

Working Paper

**Four Rs of Profitability:
Rents, Resources, Routines and
Replication**

Sidney G. Winter

The Wharton School, University of Pennsylvania

WP-95-07
February 1995



International Institute for Applied Systems Analysis □ A-2361 Laxenburg □ Austria

Telephone: +43 2236 807 □ Fax: +43 2236 71313 □ E-Mail: info@iiasa.ac.at

**Four Rs of Profitability:
Rents, Resources, Routines and
Replication**

Sidney G. Winter

The Wharton School, University of Pennsylvania

WP-95-07
February 1995

Working Papers are interim reports on work of the International Institute for Applied Systems Analysis and have received only limited review. Views or opinions expressed herein do not necessarily represent those of the Institute or of its National Member Organizations.



International Institute for Applied Systems Analysis □ A-2361 Laxenburg □ Austria

Telephone: +43 2236 807 □ Fax: +43 2236 71313 □ E-Mail: info@iiasa.ac.at

Preface

The research project on *Systems Analysis of Technological and Economic Dynamics* at IIASA is concerned with modeling technological and organisational change; the broader economic developments that are associated with technological change, both as cause and effect; the processes by which economic agents – first of all, business firms – acquire and develop the capabilities to generate, imitate and adopt technological and organisational innovations; and the aggregate dynamics – at the levels of single industries and whole economies – engendered by the interactions among agents which are heterogeneous in their innovative abilities, behavioural rules and expectations. The central purpose is to develop stronger theory and better modeling techniques. However, the basic philosophy is that such theoretical and modeling work is most fruitful when attention is paid to the known empirical details of the phenomena the work aims to address: therefore, a considerable effort is put into a better understanding of the ‘stylized facts’ concerning corporate organisation routines and strategy; industrial evolution and the ‘demography’ of firms; patterns of macroeconomic growth and trade.

From a modeling perspective, over the last decade considerable progress has been made on various techniques of dynamic modeling. Some of this work has employed ordinary differential and difference equations, and some of it stochastic equations. A number of efforts have taken advantage of the growing power of simulation techniques. Others have employed more traditional mathematics. As a result of this theoretical work, the toolkit for modeling technological and economic dynamics is significantly richer than it was a decade ago.

During the same period, there have been major advances in the empirical understanding. There are now many more detailed technological histories available. Much more is known about the similarities and differences of technical advance in different fields and industries and there is some understanding of the key variables that lie behind those differences. A number of studies have provided rich information about how industry structure co-evolves with technology. In addition to empirical work at the technology or sector level, the last decade has also seen a great deal of empirical research on productivity growth and measured technical advance at the level of whole economies. A considerable body of empirical research now exists on the facts that seem associated with different rates of productivity growth across the range of nations, with the dynamics of convergence and divergence in the levels and rates of growth of income, with the diverse national institutional arrangements in which technological change is embedded.

As a result of this recent empirical work, the questions that successful theory and useful modeling techniques ought to address now are much more clearly defined. The theoretical work has often been undertaken in appreciation of certain stylized facts that needed to be explained. The list of these ‘facts’ is indeed very long, ranging from the microeconomic evidence concerning for example dynamic increasing returns in learning activities or the persistence of particular sets of problem-solving routines within business firms; the industry-level evidence on entry, exit and size-distributions – approximately log-normal – all the way to the evidence regarding the time-series properties of major economic aggregates. However, the connection between the theoretical work and the empirical phenomena has so far not been very close. The philosophy of this project is that the chances of developing powerful new theory and useful new analytical techniques can be greatly enhanced by performing the work in an environment where scholars who understand the empirical phenomena provide questions and challenges for the theorists and their work.

In particular, the project is meant to pursue an ‘evolutionary’ interpretation of technological and economic dynamics modeling, first, the processes by which individual agents and organisations learn, search, adapt; second, the economic analogues of ‘natural selection’ by which inter-

active environments – often markets – winnow out a population whose members have different attributes and behavioural traits; and, third, the collective emergence of statistical patterns, regularities and higher-level structures as the aggregate outcomes of the two former processes.

Together with a group of researchers located permanently at IIASA, the project coordinates multiple research efforts undertaken in several institutions around the world, organises workshops and provides a venue of scientific discussion among scholars working on evolutionary modeling, computer simulation and non-linear dynamical systems.

The research focuses upon the following three major areas:

1. Learning Processes and Organisational Competence.
2. Technological and Industrial Dynamics
3. Innovation, Competition and Macrodynamics

**FOUR Rs OF PROFITABILITY:
RENTS, RESOURCES, ROUTINES AND REPLICATION**

Sidney G. Winter*

The Wharton School

This paper seeks to connect related strands of thought in evolutionary economics and the resource-based view of the firm. Although conceived primarily as an approach to the descriptive analysis of the firm and industry, evolutionary economics offers a distinctive view of the firm that is adaptable for the purposes of normative analysis (Winter, 1987). The resource-based view, as it has been developed in the strategy literature, seeks to derive normative guidance for business decision making from a deeper understanding of the sources of interfirm profitability differences (Wernerfelt, 1984; Rumelt 1984). It interprets these as reflections of differences in streams of rents and quasi-rents accruing to firms, which in turn are attributed to differences in the control and management of strategic resources.

Both approaches place major emphasis on the heterogeneity of the population of business firms and on the sources of that heterogeneity in the idiosyncratic internal features of individual firms (Rumelt, 1984; Nelson, 1991). Although the focal issues differ somewhat, there are areas of substantial overlap.

A prominent example of such overlap relates to the nature and sources of productive competence in the individual firm. In evolutionary economics, a business firm is first and foremost an

organization that knows how to do something. In the resource-based view of the firm, the scope of the term "resources" is certainly broad enough to include the knowledge underlying the firm's productive competence (Wernerfelt, 1984).

The heart of the normative guidance offered by the resource-based view lies in the idea of leveraging the idiosyncratic profit opportunities latent in existing resource endowments. When the resources in question are productive routines, such exploitation often takes the form of replicating the firm's routines in the quest for greater profit through growth, a process that is a central feature of evolutionary economics. These relationships between the two approaches suggest an inviting target for further inquiry, and a "compare and contrast" analysis of this area is the general purpose of this paper.

Agenda. The strategy field has its "5 forces" analysis and its "7-S" framework; this paper has a "4 Rs" theme: rents, resources, routines and replication. Routines are the building blocks of organizational capability. As such, routines clearly qualify as resources, given the expansive use of the term "resources" in the literature of the resource-based view. On the other hand, resources in a narrow sense (e.g., appropriately specialized labor and machinery) are requisites of the performance of most routines, and the knowledge underlying a routine is embodied or embedded to a large extent in its associated human, physical and organizational capital. The first objective here is to further explicate this routines/resources relationship.

The next step is to fit the rents and replication pieces into the profitability picture. An emphasis on replication, and on the types of resources that can be exploited through replication, differentiates the evolutionary approach from the resource-based view. Replication of profitable routines is only one approach to leveraging the profit opportunities latent in an initial resource endowment. Compared, however to the broader idea of "leveraging," it is relatively specific in its content and implications.

The 4 Rs discussion turns up two sets of issues that deserve closer analysis. Both have to do with appraising the results of the quest for profitability. The first set relates to the problem of conceptualizing and measuring profitability itself, and the second to the problem of appraising the social implications of profit-seeking behavior. Both sets include some difficult analytical and conceptual issues. An exploratory treatment of these matters occupies two sections of the paper. A brief concluding comment looks again at the wider horizons of the subject.

Throughout, this paper builds on contributions in the prior literature of the resource-based view, going back to Penrose (1959). As suggested above, the discussion here is narrower in focus than most of the resource-based literature, emphasizing resources and processes that are closely related to themes in evolutionary theory. The hoped-for benefits of this narrowed focus include a sharper view of certain issues, and the establishment of the clearest possible connections to the treatment of the corresponding issues in evolutionary economics.

