away from in the next section by assuming that the “best” paradigm wins; the section that follows reintroduces some of the complexities wrought by connections among choices even if they are not of the “strategic” sort that crop up in races and other small-number contests.

Or to restate matters, the motivation for these assumptions is similar to the motivation for the assumption of privately efficient choices explained earlier. The deduction of social inefficiency given obvious or known sources of inefficiency would not be too surprising. But the possibility of social inefficiency despite modeling assumptions that seem to restrict its scope *would* be dismaying, and is the central concern

of the analysis that follows. The supply side of the model that has been set up is analyzed in Section IV, and a demand-side extension is examined in Section V.

IV. Supply-side Analysis

One recurrent BOHICAn suspicion about the market for management ideas concerns the hunt for highly uncertain jackpots: the prospect of gurdum for an entrepreneurial individual, of a large new product line for an established consulting firm, of a blockbuster book or article for a publishing entity, and so forth. Might competition for such pecuniary (not to mention psychic) rewards prove excessive? Analysis of the model suggests a concrete basis for such a concern.

Proposition 1: For $N > 1$, the private surplus that the N th developer expects to earn unambiguously exceeds the social surplus that it is expected to generate.

Proof: The private surplus that the N th developer expects to earn is

$$V(1|N)/N - c. \quad (1)$$

And the expected social surplus generated by the N th developer is given by

$$V(1|N) - V(1|N-1) - c. \quad (2)$$

To verify that the term in (1) is greater than the term in (2), delete one of the N draws at random and consider $V(1|N-1)$. This was either the largest of the N draws with probability $(N-1)/N$ or the second largest with probability $1/N$. As a result,

$$V(1|N-1) = ((N-1)/N)V(1|N) + (1/N)V(2|N),$$

implying that

$$V(1|N) - V(2|N) = N(V(1|N) - V(1|N-1)). \quad (3)$$

Given equation (3), the term in (2) is equal to

$$V(1|N)/N - V(2|N)/N - c, \quad (4)$$

which is unambiguously less than the term in (1). Q.E.D.

Proposition 1 is driven by a divergence between marginal values of incremental paradigms, which decline rapidly, and average values, which (by definition) decline less rapidly. As a result, the private incentives to develop paradigms, which are related to average values, exceed their expected social benefits. And the number of paradigms that profit-minded developers decide to develop ends up being greater than the socially optimal number (except when integer constraints make the two numbers coincide). Note that this result is independent of specific assumptions about the distribution from which paradigms' values-in-use are drawn.

To what extent should we expect the tilt implied by Proposition 1 to persist as the more restrictive assumptions underlying the formal model are relaxed? Several sorts of supply-side generalizations suggest themselves. They will be discussed one at a time, relative to the basic model laid out above, instead of being layered on each other.

Generalized surplus allocations. Proposition 1 may evoke winner-take-all surplus allocation rules, of the sort focused on by Robert Frank and Philip Cook (1995), but is not predicated on them. Private incentives to develop new paradigms continue to be socially excessive if the rule under which one developer wins all the surplus that its paradigm generates (expected to be $V(1|N)$) is replaced by any other rule for allocating all the surplus (still expected to be $V(1|N)$, given homogenous demand) among all the developers who entered into the fray. (For example, innovators may have to share some of the spoils with capable imitators.) Given the *ex ante* symmetry of the developers as well as complete appropriation by the supply side, each developer's expected payoff continues to be $V(1|N)/N$. The rest of the proof then goes through exactly as before.

Efficiency differences. One obvious way of relaxing the assumption of *ex ante* symmetry among developers is to assume that they may differ in the efficiency levels. Frank and Cook (1995) assume that these differences in efficiency directly affect contestants' probabilities of winning as well as the value of the prize (V), and conclude that while observable differences of this sort can mitigate welfare losses, they do not altogether eliminate them. Dixit (1987) has studied a somewhat different model that fixes the value of the prize (V) but lets contestants with different intrinsic efficiency levels precommit to different effort levels. His results are sensitive to the sequencing of moves and specific to particular functional forms but do reveal a strategic incentive for the favorite to precommit to high levels of effort and the underdog(s) to low levels. Given the fixed value of the prize, all investments in effort are purely wasteful from a social perspective. However, one would probably want to generalize Dixit's set-up—so as to allow for efforts that enhance the value of the prize—before deriving definite welfare implications in the present context.

