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MARKETS, FIRMS, AND THE PROCESS OF ECONOMIC DEVELOPMENT

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We develop a framework to describe value creation as a process comprising resource combinations and exchanges and use the framework to show how organizations in general, and business firms in particular, interact with markets to create economic value for themselves, for their members, and for society. The theory offers an explanation of why neither a market nor a firm, by itself, can achieve adaptive efficiency and why institutional pluralism contributes to the process of economic development.

Organizations dominate our socioeconomic landscape. Their influence in our everyday lives has grown steadily for two centuries (Coleman, 1992), particularly among the wealthiest and most developed regions of the world (cf., Demsetz, 1995). Indeed, this "ubiquity of organizations" prompted Herbert Simon (1991) to question the use of the term *market economy* to describe the structure of our economic interactions. "Wouldn't 'organizational economy' be the more appropriate term?" asks Simon (1991: 28). Even more curious than our choice of name, however, is how little attention scholars have given to the role organizations play in economic development, relative to that played by markets.

Certainly, the notion of an organizational economy, as characterized by both intensely competitive markets and multiple firms, coexisting in a constant state of vigorous but creative tension, is uncontroversial. Such an economy is the basis of the process of creative destruction that Joseph Schumpeter (1942) described over half a century ago. This familiar evolutionary process is one of continuous interaction among firms, on the one hand, creating and realizing new value, and markets, on the other hand, forcing these same firms to surrender, over time,

most of this value to others. The tension, causing this interactive process to repeat itself over and over, induces the system to evolve by forcing actors to accept this "handing on the fruits of progress" to consumers and workers (Schumpeter, 1947: 155) and to discover and exploit other possibilities the process enables or else lose control over resources to those who do. In their struggle to remain viable and healthy in the midst of old economic structures surrendering their value and resources to new ones, firms are induced to engage in a relentless search for new ways to create and realize value. This ensures that the tension never subsides.

Formal models of economic growth, however, offer little to reflect this process of creative destruction or to suggest any significant role for organizations, much less model the process itself. To be sure, improvements in such models have been significant, as reflected in recent efforts to endogenize some of the proximate sources of growth—like technological advance and human capital—and to incorporate features like proprietary technology, imperfect competition, externalities, and economies of scale (e.g., Aghion & Howitt, 1992, 1994; Grossman & Helpman, 1991; Romer, 1990, 1994). Notwithstanding the insights yielded by this work, Nelson writes, "The new formal models continue in the spirit of the older ones in treating the actions taken by firms as determined by the environment they are in, and in ignoring anything like Schumpeter's 'entrepreneurship' or Abramovitz' 'enterprise'" (1994a: 26).

Until recently, it was common to assume that the discipline of competitive market forces is somehow efficient and therefore "corrective" (cf.,

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Alchian, 1950; North & Thomas, 1973; Williamson, 1985). The implication of this assumption, as Douglass North points out, "is not only that institutions are designed to achieve efficient outcomes, but that they can be ignored in economic analysis because they play no independent role in economic performance" (1990b: 16). However, North's own compelling accounts of economic history (1981, 1994) suggest otherwise: "inefficient economic institutions are the rule, not the exception" (1990a: 191). Consequently, scholars like North are abandoning any efficiency view of institutions, and, as Nelson observes, "There is now strong recognition that one needs a process model to predict and understand what the institutional accommodations will be" (1994b: 57).

Our purpose in this article is to lay the groundwork for such a model. Our objective is to flesh out what we believe to be the essential elements for a dynamic theory of the role of firms in economic development and to provide a framework for linking these elements to theory at the societal level of analysis. We begin by drawing appreciably on the work of Schumpeter and of Penrose to develop the perspective that economic development stems from the way resources are accessed and used. On this basis we construct (in the second and third sections of the article) a theoretical framework and use it to describe economic development as an iterative process of creating and realizing value through resource combinations and exchanges.

In the fourth section we build on North's (1994) argument that the path of economic development is shaped by the interaction between organizations and institutions. Although we agree with the notion that organizations "reflect the opportunities provided by the institutional matrix" (1994: 361), we argue that they also reflect the convictions, hopes, and aspirations of their members. We advance the proposition that organizations are more than mere players in a game to allocate resources efficiently. They are also powerful levers that enable people to productively defy the market's institutional forces. We then use this theoretical framework to show how firms can substantially enhance the fraction of the total potential value obtained from society's resource endowments, and we explain why both firms and markets are needed to ensure that economies develop in a way that achieves what North (1990a) has termed *adap-*

tive efficiency. In the fifth section we explore some implications that our broader view of the role of firms holds for related theories in economics and for firm-level strategy.

Our argument shares many common threads that run through the various resource-based views of the firm currently emerging in the field of strategy. These include the notion that resource heterogeneity—a defining characteristic of firms (Nelson & Winter, 1982; Penrose, 1959; Rumelt, 1984, 1987)—is influenced by the routines (Nelson & Winter, 1982) and processes by which resources are used. This heterogeneity, in turn, influences the extent to which certain resource deployments may complement each other (Teece, 1986) or become substitutes and, consequently, which resources tend to be accumulated (Dierickx & Cool, 1989), developed further into dynamically coherent capabilities (Teece, Pisano, & Shuen, 1997), and ultimately lead to the creation of new rent sources (e.g., Amit & Schoemaker, 1993; Mahoney & Pandian, 1992).

