



Benefits of Narrow Business Strategies

Julio J. Rotemberg; Garth Saloner

The American Economic Review, Vol. 84, No. 5. (Dec., 1994), pp. 1330-1349.

Stable URL:

<http://links.jstor.org/sici?sici=0002-8282%28199412%2984%3A5%3C1330%3ABONBS%3E2.0.CO%3B2-G>

The American Economic Review is currently published by American Economic Association.

Your use of the JSTOR archive indicates your acceptance of JSTOR's Terms and Conditions of Use, available at <http://www.jstor.org/about/terms.html>. JSTOR's Terms and Conditions of Use provides, in part, that unless you have obtained prior permission, you may not download an entire issue of a journal or multiple copies of articles, and you may use content in the JSTOR archive only for your personal, non-commercial use.

Please contact the publisher regarding any further use of this work. Publisher contact information may be obtained at <http://www.jstor.org/journals/aea.html>.

Each copy of any part of a JSTOR transmission must contain the same copyright notice that appears on the screen or printed page of such transmission.

The JSTOR Archive is a trusted digital repository providing for long-term preservation and access to leading academic journals and scholarly literature from around the world. The Archive is supported by libraries, scholarly societies, publishers, and foundations. It is an initiative of JSTOR, a not-for-profit organization with a mission to help the scholarly community take advantage of advances in technology. For more information regarding JSTOR, please contact support@jstor.org.

Benefits of Narrow Business Strategies

By JULIO J. ROTEMBERG AND GARTH SALONER*

Firms often concentrate on a narrow range of activities and claim to forgo other, apparently profitable, opportunities. This pursuit of narrow strategies is applauded by some academics who study strategic management. We present two related theoretical models in which firms do indeed benefit from pursuing such narrow strategies. In these models, a narrow strategy is beneficial because it enables the firm to motivate its employees to search for ways of increasing the profitability of its core activities. These benefits arise in our model because an incompleteness of contracts precludes offering similar incentives when the firm is involved in many activities. (JEL L21, L14, O31)

Many firms have narrow strategies. Consider the Great Atlantic and Pacific Tea Company (A&P) which was the largest chain of grocery stores in the United States until the late 1960's. Its considerable growth and profitability were based on a strategy of providing consistently good-quality foods at low prices. When consumer tastes changed and other grocery stores profited from selling other items as well, A&P did not follow suit. As a divisional president put it: "I think our primary purpose is to sell food cheaply, and tangents tend to hurt the food operation. There is a higher profit margin on non-foods, but it's *just not our business*."¹ Perrow (1970) cites many other examples of companies that seem to give up profitable ventures because they do not fit in well with "what the company does."

A narrow emphasis is applauded by some academics working in the field of strategic

management. In his classic book, Kenneth Andrews (1971 p. 23) says, "Our theory begins with the simple proposition that every business organization...should have a clearly defined set of goals which keeps it moving in a deliberate direction and prevents its drifting in undesired directions." When Andrews says that the goals must be "clearly defined" he means quite narrow as is evident from the examples he gives of well-formulated strategies. In one example, a watchmaker "plan[s] to produce watches of the highest quality—in a price range between the hand-made ultraexclusive level and Omega and Rolex."

Narrow objectives need not be synonymous with narrow product lines, however. The firm may have a broad product line yet set narrow objectives in the *kind* of product line it has. Michael Porter (1980), for example, strongly advocates that firms restrict themselves to pursuing either high quality or low cost. Within those general constraints, however, the firm may pursue a broad product line or "focus" on a narrow one. Firms are cautioned against attempting to pursue both a high-quality and a low-cost strategy, however, even if that means having to forgo profitable opportunities. For example, the power-tool company, Skil, which repositioned its product line in the early 1980's receives praise for turning down a substantial amount of business (estimated at around \$100 million) from a distribution

*Sloan School of Management, Massachusetts Institute of Technology, Cambridge, MA 02139, and Graduate School of Business, Stanford University, Stanford, CA 94305, respectively. We thank two anonymous referees for extremely helpful comments, Robert Burgelman, Benjamin Friedman, Oliver Hart, David Scharfstein, and Birger Wernerfelt for helpful conversations, and the National Science Foundation and the International Financial Services Research Center at MIT for support.

¹Quoted in Charles Perrow (1970 p. 160), who added the emphasis.

channel that was no longer in keeping with the firm's stated narrow objectives.²

This emphasis by some companies on the steadfast pursuit of narrow objectives seems to run counter to the prescription that emerges from economics. In economics, firms are deemed to be doing their job when they maximize the expected present discounted value of profits. Turning away profitable opportunities is not generally recommended, certainly not on the basis that it would lead to "drifting" away from corporate objectives. If anything, economic models tend to suggest that diversification is valuable even when it reduces expected profits discounted at market discount rates.³

One seemingly plausible rationale for narrowness is that there are increasing returns to specialization. Another is that narrow objectives promote coordination. For example, Paul Milgrom and John Roberts (1992) study a coordination game among managers within a firm. This coordination game sometimes has multiple equilibria. They argue that a statement of strategy can avoid the dominated equilibria in this game. Neither of these possible candidates can, by itself, explain why one firm cannot have different groups each of which pursues a narrow objective and achieves the economies of specialization and coordination. Nor do these theories explain why firms fear that their existing lines of business will suffer if they branch off into other lines.

Narrowness may be attractive if the proliferation of specialized groups within the same organization generates management diseconomies. Top management might find it difficult to monitor such groups, and these monitoring difficulties might even reduce the performance of the groups that initially constituted the core of the firm. In other words, monitoring may be subject to diminishing returns to scope.

We examine instead a setting where narrowness facilitates the provision of incentives. This benefit of narrow objectives has been anticipated by Andrews (1971 p. 25) who says, "He [the manager] needs clearly articulated corporate purposes in order to provide the incentive and control systems that will reward the specialist contributions in proportion to their organizational value." The idea that breadth is deleterious to incentives may be surprising because the standard principal-agent model generally implies that principals gain from having several agents working at once. This is advantageous whenever the actions of one agent affect the payoffs of other agents (see e.g., Bengt Holmström and Milgrom, 1990). It is also generally profitable insofar as it facilitates making the compensation of one agent depend on the profits from other agents' activities (see Holmström, 1982). In the environments we study, there is a countervailing cost which is exacerbated by increasing the number of activities the firm is involved in.

Employees in our model can generate ideas for improving profitability by exerting effort. Whether these ideas represent major or minor innovations, we assume that the firm must take the further step of implementing them before profits rise, as in Kevin Roberts and Martin Weitzman (1981) and Daniel Levinthal (1985). As is generally true in practice, we assume that the resulting implementation decision rests with senior management.⁴

Narrowness can be attractive because the implementation decision interacts with the provision of incentives. In particular, we assume that the only incentive payment available to the firm is a payment that depends on whether the firm actually implements the employee's idea. This incentive scheme has an unfortunate side effect. Once the idea exists, it should be implemented if its benefits exceed the costs of im-

²See the Harvard Business School video program *Michael Porter on Competitive Strategy*.

³While such diversification is not desirable when financial markets are perfect, it is attractive when bankruptcy is costly.

⁴In practice this is probably true because senior management is in a better position to know whether the idea is useful in the first place.

plementation. The firm, however, will only implement it if the difference between its benefits and the incentive compensation to the innovative employee exceeds the costs of implementation. Profit-maximizing senior management may thus fail to implement a socially valuable innovation.⁵ As a consequence, employees may be reluctant to exert effort in the first place. Thus, the firm may have difficulty motivating employees *ex ante*.

The point of the paper is that this distortion of the firm's *ex post* implementation decision is exacerbated if the scope of the firm's activities is broad. The reason is that broad firms have a bigger range of projects to implement *ex post*. As a result, they are more likely to implement a project that is not ideal for providing *ex ante* incentives. We study two circumstances in which these deleterious consequences of breadth arise.

In the first, the ideas generated for one activity can sometimes be used in another. For example, two employees in different activities might be researching inventory-control systems, and the inventory-control system invented for one activity might be applicable in the other. This type of synergy is problematic because the ideas imported from another activity might be used to supplant better ideas generated locally. The firm might nonetheless prefer imported ideas *ex post* simply because they involve smaller incentive payments. Focusing on only one activity then has the benefit that it commits the firm not to supplant its employees' ideas with inferior imports.

In the second, financial constraints prevent the firm from borrowing for all its profitable projects. The presence of these constraints means that the firm might be able to implement only one idea even when

several employees succeed in generating valuable innovations. The firm will then implement the innovation that gives it the highest profits net of incentive payments. As a result, the employee in the *ex ante* more profitable activity might not make an effort because he rationally anticipates that his innovation will not be implemented when other employees succeed as well. The firm may then be better off by setting narrow objectives and restricting the scope of the firm to the *ex ante* more profitable activity. Here too, supplantation of one employee's ideas by another is the source of difficulty, but the only element that is common to both ideas is their thirst for cash.

Concern with this competition for cash surfaces in Gordon Donaldson (1984 p. 115). He reports on a company confronting a choice between renovating an aging plant and acquiring a new company. A Donaldson interviewee commented, "Internal management really doesn't want acquisitions. There is nothing in it for them. All they get is newcomers who will compete with them [for resources]." The company chose to renovate the plant even though this decision could only be rationalized by applying a much lower hurdle rate than the company usually required.