Risk aversion. Proposition 1 rested on risk-neutrality on the part of the participants. Risk-aversion can, if sufficiently severe, lead to suboptimal levels of investment in paradigm development by shrinking private incentives without affecting social gains since the risks of failure are unsystematic from a social perspective and therefore insurable. Of course, the developers could buy insurance for themselves—and eliminate the possibility of underinvestment—by banding together to form a cooperative that takes advantage of risk-sharing possibilities.

Incomplete appropriability. Proposition 1 also assumed complete appropriability of surplus by the supply-side. Once again, appropriability problems can, if sufficiently

severe, lead to suboptimal levels of investment in paradigm development: with zero appropriability, for example, profit-maximization will imply zero developers. In order to achieve a bit more precision, introduce an appropriability parameter, θ (≤ 1), such that the private surplus expected by the N th developer (the incomplete-appropriability analogue of the term in (1)) is now given by

$$\theta V(1|N)/N - c, \quad (5)$$

while the expression for social benefits continues to be the term in (2). Using equation (3) to compare the terms in (2) and (5), the private surplus expected by the N th developer exceeds the expected social benefits iff

$$V(2|N)/V(1|N) > 1 - \theta. \quad (6)$$

Even for low N s, this inequality implies that relatively limited amounts of appropriability will ensure overinvestment. For instance, with $N = 2$ draws from a uniform distribution, $\theta > .25$ will suffice. Given arbitrary distributions and values of θ , inequality (6) is more likely to be satisfied as N increases (although one does have to worry that a combination of a low θ and a high N may be unsustainable given nonnegative profit requirements).

That concludes our exploration of the supply side of competition among management paradigms. The next section will look at the demand side and will focus, in particular, on an intertemporal extension of the basic model explored so far.

V. Demand-Side Extensions

Much could be done to generalize the basic model on the demand side as well as the supply side. Perhaps the most interesting extension is to consider explicitly a dynamic that is left implicit in Kuhn's discussion: as a paradigm is used or applied, it cumulates knowledge within its own frame of reference. (Since T2 rules out inter-

paradigmatic learning, individual paradigms are left as the only possible loci of cumulative learning.) Cumulative knowledge development can be modeled most simply by assuming that the value-in-use derived at any point in time from a particular paradigm varies positively with the stock of paradigm-specific knowledge that has already been built up through its prior use.

To analyze the implications of cumulative knowledge development, it will be convenient to focus on two periods and two candidate paradigms (rather than N) whose development costs are already sunk and with the value-in-use of paradigm i in a given period equaling $V_i(y_i)$, where y_i is prior usage (set to zero for both paradigms at the beginning of the first period). Inter-paradigmatic learning is ruled out ($dV_i/dy_j = 0$ for $j \neq i$) but at least one paradigm (without further loss of generality, paradigm 1) offers the potential for paradigm-specific learning ($dV_1/dy_1 > 0$). The other assumptions from the previous section—very many users, identical preferences, inelastic demand equal, in the aggregate, to unity, and privately efficient but independent choices—are maintained exactly as before and, for the sake of convenience, the discount rate is set equal to zero.

Proposition 2. Privately efficient but independent choices of paradigms by very many users will, from a social perspective, be biased towards topical paradigms at the expense of paradigms that offer more potential for cumulative knowledge development.