ROUTINES AND RESOURCES

The definitions of key theoretical terms are often rather broad and hazy; ample room is left for pragmatic adjustment as new problems are addressed. This pattern is well illustrated by the cases "resources" and "routines." Wernerfelt (1984) explains that the term "resources" embraces "... anything that could be termed a strength or weakness of a given firm" -- "... (tangible or intangible) assets which are tied semi-permanently to the firm...." Subsequent discussion in the literature has emphasized the resources that underlie competitive advantage ("strengths"), and has sought to identify the characteristics such resources must have if success is to be sustained. The term "routine" has been used in evolutionary economics in a similarly expansive fashion. Nelson and Winter (1982) say that "... most of what is regular and predictable about business behavior is plausibly subsumed under the heading "routine," especially if we understand that term to include the relatively constant dispositions and strategic heuristics that shape the approach of a firm to the non-routine problems it faces." (p. 15).

Given the expansiveness of these definitions, the existence of a substantial overlap should come as no surprise. At a micro level, a routine in operation at a particular site can be conceived as a web of coordinating relationships connecting specific resources; without those resources it could not exist. Considered as an abstract activity pattern, however, "that same routine" may be in operation also at a different site, where a different but similar set of resources is coordinated by a very similar web of

relationships: the routine has been replicated. This suggests that the routine per se -- the abstract activity pattern -- is itself a resource.¹

In the context of strategic decision making, the two terms have different connotations. "Resources" suggests an inventory of items whose relationship to decision options requires definition through strategic analysis. By contrast, "routines" connotes a menu of previously learned patterns of action. Typically, some of these patterns have acquired the status of default options: they are carried out in the absence of an explicit decision to the contrary. Deliberate decision making (when it occurs) often takes the form of a choice from the prevailing menu of routines. It can, however, take less structured forms as well, such as the development of an intention to expand the menu in a particular direction.

Diversity of resources and management challenges. The preceding paragraphs attempt to capture what can be said about the general conceptual relationships between "resources" and "routines." This paper, however, aims not at a comprehensive treatment of these relationships, but at a careful examination of some of the issues that are specific to the overlap between the two concepts. Some types of resources are more relevant than others in this connection, and a preliminary task is to pick out from the broad array of "resources" the types that are most closely linked to "routines."

In the literature of the resource-based view, a broad range of resource types has been mentioned by way of illustration. There is a corresponding diversity in the managerial tasks required for the

effective development and exploitation of the different resources. Defending the intellectual property represented by a patent position is quite a different undertaking from defending the team-embodied skills of the professionals in the R&D lab, which is in turn quite different from defending the team-embodied skills and specialized assets of the assembly line. When reputation is at stake, it is not so much the legal context as pragmatic understanding of human nature and of the media environment that is the issue. Also, while a reputation for toughness may be generally valuable, it must be developed and exercised quite differently with respect to rivals, suppliers and workers. Different types of resources thus pose quite different managerial challenges, and may be strategic or "critical" to quite different degrees (Wernerfelt, 1989)

Although the specific challenges differ widely across resources, they typically involve both a static aspect and a dynamic aspect. The static aspect consists of employing the resource to generate a flow of quasi-rents in the near term. In the explanation of interfirm profitability differences at given point in time, it is this static aspect of differing resource endowments that dominates the picture. The most interesting strategic issues, however, involve the dynamic aspect -- the challenge of leveraging the existing resource position into a more favorable future position (Diericks and Cool, 1989; Kogut and Zander, 1992). This challenge in turn has different components, among which the following three may be identified: (i) the speculative component, where superiority involves a better eye for resource value, (ii) the developmental

component, where advantage inheres in a superior ability to amplify the contributions of present resources and expand existing lines of activity, and (iii) the creative component, which consists of the ability to combine resources in novel ways and establish new activities. It is in addressing the dynamics of resource exploitation that one finds the strongest complementarities between the resource-based view and evolutionary economics -- and also between those two and the synthesis dubbed the "dynamic capabilities approach" by Teece, Pisano and Shuen (forthcoming).

Montgomery (1992) provides a good illustration of the static-dynamic distinction in an exposition featuring the Disney cartoon characters as a key resource of Walt Disney Company; her example also serves well to illustrate the role of creativity.

From the static viewpoint, the value of this type of resource is fundamentally a matter of intellectual property law. If there were no way to prevent rivals from doing a knock off copy of any Mouse-related product, then there might be esteem but there would be little profit in the claim to offer the One and Only Original Mickey Mouse. In fact, however, the law does protect the profit potential of that claim and the corresponding claims with respect to other characters. Given the protection of that institutional frame, however, the Mouse and his friends cannot merely reproduce indefinitely in the form of any given product, but also mutate into entirely new forms.² This possibility illustrates the dynamic aspect of the profit opportunity inherent in the Disney characters: how can human creativity be applied to exploit these profit

potentials in ways that are ever-new in detail, and responsive to ever-changing circumstances?

Montgomery's example nicely illuminates the subtlety of this dynamic aspect. On the one hand, it is clear that the Disney characters are a very valuable resource indeed. On the other hand, just how valuable it is probably depends fundamentally on the effectiveness with which human creativity is mobilized to expand its applications. Because of the inherent uniqueness of creative achievement, the amount that analysis from the strategic management viewpoint can contribute much to such an undertaking is open to question. At the same time, the example also serves well to illustrate the point that the concerns of the resource-based view are broader than those addressed in this paper: here, more attention is given to the relatively prosaic developmental component of resource dynamics than to the creative component.

Team-embodied skills as the focal example. The type of resource to which this discussion relates most directly is team-embodied skills, and the corresponding routines are the activities in which the team exercises those skills repetitively. Illustrative settings might include an assembly line, the back office operations of a financial institution, a fast food counter, a construction site, an airport gate, or a football field, to name but a few. There are several related propositions about these situations that derive from the basic understanding of skills and routines developed in evolutionary economics; all touch on the central point that routines and supporting skill packages are a key repository of

knowledge in the firm: the firm "knows how" to do something because it commands the appropriate routines.

Organizational command of a routine is not reducible to the level of individual skills, because the context of each individual performance includes the performances of other members; learned patterns of interpersonal coordination are the basis of team performance.

By the same token, command of the routine does not reduce to the resource "team-embodied skills" because there is more to the context of individual performance than just the performances of other team members. Heading the list of these other contextual features are the equipment and facilities (appropriately arranged and installed) that establish the physical setting; next come the information flows from the environment that trigger particular performances. But the list of possible context dependencies continues more or less indefinitely.

The fact that the appropriate details of individual performance are linked to highly specific contexts implies that the required constituent resources are not available as such in the marketplace. The requisite mutual consistency of individual contexts is the product of organizational learning and other processes that reshape the skills of individuals after they have joined the organization. "'Generic labor' is rented in the market; firm-specific skills, knowledge and values are accumulated through on the job learning and training." (Dierickx and Cool, 1989, p. 1504).

The knowledge and information-related aspects of inputs joined

in a productive routine represent territory that is largely unexplored by economic analysis. Following the classic exposition of information economics by Arrow (1962), most scholars have recognized that information is not an ordinary economic commodity subject to ratio-scale measurement, but something with an economic logic of its own. Central to this logic is the contrast between high costs of initial creation or acquisition and costs of reproduction that are so low as to be considered negligible. At the opposite conceptual pole from Arrow-type information are service flows of generic inputs, whose potential for contributing information to the production process is left implicit in their definition, description or index number. For these inputs, ratio-scale measurement is thought to be non-problematic. Team-embodied skills occupy an intermediate position between these poles. They do embody significant information and their initial creation involves corresponding up-front costs -- characteristics of Arrow-type information. On the other hand, like ordinary inputs, they are required in production on a continuing basis in some ratio to the level of activity, and the costs of additional units do not become negligible after the first unit is acquired. As for ratio-scale measurement, it is certainly feasible to measure the service flows in terms of the time put in; economically significant ambiguity nevertheless arises because the definition, observation and measurement of the relevant skills are all problematic. This ambiguity may result in significant transactional hazards because of the buyer's inability to ascertain what he or she is buying.

Resources with these characteristics occupy a central position in evolutionary economics and the resource-based view of the firm; team-embodied skills provide the most straightforward illustration of the general analytical issues involved. One issue in particular is central to the discussion of replication that follows -- the character of the process by which new members acquire their skills, or by which new similar teams are created. Frequently, this instruction process places demands on the time of individuals already possessing the skills, and thus involves a short term sacrifice in terms of the availability for current production of skills of the very type that the firm seeks to expand. More generally, the instruction process relies on some resources idiosyncratic to the firm, if not literally on the members of some "template team."