The basic conclusion of our financial-constraints model is that the joining of unrelated activities inside a firm may not be desirable. This is consistent with the main message of the empirical literature on diversification. This literature, which starts with Rumelt (1974), asks whether diversified companies have higher or lower profits than their undiversified counterparts. The results are rather mixed, in part because controlling for industry effects is difficult.⁶ Overall, however, *unrelated* diversification seems to be associated with lower profitability and lower stock-market prices.⁷ Additional evidence for this view is provided by the case studies of David Ravenscraft and Frederic

⁵Profit-maximization by managers is to be expected if managers are risk-neutral, care only about their income, and can be paid a proportion of total firm profits. We show in Rotemberg and Saloner (1993) that the inefficiencies created by our incentive scheme can be resolved to some extent by hiring senior managers whose utility function also depends directly on the welfare of their employees.

⁶See Michael Lubatkin and Ronald Rogers (1989) for a recent example and a discussion of this literature.

⁷The latter result is due to Cynthia A. Montgomery and Birger Wernerfelt (1988).

Scherer (1987), which suggest that the divisions that conglomerates divest tend to become more profitable when they are on their own.

Our models hinge on the effects of the scope of the firm on employee effort in the absence of complete contracts. In this, they are closely related to the models of Sanford Grossman and Oliver Hart (1986) and Hart and John Moore (1990). In those models, owners of firms have difficulty inducing their employees to accumulate human capital. This problem is ameliorated if these employees own their own stand-alone firms. Thus the optimal scope of the firm is limited because there exist activities which are profitable on their own but not as parts of larger firms. However, their framework does not explain the sort of statement made by the A&P vice-president. There, a firm refrains from undertaking an activity that would remain profitable even when incorporated into the existing company. Margaret Meyer et al. (1992) develop a model that also features incomplete contracts and has similar implications, though the mechanism is different. They show that divisions within firms can be more profitable as stand-alone enterprises if this reduces wasteful influence activities between the division and corporate headquarters.

Our paper proceeds as follows. In Section I we provide the basic contracting structure that underlies the paper. This section explains the inefficiencies that arise when employees can only be motivated with incentive payments that depend on the implementation of their ideas. In Section II we show how these inefficiencies arise when the firm has two employees whose projects have a certain type of synergy. We also show that concentrating on only one project can then be more profitable than working on two. Section III is devoted to showing that a similar analysis applies when the firm is subject to financial constraints. We present our conclusions in Section IV.

I. The Basic Structure

Before describing our specific models, we provide their basic structure and describe

the intuition that underlies them. This structure can be understood by focusing on just one activity, which we label a . By being innovative, the firm can improve the product, reduce its costs, increase its market, and so forth. These innovations must first be discovered and then must be implemented. Discovery occurs with positive probability if the employee in a exerts effort at a personal loss in utility which is equivalent to d units of cash. We denote this employee by A and assume that his preferences have the following additional features: he must be paid a minimum wage w in every period, and he is risk-neutral concerning income beyond w .

The model has three periods. In the first, A decides whether or not to exert effort. In the second, top management decides whether to implement the innovation he uncovers. Finally, in the third period, the firm's actions bear fruit. The structure of the model is thus akin to that in Hart and Moore (1988) where a seller (who corresponds to our employee A) can, by making an effort, improve the product. Hart and Moore's buyer (who corresponds to our top manager) decides, *ex post* whether to buy the product. Purchase by their buyer and implementation by our top manager are equivalent because our incentive payment can depend only on whether the idea is implemented.

For concreteness we assume that the profit-enhancing innovation affects revenues. We assume that third-period revenues from activity a equal S if A does not make the effort. If A makes the effort and has a good idea, and if the idea is implemented, revenues rise. We contrast two different settings. In setting 1, A 's effort can only lead to one good outcome. He gets this idea with probability Q , and if it is implemented, revenues rise to $S + g$, where $g > 0$. With probability $1 - Q$ he is unsuccessful, and the firm's revenues remain equal to S .

We wish to concentrate on situations in which A 's effort is worthwhile on average. We therefore assume that its expected benefits Qg exceed its cost. Therefore,

$$(1) \quad Qg - d \geq 0.$$

In setting 2, A 's effort may yield one of two good outcomes. If A exerts effort and his idea is implemented, the revenues and their respective probabilities are:

$$\begin{aligned} S + g & \quad \text{with probability } Q' \\ S + z & \quad \text{with probability } Q'' \\ S & \quad \text{with probability } 1 - Q' - Q''. \end{aligned}$$

We assume that $0 < z < g$ but that the expected value of A 's effort is identical to that in setting 1, that is,

$$(2) \quad Q'g + Q''z = Qg.$$

Note that for (2) to hold it must be the case that $Q' < Q$.

The difference between the two settings can loosely be characterized as follows: in setting 1, A has a shot at producing a "jackpot." However, it is an "all or nothing" process: either his idea is a jackpot or it is valueless. In contrast, in setting 2 there is a lower chance that he will hit the jackpot, but there is also some chance that he will generate an idea of moderate value. Our main point is that motivating A in setting 2 may be harder. Thus, despite the identity of the value of A 's effort in the two settings, the firm may be strictly worse off (and A no better off) in setting 2.

As in the principal-agent literature, we focus on the case in which the firm cannot pay d to A in exchange for his effort.⁸ What the firm can do is to make the payment to A contingent on whether or not A 's innovation is implemented. A contract of this kind is feasible as long as the parties responsible for enforcing contracts can verify the implementation of the innovation. The parties that can fulfill this role most easily are the other employees in activity a . They realize when the innovation that A has been working on is implemented, and

⁸This does not require that senior management be unable to observe the level of effort. It requires only that effort not be observable by those outsiders who are responsible for enforcing contracts.

they expect the firm to compensate him accordingly. If the firm fails to do so, its reputation for fairness suffers. Instead of modeling this reputational mechanism explicitly, we simply assume the enforceability of contracts that tie A 's compensation to the implementation of his ideas.

Since the minimum wage is w , we assume that the employee gets this amount when his innovation is not implemented. We suppose that he gets an additional k when it is implemented.

LEMMA 1: *In setting 1, by setting $k = d/Q$, the firm can obtain the first-best outcome (i.e., the same outcome as if it were possible for the firm to make payments contingent on effort).*

PROOF:

Notice first that when A is successful, implementation of his idea nets the firm $g - d/Q$, which is positive given (1). Knowing that his idea is implemented whenever he is successful, A is indifferent between making the effort and not making it; doing so raises his expected utility by $Q(d/Q) - d = 0$. Finally, the firm's *ex ante* expected gain from putting this incentive scheme in place is $Q(g - d/Q) = Qg - d$, which is the same as if the firm had access to contracts that paid d to A in exchange for his effort.

In setting 2, by contrast, it may be impossible to induce A to make an effort. The outcome depends on the following conditions:

$$(3) \quad z \geq \frac{d}{Q' + Q''}$$

and

$$(4) \quad g \geq d/Q'.$$

LEMMA 2: *There are three cases. (i) When (3) holds, the first best is achieved. (ii) When (3) does not hold but (4) does, A exerts effort, but his idea is only implemented when it has value g . Because the firm also ought to implement A 's idea *ex post* when it is worth only z , we label this outcome *ex post inefficient*.*

(iii) When neither (3) nor (4) holds, A is not motivated to exert effort. Because A 's *ex ante* effort is distorted relative to the first best, we label this outcome *ex ante* inefficient.

PROOF:

We begin with case (iii). Consider first $k \leq z$. With such a value of k , the firm implements the idea whenever it has positive value (i.e., when it is worth either z or g). However, by making an effort, the employee adds less than $(Q' + Q'')z$ to his average compensation which, given the failure of (3), is at most d . Therefore it is not possible to elicit effort with an incentive payment of z or less. Now consider values of k between z and g . These lead the firm to implement the employee's idea only when its value is g (so that when its value is only z , the idea is wasted). As a result, the effort raises average employee compensation by at most $Q'g$. Given the failure of (4), this is also less than d .

In case (ii) it is still impossible for the firm to induce A to exert effort with an incentive payment of z or less (for the same reasons as above). However, it is now possible to induce A to make an effort by setting $k = d/Q' > z$. With such an incentive payment the firm will not implement A 's idea when it is worth z . However, it will implement it when it is worth g . Moreover, this k is sufficiently high that A is willing to exert effort (and earn $Q'd/Q' = d$) even though his idea is only implemented with probability Q' . Nonetheless, because the firm fails to implement the idea when it has positive value z , the outcome does not mimic the first best.

Finally, in case (i), A makes the effort with $k = d/(Q' + Q'')$, and the firm is willing to implement A 's idea whenever he is successful. Thus, the firm achieves the first best.

The intuition for the main result, namely, that A makes no effort in case (iii), is that contracts that attempt to induce effort "unravel." A low incentive payment is insufficient even if A expects to be compensated whenever he is successful. Increasing the value of the incentive payment is ineffectual

because it leads the firm to implement the idea in fewer states of nature. Thus A expects to earn his incentive compensation with sufficiently low probability that, even though the incentive pay is "high," the expected value is too low to make the effort worthwhile.

It is obviously important to this result that the firm is only able to offer A an incentive payment of k which is independent of the value of his idea. With a more complex instrument at its disposal (e.g., a contract that compensates A on the basis of some variable that is correlated with the value of his idea), the firm would be able to reduce the inefficiency, or even eliminate it entirely. In the following section, when we give these settings some context, we also describe why those contexts limit the contracts that are available to the firm and how the results are affected if more complex contracts are allowed.