Similarly, we also draw liberally on what Nelson and Winter (1982) refer to as "appreciative" theories of economic development (as opposed to formal models) that suggest the role of firms, both as allocatively efficient responses to market forces (e.g., Coase, 1960, 1988) and as the primary source of institutional change (North, 1990b). In our synthesis we consider both these roles and elaborate a view of firms that casts them as the primary marshaling yards where society's resources are gathered, developed, and used to initiate and harness the processes of economic development.

Despite the many common strands that our argument shares with much of the emerging resource-based theories of the firm, as well as with some key strands of economic history, the role that we see firms and their entrepreneurs playing in economic development differs markedly from their role in efficiency-based theories of the firm (e.g., Coase, 1991; Williamson, 1985) and ecological theories that essentially leave to markets the determinants of development and its selection mechanisms (cf., Hannan & Freeman, 1977). Although there can be no doubt that many organizations, and the broader institutions supporting them, often persist beyond their usefulness, this fact remains besides the essential point: adaptive efficiency—always difficult and never certain—is far less likely without the

guidance of organizations, whether that guidance is intentional or not. Our argument suggests that institutions—and, by implication, firms—not only matter (North, 1990b) but, as development ensues, they matter even more (cf., Weitzman, 1996).

RESOURCE COMBINATION

The creation of economic value, be it by individuals or organizations, is a process that involves the use of resources. Indeed, securing “the best use of resources” is what many believe to be *the* “economic problem” that confronts not only firms (Penrose, 1959) but society as a whole (Hayek, 1945), particularly when growth or development is a concern. Resources, in this sense, refer to all existing assets, both tangible and intangible, whose services can be used productively (Penrose, 1959; cf., Wernerfelt, 1984; Winter, 1995). Use refers here to any deployment whatsoever, whether to exploit the known potential of current resources or to discover or create new resources and potentials. We consider two broad categories of resource deployments: combinations and exchanges. Both are widely acknowledged by economists to be essential mechanisms of economic development. We focus on the role of combinations in this section and on the role of exchange in the next.

Combinations refer to all the many ways in which resources are pressed into service. For the sake of convenience and simplicity, our use of the term comprises all deployments of resources, short of exchange.¹ As Schumpeter puts it, “To produce means to combine the things and forces within our reach. Every method of production signifies some such definite combination.” This encompasses “everything that is production in its widest sense” (1934: 14). Even more broadly, combinations “include many different methods of using, and of behaving towards,

goods; all kinds of locational changes, and changes in mechanical, chemical and other processes” (1934: 14). Combinations can be the intended result or an unintended by-product of some other deployment, or they may emerge as the chance coincidence of two or more uncoordinated deployments made independently by different parties. Production is a general example of all kinds of combinations that are largely intentional. A more specific example is the mixing of compounds by 3M scientists that led to the accidental discovery of the adhesive used by Art Fry many years later to create Post-it[®] Notes. It illustrates nicely the unanticipated consequences that can easily arise from many intentional combinations.

New Combinations As the Source of Potential Value

Particular combinations, however derived, render particular uses or services. As Penrose notes, “Exactly the same resource when used for different purposes or in different ways and in combination with different types or amounts of other resources provides a different service or set of services” (1959: 25). The extent to which any particular combination changes the availability of potential services depends on whether or not the act of combining exhausts all available sources of the resources used to make up the combination and if the resulting combination is new or routine. Because all combinations generally withdraw resources from their current uses and alter the potential for future combinations and services, all prospective gains from any combination are offset by some corresponding loss in current productivity and in some future potential.

Routine combinations—like inputs or investments in specific commonly known products or processes—are more likely to replicate services that already exist, perhaps elsewhere; hence, they tend to make some existing service and its associated potential more readily available. *New combinations*, however, essentially create new services; in the process, they enhance the potential productivity of any given set of resources. Again, in Schumpeter’s words, “To produce other things, or the same things by a different method, means to combine these materials and forces differently” (1934: 65). Such new combinations represent “simply the differ-

¹ More complex classifications of resource deployments are, of course, possible. For example, distinguishing among those combinations that consume or otherwise deplete resources and those that do not may yield useful insights. Adding such complexity would not change our argument. Our approach is also consistent with Schumpeter’s classification of resources, “in ‘orders,’ according to their distance from the final act of consumption” (1934: 16), and with the approach of others to subsume all of consumption into production—whereby consumers seek to maximize their “production” of utility (cf., Lancaster, 1971; Stigler & Becker, 1977).

ent employment of the economic system's existing supplies of productive means" (1934: 68). To the extent that the services made possible by new combinations are capable of rendering new productive possibilities, they serve as the basis for the creation of new and better resources or new and better (i.e., more productive) ways of making resources. In this way new combinations constitute the source of all endogenous changes that characterize the process of economic development (Schumpeter, 1934: 64–66). This is the same process of "industrial mutation" that Schumpeter describes as "creative destruction": the evolutionary process "that incessantly revolutionizes the economic structure from within, incessantly destroying the old one, incessantly creating a new one" (1942: 83; emphasis in original).