REPLICATION AND RENTS -- AND MONOPOLY RETURNS

Because appropriately specialized input resources cannot simply be purchased on markets, the firm's use of a profitable routine is limited in the "short run" by its available stocks of those resources, if by nothing else. The mix of activity may be subject to routine adjustment, but individual activities are always subject to upper bound constraints set by the availability of the input service flows containing coordinating information.

Over time, however, the firm can typically augment its stocks of all of the requisite resources. It can acquire and install new units of specialized equipment, or produce these itself. Most

importantly, it can develop new supplies of the team-embodied skills capable of coordinating the routine. It can therefore replicate existing activity patterns on a larger scale. In the conceptually simplest case, this means starting up a new plant with capabilities that are intended to be substantially identical to those of the original, "template," plant. Such a replication effort involves not merely the establishment of the appropriate physical setting, but also the replication of a hierarchical structure of organizational routines. Of course, even if exact replication is aimed at, it will never be fully achieved in practice, and a number of variables will affect its actual precision. In many actual cases the objective is not exact replication but partial replication, accompanied by adaptive or innovative change in some routines.

The analysis of replication presents a number of interesting and challenging issues. In the strategic management literature, most of the illumination of the subject has been indirect, reflected from inquiries into the problems facing a rival who aspires to imitate a profitable performance where productive knowledge is not codified (Lippman and Rumelt, 1982; Barney, 1986, 1991; Reed and DeFillippi, 1990). Less severe versions of the same problems confront the effort to replicate a productive performance within the boundaries of the same firm, but these have received less attention. It has been noted, however, that there are subtle and important considerations linking imitation, replication and the problem of sustainable advantage (Winter, 1987; Kogut and Zander, 1992; Zander and Kogut, forthcoming). And recently, the problem of replication

of routines has been closely studied in its own right, under the heading "intra-firm transfer of best practices" (Szulanski, 1994).

Here, the focus is on the point, noted above, that the replication of routines typically requires support from the firm's existing stocks of idiosyncratic resources. This requirement arises because productive knowledge is not fully codified and the generic labor inputs available on the market do not command the coordinating information specific to an individual firm's routines. For example, the design of a new production line may draw on the expertise of engineers whose normal duties consist primarily of trouble-shooting and incremental adaptation of the prevailing routine. The latter role is likely to endow them with just the sort of tacit knowledge needed to create a good design for the new line, knowledge that is not likely to be possessed by newly hired engineers.³

There are implications of two related kinds. First, the availability of idiosyncratic resources constrains the rate at which routines can be replicated, and also imposes opportunity costs of replication. These considerations bear on the technically feasible and economically appropriate rate of growth of the firm as a whole. Penrose (1959) emphasized this causal nexus but focused almost entirely on managerial resources. Rubin (1973) provided a formal statement of the problem in the framework of the economic theory of production, and related theoretical issues were addressed at a more abstract level in the adjustment cost theory of investment (Lucas, 1967; Gould, 1968; Treadway, 1970)

Second, the value of idiosyncratic resources to the firm -- i.e., the present value of their future rent streams -- is affected by the fact that their possible uses include development of more idiosyncratic resources. In simple cases this involves production of more resources of same type, but analogous issues arise when resources are creatively applied to extend the capabilities of the firm (Kogut and Zander, 1992; Teece, Pisano and Shuen, forthcoming). In many cases this source of value may greatly outweigh the present value of directly productive service flows; such situations illustrate most strongly the role of idiosyncratic resources as explanations of long-term advantage. In a hypothetical world of fully codifiable knowledge and costless replication, this additional value would be associated with the knowledge per se (the ability to supply a flow of Arrow-type information), and the competitive advantage obtained would depend on the effectiveness with which the firm could protect this intellectual property. In the world of uncertain imitability and costly replication, the ability to conduct the activity on a large scale in the future depends on the scale at which it is currently conducted, and the rents to superior knowledge are assignable to the underlying scarce resources. The extent to which these idiosyncratic resources may be tradeable, and the characteristics of the markets for them (if any), becomes an important factor in the equation governing the sustainability of competitive advantage (Dierickx and Cool 1989, Peteraf 1993).

To avoid the need to allocate its existing idiosyncratic

resources to support replication, the firm might attempt instead to repeat the original learning process underlying the routine. Because of the context and path-dependent character of learning, what this would create would not be a copy of the template but a new routine that might, with luck, serve the same purposes (Levinthal, 1994). In almost all cases, such an approach would involve substantially higher costs: the basic distinction between the first and subsequent copies in Arrow-type information economics argues for replication; in a similar sense, so do the sunk investments in learning that the firm made in moving from its initial trials to a functioning routine. Further, reinvention would involve the acceptance of greater uncertainty regarding the time at which the new capacity would be available, as well as uncertainty regarding operating costs, output quality, and similarity to the existing routine.

These latter uncertainties imply that, quite apart from the costs of reinvention de novo, the economic considerations that would typically motivate replication may simply not apply to reinvention. The profitability and quality performance of the existing routine are not likely to be predictive of the reinvented one; and the latter is likely to require accommodating changes in complementary routines that would not be needed under replication. In short, while reinvention may be a plausible alternative to abandoning the activity accomplished by an existing routine, it is not generally a plausible alternative to replication when the goal is to seize a larger share of an extant profit opportunity successfully exploited

by the prevailing routine.⁴

To explore the role of replication in the history of an individual firm, consider a hypothetical business that has attained, for the moment, a competitive advantage over its rivals. This advantage derives from an innovative product or process that the firm has successfully embodied in a stable routine; the routine is in operation at an initial scale at some particular geographical site.⁵ The operation is earning above normal returns in the following specific sense: if the operation could be continued indefinitely into the future, and current price relationships continue to prevail, the net present value of the resulting future cash flow stream would be positive (and substantial relative to the assets committed) when discounted at the firm's cost of capital. Implicit in this calculation is the assumption that the firm is capable of temporal replication of the routine at the initial site: it can replace equipment when appropriate, it can also hire new employees (up to and including the CEO) to replace those who quit or retire, and impart to them the skills required for them to play their roles in the continuing routine. (Note that any one-time costs of the original creation of the routine are sunk and do not affect this calculation; profitability in this forward-looking sense is therefore compatible with an overall loss when those one-time costs are included.)

The question is, what might happen next? From the initial position just described, a number of different scenarios might follow. In each scenario, a range of interrelated analytical issues

are illustrated; different scenarios give different prominence to the various issues. Among these are (i) descriptive issues: which scenarios are most likely, or best typify how the economy generally works? (ii) prescriptive/normative issues at the firm level: what guidance can be offered to the firm if it is seeking the largest possible returns attainable from this initial position? (iii) normative issues at the societal level: what contribution to society is the firm making, and how might that differ according to the particular actions of the firm, or the policy context in which it operates?

So far as the descriptive issues are concerned, the evolutionary economics view in its simplest terms emphasizes the following scenario: profitability is likely to be reflected in growth; growth is likely to involve a substantial component of replication or partial replication of the routine underlying the initial success, and that growth will ultimately end, quite possibly because excess returns are competed away by imitating rivals. Although there are many other possible scenarios, that one is focal.

The prominence given to this scenario reflects an implicit judgment that information-embodying idiosyncratic resources are typically a key factor in success. If the initial success were a matter of arranging untutored generic inputs according to a fully codified success formula, one would expect imitation to appear promptly, unless the formula can be protected by intellectual property law or secrecy. On the other hand, if the underlying resources that account for initial success have no component of

(Arrow-type) information to them, then replication is not a way to leverage the initial success because the initial position confers no informational advantage over rivals. (Perhaps, in fact, there is no way to leverage that success). The normative advice that evolutionary economics derives from this descriptive account is this: when successful, copy yourself before others copy you.