One possible criticism of the above analysis is that we have assumed that innovations are passed up *ex post* when their value exceeds k . This may be regarded as unsatisfactory because there is a strong incentive to renegotiate the contract in this case. We thus consider now the effect of renegotiation, although such renegotiation is not very plausible in the applications we consider. We suppose that in the second period top management makes one additional offer to the employee. This offer consists of a payment f , which the firm offers to make in exchange for the right to implement the idea. The employee can then either accept the offer or reject it. If the employee accepts it, he receives f , and the idea is implemented. If he rejects the offer, the firm still has the option of implementing the idea by paying k .

LEMMA 3: *Renegotiation does not change the equilibrium in case (iii), but it makes the first best achievable in case (ii).*

PROOF:

At the renegotiation stage, the firm obviously has nothing to gain from making an offer such that f exceeds k . If the *ex post* value of A 's innovation exceeds k , the firm

also has nothing to gain by making an offer lower than k . Any such offer would be turned down because the employee knows that the firm will implement the project even at a cost of k . But consider the case in which the incentive payment k exceeds the *ex post* value of A 's innovation. Now the firm can be sure that the employee will accept any offer when f is even trivially above zero. The reason is that the employee knows that the firm will not implement the project if it must pay k . The employee is thus strictly better off accepting such an offer. The result is that there is no *ex post* inefficiency. The project is implemented whenever its value is positive, even when this value is below the prespecified incentive payment k .

Therefore, when (4) holds and (3) does not, $k = d/Q'$ achieves the first best. This k is just sufficient to induce A to make the effort, even though he receives it only when the project is worth g . Moreover the firm now implements the project whenever A is successful and pays an average of d for A 's effort.

However, when (3) and (4) are violated, A still cannot be induced to make an effort. An incentive payment k below z (which would be paid whenever A is successful) is still not enough to compensate A for his disutility d . An incentive payment between z and g would still only be paid with probability Q' . It is true that the idea would now be implemented also when it is worth z , but the employee gains nothing in this eventuality. Thus, the employee still gets at most $Q'g$ on average, and this is less than d . Since values of k above g would never be paid, there is no k that leads the employee to make an effort.

In essence, this section demonstrates that certain kinds of increases in the number of potential outcomes make it harder to provide incentives. In the subsequent sections we show that adopting a broad strategy can increase the number of potential outcomes. As a result, adopting a broad strategy which would be profitable absent incentive problems may be unprofitable once incentive problems are recognized.

For breadth to be deleterious to activity a , it must have an analogous effect on the benefit of A 's effort as that which results in moving from setting 1 to setting 2. The relevant properties are that "intermediate" outcomes from A 's effort [i.e., outcomes whose payoff is a value of z which fails to satisfy (3)] must be more likely, and it must be less likely that A 's ideas result in "great" outcomes so that the probability of obtaining g falls [as is required for (1) to hold while (4) does not].

What we argue below is that synergistic activities sometimes have this property, as do certain financial constraints. Synergies lead to more intermediate outcomes (and fewer great outcomes) when they give the firm access to better substitutes for the ideas that result from A 's effort. When the firm has access to these substitutes, its net payoff from A 's idea decreases. It is important to stress that not all forms of synergy have this drawback. For instance, synergies which simply raise the value of A 's ideas when he is successful do not make it harder to induce A to make an effort.

Breadth in the presence of financial constraints also generally raises the probability of intermediate outcomes at the expense of great ones. The reason is that a broad firm has access to a wider variety of projects in which to invest its scarce cash. This means that the value to the firm of any one of these projects is diminished.

II. Synergy

We now consider a model in which senior management can potentially involve the firm in two related activities, a and b . We assume that activity a is similar to setting 1 in the previous section. In particular, A can raise revenues to $S_a + g_a$ with probability P_a by exerting effort which costs him d_a . Therefore, a firm which restricts attention to activity a and offers an incentive payment of $k_a = d_a/P_a$ achieves the first best. In this section we show that the addition of b can reduce the firm's profits even if b is profitable on its own. We consider synergies between a and b such that carrying out both activities in the same firm under com-

plete contracting is attractive. We show that these very synergies make the joining of these activities within the same firm unattractive when contracts are incomplete.

Activity b is analogous to activity a in most respects. Its employee, B , is able to generate new opportunities that enhance the revenues of b . We denote by S_b , g_b , d_b , and P_b the variables that are analogous to S_a , g_a , d_a , and P_a , respectively. We assume that $S_b = w$ so that, even absent any effort, the expansion into activity b does not reduce profits. We assume, by analogy with a , that $P_b g_b \geq d_b$.

We suppose also that when B is successful (i.e., has an idea that raises revenues in activity b to $S_b + g_b$), his idea may also be useful in a . Conditional on B 's success in raising profits in activity b , there is a probability \bar{P} that his invention can be applied in a and raise revenues there to $S_a + \bar{g}$ (where $\bar{g} > 0$). However, because B 's idea when applied to a is a substitute for A 's idea, the firm cannot profitably implement both ideas in a . To motivate this, imagine that A and B are each trying to invent superior promotion or distribution methods for their products. It is then possible that, if B is successful, his method is also applicable to the products of a at no additional cost.

Because $P_b g_b - d_b$ is nonnegative, the positive probability of raising revenues in a implies that, unless there are other negative consequences in a , the firm is strictly better off incorporating b . The cost of having access to the synergy from b is that the firm may be led to implement B 's idea in a even when A 's idea is better. To show this, we assume that if A is successful his idea is more valuable (i.e., that g_a exceeds \bar{g}).

Because $P_b g_b \geq d_b$ and A provides no synergies for b , the equilibrium contact with B should specify that $k_b = d_b / P_b$. The result is that the firm implements B 's idea in b whenever B succeeds and that B makes the effort.⁹ The value to the firm of A 's

effort and its corresponding probability of occurrence are then:

$$\begin{array}{ll} g_a & \text{with probability } P_a(1 - P_b\bar{P}) \\ g_a - \bar{g} & \text{with probability } P_a P_b \bar{P} \\ 0 & \text{with probability } 1 - P_a. \end{array}$$

The first line corresponds to the case in which A is successful and B does not produce an innovation that is useful in a . In that case A 's effort is worth g_a to the firm. The second line corresponds to the case in which A is successful but B is also successful and produces an innovation that is useful in a . The value of A 's effort is then the difference between g_a and what the firm gets from implementing B 's idea in a . Finally, the third line corresponds to the case in which A is unsuccessful.

The lower payoff from A 's idea when B is also successful means that motivating A may no longer be profitable, even with complete contracts. To ensure that A 's effort is worthwhile, we assume that

$$(5) \quad P_a g_a - P_a P_b \bar{P} \bar{g} - d_a > 0.$$

The line corresponding to (5) holding as an equality is represented graphically in Figure 1. Points above this line satisfy inequality (5).

It is now possible to draw a fairly straightforward analogy with setting 2. As in that setting, the nature of the equilibrium depends on conditions which are analogous to (3) and (4):

$$(6) \quad g_a - d_a / P_a - \bar{g} \geq 0$$

and

$$(7) \quad g_a - \frac{d_a}{P_a(1 - P_b\bar{P})} \geq 0.$$

essary to motivate B . Such contracts would be beneficial if they convinced A that the firm has no incentive to substitute A 's innovation with B 's invention. However, insofar as this substitution is profitable with our basic contracts, the firm has an incentive to sign a secret contract with B whose payments do not depend on the implementation of B 's idea in a .

⁹Note that paying B for having his ideas implemented in a is not only impractical, but is also unrec-

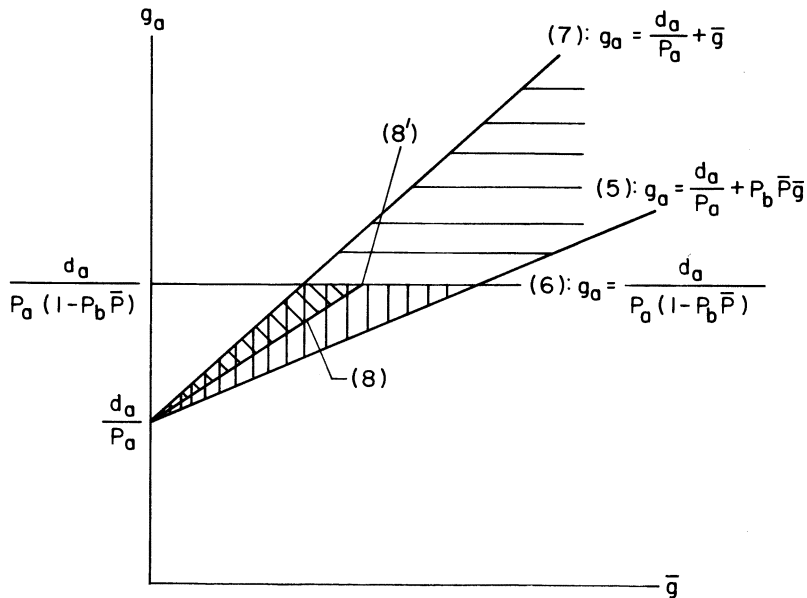


FIGURE 1. Ex Ante and Ex Post Inefficiency

Figure 1 displays combinations of parameters for which (6) and (7) hold with equality.