Proof: With privately efficient but independent choices of paradigms by very many users, each user will find it privately efficient to choose paradigm 2 rather than paradigm 1 in the first period iff

$$V_2(0) > V_1(0). \tag{7}$$

The social efficiency of choosing paradigm 2 is governed by a different condition that depends on how much learning potential paradigm 2 offers. Three cases can be distinguished:

i: Fad

In this case, paradigm 2 is a fad—perhaps a response to sociopsychological fluctuations—that will be unavailable for use in period 2 even if it is used in period 1. Looking across the two periods, it will be socially efficient for paradigm 2 to be adopted in the first period, and paradigm 1 to be fallen back on in the second period, if

$$V_2(0) + V_1(0) > V_1(0) + V_1(1)$$

or

$$V_2(0) > V_1(1). \tag{8}$$

This is obviously more stringent than the private efficiency condition in (7). Note the result, familiar from the literature on learning curves (e.g., Spence 1981), that the opportunity cost of not using paradigm 1 in the first period is given by the increment in the end of horizon benefits that would have been afforded ($V_1(1)$) rather than just the benefits sacrificed in the first period ($V_1(0)$).

ii. Disconnected Insight

In this case, paradigm 2 is available to be used in permanence, but does not afford a basis for cumulative knowledge development ($V_2(1) = V_2(0)$). Given the structure of the situation, if paradigm 2 is used in the first period, it will also be used in the second period. This outcome will be socially efficient if

$$V_2(0) + V_2(0) > V_1(0) + V_1(1),$$

or

$$V_2(0) > (V_1(0) + V_1(1))/2. \quad (9)$$

Once again, this is obviously more stringent than the private efficiency condition in (7) (although it is a bit weaker than the social efficiency condition in case i).

iii. Basis for Cumulative Knowledge Development

In this case, paradigm 2 is available to be used in permanence, and does afford a basis for cumulative knowledge development ($V_2(1) > V_2(0)$). Again, as a result of the structure of the situation, if paradigm 2 is used in the first period, it will also be used in the second period. This outcome will be socially efficient if

$$V_2(0) + V_2(1) > V_1(0) + V_1(1).$$

or

$$V_2(0) > V_1(0) + [V_1(1) - V_2(1)]. \quad (10)$$

In relation to the private efficiency condition in (7), this inequality suggests that comparisons of instantaneous values-in-use of paradigms have to be supplemented with comparisons of the heights that can ultimately be attained with them (or alternatively, the potential for cumulative knowledge development that they offer) if choices between them are to be socially efficient. Q.E.D.

In each of the three cases, there is a failure, given privately efficient but decentralized choices by very many users, to internalize the externality of future knowledge development. Note that this failure to tap a positive externality on the demand side is different from the failure to account for a negative externality on the supply side that was derived in the previous section and therefore represents a distinct cause for concern about competition among paradigms. But having said as much, it

should be added that the biases deduced in Propositions 1 and 2 can feed on and reinforce each other.

Interactions between supply and demand. To extend the theoretical structure developed so far to study the interactions between supply-side and demand-side biases, retain the demand-side structure developed in this section, particularly the assumption of two periods, but otherwise revert to the supply-side assumptions made in the previous section in which i paradigms, rather than just two, are developed at the cost of c apiece at the beginning of the time horizon. Absent any fundamental change between the two periods, the socially optimal choice is to use the paradigm that maximizes $V_i(0) + V_i(1)$ in both periods. But the privately optimal choice (for users) is to pick the paradigm that maximizes $V_i(0)$ in the first period. Proposition 2 points out that because of this divergence, learning will be deemphasized in the first-period choice of paradigms. But as a result, paradigms that are candidates for development in the second period will face a lower threshold that they must exceed in order to “win.” Proposition 1 tells us that this is unambiguously bad because private incentives (for suppliers) to develop new paradigms exceed social ones.

Learning traps. Another interesting extension involves varying the relative times of market entry of a paradigm that offers a basis for cumulative knowledge development (paradigm 1, based on the earlier labeling convention) and one that does not but is taken, to simplify matters, as being available in permanence (paradigm 2 in case ii above). The earlier paradigm 2 arrives relative to paradigm 1, the more likely it is that the cumulation of knowledge within paradigm 1 may permanently and undesirably be blocked—even though paradigm 2 itself does not offer any potential for cumulative knowledge

development. Alternatively, if the level of paradigmatic development of a field is sufficiently limited, it may get stuck with ideas that do not offer the potential for cumulative knowledge development, whereas a more developed field, faced with the same contenders, might continue to make progress along this dimension instead of stagnating. Particular attention should be paid to this point in fields in the hunting and gathering stages of their histories.