Yet, the mere existence of more productive services made possible by new combinations does not ensure that such development comes about. It simply enhances the potential. The new combinations create a new source of *potential value*. Economic development, however, results only if some of this potential is realized and when this realization exceeds the cost of services withdrawn. *Value realization* generally requires some awareness of this potential and some subsequent deployments to exploit it. For an economic system to be in dynamic balance, both value creation and value realization are needed (Teece et al., 1997). This is as true for individuals and for society as it is for business firms.

In this sense the "carrying out of combinations" is more usefully viewed as a discovery process than as some sequence of discrete acts of joining known resources to produce some known outcome(s). As Schumpeter observes, "We are dealing with a process whose every element takes considerable time in revealing its true features and ultimate effects" (1942: 83). New service possibilities must be discovered, but so too must their productive potential, which is often not clear initially.

Compounding the problem of their obscure potential, most new combinations are saddled with little or no way of realizing this potential until some of it is discovered and harnessed via some subsequent deployment(s) (viz., additional new combinations) that complement this potential. As studies by Nelson and others have documented,

Broad new technologies tend initially to be brought into practice in crude form, representing a bundle of potentialities, rather than being introduced in an operationally ready state. The automobile, the airplane, the transistor, the computer, and the laser—all surfaced as new technologies, of potentially wide applicability. But they required considerable work and ingenuity before they would be economically useful. It took a long time, a lot of investment, a lot of learning, and a lot of learning how to learn before these new technologies became major contributors to economic growth (Nelson, 1997: 49).

Indeed, Schumpeter saw that the essence of innovation—of economic development itself—lies not so much in the novelty of a new combination but in the necessary tradeoff in the serviceability of resources that the combination gives rise to, particularly if the combination is new. Again, in his words, "What we, unscientifically, call economic progress means essentially putting productive resources to uses *hitherto untried in practice*, and withdrawing them from the uses they have served so far. This is what we call 'innovation'" (1928: 378; emphasis in original).

This tradeoff implies some certain loss in currently realizable value—in the withdrawal of resources from previously productive services—and some less certain gain in potential value—from prospective services in the future. Of course, this tradeoff is present in most combinations (i.e., those that deplete any resource), but it is most pronounced in those that are new. In all new combinations the loss in realizable value is always more certain and often more immediate than is any gain in potential value. New combinations generally represent an immediate net drain on any system; only after the services they make possible are discovered, accepted as valuable, and routinely replicated does their creative potential begin to be realized and to compensate for the destruction that follows in the wake of this realization.

The evolutionary path that development takes is influenced by the forces that determine which of the many possible resource combinations are made and which alternative combinations are foreclosed. Obviously, all deployments that could be expected to enhance the creation and realization of value (i.e., that lead to greater marginal utility) should be carried out. Yet, for reasons we address below, nowhere near all such combinations (i.e., that are possible and productive for the sets of resources and of pref-

erences that exist at any given time) are ever actually made. As a result, there is always and everywhere a gap that exists between what is possible and would be productive and what is realizable at any given time.

The Gap Between Productive Possibilities and Productive Opportunity

The reasons for this gap between potential and realizable opportunities can be attributed to the forces that influence which resources are deployed and how. One such force stems from the constellation of resources and institutions that exists at any time and that characterizes the structure of most economic systems. As suggested above, the mere presence or absence of certain resources will render some services from a combination more or less available, productive, or visible than others. By prescribing what people should do and proscribing what they should not do, institutions also determine what is seen as viable or productive. As a result, they influence what we end up doing.

We follow North in defining institutions as the "humanly devised constraints that shape human interaction" and in referring to the "institutional matrix" as the web of institutions that acts as a sort of glue that holds an economy's resources in place (1994: 360). Institutions exert their influence by limiting people's choice sets and defining the implications of their choices (North, 1991). By specifying both the formal and informal "rules of the game" that guide most interactions, institutions determine what possibilities are productive and influence which possibilities are likely to be seen as such at any given time. Over time, institutions influence which deployments are even possible.

Institutions and resources combine to exert a powerful inertial force that tends to encourage people to deploy resources in ways that cause development to carve out and to follow certain trajectories of technological and institutional change (Dosi, 1982, 1988; North, 1990b). A person's will to act, enabled and constrained as it is by limited human faculties of perception and discernment, represents an important countervailing force to overcome this inertia. As the number of resources and their attendant possibilities grow, the range of things we are able to do generally will expand but our cognitive capacity will become more and more limiting

(Simon, 1976). Human will—that is, the complex mix of convictions, hopes, fears, and aspirations that drives people to take initiative—determines how we cope with growing opportunity amidst this greater uncertainty.

Edith Penrose's (1959) theory of the growth of firms offers a simple but elegant way of incorporating all these forces into a framework for viewing this "economic problem" of securing the best use of resources. In seeking to account for the limits to the growth of successful firms, Penrose defines a firm's "productive opportunity" as those possibilities for deploying resources that the firm's entrepreneurs and managers can see and which they are *willing* and *able* to act on (1959: 32). Even though a growing firm has an ever-larger set of productive possibilities within its reach—from the continual accumulation of resources, which naturally accompanies its growth—the firm's productive opportunity remains restricted by the extent to which these three conditions are satisfied.