PROPOSITION 1: *If (6) holds, A exerts effort, and he is compensated whenever he is successful. If (6) does not hold but (7) does, A exerts effort but his innovation is adopted only when he is successful and B fails to produce an innovation that is useful in a. This is ex post inefficient. If neither (6) nor (7) holds, there does not exist an equilibrium in which it is possible to motivate A so that, given (5), there is ex ante inefficiency.*

PROOF:

Set the value of g equal to g_a , z equal to $g_a - \bar{g}$, Q' equal to $P_a(1 - P_b \bar{P})$, and Q'' equal to $P_a P_b \bar{P}$. The result follows from Lemma 1.

As far as A is concerned, increasing the breadth of the firm is similar to moving from setting 1 to setting 2. As long as $P_b \bar{P}$ is positive, his activity is changed from one with a single "high" payoff to one in which there is either a "high" payoff or an "intermediate" payoff.¹⁰

¹⁰Actually, adding activity b makes a even less attractive than does moving from setting 1 to setting 2.

In Figure 1, the parameters that lead to *ex ante* and *ex post* inefficiency are shaded with vertical and horizontal lines, respectively. It is apparent from the figure that the vertically shaded region is nonempty only if $P_b \bar{P}$ is less than 1. If $P_b \bar{P}$ were equal to 1 so that B always generated spillovers, A 's *ex ante* net marginal contribution would be $P_a g_a - d_a - P_a \bar{g}$. This would be positive only if his net *ex post* contribution, $g_a - d_a / P_a - \bar{g}$, were positive as well.

We now turn to demonstrating the major conclusion of this section. We will show two sets of conditions under which the firm can earn higher profits by being narrow and giving up activity b . In the first, which can arise when both (6) and (7) are violated, narrowness is a remedy for *ex ante* inefficiency. The violation of (6) and (7) requires that g_a be low. Since narrowness is beneficial only if $P_a g_a - d_a$ is high, this case arises

The *ex ante* value of the project was the same in the two settings (since we require that $Qg = Q'g + Q''z$), while here $P_a(1 - P_b \bar{P})g_a + P_a P_b \bar{P}(g_a - \bar{g}) = P_a g_a - P_a P_b \bar{P} \bar{g} < P_a g_a$; access to B 's innovation reduces the value of A 's effort. However, the inefficiencies surrounding A 's effort are the same.

only when P_a is relatively high. The second can arise when (7) holds while (6) is violated. Narrowness can then be a remedy for *ex post* inefficiency. This remedy can be attractive when g_a is substantially larger than \bar{g} so that the inefficiency from implementing B 's innovation in a is large.

PROPOSITION 2: *There exist conditions under which the firm earns higher profits by being narrow.*

PROOF:

In the case where (6) and (7) are violated, the broad firm cannot motivate A , so that its profits are $P_b(g_b + \bar{P}\bar{g}) - d_b$. Exclusive attention to a gives profits of $P_a g_a - d_a$, so that the firm is more profitable when it is narrow if

$$(8) \quad P_a g_a - d_a - P_b(g_b + \bar{P}\bar{g}) + d_b \\ = [P_a g_a - d_a] - [P_b g_b - d_b] - P_b \bar{P}\bar{g} \\ > 0.$$

The cross-hatched area in Figure 1 displays the region where (6) and (7) are violated while (8) holds for the instructive case where $P_b g_b - d_b$ is zero. The region obviously continues to exist when the profits in b itself are strictly positive as long as they are not too large. It follows immediately from (8) that narrowness is beneficial only if $P_b \bar{P}\bar{g}$ is small. In addition, we require that $P_b \bar{P}$ be smaller than P_a (i.e., the spillovers from B are less frequent than A 's success), because this is implied by the violation of (6).¹¹

¹¹Broadening the scope to include b is undesirable when A 's innovation is more valuable than B 's innovation *ex ante*, but the presence of b leads the firm to abandon A 's innovation *ex post*. Ignoring $P_b g_b - d_b$, A 's innovation is more valuable than B 's innovation *ex ante* only if $P_a g_a - d_a$ is bigger than $P_b \bar{P}\bar{g}$ (i.e., if $g_a - d_a/P_a$ exceeds $(P_b \bar{P}/P_a)\bar{g}$). On the other hand, the temptation to supplant A 's innovation *ex post* is large only if the synergy \bar{g} exceeds the *ex post* profits from A 's invention, $g_a - d_a/P_a$. These two requirements are compatible only if the odds of B 's success are low (i.e., only if $P_b \bar{P}$ is smaller than P_a).

If (6) is violated while (7) is not, the broad firm motivates both employees but implements B 's innovation when both are successful, so that its profits equal $P_b g_b - d_b + P_b \bar{P}\bar{g} + P_a(1 - P_b \bar{P})g_a - d_a$. Narrowness is more profitable in this case if

$$(8') \quad [P_b g_b - d_b] + P_b \bar{P}(\bar{g} - P_a g_a) < 0.$$

Equation (8') is drawn in Figure 1 for the case where $P_b g_b - d_b = 0$. Equation (8') applies above the horizontal line which is where (7) is satisfied. It requires that \bar{g} be smaller than $P_a g_a$.

In both cases where narrowness leads to higher profits, its benefit stems from the implied commitment not to supplant A 's innovation with B 's innovation when both are successful. Firms that want to innovate might thus be led to take great pains in defining their objectives very narrowly and in erecting institutional barriers that prevent breadth. That is not to say that firms would not supplant their own employee's innovations *ex post* if they came to learn of valuable substitutes through other means. Thus, as Robert A. Burgelman (1991) reports, Intel eventually decided to enter the RISC (reduced instruction set computer) processor business once its viability had been proven. It did this in spite of its having earlier tried hard to suppress the development of an in-house capability in RISC technology.

It might appear that our demonstration that synergy can be detrimental implies that the expansion of a firm into areas related to its core area is worse than expansion into unrelated areas. This is not the case. As two activities a and b become more related, \bar{g} increases. The effect of these increases can be seen in Figure 1. Suppose that $d_a/P_a < g_a < d_a/P_a(1 - P_b \bar{P})$ and that we start with $\bar{g} = 0$. Increases in \bar{g} from this point first make a broad strategy more attractive. Further increases in \bar{g} lead us to the cross-hatched area where broad firms cannot induce A to make an effort, and narrowness is profitable. But, as \bar{g} gets very high, the abandonment of A 's effort is also a feature of the first best. When the synergies are

very high the efforts of *A* and *B* duplicate each other, and having one employee make the effort is enough. At this stage expansion into *b* is attractive even with our incomplete contracts.

This argument also implies that large scale, as opposed to large scope, is generally beneficial. The reason is that firms operating at a large scale do not necessarily require that many individuals generate innovative ideas. On the other hand, the value of the employee's ideas is larger when the firm's scale is large. Thus firms whose scale is large are less likely to pass up valuable opportunities *ex post*.

An additional implication of our analysis is that innovative firms that wish to be involved in a relatively broad range of activities may benefit from seeking ways of committing themselves to give up potential synergies. In practice this means creating a structure such that *B*'s innovations cannot be used in *a*. For instance, *A*'s senior management might be kept ignorant of *B*'s activities by the erection of a "Chinese wall" between *a* and *b*. Again, Burgelman's (1991) Intel study is relevant. He writes, "Some middle-level managers had the idea to develop add-on boards for personal computers. The strategic planning process initially rejected the idea.... The idea, however, was able to get support through Intel's internal corporate venturing program and became a separate business" (p. 17, emphasis added). Of course, insofar as these walls are not credible to employees, incentives suffer.

The separation of Waterford Wedgwood's crystal and ceramic operations in late 1990 may represent another case in point. In announcing the separation, the company's chief financial officer and the person in charge of the reorganization, Robert Davies, stressed that "Waterford Wedgwood will be very much a holding company now, instead of an operational company."¹² The two businesses had previously been placed un-

der one roof via merger in 1986 in order to exploit marketing synergies, in particular "to use the products' overlapping customer base to strengthen the brands' marketing position." In part at least, the rationale for the separation was to improve the ability of the businesses to undertake innovative activities, in particular, to "give the crystal business the flexibility it needs to come up with new products..."¹³

The benefits from narrowness that we describe are entirely absent in firms that do not seek innovations. Our analysis is consistent with the experience of the textile industry in the early 1960's described by Perrow (1970). In that industry, narrow firms which were passionately devoted to a single kind of fabric coexisted with Indian Head Mills, which was proud to be broad.¹⁴ Indian Head Mills' strategy was to purchase nearly bankrupt textile companies, close down a large part of their operations, and keep only the profitable pieces. Their objective was thus to extract revenues from existing technologies and not to innovate. In declining industries, such a strategy can be profitable, even alongside a strategy of searching for innovations.

So far, we have assumed that, when (6) is violated, the firm gives up *A*'s innovation when both *A* and *B* are successful even though *A*'s innovation is more valuable. If the firm is able to demonstrate credibly the availability of *B*'s innovation for *a*, it can make a new offer to *A* as in Section I and eliminate this *ex post* inefficiency. For such renegotiation to be possible, those in charge

¹³An industry analyst, John Hogan, quoted in "A Parting at Waterford," *New York Times*, 14 December 1990, p. C1.