Uncertain values-in-use. The assumption that has been employed so far is that users are perfectly aware of candidate paradigms' values-in-use when they decide which one to adopt. But ideas' values-in-use seem to be subject to significant uncertainty *ex ante* (and even *ex post*, given the general dearth of formal performance contracts between idea suppliers and users). While the model itself has little to say about this, other microtheoretic analyses suggest the possibility of "cascades" of ideas, in which users who choose late infer information from the choices made earlier by other users and optimally decide to ignore their own information and act alike (Bikhchandani, Hirshleifer and Welch 1998). Cascades are likeliest, theoretically, when actions (other users' choices) are publicly visible but information (other users' performance) is not. While cascades can obviously favor either worthy or unworthy ideas, note that without them, it would be hard to explain widespread adoption of an idea that turns to be inefficient even in terms of instantaneous value-in-use—except as a string of unlucky coincidences. There are even rule-of-thumb models of learning from others by following their choices in which it is possible for a product to capture the entire market, no matter how poor its quality!⁷ This is a particularly vivid type of learning trap.

VI. Conclusions

This article focused on a particular class of management innovations—the development of paradigms that compete among themselves for use—and constructed a simple theoretical model in order to analyze the economic incentives to develop and use new paradigms. In spite of assuming all decisions to be privately efficient, the modeling effort uncovered biases toward the development of too many paradigms and too much turnover (or, more accurately, too little cumulation of knowledge) in their use.

Of course, whether these biases actually manifest themselves in the real world of management is an empirical matter. But even if one's primary interests are empirical rather than theoretical, the theoretical analysis supplies guidance about the kinds of biases that are worth looking for empirically. Note, in this regard, that biases deduced despite assuming private efficiency are likely to be relatively ineradicable.

Of the many possible extensions of the present analysis, the one that might be most useful, from the standpoint of both theory and measurement, would be integrate the analysis of the for-profit and nonprofit (or academic) sectors in a way that accounts for the interactions between them. But even the partial analysis of the for-profit sector contained in this paper *does* have some implications for academics, although they are more in the nature of cautions than definite conclusions. Consider just three:

1. Academics should recognize the importance of and the incentives within the for-profit sector instead of ignoring it or treating it as inconsequential. This usually involves learning more about the for-profit sector.
2. Academics should understand that the purpose of the nonprofit sector may differ from—and even be intended as a remedy for—the principal purpose of the for-

- profit sector. A nonprofit sector that focuses, like the for-profit sector, on the development or dissemination of instantaneously successful management ideas would do nothing to counteract the for-profit sector's tendency to emphasize currency at the expense of cumulative knowledge development.
3. Academics have (at least) two direct avenues for influencing the for-profit sector. First, they can seek to conquer some part of it by promoting new and improved ideas, or at least ones that were previously unknown to the target set or have been attractively repackaged for it. Second, they can critique the for-profit sector by debunking ideas or practices whose influence in the for-profit sector vastly exceeds their efficacy. Effort typically does have to be allocated between the two avenues, however, and once again, the privately efficient allocation may be socially inefficient: even academics may exhibit private biases—combining pecuniary considerations and prestige—toward conquests in the for-profit sector in the teeth of evidence that more critiques might be expected to be more efficient socially.

NOTES

1 Figure 1 is based on the work of Richard Pascale and is used here with his permission. For an explanation of the methodology, in the context of an earlier version of this figure, see Pascale (1990).

2 That is not to say that there have been *no* efforts at careful empirical analysis of these issues. Consult, in particular, a body of work associated with Eric Abrahamson (e.g., Abrahamson (1991) and Abrahamson (1996) and Guillen (1994).

3 The estimate of consultants' revenues is based on *Consultants' News*. Estimates of the market for MBA education are based on total enrollment in MBA programs in the United States, and of the market for executive education on a study conducted by a major consulting firm for a leading business school. The sources of the other figures that follow are similarly diverse, and include inferences by the author.

4 See, for instance, Coles (1984).

5 Also see Blaug (1980), pp. 32-33, who notes that Kuhn subsequently watered down all four theses.

6 Taken together, T3 and T4 ensure that the evolution of a field is covered by a sequence of dominant paradigms without gaps or overlaps.