Further, evolutionary economics suggests that a firm with a profitable routine in hand has an inherent advantage in pursuing this strategy, by virtue of its superior access to the successful "template" example (Nelson and Winter, 1982, pp. 118-124). This advantage is particularly significant when the existing routine involves tacit skills or otherwise resists codification. To the extent, however, that the tacitness derives from the limited "causal depth" of knowledge or "causal ambiguity" of the original success, contextual differences between the template and the new site may impede replication (Nelson and Winter 1982, Lippman and Rumelt 1982, Winter 1982).

The resource-based view offers normative suggestions that are more comprehensive than the evolutionary view, but also less focused. It would suggest that the profitability of the firm in the initial position is attributable to its ownership of some resource, but the resource need not be a replicable routine. At one extreme, the resource might be something like the Disney characters; the most profitable form of "replication" requires a substantial dose of added creativity. At the opposite (mundane) extreme, the resource might be a unique physical asset -- a high grade ore deposit, for

example. Whatever opportunities may exist for leveraging this resource cannot take the form of replication, since it is non-replicable by definition.

The resource-based view also stresses the point that imitation by rivals poses a threat to long-term profitability, and urges reliance on resources that are not susceptible to such imitation. Partly because such defenses are rarely perfect, the initial competitive advantage may not be sustainable indefinitely -- but that is no reason to refrain from exploiting it vigorously in the medium term. In this sense, the emphasis the strategy literature gives to sustainable advantage may have the unintended consequence of diverting attention from the effective pursuit of transient rents.⁶ Finally, there is the possibility that the profitability of the initial position is derived from market power. This would have implications for the answer to the "what next?" question; in particular, it might eliminate replication as an approach to leveraging profitability. And it obviously bears also on the normative assessment of the situation at the societal level.

Analytics of scarcity rent and market power. These various strands can be pulled together with the aid of a simple analytical framework illustrated in Figure 1. The diagram portrays the cost and demand conditions facing the profitable firm posited at the start of this section. Assume that the firm produces output by combining N different inputs in fixed proportions. If all inputs were increased by the same percentage, output would increase by that percentage: constant returns to scale prevail so far as production

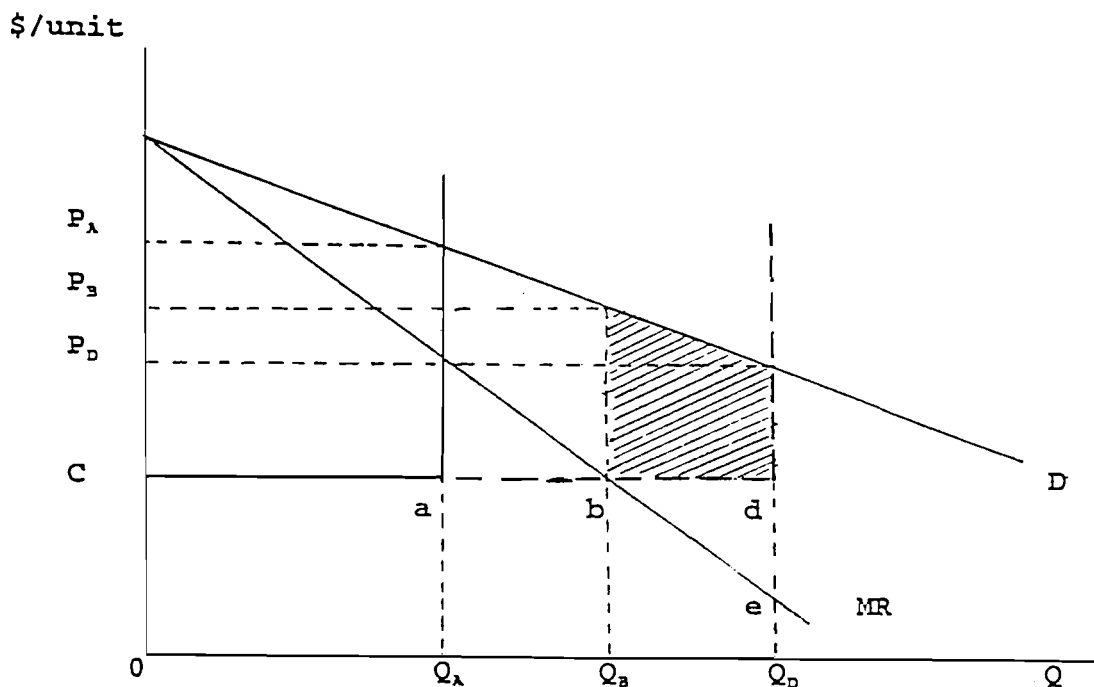


Figure 1. Scarcity Rent vs. Output Restraint

technique is concerned. All but one of the inputs is available in the market at given prices, in whatever amounts the firm might desire. Taken together, these $N-1$ inputs account for costs of C per unit output. The analytical focus is on the N th input, which is available to the firm in a strictly limited amount. For convenience, call this N th input the "constraint input."

The diagram is subject to different interpretations according to the nature of the constraint input. Suppose initially that the

constraint input represents the classical type of rent-earning resource -- specifically, land with attributes uniquely appropriate to the production of the output whose demand curve D is shown in the diagram. Suppose also that the diagram portrays a "long run" analysis: the $N-1$ inputs may include facilities that are fixed in the short run, as well as short-run variable inputs, but in the long run all these inputs are variable. The firm in question owns the entire world supply of this unique resource, and is on that account a monopolist in the output market. Its profit-maximizing course of action is to fully utilize the constraint input, which suffices for Q_A units of output. Up to that level, the additional revenue obtained from production and sale of another unit, given by the MR curve, exceeds the marginal cost C , and beyond that level it is impossible to go. By producing at that level, the firm obtains revenue of $(P_A - C) Q_A$ in excess of the amount required to pay for the first $N-1$ inputs. If the firm is equity financed, it can use those funds to pay dividends. An efficient capital market will price the firm's stock so that those dividends represent normal returns.

What is the economic nature of this surplus? The firm clearly has market power: it is a monopolist in the output market, based on its "sustainable advantage" in the form of exclusive control of an essential input, and it could restrict output and raise price. What it does not have, however, is an incentive to restrict output. Its profit-maximizing output is the same as a competitive industry would choose. If the control of the constraint input were divided among

numerous atomistic competitors, their competition would bid the price to $P_A - C$. At that price, the circumstances of the availability of the constraint input would look the same to an individual competitor as those of any other input; any amount it might (practically) want would be available at the market price.

Monopolistic market structure and "sustainable advantage" notwithstanding, the foregoing considerations point clearly to the following conclusions: (i) the difference $P_A - C$ is properly interpreted as a scarcity rent, (ii) the maximized economic profit is zero since the scarcity rent is simply the normal flow return on the properly calculated value of the asset. (iii) there is no efficiency loss from monopoly in this case.⁷

Consider now a situation differing from that just described in a single respect: the amount of the constraint input is large enough to support output Q_D . In this case, the monopolist does have an incentive to restrict output, specifically, to Q_B . This restraint increases the excess of revenue over cost by the amount equal to the excess of $(P_B - C) Q_B$ over $(P_D - C) Q_D$.⁸ The profit from output restraint is attended by an "efficiency" (total surplus) loss corresponding to the shaded area; output units potentially producible at C and valued by buyers in the range P_D to P_B are foregone. Thus "market power" is a real factor in the situation: it both augments net revenues relative to a competition-mimicking result and imposes an efficiency loss. As a matter of terminology, however, it seems appropriate to identify only the net revenue increment from output restraint as a monopoly profit, since the

scarcity rent $(P_D - C) Q_D$ would also accrue under competitive organization of the industry.

For a second interpretation of Figure 1, suppose now that the constraint input is a firm-specific idiosyncratic resource, such as the team-embodied skills that underlie the firm's capability to produce its product. The different quantities of the constraint input now correspond to different short run situations with respect to the availability of these skills. There may perhaps be other inputs that also involve durable commitments, but it is the skills package that imposes the significant constraint on the rate at which output can be adjusted. Assume the firm can replicate the skills; it is simplest to assume here that although this replication is costly and time-consuming it does not impose an opportunity cost in foregone output. At a point in time when the available skills supply supports output level Q_A , the skills earn a quasi-rent for the firm. And here again, although symptoms of market power are clearly present, the return is not affected by output restraint and in that sense is not a consequence of the market power in the output market.