¹⁴As an indication of the passion with which the narrow strategies were pursued, Perrow (1970) recounts a meeting in the early 1960's at the Fashion Institute of Technology where an "executive of one large textile company was hissed by 'silk men' in the audience when they felt that their true love had been slurred." By contrast, James Robinson, the chairman of Indian Head Mills, said of the broad strategy they pursued, "We have no emotional involvement ..." (p. 164).

¹²"A Parting at Waterford Wedgwood," *New York Times*, 14 December 1990, p. C1.

of enforcing the contract must realize that a new contract has been drawn and that the new schedule of payments does not simply represent a breach of the initial contract. Such renegotiation may thus be difficult when the contract is an implicit one that is enforced by the employees' coworkers.

In any event, as the analysis of Section I indicates, renegotiation in which the firm gets to make one more take-it-or-leave-it offer before deciding on implementation has a relatively small effect on our conclusions. What is important for the conclusions is that, as in the related model of Benjamin Hermalin and Michael Katz (1990), the firm has strong bargaining power at the moment of renegotiation. Since it does eliminate the *ex post* inefficiency, the firm ceases to gain from narrowness when (7) holds but (6) does not. However, in the case where (7) and (6) are both violated, the broad firm is still unable to motivate *A*, so that it gains from narrowness when (8) is satisfied.

More Complex Contracts.—So far, we have assumed that a particular employee's compensation can depend only on whether his or her innovation is implemented in his or her own activities. Thus *A*'s compensation cannot depend on whether *B*'s innovation is implemented in either *a* or *b*. The reason we make this assumption is that we view *A*'s coworkers as the parties responsible for the enforcement of the contract. *A*'s coworkers are unlikely to be informed about what takes place in *b*, and for this reason payments that depend on what occurs in *b* are not plausible. Similarly, when *A*'s idea is not implemented, *A*'s coworkers may well be unable to determine whether management implemented any idea at all. Even when they can verify that an implemented idea acts as a substitute for the project *A* was working on, they cannot know the origin of the imported idea. The reason is that ideas tend to be modified somewhat when they are imported, so it is hard to determine their origin.

Although we regard these more complex contracts as unrealistic, we analyze them here to explore the robustness of our conclusions. The following two propositions

summarize our results for the cases where *A*'s payment can depend on whether *B*'s innovation is implemented in *a* and *b*, respectively.

PROPOSITION 3: *If A's payments can be conditioned on whether B's idea is implemented in a, narrowness is not beneficial. However, the first best cannot necessarily be achieved.*

PROOF:

Suppose the firm pays x to *A* when it implements *B*'s idea in *a*. By setting $x > \bar{g}$, the firm is deterred from ever implementing *B*'s idea in *a*. This contract is superior to a narrow focus on *a* because the firm also earns $P_b g_b - d_b$ from *b*.

Such an x does not necessarily yield the first best, however. To mimic the first-best implementation of ideas, the firm would have to set x no smaller than $\bar{g} + k_a - g_a$. Otherwise, the firm would import *B*'s idea when both are available. The problem with having a positive x is that it reduces *A*'s payoff from making an effort. Even though *A* is assured that he will get k_a whenever he is successful, he will make an effort only if

$$P_a k_a + (1 - P_a) P_b \bar{P} x - d_a \geq P_b \bar{P} x$$

or

$$P_a k_a \geq d_a + P_a P_b \bar{P} x.$$

Thus, *A* earns more than d_a on average, and this is costly to the firm. The most profitable contract that brings about this allocation has the smallest possible x , namely, $\bar{g} + k_a - g_a$. Because this gives a rent to *A*, this contract might be less profitable than letting x exceed \bar{g} . This occurs if

$$P_b \bar{P} (1 - P_a) \bar{g} < P_a P_b \bar{P} (\bar{g} + k_a - g_a)$$

which, using the optimal k_a , reduces to

$$[P_a (g_a - \bar{g}) - d_a] + (1 - P_a) (1 - P_b \bar{P}) \bar{g} > 0.$$

The term in brackets is negative whenever (6) is violated. The overall expression is

not negative for all the parameters that lead to the optimality of narrowness with simple contracts. However, it is negative for certain parameter configurations which also violate (6) and (7) while satisfying (8).¹⁵

This highlights the incompleteness of contracts that underlies the benefits of narrowness. In particular, contracts whose payments depend on whether other employee's ideas are implemented in A must be unavailable.

PROPOSITION 4: *Consider contracts in which A 's payments depend on the implementation of B 's idea in b . Whether or not these contracts affect the earlier results depends on whether the implementation of B 's idea in b is a good signal of the availability of this innovation for a .*

PROOF:

We show this by considering the two polar extremes where the adoption of B 's innovation in b is either a completely uninformative signal ($P_b = 1$) or a perfect signal ($\bar{P} = 1$).

When $P_b = 1$, the implementation of B 's idea in b does not signal its applicability in a . Employee A now receives different payments when the firm implements no project, implements only A 's innovation, implements only B 's innovation, or implements both. We label these k_a^0 , k_a^a , k_a^b , and k_a^c , respectively. If k_a^b is much larger than k_a^c , the firm will implement B 's idea only when A 's idea is implemented as well. We assume that, because $P_b g_b$ is less than d_b , the firm then gains nothing from activity B . This means that the firm has to choose between giving up the profits from B (so that it might as well be narrow) and implementing B 's idea with probability 1.

Now suppose that B 's idea is always implemented. The incentive payments k_a^0 and k_a^a are then irrelevant. The incentive payment k_a^b should then be set to zero since

the firm would have to pay this with probability 1, and positive values of k_a^b would not motivate A . Thus k_a^c now plays the role of what we used to label k_a . The analysis of the previous section is then unaffected because, ignoring $P_b g_b - d_b$, then (6), (7), and (8) depend on P_b only through its product with \bar{P} . Thus, for $P_b g_b - d_b$ equal to zero and a given $P_b \bar{P}$, one obtains the same results with the more elaborate contracts as long as $P_b = 1$.

Exactly the opposite is true when $\bar{P} = 1$. The first best can be achieved by setting $k_a^0 = 0$, $k_a^a = [d_a - P_a P_b (g_a - \bar{g})] / P_a (1 - P_b)$, $k_a^b = 0$, and $k_a^c = g_a - \bar{g}$. When both succeed, the firm can implement B 's idea in both activities at zero cost, or it can implement A 's idea in a at an additional cost of $g_a - \bar{g}$, so that it does the latter. When only A succeeds, (8) ensures that $k_a^a < g_a$ so that the firm implements A 's idea. The result is that A is willing to make the effort and gets d_a on average. The firm's expected profits are $P_a g_a - d_a$ so the first best is achieved.

III. Financial Constraints

We have two main goals in this section. The first is to demonstrate that the competition for internal funds that is often observed in organizations which encompass several activities can provide an independent rationale for a narrow strategy. The result of this competition is that, as Donaldson (1984 p. 169) writes, "members of the existing organization are likely to be highly ambivalent about the benefits [of diversification]... They know that the new product markets will inevitably become strong competitors for corporate resources..." In this section we show that this concern among employees may not be a purely parochial one. Our second goal is to explore the role of asymmetries in activities a and b in generating benefits from narrowness. In the previous section, activities a and b were very different since only one of them generated synergies. Here we demonstrate that asymmetries in the activities are *necessary* for our results.

The strong correlation between firms' internally generated cash flows and the

¹⁵This is true, for example, when g_a , P_a , d_a , \bar{g} , P_b , and \bar{P} equal 100, 0.6, 50, 60, 1, and 0.2, respectively.

amount they invest has led many authors to conclude that financial constraints exist. Evidence that this correlation is not based only on the fact that firms with large cash flows also have good investment opportunities is provided by Takeo Hoshi et al. (1991). In the presence of asymmetric information, it is easy to construct models in which firms do indeed face financial constraints. Following Douglas Gale and Martin Hellwig (1985), we assume that borrowing is costly because it requires monitoring. We simplify further by making these monitoring costs so high that there is no borrowing at all. As before, A must make an effort which gives him a disutility d_a for revenues to increase. We now assume that there is a cost, F , to implementing A 's innovation. In contrast to the previous section, we suppose that, after implementation, the revenues from A 's innovation are stochastic. If the firm does implement A 's successful innovation, revenues rise to $S_a + (F + g_a)/q$ with probability q and are S_a with probability $1 - q$. Thus, as before, the expected net benefit from implementing A 's successful innovation is g_a .

Suppose that the firm did not have the necessary funds F to finance the implementation of A 's idea. It could ask for credit from a financial institution. Following Gale and Hellwig (1985), we assume that financial institutions must spend resources to ascertain *ex post* whether the implementation led to revenues of $(F + g_a)/q$ or not. Since the firm has no other resources, it would never admit that it was successful unless it was monitored. We assume that the costs of this monitoring exceed g_a . As a consequence, the firm is effectively unable to borrow.

Now suppose that the firm also has access to activity b . The firm must also spend F in order to implement B 's innovation. This implementation leads to expected revenues from activity B equal to $S_b + F + g_b$. We continue to assume that $S_b = w$, but now we also have $P_b g_b > d_b$. Therefore it would be profitable to motivate B to exert effort if b were the only activity that the firm was involved in. We assume that the firm's internal funds C are sufficient to finance one

project, but not both. Thus the setting is one in which, as in Donaldson (1984), there is *ex post* competition for funds.