Penrose's insight can be applied more generally to define the productive opportunity of any system, whether it comprises one individual, a collection of individuals, or society as a whole. As the system accumulates more and more varied resources, the combinations and services that are possible will expand naturally at a combinatorial rate (Weitzman, 1996). The likelihood that a particular combination will be of value to someone also will increase with the number of people and the variety of their interests. But the productive opportunity, which drives the pace and path of the system's development, will not expand unless someone, somewhere, is able to see some of these productive combinations and is willing to carry them out. The more people there are, the more the productive opportunity of any individual or group depends on the behavior of others and the resources and institutions that shape that behavior.

Consistent with this reasoning, three necessary conditions must be satisfied before any particular deployment can be considered an element of a system's productive opportunity set. First, the deployment must be *enabled*—that is, someone must have or have access to all the requisite resources to execute the deployment. Second, the deployment must be *motivated*—that is, someone must benefit from its execution. Third, some service must be *perceived* to flow

from the deployment—that is, someone must see the deployment as a viable act from which some service is anticipated.

To be sure, many resource deployments can and do occur by accident. As we noted earlier, many combinations occur as the unintended and often unknown by-product of uncoordinated deployments made by independent parties who bring resources together. Although some of these individual deployments may occur without meeting any of the three conditions, and others may, perhaps, be executed solely on the basis of some faulty perception of benefit (i.e., failure to meet the first or second condition), most combinations are likely to be the by-product of some purposive deployment.

It is these purposive deployments that we are interested in. For purposive deployments to occur voluntarily, all three conditions must be met. Moreover, it is not enough for these conditions to be met separately by independent parties. Rather, all three conditions must be satisfied jointly in some coordinated fashion. That is, some actor or coordinated group of actors, with the means and ability to execute the deployment, must also be able to see some service provided by the deployment and be in a position to benefit from it.

Because these conditions must coincide within a single individual or be coordinated within a group, only a very tiny fraction of the subset of productive possibilities will actually wind up executed; most will either not be fully motivated or perceived by those able to carry them out. Compared with all combinations that may be physically (or cognitively) possible at any time, relatively few will be executable with only one deployment (e.g., adding the last piece to complete a jigsaw puzzle). Most combinations will require certain other prior combinations and exchanges to be carried out in order to place the desired combination within the reach of any party (i.e., enable the combination, motivate it, and/or stimulate the perception that it can be executed and that some gain can be appropriated). This, in turn, requires that all necessary intermediate deployments be within the reach of all relevant parties. Consequently, many value-adding combinations that are possible and that would be productive, given the capabilities and tastes of the parties involved, will not occur, either because some parties in control of the

requisite resources are not in a position to benefit from making the combination or because they do not see the opportunity or its value to them. The productive possibility-opportunity gap for any system, therefore, will be large.

THE DUAL ROLE OF EXCHANGE

In the previous section we argued that new combinations expand the set of possible services within, and thereby add a new source of potential value to, any economic system. This latent value becomes realized as wealth-enhancing economic value, however, only as the services made possible by new combinations are themselves productively exploited. Deployments that make the potential value of new combinations more widely recognized or available contribute to this value's realization. As noted above, routine combinations like production serve this purpose. But whether production is centralized or decentralized, routine combinations alone generally are unable to carry the realization process very far. For this to occur, some form of exchange is also needed. Exchange is the principal mechanism through which most of the productive potential of resources becomes realized (Hayek, 1945; North & Thomas, 1975).²

This role of exchange—to facilitate the continual reallocation of resources to more productive uses (i.e., through combinations)—receives a great deal of attention in the field of economics. Exchange has another role, however, that receives far less attention. By *recombining* the set of resources that are within one's reach, exchange changes and reprioritizes the services that are possible and/or motivated for each party, and it stimulates the perception of new combinations. In this way exchange influences the nature and extent of the potential that is created in the first place, thereby influencing

² Exchange can be personal or impersonal. Personal exchange accompanies most voluntary social interaction, including simple information sharing; doing favors for others; and all trading among family, friends, and their acquaintances. Impersonal exchange extends these interactions beyond this relatively small group of people to include many others who may not know each other at all. Except for simple barter transactions, most impersonal exchanges presuppose the existence and support of market institutions (like currency, property rights, enforcement, and so on).

the ultimate path that the process of value creation takes for the economic system as a whole. We consider each role in turn.

The Realization of Potential Value

Hayek (1945) alerted us to a critical problem in "the use of knowledge" that is solved by exchange.

The peculiar character of the problem of a rational economic order is determined precisely by the fact that the knowledge of the circumstances of which we must make use never exists in concentrated or integrated form, but solely as the dispersed bits of incomplete and frequently contradictory knowledge which all the separate individuals possess. The economic problem of society is thus not merely a problem of how to allocate "given" resources—if "given" is taken to mean given to a single mind. . . . It is rather a problem of how to secure the best use of resources known to any of the members of society, for ends whose relative importance only these individuals know. Or, to put it briefly, it is a problem of the utilization of knowledge not given to anyone in its totality (1945: 519–520).