Over time, the firm could replicate the skills and, if it wished, produce output level Q_D . But if the situation remains as displayed in the diagram, it obviously will not want to move beyond Q_B . In fact, it will stop somewhere short of that output level because of the positive costs of replicating the constraint input. Thus, in this "dynamized" interpretation of the diagram, the firm starts in an initial region where output restraint is no issue,

replication is focal and the returns are plainly scarcity rents, and moves over time to a region where further replication is not desired, accurate assessment of demand conditions is focal, and returns are a mix of scarcity rents and monopoly returns.

The foregoing account neglects the first phase of this stylized historical episode, the period when the initial level of the constraint input was acquired through development of a new routine, purchase of a piece of land, or whatever. To assess the overall profitability including that first phase, one would need to know not only the information implicit in the diagram, but also the original investment costs that gave rise to this idiosyncratic resource, the replication costs, the time rates at which everything happens, and the relevant cost of capital.

Another variant of the story arises if the process is so esoteric or context-dependent that profitable replication is costly or impossible. For example, the effectiveness of the process might depend on features of its original location that are unique, or inadequately understood, and the market might be geographically segmented. In such a case, one might expect the operation to become sized relative to its original local market in a way that exploited some market power there, and perhaps transferred to a few other favorable locations. This is a more complex form of leveraging the key resource underlying the profitable initial position. Here, the absence of larger scale replication is not a reflection of monopoly restraint but of natural barriers to replication.

Missing from the above stylized account is the strategically

important question of how long the situation depicted is likely to last. Various things can happen on the way from Q_A to Q_B , and a sensible firm will want to consider these scenarios as it chooses a path. Other firms may succeed in imitating the process or coming up with a substitute product; the demand curve shifts down and flattens, costs become focal and the mirage of a future regime of output restraint fades away. Alternatively, knowledge of the firm's product diffuses and the demand curve shifts to the right, with the result that the regime in which replication is the key activity is extended (although an output restraint regime may remain visible in the distant future). Or, the firm itself may extend the duration of the replication regime if it succeeds in lowering C .

Classification of returns. The foregoing analytical exercise indicates that the economic and strategic issues surrounding idiosyncratic resources involve an interweaving of themes emphasized in evolutionary economics, the resource-based view, and standard economic analysis. The resulting picture is complex, especially considering the highly stylized nature of the initial framework. The various mechanisms alluded to in the analysis are quite general, but others were passed over because they do not fit easily into the stylized picture presented by Figure 1. This section presents a more comprehensive and qualitative summary of the issues, schematically organized in Figure 2.

A slightly amended version of the premise of the preceding analysis serves to organize this summary. Whereas the discussion of Figure 1 proceeded by contrasting a "team-embodied skills"

interpretation with other interpretations of the constraint input, this section acknowledges that multiple obstacles to leveraging a profitable position may be present simultaneously.

The first question to be asked is whether the innovator possesses a replicable routine. The answer may be no -- a situation corresponding to the left branch of Figure 2. The reasons may be (i) characteristic of the site (an ore deposit of distinctive quality and other attributes, or a resort locale in a unique natural setting). Alternatively, (ii), the obstacles to replication may lie in the cognitive and motivational characteristics of the routine considered as a problem solution -- complexity, tacitness, lucky outcomes in highly path-dependent organizational learning, a strong high-performance culture, and so on. Or, (iii), interactions of the routine with its site may be involved: the features of the routine that resist replication may be the determinants of its effectiveness in coping with the particular flow of micro-problems characteristic of the site -- short-term variations characteristic of the site's particular raw material sources, environmental contaminants, labor pool, or customer population.

Whatever the reason for the lack of replicability, the consequence is that the innovative routine is of determinate scale. Demand conditions then determine whether this scale is small or large relative to the market, and, closely related, whether demand elasticity is large or small. If product attributes are not unique, and if transportation costs are not a major factor, the likely case

**Efficiency-enhancing
innovation
(initial scale, initial site)**

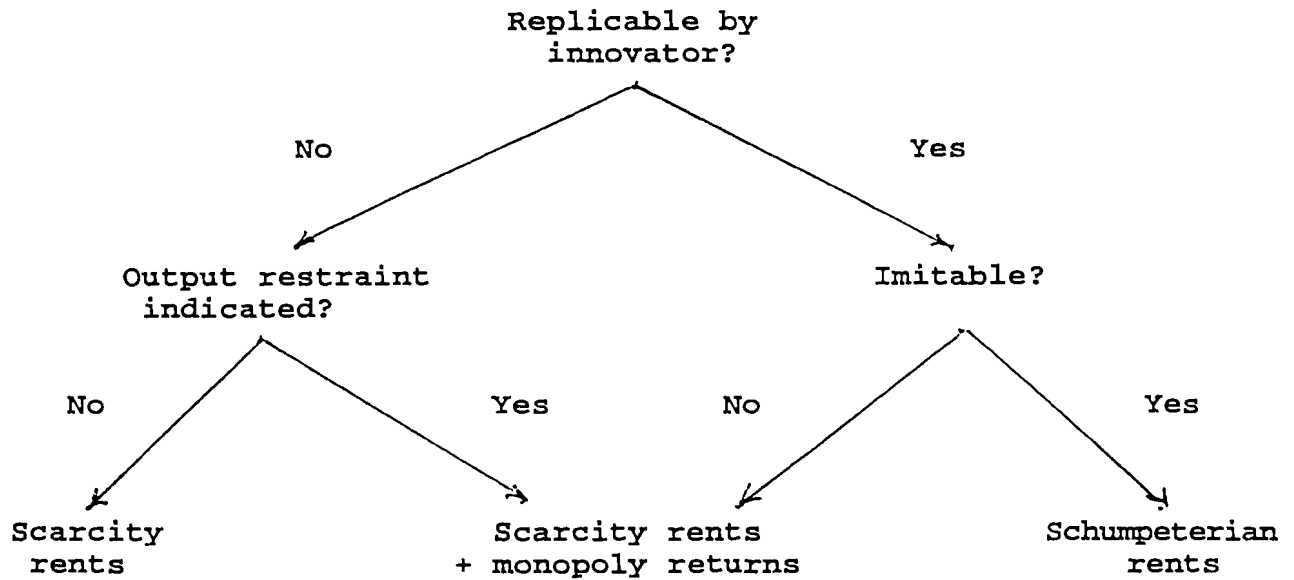


Figure 2. Classification of returns

is that the scale is small and the demand highly elastic. At the extreme, this is one output source out of many in a world market. The economic outcome is of the type illustrated by Q_A in Figure 1: there is a flow of return that is of the nature of a Ricardian rent to the scarce resource represented by the routine. The presence of this source of supply may affect the price, as it does in Figure 1, but not to the point where output restraint becomes an issue.

If product attributes are sufficiently unique or other

considerations limit the extent and elasticity of demand, it is conceivable that the initial scale might exceed the long run profit-maximizing level. This is illustrated by the position of Q_b in Figure 1. Considerations of output restraint come into play in the sense that incentives for down-sizing exist. A response to those incentives might well present hazards for the stability of the routine, since, for example, different task allocations would be required in a smaller workforce. Also, an adequate analysis of the economics of such a situation would involve attention to the distinctions among variable, fixed and sunk costs, and also to the possibilities of price discrimination. (Consider a new resort hotel in a unique location, built and staffed at so large a scale that it cannot be kept full at a profit -- a potential "white elephant.") Thus, it is not entirely obvious that the ultimate outcome closely approximates the one illustrated by Q_b in Figure 1. If the returns realizable (on a forward-looking basis) are sufficient to make the operation viable with some room to spare, they are interpretable as a mix of scarcity rents and monopoly returns.

These two outcomes correspond to the left hand branch of Figure 2, with output restraint involved only in the second. The structure of the diagram reflects a basic proposition of evolutionary economics that was mentioned previously: replication of an established routine is much easier than imitation, because the imitator does not have the advantage of full access to the template (assuming the imitatee is not cooperating with the effort). Thus, it is assumed that a "no" answer on the feasibility of replication

implies the same answer for the feasibility of imitation. By contrast, on the right hand of Figure 2, the "yes" answer on replication poses the imitation question as the follow-on.