Without loss of generality, we consider the case where a is more valuable *ex ante* so that

$$(9) \quad P_a g_a - d_a > P_b g_b - d_b.$$

Since $P_a g_a > d_a$, this implies that a firm that can motivate employees by simply paying them d_a (or d_b) would start by motivating A . We assume that conditions are such that it would, in addition, motivate B , that is,

$$(10) \quad (1 - P_a)P_b g_b + P_a P_b \max(g_b - g_a, 0) > d_b.$$

Finally, we assume that $g_a > g_b$. As we will show below, this is required for narrowness to be optimal.

The game starts, once again, with the firm simultaneously offering incentive contracts to A and B . We assume that A and B do not know the terms of each other's contracts at the time when they must make their effort decisions. One motivation for this is simple physical separation between a and b as well as between the coworkers responsible for enforcing contracts. More importantly, B (and his coworkers) may have an incentive to cooperate with senior management in deceiving A about the terms of B 's contract. We capture this ability of B and senior management to collude against A by assuming that each employee is ignorant of the other's contractual terms.

The analysis is a bit different from that in the previous section because the implementation of A 's project used to be independent of B 's incentive payment. Now B receives his incentive payment only when his innovation is implemented while A 's is not. Thus, the *ex post* value to the firm of either employee's innovation depends on the other's incentive payment, and this incentive payment must itself be derived from equilibrium considerations.

As before, the existence of *ex ante* and *ex post* inefficiency depends on conditions

analogous to (3) and (4). These are

$$(11) \quad P_a g_a - d_a - \frac{P_a}{P_b} (P_b g_b - d_b) \geq 0$$

and

$$(12) \quad g_a > \frac{d}{P_a(1 - P_b)}.$$

PROPOSITION 5: *There exist conditions in which the firm is better off being narrowly focused on a.*

PROOF:

We start by showing that *B* makes an effort in equilibrium. With $g_a > g_b$, (10) implies that g_b exceeds $d_b/P_b(1 - P_a)$. Thus *B* will make the effort as long as $k_b = d_b/P_b(1 - P_a)$. The firm will then implement *B*'s idea when he alone is successful, and so *B* gains at least d_b on average. Since the firm gains by this, we can be sure that the firm will induce *B* to make an effort in equilibrium. Note that this analysis does not imply that $k_b = d_b/P_b(1 - P_a)$. Indeed, we will argue shortly that it sometimes equals d_b/P_b in equilibrium.

Given that *B* makes an effort, the *ex post* value to the firm of *A*'s effort (ignoring *A*'s incentive payment) is

g_a	with probability $P_a(1 - P_b)$
$g_a - (g_b - k_b)$	with probability $P_a P_b$
0	with probability $1 - P_a$.

These values are analogous to those of setting 2 with Q' set equal to $P_a(1 - P_b)$, Q'' set equal to $P_a P_b$, and z set equal to $g_a - (g_b - k_b)$. Condition (4) then reduces to (12). Condition (3) depends on z and therefore on k_b . It does reduce to (11) if $k_b = d_b/P_b$. It is true that the condition would be weaker if k_b were higher. However, when (11) is violated, the firm benefits from offering $k_b = d_b/P_b$, as opposed to offering a higher k_b . To induce *B* to make the effort, a higher k_b would still have to give *B* average incen-

tive payments of d_b . But, an offer that leads the firm to adopt *A* when both are successful means that the firm could make more money when both are successful by setting $k_b = d_b/P_b$. Moreover *B* will be happy to make the effort with this incentive payment because the violation of (11) implies that he will receive this payment when both employees succeed.

Since (11) and (12) are analogous to (3) and (4), Lemma 1 implies that *A* does not make an effort. However, (9) implies that the firm is then better off concentrating only on *A*. To see that (9) and (10) can hold while (11) and (12) fail, suppose that (9) holds as a near equality. Then (11) and (12) fail as soon as $P_b < P_a$ and $P_b < 1$. Having $P_b < P_a$ is consistent with $g_a > g_b$ and the near equality of (9) as long as d_b is smaller than d_a . Finally, when $g_a > g_b$, inequality (10) requires that $P_b g_b(1 - P_a) > d_b$. This too is satisfied as long as d_b is sufficiently small.

If (12) holds while (11) fails, *A* makes an effort, but the equilibrium is *ex post* inefficient. It is easy to show with a numerical example that such equilibria are possible and that the resulting inefficiency can be so severe that the firm is better off shedding activity *b*.¹⁶

The reason this model resembles setting 2 is that *B*'s success reduces the net payoff

¹⁶Suppose $g_a, P_a, d_a, g_b, P_b,$ and d_b equal 100, 0.9, 80, 99, 0.1, and 8.5, respectively. Condition (9) is met since $P_a g_a - d_a$ equals 10 while $P_b g_b - d_b$ equals only 1.4 and, in addition, g_a is larger than g_b . Effort in *a* is thus more valuable both *ex ante* and *ex post*. Inequality (10) is met as well because the expected value of *B*'s idea if it is implemented only when he alone is successful, $(1 - P_a)P_b g_b$, is 8.91, so that it exceeds d_a . Condition (12) is also met because $d_a/P_a(1 - P_b)$ is 98.77, which is below 100. Finally, condition (11) is violated: $g_a - d_a/P_a$ equals only 11.11, while $g_b - d_b/P_a$ equals 14. By remaining broad, the firm earns $P_b g_b - d_b + P_a(1 - P_b)g_a - d_a$, whereas it earns $P_a g_a - d_a$ by focusing only on *a*. A narrow strategy is therefore more profitable if $P_b g_b - d_b < P_a P_b g_a$. For our parameters, the left-hand side of this condition is 1.4, while the right-hand side is 9. Therefore, narrowness is a profitable response to the *ex post* inefficiency in this case.

from implementing A 's idea.¹⁷ For narrowness to be optimal in this setting, several conditions that involve asymmetry must be met. First, the activity that is *ex ante* more valuable (a) must also have a higher payoff gross of incentive payments *ex post* (g_a). Only then, is the implementation of B 's idea inefficient when both are successful. Second, B 's idea must be more attractive *ex post*. For fixed values of the *ex ante* profitability of the two activities, this tends to be true if P_b is less than P_a . The reason is that, for fixed $P_b g_b - d_b$, the *ex post* profitability, $g_b - d_b/P_b$, rises as P_b falls. These differences between the parameters describing the two activities are essential for our result, as the following propositions demonstrate.

PROPOSITION 6: *There are no benefits to narrowness when g_b exceeds g_a .*

PROOF:

The inequalities (9) and (10) now imply (12), so that the firm gains by inducing A to make an effort and can do so with a contract with $k_a = d_a/P_a(1 - P_b)$. While it is now easy to motivate A , there are two potential problems. First, the contracts with A and B might lead the firm to implement A 's invention when both employees find a useful innovation. This is now *ex post* inefficient. Second, the firm might find it impossible to motivate B to make an effort.

The conditions under which these effects are absent are analogous to (11) and (12). The main difference between the case in which $g_a > g_b$ and the one with $g_b > g_a$ is that, in the latter, narrowness is not a palliative for our two inefficiencies. The reason is that, in spite of the possible inefficiencies, equilibrium profits exceed $P_a g_a - d_a$. Given (9), they thus exceed the profits from a narrow strategy that focuses on b .

PROPOSITION 7: *In the fully symmetric case in which $g_a = g_b$, $P_a = P_b$, and $d_a = d_b$,*

not only is there no benefit from narrowness, but the firm can achieve the first best.

PROOF:

In this symmetric case, (10) implies that $P_a(1 - P_a)g_a > d_a$. The firm can then achieve the first-best outcome by offering $k_a = d_a/P_a$ and $k_b = d_a/P_a(1 - P_a)$. Since $k_a < k_b$, A 's idea is always implemented when he is successful, while (10) implies that B 's idea will be implemented when only he is successful. The result is that both employees are motivated since they get d_a on average.

In this section, the attractiveness of narrow focus depends on credit-market imperfections. If the firm can raise sufficient funds to finance both projects, narrow focus is unnecessary, since the firm can provide good incentives for both employees. Our result goes beyond the statement that a firm with limited investable resources gains little from having a wide array of investment projects. In our model, having access to alternative investment projects actually reduces overall profits in the presence of these financial imperfections. This reduction would not take place if the firm could credibly promise A that his project has funding priority over B 's project. Such a promise is much more credible when the firm does not even have access to B 's project (i.e., when it is narrow).

As before, our main result does not hinge on the absence of renegotiation. We show this in a setting where the firm simultaneously makes new take-it-or-leave-it offers to its employees after it becomes common knowledge which of them has been successful. Then, the two employees simultaneously indicate whether they accept their own offers. Finally, the firm picks which, if any, project to go forward with.

PROPOSITION 8: *When (11) and (12) are violated, narrowness is attractive even in the presence of renegotiation.*

(See the Appendix for a proof.)

Costs of Creating an Internal Capital Market.—In the presence of financial constraints, there is a natural incentive to cre-

¹⁷Notice that these benefits from narrowness cannot be obtained by being broad and using a "Chinese wall" that prevent funds from flowing from one activity to another.

ate internal capital markets. As Oliver Williamson (1975 pp. 146–47) notes, these allow divisions whose projects are particularly profitable to invest the funds generated by other divisions. An alternative organizational design would force each division to use only funds that it has generated itself. In this section we show that this latter design can be beneficial within firms that decide to remain broad.