In essence, exchange allows us to better exploit existing knowledge as it induces the continual migration of resources to better-known uses. North and Thomas cogently summarize the "inherent productivity implications of exchange itself" in this way:

The very process of trade creates wealth as goods move from persons who value them less to persons who value them more. Both parties in a voluntary exchange become better off. Furthermore, the opportunity to trade allows specialization and lowers the costs of inventing and innovating which further increase the wealth of society (1975: 18).

Since, as Hayek points out, knowledge of a resource's "best" use can be in the mind of "anyone" and is often "contradictory," or "for ends whose relative importance only these individuals know" (Hayek, 1945: 520), exchange is needed to put the requisite resources within the reach of those who perceive the possibility of greater value from their services.

In terms of our framework, recall that many productive possibilities are not realizable productive opportunities, because the conditions of deployment are not met in any coordinated way that makes their potential services likely to be rendered—even though all these services are

possible (somehow), productive (somewhere), and many may also be perceived (by someone). By reconstituting each party's productive opportunity, exchange joins the three conditions for deployment within a single individual or coordinated group of individuals, which now has, as a result of the exchange, all that is required to execute some additional deployments and to realize some value from the service(s) rendered. Each party's productive opportunity expands, and the system-wide productive possibility-opportunity gap narrows as a result.

Expanding the Potential

Important as it is, this productivity-enhancing effect is not the only way exchange influences economic development. Indeed, exchange changes the economic landscape in another way that is even more influential. As the primary means by which resources are reallocated to more productive uses (i.e., placed within the reach of more actors), exchange not only recombines each exchanging party's resources (some of which are new) but is also, more generally, a precursor to nearly all resource combinations that ever take place. As such, exchange serves (albeit often unintentionally) as a primary means for placing "within reach" those "things and forces" that we ultimately combine (Schumpeter, 1934: 14). In this way what resources get exchanged not only influences what knowledge gets used but also largely determines how this knowledge is developed to expand or restrict the potential for future development.

As is manifest from our argument so far, even without any demand for exchange, many of the potential services from combinations that are possible would still not be rendered because of limitations in any single party's ability to perceive or to appropriate value from resource combination opportunities. For example, when a single party, such as a sovereign or king, has unlimited access to all resources and to all resource use rights (and no demand-driven need for exchange), that party is motivated to execute and to encourage others to execute all value-creating combinations that are possible. Yet, many productive deployments will not occur, even though *all* would benefit this party. Only those deployments *that party* (e.g., the sovereign) perceives as opportunities to render some

valuable service are likely to be executed. All those possibilities perceived and valued by others will go unexploited, unless some means is available for these others to appropriate some of the benefit.

Note, from this example, that exchange not only improves the lot of those who lack the resources needed to exploit their ideas but can also expand the productive opportunity of those who control the requisite resources. An inevitable by-product of any recombined set of resources is an accompanying change in each exchanging party's productive opportunity. Prior to any recombining, few of these services will be anticipated. Of these, fewer still are likely to be in the hands of those who are able and willing to carry them out. Hence, exchange executed for rendering known services begets the need for more exchange to enable and/or motivate and to discover yet unknown services.

Few of these exchanges will occur (even if they could do so without cost) absent the right to execute certain deployments and the assurance that one can appropriate value from some service that might be rendered. If such exchange were encouraged, however (e.g., by the delegation of resources and/or rights to others), not only would more existing knowledge be exploited to expand the system-wide productive opportunity, as described above, but more possibilities would wind up being perceived, and knowledge itself would grow and give rise to still more exchange. Ultimately, pressure would mount to further subdivide, alienate, and exchange more rights, in order to motivate more productive services as they become perceived.

Exchange, then, is not only a useful and common means for mitigating the ubiquitous problem of getting the highest and best-known use out of scarce resources, but it plays an instrumental role in affecting what uses are known, or even possible, and how they are valued. By affecting the valuation of the resources exchanged, exchange determines which resources are likely to be available for future combinations. In other words, exchange influences economic development not only by enhancing social productivity, through greater "allocative efficiency" (i.e., by securing "the best use of resources known to any of the members of society"), but by marking the path

taken—both in the discovery of resources and their potential services and in their selection for subsequent deployments. The most efficient paths for allocating resources to best-known uses and those for adapting these same services for unknown but potentially better uses are unlikely to be identical (i.e., to require all the same resource deployments) for very long. Hence, exchange also plays a critical role in specifying and rerouting the paths that lead to greater resource discovery, use, and further development over time.

Making Exchange Viable

Which exchanges take place and in what number depend largely upon the viability of each deployment that is implied by any exchange. As with any deployment of resources, all three necessary conditions for deployment that we stipulated earlier must be satisfied before any exchange is likely to occur voluntarily; the opportunity for exchange must exist, and it must be motivated and perceived. In addition, since exchange, by definition, requires more than one party, all three of these conditions must be satisfied for *each party* whose resources are to be included in the exchange. Jevons coined the term *double coincidence* to describe this "improbability of coincidence between persons wanting and persons possessing" (1875: 13). We use the term *multiple coincidence* to refer to the more general satisfaction of all necessary conditions for either combinations or exchanges.