Figure 2 presumes that, if replication is possible, it continues until the economic incentives for it have been eliminated. The elimination of these incentives can occur by two basic mechanisms, leading to two end conditions that are distinguished by the different returns received by the innovating firm. At one extreme, on the right hand side of the diagram, imitation sooner or later produces something approximating textbook competition, and hence zero economic profit from a forward-looking point of view. Looking forward, the once-innovative routine and the techniques for replicating it become known sufficiently widely so that this knowledge, per se, no longer commands a significant scarcity rent. Resources that are routine-specific continue to be involved, perhaps to an even greater degree than in the early days of the innovation. But since the nature of these resources and the methods for creating them are sufficiently widely understood, the logic of investment in these routine-specific capabilities is entirely conventional.

It should be emphasized again that this analysis say nothing at all about how the innovator fared in the episode as a whole. Looking backward, the balance between initial investments and the pace of imitation are key determinants of the temporary excess returns received by the innovator (the level of Schumpeterian rents). Given the size of the initial advantage the innovation confers, low investment in creating it and slow imitation spell

greater financial success for the innovator.

The other possibility is that imitation does not occur, at least not in such a way as to leave the innovator with a future prospect of only normal returns. In this case, the innovating firm has significant control over the scale at which the innovation is implemented in the long run. Failure to take account of the limits of the market when exercising this control would be tantamount to the firm's competing with itself to bring its own economic profit level to zero. Thus, the innovator will want to approach a result represented by Q_B in Figure 1. This stylized representation hardly suggests the complexity of the problem, however. In typical cases where geography and transportation costs matter, and there are significant differences in the local economic environments at the different sites where the routine might be established, the replication of the routine will typically involve its adaptation as well. The problem of appropriate scale may be faced many times over in isolated markets, or, more complex still, in a series of markets that are distinguishable but interconnected. The aggregate scale achieved through replication may itself induce change because of the managerial challenges it presents and the new scale-related innovative opportunities it reveals.

In the end, as concluded in Figure 2, the assumed absence of multiple competitors willing and able to do the same thing implies an element of output restraint and monopoly returns at the long-run position to which the firm is headed. An analysis of the full episode in present value terms might well reveal, however, that

these persistent monopoly returns are a minor factor compared to the scarcity rents received in earlier phases of the replication path (Q_1 - type conditions).

ASSESSING PROFITABILITY: CONCEPTS AND MEASURES

Although the field of strategic management has been informed increasingly from economics over the past two decades, surprisingly little attention has been paid to the basic question of what "profitable" really means. Economists worked hard for a couple of centuries to arrive at analytically useful meanings of terms like "cost," "rent," and "profit." Although this protracted effort produced something short of a full consensus regarding appropriate theoretical terminology, it certainly generated a sophisticated understanding of many of the issues involved. That understanding has infiltrated the strategic management literature only recently, however.⁹

In general terms, at least, there seems to be a strong consensus that profitability is central to what the strategic management field is about. Many would endorse the statement that "The fundamental question in the field of strategic management is how do firms achieve and sustain competitive advantage." (Teece, Pisano and Shuen, 1994, p. 1). "Competitive advantage" is typically defined as superior financial performance. Beyond this point, however, conceptual clarity starts to fade. The idea of superior financial performance may be evoked by a range of phrases such as

"above normal returns," "high quasi-rents," "value creation" and other near-synonyms for "making money." For empirical work, a more operational definition of "making money" is needed. Numerous alternatives are available and have been selected in one study or another (sometimes with little discussion of their appropriateness): for example, returns on assets, return on equity, total return to investors, Tobin's q ,¹⁰ and others.

To develop a stronger theoretical grounding for the discussion of profitability, it is important to note first that economists have developed a relatively clear idea of what an economic cost is: it is an opportunity cost in one sense or another. There is less terminological clarity regarding returns in excess of costs, such as profits or rents, partly because different perspectives on the opportunities referenced in opportunity cost lead to different perspectives on whether a return is "excess". For example, the return measured by $(P_A - C) Q_A$ in Figure 1 is a "rent from the point of view of the industry" when the industry is competitively organized, but certainly is not an excess return at the individual firm level; the firm has to pay the market price, reflecting the foregone opportunity to use the resource in another firm.

The importation of profitability concepts from economics into strategic management faces three substantial difficulties. The first problem is that an abnormally high return in economic theory is generally measured against a social opportunity cost standard -- a standard that has little relation to the business world's meaning of profitability. For example, a monopoly acquired at a price

reflecting the present value of its future returns is still a profitable monopoly by the economist's standards. The fact that it yields only a normal return to its investors has nothing to do with the economic case, but everything to do with the strategic management case (cf. Barney, 1986). The second problem is that those economic concepts reside most comfortably in the abstract world of those regions of economic theory characterized by complete and perfect markets, optimization and equilibrium. They are somewhat alien to the world of flux, uncertainty and strategic moves that the strategic management literature seeks to address. Finally, the available quantitative measures of financial performance, based either in accounting data or securities markets valuations, generally lack a coherent rationale in terms of the analytical needs of either economics or strategic management.¹¹ (Of course, some measures are better than others: "earnings per share" is little more than a trap for the unwary; measures like total return to investors and Tobin's q have problems, but of far smaller magnitude.)

Among the specific conceptual issues evoked but not thoroughly discussed in the previous section, the first that deserves scrutiny is whether ownership of a resource that earns a Ricardian scarcity rent should be considered, by itself, to confer competitive advantage. (This situation corresponds to the first interpretation offered for Figure 1, and to the far left-hand branch of Figure 2.) Many authors suggest an affirmative answer. For example, Porter's (1980) discussion of barriers to entry includes the following:

- "● Favorable access to raw materials:
established firms may have locked up the

most favorable sources and/or tied up foreseeable needs early at prices reflecting a lower demand for them than currently exists.

- "● Favorable locations: established firms may have cornered favorable locations before market forces bid up prices to capture their full value."

-- Porter (1980, p. 11)
(emphasis supplied)

Similarly, Ghemawat says:

"Access (to resources or customers) will lead to a sustainable advantage if two conditions are met: it must be secured under better terms than competitors will be able to get later, and the advantage has to be enforceable over the long run. Enforceability can come from ownership"

-- Ghemawat (1986, p. 55)
(emphasis supplied)

These statements suggest that sustainable advantage can be generated by the combination of some past speculative coup with historical cost accounting. Buying low and selling high is certainly a way to make money, and buying resources low and selling the derived products high is a variant of that basic formula. However, if the speculative success occurred a long time ago, and if the rent-earning asset could be sold at a current market value, it is not clear why possession of such a rent-earning asset is any more a source of advantage than possession of the corresponding amount of well-invested cash. Under these circumstances, a management that prides itself on its ability to generate "above normal returns" as reflected in (book) ROA is a management that may be inviting a takeover bid.

The second issue has to do with the historical path of profitability in a particular firm as it grows by replicating its routines and the associated idiosyncratic resources. As it grows, such a firm is investing in a variety of intangible assets, transforming generic inputs by imparting to them the particular information, skills, locations and relationships that make these assets capable of carrying out the firm's routines. Particularly in the case of the firm-specific human capital imparted to employees, the firm cannot own these intangible assets, though it may have good reason to expect that it can draw on their services in the future. Accounting conventions typically yield a distorted economic picture of such a growth phase, under-reporting economic earnings by failing to recognize that some portion of what is designated as current cost is actually investment. As the firm's growth slows to the point where new investments of this type are approximately balanced by renewal of old ones, the earnings picture becomes more accurate. The accounting distortions of the past live on, however, in a new form: rates of return on assets are overstated because of the understatement of the asset base. Historical cost accounting produces a similar but more correctable form of this distortion; for example, in the calculation of Tobin's q the valuation of assets at replacement cost provides such a correction. This adjustment cannot, however, compensate for the fact that some important types of assets are missing from the accountants' lists in the first place.

If "sustainable advantage" is something that is supposed to be

reflected in accounting measures like ROA, then it appears that there is a relatively straightforward way to achieve it: invest in long-lasting assets that do not show up on the balance sheet, a prime example being the initial learning that gives rise to new, replicable routines. In a hypothetical world in which everyone else's assets are fully reflected on the balance sheet, outstanding performance in terms of ROA might even be achievable by a series of investment projects with zero net present value, provided the shareholders are patient enough to put up with the understated earnings of the early years.