We start by considering a firm that is involved in two activities, a and b , but in which capital cannot flow from one activity to another. Each activity has a limited pool of cash C which is sufficient to finance the implementation of either A 's or B 's idea on a modest scale. What we mean by modest scale is that implementation of A 's idea gives, as above, net revenues of g_a , while implementation of B 's idea gives net revenues of g_b . We depart from the previous analysis in assuming that, if B is successful, there is a probability \bar{P} that it is technologically feasible to implement his idea on a larger scale. We denote the benefits from this expansion in B 's project by \bar{g} .¹⁸ This expansion is not feasible when capital does not flow between activities, however, because it requires the use of $2C$ units of cash.

Contrast this with the outcome when the internal capital market functions well. The firm can now implement B 's project on a large scale as long as it is willing to give up the implementation of A 's project. The structure of the model is now isomorphic to that of our synergy model. Implementing B 's innovation on a small scale is equivalent in the synergy model to implementing B 's innovation only in activity b . Implementing B 's innovation on a large scale is equivalent in the synergy model to implementing B 's innovation both in b and in a .

When (8) holds while (6) and (7) are violated [or when (7) and (8') hold while (6) is violated] the firm is better off with just activity a than with activities a and b to-

gether. Of course, it can do even better by keeping both divisions inside the firm and preventing the flow of funds from one activity to the other.

IV. Conclusions

We have shown that innovation-oriented firms may earn higher profits by pursuing narrow objectives and shunning some profitable opportunities. Our model based on financial constraints is also broadly consistent with the finding that firms engaged in unrelated diversification earn lower profits (and have lower stock prices) than undiversified firms. In this conclusion we ask two questions. The first is why the model is more applicable to analyzing the breadth of the firm than the interaction of individuals engaged in small teams within firms. The second is why firms nonetheless do become diversified even though the empirical literature suggests that unrelated diversification lowers both profits and stock prices.

Our model has explicitly considered only two employees, so it might appear to be more applicable to the interaction of a few people within a particular branch of the firm than to the issue of the firm's optimal scope. It should be stated at the outset that our use of only two employees is only a modeling device, we have in mind relatively large groups of individuals working together in each activity. The reason we aggregated the individuals within these groups is that their activities are often complementary.

The various individuals designing a particular product, process, or marketing campaign specialize on different aspects of the problem. They either succeed together (and are compensated accordingly) or fail together (because no piece of the product, process, or marketing campaign is particularly useful in isolation). By contrast, one level up, management has the opportunity of borrowing a process from one part of the firm and hiring new individuals to apply it in another. Probably more empirically relevant still, firms often parcel out their limited cash by adopting some projects and scuttling others. So, at this level, the efforts of groups are substitutes, and our analysis applies.

¹⁸One way to think of this is that B 's innovation may have either a small or a large market.

Turning to the second question, it is possible that firms diversify because managers are optimistic too often. Thus Rumelt (1974 p. 157) advises, "Management expecting the synergistic effects of bringing two [diversified but unrelated] firms together should be warned that the organizational problems rising from this type of merger have, on the average, nullified any beneficial gains due to scale or synergy."

Another reason for diversification may be that it serves managers' non-profit-maximizing motives. Managers might be seeking prestige as in Michael Jensen's (1986) "free cash flow" theory. A related theory mentioned in Rumelt (1974) is that inept managers (and managers who have access only to low-quality projects) seek to diversify, while competent managers, who can create profits in their existing businesses, do not. Randall Morck et al. (1989) provide some evidence for this theory. These "managerial" theories of diversification all suggest that shareholders would be better off curtailing this activity.

An alternative view of the low profits of diversifiers is due to Edith Penrose (1959) and Montgomery and Wernerfelt (1988). They regard diversification as an efficient response by firms to their having excess capacity of productive factors. Firms that have more of some factors than they can use productively in their industry of choice diversify so that these factors can become productive. For example, a firm that has an underutilized "core competence" in its existing business might seek other arenas in which its basic resource can be put to work.

Our model, in effect, provides a third rationale for the cross-sectional correlation between stock prices and profits, on the one hand, and diversification, on the other. This rationale comes from our conclusions that innovative firms must remain narrow while less innovative firms can be broad. In many industries, firms pursuing innovations coexist with firms that are content with imitation. Even if the economic profits from the two strategies are the same, the accounting profits might be different.

Innovative firms may have to make more *ex ante* investments than their imitative counterparts. Insofar as accountants do not

treat all these expenditures as investment, they will tend to overstate the *ex post* rate of return on investment of innovative firms. Similarly, understatement of these firms' investment yields measurements of Tobin's q that are biased upward. These errors in measurement would lead innovative firms to be regarded as more profitable and to have higher q 's. Along the same lines, firms may be able to innovate only if they have access to certain nonmarketable resources. Because these resources are not priced, they will be seen as having higher rates of return.

According to our model, imitative firms have nothing to lose from diversification. Thus we would expect innovative firms to be narrow, while their q and even their conventionally measured profits are high. By contrast broad firms would be exclusively imitative so that their q 's and accounting profits would be low.

APPENDIX

PROOF OF PROPOSITION 8:

For this proof, we cannot use the analysis of Section I directly because k_b is not fixed and, indeed, depends on the process of renegotiation itself. As before, the existence of a new round of offers does not matter when only one employee succeeds, as long as his incentive payment is lower than the value of his innovation. The interesting case is the one in which both succeed. The best outcome for the firm now occurs when it implements A 's project and pays him (slightly over) w . It then gains g_a . We show that this is the unique equilibrium outcome.

We prove this in two steps by considering separately the case where $g_a - k_a > g_b - k_b$ and the case where the opposite holds. In the former case, B knows that if he turns down the offer the firm adopts A 's project whether A accepts his own offer or not. B thus expects to earn w if he rejects the offer. On the other hand, if A were to reject his offer and B accepted his own, the firm would implement B 's idea, and B would get slightly more than w . Therefore, acceptance is B 's dominant strategy. Given B 's acceptance, A is strictly better off by accepting as well. If he declines the offer, he will only earn w ; the firm will implement

B 's innovation because k_a must equal at least d_a/P_a , and $g_a - d_a/P_a < g_b$.

In the case where $g_a - k_a < g_b - k_b$, A knows that if he turns down the offer the firm will adopt B 's project for sure. Thus it is now A whose dominant strategy is to accept. B 's action in this case is irrelevant. We have thus shown that both employees get paid w (or a little more) when they both succeed.

We now show that A will choose not to exert effort. With $k_b = d_b/P_b(1 - P_a)$, B makes an effort since he can be sure to receive this payment whenever he alone is successful. If the initial contract calls for a k_a of d_a/P_a , A receives w when both are successful (even though his project is now adopted). He thus chooses not to make an effort because his average incentive payment is less than d_a . Neither lower nor higher values of k_a solve the problem. For k_a between d_a/P_a and g_a , the firm pays him k_a only when he alone is successful. The failure of (12) then implies that these payments average less than d_a . For k_a above g_a , the firm always offers w , and A has no choice but to accept, so he gets nothing for his effort.

This argument establishes that A does not search for ideas if the contract with B induces B to make the effort. The question remains whether the firm cannot offer B a contract with a k_b sufficiently low that B stops exerting himself. If A believes that B has such a contract, he accepts a k_a equal to d_a/P_a and makes the effort. However, if the firm has access to activity b , A would not believe that B 's contract calls for such a low k_b . The reason is that (10) with $g_a > g_b$ implies that the firm gains strictly by offering a $k_b = d_b/P_b(1 - P_a)$ if it were required to induce B to make the effort. It is thus impossible to motivate A . The resulting equilibrium thus has the firm offering B a contract whose $k_b = d_b/P_b$. When B succeeds, he receives this k_b in spite of the existence of renegotiation.

REFERENCES

- Andrews, Kenneth R.** *The concept of corporate strategy*. Homewood, IL: Dow Jones-Irwin, 1971.
- Burgelman, Robert A.** "Intraorganizational Ecology of Strategy-Making and Organizational Adaptation: Theory and Field Research." *Organizational Science*, August 1991, 2(3), pp. 239-62.
- Donaldson, Gordon.** *Managing corporate wealth*. New York: Praeger, 1984.
- Gale, Douglas and Hellwig, Martin.** "Incentive-Compatible Debt Contracts: The One-Period Case." *Review of Economic Studies*, October 1985, 52(171), pp. 647-63.
- Grossman, Sanford and Hart, Oliver.** "The Costs and Benefits of Ownership: A Theory of Vertical and Lateral Integration." *Journal of Political Economy*, August 1986, 94(4), pp. 691-719.
- Hart, Oliver and Moore, John.** "Incomplete Contracts and Renegotiation." *Econometrica*, July 1988, 56(4), pp. 755-86.
- _____. "Property Rights and the Nature of the Firm." *Journal of Political Economy*, December 1990, 98(6), pp. 1119-58.
- Hermalin, Benjamin E. and Katz, Michael L.** "Moral Hazard and Verifiability: The Effect of Renegotiation in Agency." *Econometrica*, November 1991, 59(6), pp. 1735-53.
- Hoshi, Takeo; Kashyap, Anil and Scharfstein, David.** "Corporate Structure, Liquidity and Investment: Evidence from Japanese Industrial Groups." *Quarterly Journal of Economics*, February 1991, 106(1), pp. 33-60.
- Homström, Bengt.** "Moral Hazard in Teams." *Bell Journal of Economics*, Autumn 1982, 13(2), pp. 324-40.
- Holmström, Bengt and Milgrom, Paul.** "Regulating Trade among Agents." *Journal of Institutional and Theoretical Economics*, March 1990, 146(1), pp. 85-105.
- Jensen, Michael C.** "Agency Costs of Free Cash Flow, Corporate Finance, and Takeovers." *American Economic Review*, May 1986 (*Papers and Proceedings*), 76(2), pp. 323-39.
- Levinthal, Daniel A.** "Three Essays on Economic Models of Organizations." Ph.D. dissertation, Stanford Graduate School of Business, 1985.
- Lubatkin, Michael and Rogers, Ronald C.** "Diversification, Systematic Risk, and Shareholder Return: A Capital Market Extension