To the extent that all possible exchanges are free to occur without any encumbrance whatsoever, the economy is likely to develop in an adaptively efficient manner. Of course, the notion of totally unencumbered exchange is very difficult to even imagine, let alone observe in practice.³ Transactions that involve

³ Time, for instance—a scarce, valuable, and irreplaceable resource—cannot help but add cost to many exchanges. Exchanges supporting the discovery of as yet unknown things or new combinations (such as the creation of as yet nonexistent resources, whose value depends on more complementary combinations being made) could not occur without some cost, owing to uncertainty being incurred. Moreover, some element of this cost of exchange is intrinsically and inexorably bound up with some cost of future combinations that must be incurred, even if time could somehow be made to stand still.

exchanges among multiple parties are likely to be particularly prone to encumbrances in the form of viability concerns. This is so because the interdependent nature of these transactions is likely to require some deployment that is not independently motivated for all parties.

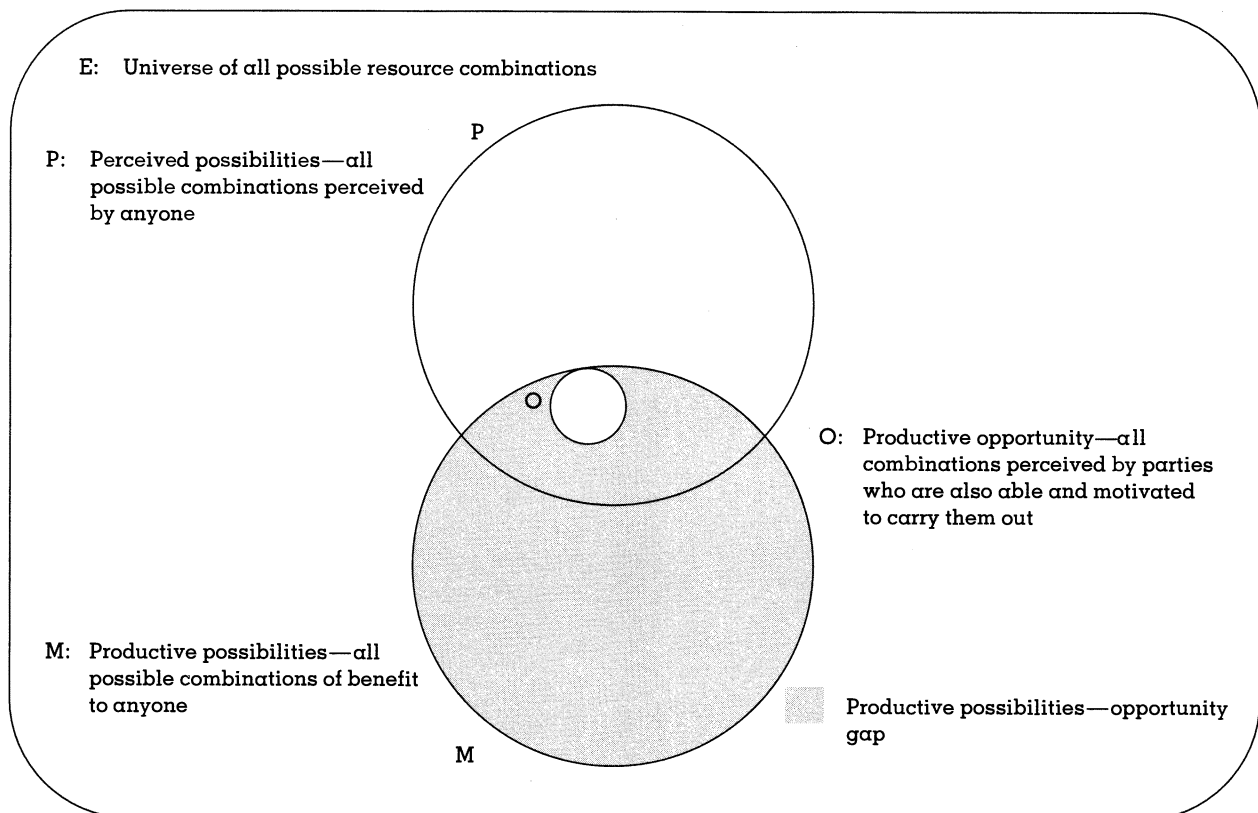
The more resources there are, the more possibilities there will be; the more parties there are, the more these possibilities are likely to be productive (i.e., available services will more likely be motivated for someone). But to fully exploit these productive possibilities, more exchange will be required. As a result, the likelihood that any given exchange will involve interdependent transactions among several parties will be greater. Indeed, it is the viability of these exchanges, involving interdependent transactions among multiple parties, that presents us with an economic problem that can be mitigated only with the help of institutions that organizations and firms, in particular, are able to provide.