At the level of the firm as a whole, reliance on stock market-based valuations might appear to offer an escape from the range of measurement errors just discussed. According to the (semi-strong) efficient markets hypothesis, publicly available information about the future earning power of the firm's assets will be fully reflected in the prices of its securities. There are, however, three significant shortcomings to stock market-based performance measures: (i) they presume that the shareholders are the only claimants whose interests are at stake;¹² (ii) they do not provide valuations at the level of individual resources or conveyable packages, but only of the firm as a whole; (iii) they necessarily rely on the presumption that the relevant information is public, although keeping secrets is often an important part of effective strategic management. (Indeed, the resource-based view suggests, following a path blazed by Hirshleifer (1971), that maintaining secrecy about its own future plans is one way that a company might

obtain resources at prices below their future market values.) But at least the stock market provides a valuation untainted by accounting conventions or other artifacts of historical measurement.

Where stock market valuations and derived performance measures are concerned, the famous list of five forces enumerated by Porter (1980) needs to be supplemented by a sixth: investor expectations. If the other five forces do not whittle away abnormally high returns, investors will happily get used to them. The market will certainly learn to discount systematic, sustained earning power, even if the sources of that power are not fully understood. Once this happens, any superiority disappears so far as stock market-based measurement is concerned. Imagine the frustration of a (hypothetically) perfect profit-maximizing CEO, fully capable of implementing every bit of valid strategic advice available from any source, who has the misfortune to lead a company that has been managed to that same high standard for decades on end. Pure good luck aside, it will be impossible for this superlative manager to look more than ordinary on stock market-based measures. The advantage goes to the manager who inherits a rich fund of strategic mistakes that can be corrected, provided that the market's awareness of the correctability of the mistakes does not precede her accession to office.

None of the foregoing should be interpreted as implying skepticism about the existence of real differences in financial performance, or as denying that available operational measures capture some of those differences. It does suggest, however, that

both the resource-based view and evolutionary economics need to contribute more to the conceptualization and measurement of profitability than has been the case thus far. Attention to this agenda is particularly urgent when the questions under examination involve comparing the performance of the same firm at different points of time. It is judgments on these questions that are most likely to be distorted because the available data contain little clue as to the actual timing of key speculative successes or key developmental investments in idiosyncratic resources.

SOCIAL IMPLICATIONS OF COMPETITIVE ADVANTAGE

When a business succeeds in obtaining "competitive advantage" over its rivals, are the consequences for society at large generally favorable or unfavorable? There is, of course, no general answer. It all depends, and in particular it depends on the nature of the advantage, how it was obtained, and how it is maintained. Recent commentary has pointed out, however, that different approaches to strategic analysis seem to imply different general orientations to this question. Since there is presumably no dispute about the observation that real cases vary across a wide spectrum, it is probably useful to think of these differences as relating to "first approximations" or "rebuttable presumptions about the typical case."

In particular, the competitive forces approach pioneered by Porter (1980) is seen as one in which the typical source of superior profitability is some form of market power. Forceful comments to this effect have been offered by Teece, Pisano and Shuen (1994):

"This approach, rooted in the structure-conduct-performance paradigm of industrial organization, ... emphasizes the actions a firm can take to create defensible positions against market forces.

...

Economic rents in the competitive forces framework are monopoly rents ... Firms in an industry earn rents when they are somehow able to impede the competitive forces (in either factor markets or product markets) which tend to drive economic returns to zero.

-- Teece, Pisano and Shuen 1994
pp.

By contrast, the resource-based view of the firm, the dynamic capabilities approach, evolutionary economics, the Chicago school view in industrial economics (e.g., Demsetz 1973) and the Schumpeterian tradition (1934, 1950) are all seen as emphasizing that profitability may derive instead from superior efficiency (Teece, Pisano and Shuen 1994; Rumelt, Schendel and Teece 1991; Foss, Knudsen and Montgomery 1994).

The analytical scheme presented earlier in this paper lends some detail, and hence some complication, to this broad-brush contrast. An innovating firm seeking to operate on a larger scale, but temporarily constrained by its stock of idiosyncratic resources, may be highly profitable. By some tests it may have "market power," but this in no way implies that it is exercising socially undesirable restraint over its output: such restraint is the furthest thing from its management's mind. The happiest version of the story is that the innovator collects sufficient Schumpeterian rents to cover its initial costs and offer some encouragement

to other innovators, but ultimately settles into an essentially competitive relationship with its rivals, while its innovation is applied at socially efficient levels. Of course, if imitation is successfully blocked, the episode may end in a period of output restraint. But even that persists only until the next gale of Schumpeterian creative destruction passes through.

Although the happy version of the story is only one case, it certainly provides an uplifting contrast to the static barriers-to-entry story offered by the competitive forces approach. Unfortunately, a cloud of complexity must be added to this carefully-selected sunny picture. There is another form of output restraint to be considered: the restraint imposed by the innovator's ability to restrain imitation. Even in the early stages of an innovator's growth, the returns earned by the innovator can only be said to be untainted by output restraint, given the imitation barriers that restrain the outputs of other firms. These barriers may be partly "natural" reflecting the intrinsic difficulty of imitation, but there are also important institutional barriers. These include patent and trade secret protection, but also a more fundamental institutional barrier that crucially fortifies the natural ones: the absence of an affirmative legal obligation of the imitator to cooperate with the imitator. The notion that the innovator might have such an affirmative obligation is of course quite remote from institutional reality; nevertheless, in principle the absence of cooperation from the imitator is a potential source of inefficiency just as other imitation barriers are.¹³ Finally,

of course, the innovator is likely to take strategic action to enhance the effect of the natural and institutional barriers.

When posed in a realistic institutional setting, and with due recognition of the importance of innovation incentives, the problems of social welfare assessment raised here lead into deep analytical waters. As Rumelt (1984) has suggested, it is fortunate and liberating for analysts in the strategy field that rendering sharp verdicts on these difficult problems is not among our central concerns (p. 561). There seems to be merit in the general idea that the quest for profit is appraised more favorably by evolutionary economics and the resource-based view than by the competitive forces approach. We can leave the details for someone else to work out.

CONCLUSION

This paper has explored a piece of intellectual territory that is common ground for the resource-based view and evolutionary economics: a firm can effectively leverage a profitable initial resource position represented by superior routines and its associated team-embodied skills, and this leveraging is accomplished by replicating the routines. In this area, evolutionary economics provides a relatively detailed account of one part of the dynamic aspect of strategic management. It is an important part of the total problem, but, as was noted more than once, only a part.

Aside from its importance, what recommends it for careful discussion is that it is a comparatively simple part of the total problem. The "speculative" and "creative" components of the problem

of dynamic resource exploitation were mentioned but left aside. The complications of replicating routines in novel contexts received even more casual treatment. Corporate-level capabilities and management issues were left implicit, although the corporate level is the arena of the great managerial challenges of scale and scope described by Chandler (1991). These simplifications made possible a clearer view of some central issues in the descriptive and normative analysis of the quest for profit. The issues thus revealed may be obscured but certainly do not go away when more realistic complications are added to the picture. Like the quest for profit itself, the quest for better understanding of profitability can be expected to continue for a long time to come.