- sion of Rumelt's 1974 Study." *Academy of Management Journal*, June 1989, 32(2), pp. 454-65.
- Meyer, Margaret; Milgrom, Paul and Roberts, D. John.** "Organizational Prospects, Influence Costs, and Ownership Changes." *Journal of Economics and Management Strategy*, Spring 1992, 1(1), pp. 10-35.
- Milgrom, Paul and Roberts, D. John.** *Economics, organization, and management*. New York: Prentice Hall, 1992.
- Montgomery, Cynthia A. and Wernerfelt, Birger.** "Diversification, Ricardian Rents, and Tobin's q ." *Rand Journal of Economics*, Winter 1988, 19(4), pp. 623-32.
- Morck, Randall; Schleifer, Andrei and Vishny, Robert W.** "Do Managerial Objectives Drive Bad Acquisitions?" *Journal of Finance*, March 1990, 45(1) pp. 31-48.
- Penrose, Edith.** *The theory of the growth of the firm*. London: Blackwell, 1959.
- Perrow, Charles.** *Organizational analysis: A sociological view*. Belmont, CA: Wadsworth, 1970.
- Porter, Michael E.** *Competitive strategy*. New York: Free Press, 1980.
- Ravenscraft, David J. and Scherer, Frederic M.** *Mergers, sell-offs, and economic efficiency*. Washington, DC: Brookings Institution, 1987.
- Roberts, Kevin and Weitzman, Martin L.** "Funding Criteria for Research, Development, and Exploration Projects." *Econometrica*, September 1981, 49(5), pp. 1261-88.
- Rotemberg, Julio J. and Saloner, Garth.** "Leadership Style and Incentives." *Management Science*, November 1993, 39(11), pp. 1299-1318.
- Rumelt, Richard P.** *Strategy, structure, and economic performance*. Cambridge, MA: Harvard Business School Press, 1974.
- Williamson, Oliver.** *Markets and hierarchies*. New York: Macmillan, 1975.

LINKED CITATIONS

- Page 1 of 3 -



You have printed the following article:

Benefits of Narrow Business Strategies

Julio J. Rotemberg; Garth Saloner

The American Economic Review, Vol. 84, No. 5. (Dec., 1994), pp. 1330-1349.

Stable URL:

<http://links.jstor.org/sici?sici=0002-8282%28199412%2984%3A5%3C1330%3ABONBS%3E2.0.CO%3B2-G>

This article references the following linked citations. If you are trying to access articles from an off-campus location, you may be required to first logon via your library web site to access JSTOR. Please visit your library's website or contact a librarian to learn about options for remote access to JSTOR.

[Footnotes]

⁵ **Leadership Style and Incentives**

Julio J. Rotemberg; Garth Saloner

Management Science, Vol. 39, No. 11. (Nov., 1993), pp. 1299-1318.

Stable URL:

<http://links.jstor.org/sici?sici=0025-1909%28199311%2939%3A11%3C1299%3ALSAI%3E2.0.CO%3B2-3>

⁶ **Diversification, Systematic Risk, and Shareholder Return: A Capital Market Extension of Rumelt's 1974 Study**

Michael Lubatkin; Ronald C. Rogers

The Academy of Management Journal, Vol. 32, No. 2. (Jun., 1989), pp. 454-465.

Stable URL:

<http://links.jstor.org/sici?sici=0001-4273%28198906%2932%3A2%3C454%3ADSRASR%3E2.0.CO%3B2-F>

⁷ **Diversification, Ricardian Rents, and Tobin's q**

Cynthia A. Montgomery; Birger Wernerfelt

The RAND Journal of Economics, Vol. 19, No. 4. (Winter, 1988), pp. 623-632.

Stable URL:

<http://links.jstor.org/sici?sici=0741-6261%28198824%2919%3A4%3C623%3ADRRATQ%3E2.0.CO%3B2-6>

References

NOTE: *The reference numbering from the original has been maintained in this citation list.*

LINKED CITATIONS

- Page 2 of 3 -



Incentive-Compatible Debt Contracts: The One-Period Problem

Douglas Gale; Martin Hellwig

The Review of Economic Studies, Vol. 52, No. 4. (Oct., 1985), pp. 647-663.

Stable URL:

<http://links.jstor.org/sici?sici=0034-6527%28198510%2952%3A4%3C647%3AIDCTOP%3E2.0.CO%3B2-W>

The Costs and Benefits of Ownership: A Theory of Vertical and Lateral Integration

Sanford J. Grossman; Oliver D. Hart

The Journal of Political Economy, Vol. 94, No. 4. (Aug., 1986), pp. 691-719.

Stable URL:

<http://links.jstor.org/sici?sici=0022-3808%28198608%2994%3A4%3C691%3ATCABOO%3E2.0.CO%3B2-F>

Incomplete Contracts and Renegotiation

Oliver Hart; John Moore

Econometrica, Vol. 56, No. 4. (Jul., 1988), pp. 755-785.

Stable URL:

<http://links.jstor.org/sici?sici=0012-9682%28198807%2956%3A4%3C755%3AICAR%3E2.0.CO%3B2-I>

Property Rights and the Nature of the Firm

Oliver Hart; John Moore

The Journal of Political Economy, Vol. 98, No. 6. (Dec., 1990), pp. 1119-1158.

Stable URL:

<http://links.jstor.org/sici?sici=0022-3808%28199012%2998%3A6%3C1119%3APRATNO%3E2.0.CO%3B2-3>

Moral Hazard and Verifiability: The Effects of Renegotiation in Agency

Benjamin E. Hermalin; Michael L. Katz

Econometrica, Vol. 59, No. 6. (Nov., 1991), pp. 1735-1753.

Stable URL:

<http://links.jstor.org/sici?sici=0012-9682%28199111%2959%3A6%3C1735%3AMHAVTE%3E2.0.CO%3B2-N>

Corporate Structure, Liquidity, and Investment: Evidence from Japanese Industrial Groups

Takeo Hoshi; Anil Kashyap; David Scharfstein

The Quarterly Journal of Economics, Vol. 106, No. 1. (Feb., 1991), pp. 33-60.

Stable URL:

<http://links.jstor.org/sici?sici=0033-5533%28199102%29106%3A1%3C33%3ACSLAIE%3E2.0.CO%3B2-P>

NOTE: *The reference numbering from the original has been maintained in this citation list.*

LINKED CITATIONS

- Page 3 of 3 -



Agency Costs of Free Cash Flow, Corporate Finance, and Takeovers

Michael C. Jensen

The American Economic Review, Vol. 76, No. 2, Papers and Proceedings of the Ninety-Eighth Annual Meeting of the American Economic Association. (May, 1986), pp. 323-329.

Stable URL:

<http://links.jstor.org/sici?sici=0002-8282%28198605%2976%3A2%3C323%3AACOF%3E2.0.CO%3B2-M>

Diversification, Systematic Risk, and Shareholder Return: A Capital Market Extension of Rumelt's 1974 Study

Michael Lubatkin; Ronald C. Rogers

The Academy of Management Journal, Vol. 32, No. 2. (Jun., 1989), pp. 454-465.

Stable URL:

<http://links.jstor.org/sici?sici=0001-4273%28198906%2932%3A2%3C454%3ADSRASR%3E2.0.CO%3B2-F>

Diversification, Ricardian Rents, and Tobin's q

Cynthia A. Montgomery; Birger Wernerfelt

The RAND Journal of Economics, Vol. 19, No. 4. (Winter, 1988), pp. 623-632.

Stable URL:

<http://links.jstor.org/sici?sici=0741-6261%28198824%2919%3A4%3C623%3ADRRATQ%3E2.0.CO%3B2-6>

Do Managerial Objectives Drive Bad Acquisitions?

Randall Morck; Andrei Shleifer; Robert W. Vishny

The Journal of Finance, Vol. 45, No. 1. (Mar., 1990), pp. 31-48.

Stable URL:

<http://links.jstor.org/sici?sici=0022-1082%28199003%2945%3A1%3C31%3ADMDBA%3E2.0.CO%3B2-6>

Funding Criteria for Research, Development, and Exploration Projects

Kevin Roberts; Martin L. Weitzman

Econometrica, Vol. 49, No. 5. (Sep., 1981), pp. 1261-1288.

Stable URL:

<http://links.jstor.org/sici?sici=0012-9682%28198109%2949%3A5%3C1261%3AF%3E2.0.CO%3B2-8>

Leadership Style and Incentives

Julio J. Rotemberg; Garth Saloner

Management Science, Vol. 39, No. 11. (Nov., 1993), pp. 1299-1318.

Stable URL:

<http://links.jstor.org/sici?sici=0025-1909%28199311%2939%3A11%3C1299%3ALSAI%3E2.0.CO%3B2-3>

NOTE: *The reference numbering from the original has been maintained in this citation list.*