THE VALUE-CREATING ROLE OF MARKETS AND FIRMS

With the mechanisms of combination and exchange specified, we now can examine how markets and firms interact to drive the value-creation process. As an aid in tracing the essential features of this process, let us consider the simple multiparty system specified by the Venn diagram shown in Figure 1. The universe (E), represented by the large rectangle that contains the circles, is the set of all possible services that are available to any party at an instant in time. It corresponds to the set of all combinations for which the first necessary condition for purposive deployment is satisfied for anyone, anywhere, and represents the total set of combinations and their attendant services that are enabled by those existing resources and combinations that are immediately within one's reach or could be put there by some exchange.

Similarly, the elements of circles M and P correspond to those possible combinations that

FIGURE 1
The Productive Possibilities-Opportunity Gap



meet the second and third conditions, respectively. They represent the subsets of all enabled services that are *motivated* (M) for and *perceived* (P) by any party. The elements of circle O correspond to the subset of all productive possibilities for which the *multiple coincidence* of all necessary conditions is satisfied for all relevant parties. As such, O represents the collective productive opportunity for the system as a whole, which is the union of all individual productive opportunities. It comprises all prospective combinations of resources involving those resources about to be acquired in imminent exchange, as well as those already in hand. In other words, O circumscribes the set of all purposive economic activity that accounts for all possible uses (i.e., combinations and exchanges) of resources that exist and are objectively (i.e., physically, economically, and cognitively) available in the system at any time.

The inertial forces that specify the elements of E and M will also indirectly influence the composition of P and O. The stronger these forces, the greater the tendency for O to become locked in to supporting (i.e., enabling, motivating, and making salient) those deployments that reinforce these inertial forces, and the harder they will be to contravene. But even if these inertial forces were *never* challenged, development would still occur and would be characterized by a process of creative destruction like that described by Schumpeter (1942) as revolutionary. In other words, new combinations would emerge as the by-product of other deployments and would give rise to new possibilities that change the (relative) productivity of the underlying resources and institutions. Many potential deployments, previously unproductive, will become productive, and some will wind up executed. Other hitherto sources of realized value will no longer be as valuable. The ensuing devaluation in the productive potential of many existing combinations will, in time, lead to the destruction of the devalued combinations themselves, as their constituent resources are freed up for more valuable redeployments.

Over the course of an economy's development, marked by growing numbers of people and resources, the amount and range of productive possibilities (M) grow at an accelerating pace (albeit more slowly than E), until the number of exchanges required to exploit this potential becomes astronomical. Yet, however many ex-

changes are needed to accommodate the growing set of productive possibilities, allocative efficiency still can be achieved if the costs of these exchanges can be kept sufficiently low to allow O to expand in pace with an expanding $M \cap P$. Over time, $M \cap P$ itself tends to expand, as exchange stimulates the perception of more productive possibilities. In this way exchange narrows the productive possibilities-opportunity gap, expands P to include more of M, and promotes greater allocative efficiency.

But all this development is predicated upon unencumbered exchange. In any growing economy where the number of productive exchanges is literally exploding, enabling all to occur at low cost can quickly become an exceedingly difficult task. Any finite cost of exchange, however small, can consume, in time, a significant proportion of an economy's resources. Therefore, even if the cost of exchange is somehow reduced, as the number of exchanges grows, the proportion of resources dedicated to overcoming these costs likely will rise. This, indeed, is what happened in the United States between 1870 and 1970: the proportion of GNP allocated to overcoming transaction costs rose from 25 to 45 percent (Wallis & North, 1986).

There is nothing in the development process, however, to ensure that it follows an adaptively efficient path. For an economic system to be efficient in the long run, it must evolve in ways that motivate the creation and realization of new value as new resource deployment possibilities emerge. In terms of the Venn diagram in Figure 1, adaptive efficiency requires more than just a reconstitution of the elements of M (accompanied, of course, by some convergence of P toward this changing M and the expansion of O within $M \cap P$). Also needed is some minimum level of institutional responsiveness that will motivate (include in M) more of those intermediate deployments required for many productive combinations.

To better understand why adaptive efficiency might be more difficult to achieve than allocative efficiency, it is useful to consider two different ways individuals can respond to changes in economic conditions. The first is by executing any of those deployments that are already elements of M. Schumpeter refers to this type of response, which is "within existing practice," as the "adaptive response" (1947: 153). In effect, adaptive responses (i.e., deployments) are fa-

vored by the prevailing economic and institutional structure, because actors have the requisite resources, ideas, and rights needed to independently execute and benefit from them. If more than one deployment is required, then each is enabled, motivated, and, perhaps, even perceived within the current economic structure.

Additional institutional support may be needed to facilitate the joining of these conditions (i.e., to satisfy the multiple coincidence) for this class of deployment, but not to make them productive. Transaction costs are all that stand in the way of the execution of the necessary exchanges. Such costs, for example, may come in the form of search costs that can frustrate one's ability to find the best available exchange parties or to discover the best resources known (by someone) to complement (i.e., enhance the productivity of) others the individual may have. If the necessary links are too costly to establish, the services from these deployments may remain excluded from the productive opportunity. However, these costs often can be overcome via other deployments that are themselves viable under the prevailing institutional structure. Market institutions are particularly well suited to the coordination of these independently viable deployments. Note that, when such coordination occurs, the allocative efficiency of the system is enhanced.