7 See Smallwood and Conlisk (1979) and Kirman (1993).

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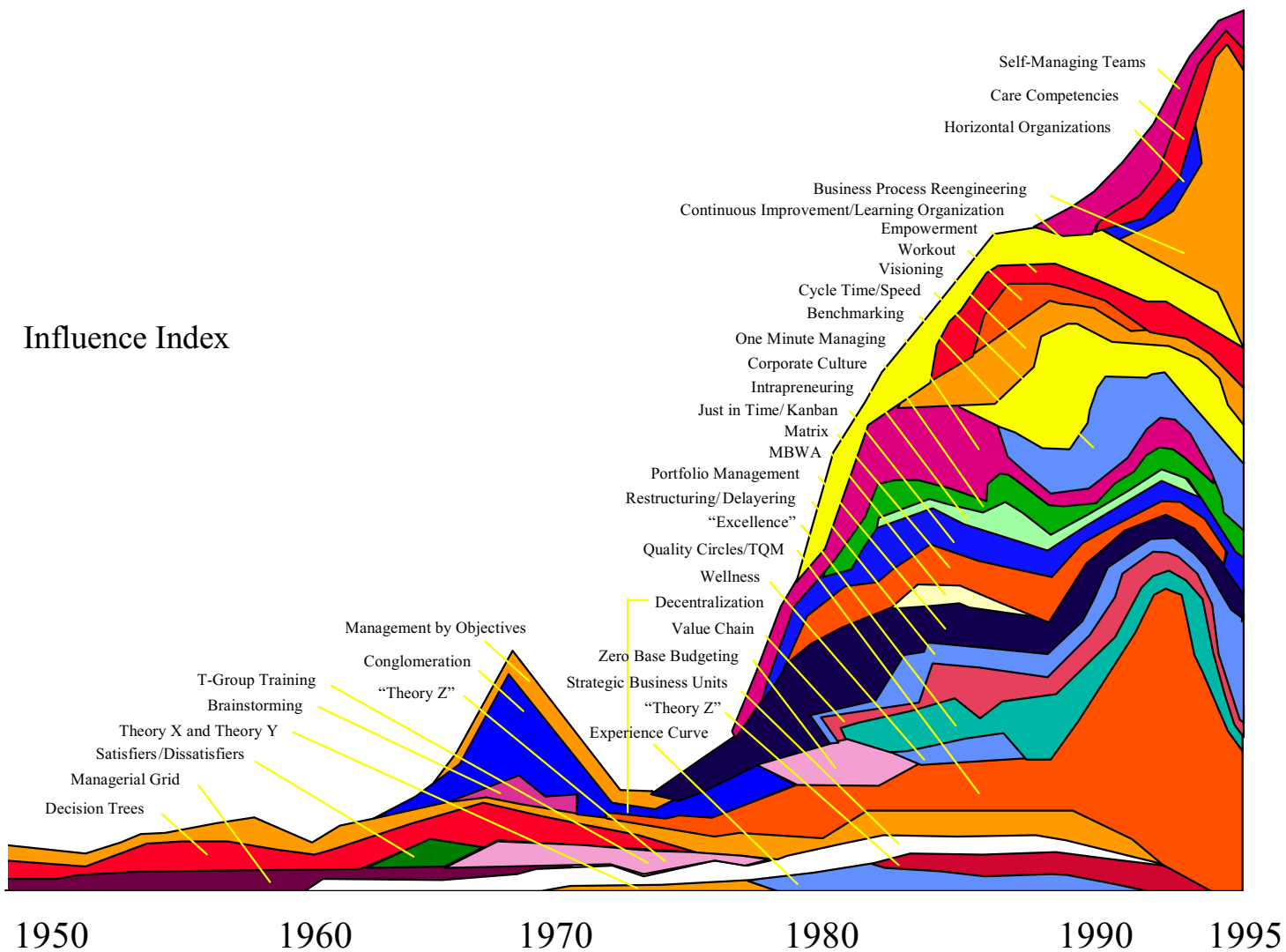
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Figure 1. Ebbs, Flows and Residual Impact of Business Fads* 1950-1995



Source: Richard Pascale