REFERENCES

- Amit, R., and Schoemaker, P. 1993. "Strategic assets and organizational rent." *Strategic Management Journal* 14 (January): 33-36.
- Arrow, K. 1962. "Economic welfare and the allocation of resources for invention." In R. Nelson, ed., *The rate and direction of inventive activity*: 609-625. Princeton, NJ: Princeton University Press.
- Barney, J. 1986. "Strategic factor markets: expectations, luck and business strategy." *Management Science* 32 (October): 1231-1241.
- Barney, J. 1989. "Asset stocks and sustained competitive advantage: a comment." *Management Science* 35 (December): 1511-1513.
- Barney, J. 1991. "Firm resources and sustained competitive advantage." *Journal of Management* 17 (October): 99-120.
- Beaver, W., and Demski, J. 1979. "The nature of income measurement." *The Accounting Review* 54: 38-46.
- Castanias, R., and Helfat, C. 1991. "Managerial resources and rents." *Journal of Management* 17 (October): 155-171.
- Chandler, A. 1990. *Scale and scope: the dynamics of industrial competition*. Cambridge, MA: Harvard University Press.
- Demsetz, H. 1973. "Industry structure, market rivalry, and public policy." *Journal of Law and Economics* 16 (April): 1-10.
- Dierickx, I., and Cool, K. 1989. "Asset stock accumulation and sustainability of competitive advantage." *Management Science* 35 (December): 1504-1511.
- Foss, N., Knudsen, C., and Montgomery, C. 1994 "An exploration of common ground: integrating evolutionary and strategic theories of the firm." This volume:
- Ghemawat, P. 1986. "Sustainable advantage." *Harvard Business Review* (September-October): 53-56.
- Gould, J. 1968. "Adjustment costs in the theory of investment of the firm." *Review of Economic Studies* 35: 47-55.

Gould, S. 1980. *The panda's thumb: more reflections in natural history*. New York: Norton.

Hirshleifer, J. 1971. "The private and social value of information and the reward to inventive activity." *American Economic Review* 61: 561-574.

Kogut, B., and Zander, U. 1992. "Knowledge of the firm, combinative capabilities, and the replication of technology." *Organization Science* 3: 383-397.

Koopmans, T.C. 1957. *Three essays on the state of economic science*. New York: McGraw-Hill.

Levinthal, D. 1994. "Adaptation on rugged landscapes." Unpublished manuscript. Wharton School, University of Pennsylvania.

Lippman, S, and Rumelt, R. 1982. "Uncertain imitability: an analysis of interfirm differences in efficiency under competition." *Bell Journal of Economics* 13: 418-438.

Lucas, R. 1967. "Adjustment costs and the theory of supply." *Journal of Political Economy* 75 (August, Part I): 321-334.

Montgomery, C. 1992. "Resources: the essence of corporate advantage." Teaching note. Boston: Harvard Business School.

Nelson, R. 1991. "Why do firms differ, and how does it matter?" *Strategic Management Journal* 12: 61-74.

Nelson, R., and Winter, S. 1982b. *An evolutionary theory of economic change*. Cambridge: Harvard University Press.

Penrose, E. 1959. *The theory of the growth of the firm*. New York: John Wiley & Sons.

Peteraf, M. 1993. "The cornerstones of competitive advantage: a resource-based view." *Strategic Management Journal* 14: 179-91.

Porter, M. 1980. *Competitive strategy*. New York: The Free Press.

Reed, R., and DeFillippi, R. 1990. Causal ambiguity, barriers to imitation, and sustainable competitive advantage. *Academy of Management Review* 15: 88-102.

Rubin, P. 1973. "The expansion of firms." *Journal of Political Economy* 81: 936-949.

- Rumelt, R. 1984. "Towards a strategic theory of the firm." In R. Lamb, ed., *Competitive strategic management*. Englewood Cliffs, NJ: Prentice-Hall.
- Rumelt, R. 1987. "Theory, strategy and entrepreneurship." In D. Teece, ed., *The competitive challenge: strategies for industrial innovation and renewal*: 137-158. Cambridge: Ballinger.
- Rumelt, R., Schendel, D., and Teece, D. 1991. "Strategic Management and Economics." *Strategic Management Journal* 12: 5-29.
- Schumpeter, J. 1934 (Orig. in German, 1911). *The theory of economic development*. Cambridge: Harvard University Press.
- Schumpeter, J. 1950. *Capitalism, socialism and democracy*, 3rd ed. New York: Harper and Row.
- Szulanski, G. 1994. "Intra-firm transfer of best practices project: executive summary." INSEAD and International Benchmarking Clearinghouse.
- Teece, D., Pisano, G., and Shuen, A. Forthcoming. "Dynamic capabilities and strategic management." *Strategic Management Journal*.
- Treadway, A. "Adjustment costs and variable inputs in the theory of the competitive firm." *Journal of Economic Theory* 2: 329-347.
- Wernerfelt, B. 1984. "A resource-based view of the firm." *Strategic Management Journal* 5: 171-180.
- Wernerfelt, B. 1989. "From critical resources to corporate strategy." *Journal of General Management* 14 (Spring): 4-12.
- Winter, S. 1982. "An essay on the theory of production." In S. Hymans, ed., *Economics and the world around it*: 55-91. Ann Arbor, Michigan: University of Michigan Press.
- Winter, S. 1987. "Knowledge and competence as strategic assets." In D. Teece, ed., *The competitive challenge: strategies for industrial innovation and renewal*: 159-184. Cambridge: Ballinger.
- Zander, U. and Kogut, B. Forthcoming. "Knowledge and the speed of transfer and imitation of organizational capabilities: an empirical test." *Organization Science*.

Notes

* With the customary caveats, I would like to express my appreciation for the helpful comments on an earlier draft that I received from Connie Helfat, Dan Levinthal and -- especially -- Cynthia Montgomery.

1. In a helpful conceptual discussion, Amit and Schoemaker (1993) narrow the term resources to refer to "stocks of available factors owned or controlled by the firm", most if not all of which are tradable. "Capabilities, in contrast, refer to a firm's capacity to deploy Resources" (p. 34). Routines, not explicitly mentioned by Amit and Schoemaker, are among the organizational processes underlying capabilities. However, since routines are not just a way of deploying, but deployable in their own right, they arguably belong under the resources rubric as well.

2. Biologist Stephen Jay Gould wrote a fascinating essay in recognition of the "50th birthday" of Mickey Mouse. He identifies interesting parallels between the transformation of Mickey's image by cultural evolution (i.e., creative resource dynamics) and the evolutionary development of the human species (Gould, 1980, Chapter 9).

3. See the HBS case ALTOONA CORPORATION: CONSUMER PRODUCTS DIVISION for an interesting account of an organization stressed by these sorts of competing demands on its key engineers.

4. This appraisal needs to be qualified, however, when rapidly advancing technology has greatly enriched the design options available for the creation of a new routine.

5. An empirically important possibility is being set aside here: initial success may prove to be a transient phenomenon; no stable routine may emerge that is capable of sustaining the success over time. One common explanation for this outcome is that the initial success was crucially dependent on the roles played by particular individuals, and was not sustainable when some of those individuals left the scene or lost their enthusiasm for the cause.

6. Barney defines a sustained advantage as one that "continues to exist after efforts to duplicate that advantage have ceased." (1991, p. 102). On this definition, very significant and long-lasting profit opportunities are outside of the scope of the "sustained advantage" analysis.

7. Some theorists may object that the absence of an efficiency loss is attributable to the sharp corners in the diagram: if marginal cost rose continuously as output approached an upper bound, there would be at least some efficiency loss. While this is true, it is also true that there are continuous examples that lie as close as one likes, in quantitative terms, to the Figure 1 case. Thus, continuity itself is not the issue. The example of Figure 1 captures the analytical connotation of "rent" and dramatizes the distinction between a scarcity rent and a monopoly return.

8. That this difference is positive follows directly from the fact that the equation of marginal revenue and marginal cost identifies the profit maximizing position. The difference corresponds, in fact, to the area of triangle **bde**.

9. Peteraf (1993) provides the most careful statement thus far of the theoretical connections between the rent concepts of economics and the concerns of strategic management. The present paper concurs with her analysis on a number of key points.

10. Tobin's q is defined as the market value of the company's assets (from the liabilities side) divided by the replacement cost valuation of those assets (assets side).

11. Merging aspects of the second and third points, Beaver and Demski (1979) argue convincingly that income measurement can be well defined only in the context of complete markets. Outside of this hypothetical context accounting rules can be rationalized only on pragmatic cost-benefit grounds.

12. Aside from employees, customers, suppliers and other familiar entries on the extended list of stakeholders, there is top management. Castanias and Helfat (1991) argue, in effect, that a "managerialist" interpretation of the corporation may be economically sound, at least in the sense that managers are more likely to be providing idiosyncratic rent-earning resources than the providers of financial capital.

13. For a good, concise statement on this issue see Koopmans (1957, pp. 64-66.)