All other deployments belong to the second class of deployments, which Schumpeter refers to as the "creative response"—that is, "something that is outside of the range of existing practice" (1947: 153). Schumpeter takes care to stress that the "creative response" is both *unpredictable* and *discontinuous*, and it always involves *entrepreneurial activity*. These deployments are *not* independently motivated under the current incentive regime and, therefore, are not likely to occur without some entrepreneurial initiative. They constitute, by far, the biggest class of contenders for O.

Included in this second class are many deployments that are motivated but are not likely to occur because they depend upon some additional deployment(s) either not motivated or perceived. Hence, such potentially productive deployments are unlikely to be induced autonomously by the prevailing institutional matrix. Rather, they are more likely to

be *systematically discouraged*, given the existing distribution of resources, rights, and individual perceptions and the way in which these are combined at the time. Moreover, unless and until other productive and complementary deployments soon follow, the allocative efficiency of the system will drop to the extent any prerequisite deployments that are not independently motivated do manage to occur. Although the persuasive force of some entrepreneur's will and initiative can be sufficient to bring these deployments about (i.e., by ignoring or defying the forces of allocative efficiency), some institutional change generally is needed to *make this class of deployments efficient*. Institutional change motivates more deployments, either by making them independently viable or by linking them in some way that allows the viability of some to motivate the others.

Despite this difference in the viability of these two classes of deployments, both require some change in the prevailing institutional matrix to support their exploitation. Some institutional change follows automatically from whatever adaptive response is elicited by the productive opportunity. This change includes the intentional outcomes and the unanticipated by-products of whatever coordination is made possible by the actions of individuals and firms in industries and markets (Richardson, 1972). More change, however, will result when individuals and firms respond creatively, often in ways that cannot be meaningfully labeled *ex ante* as allocatively efficient.

It is, as Schumpeter calls it, "the interaction of institutional forms and entrepreneurial activity, the 'shaping' influence of the former and the 'bursting' influence of the latter" (1947: 153), that drives the development process toward greater adaptive efficiency. It is by facilitating and supporting more and more varied adaptive and creative responses and enabling them to be amplified and leveraged across many individuals and purposes that firms help create value for society beyond what markets alone can create (Ghoshal & Moran, 1996). A theory of value creation requires a more precise understanding of how firms can and do engender such support and the institutional change it accords. It is an explication of this process that we now turn to.

Bridging Missing Markets to Broaden the Scope of Exchange

Exchange-enhancing institutions have evolved throughout history to help us cope with the frictions of exchange (Coase, 1992). Examples include secure property rights that define and help clarify appropriability, thereby motivating many more deployments than would otherwise be motivated (expanding M in Figure 1); a system of prices that makes it easier to "cost out" many of the deployment possibilities seen, thereby enhancing the visibility of those that are economically viable (expanding P); and the expanded use of money, credit, and other negotiable instruments that have freed us from the restrictions of barter trade. As a result, the predictability and security of many exchanges increase, and so does the number of exchanges for which the multiple coincidence is satisfied (moving more of $M \cap P$ into O).

In the markets of the most developed economies, those conventions have evolved that support and reinforce an institutional logic enabling actors to enter into and exit from a variety of exchange relations at comparatively little cost and, thereby, to preserve their independence from all other actors. The very advantage of independence, which makes it easier for market participants to adapt autonomously to changing conditions without the need to consult others, necessarily restricts the form of viability that must exist around each exchange transaction. Consequently, market exchanges must generally satisfy a condition that Coleman (1990) has called "reciprocal viability." That is, each actor must have a positive account balance in each exchange relation that it is a part of. Reciprocally viable relations end when one party finds the relation to be no longer beneficial. This may occur simply because the "multiple coincidence" of conditions necessary for an exchange are incomplete or missing entirely—not because the possibility is unmotivated for anyone or unperceived by all. Examples of such "missing markets" (Milgrom & Roberts, 1992) include exchanges for which pricing is difficult; money is inappropriate; exchange parties are too few; rights are unclear, inadequately specified, or not adequately protected or enforced by law; and so on. The existence of social institutions allows many exchanges to take place under other, less restrictive, forms of viability. With

the demand for viability relaxed, the scope of resources that are considered for exchange broadens considerably.

In terms of our framework, every element of $M \cap P$ that lies outside of O is a combination that requires some exchange for which the multiple coincidence is not satisfied (otherwise, it would be an element of O). In a simple two-party system, all prospective exchanges must, by definition, be reciprocal. The introduction of more parties introduces the possibility for more complicated exchanges, many of which are not likely to be reciprocally viable. To the extent market institutions, like the use of money and credit, monetize the resources involved in many exchanges, they can make some otherwise interdependent transactions reciprocally viable. In this way such institutions make it easier for the multiple coincidence to be satisfied by making more exchanges reciprocally viable and thereby shifting them from $M \cap P$ into O . But as the variety of resources and number of parties increase, more and more productive exchanges will be possible only through more complex, nonreciprocally viable exchanges. Hence, the expanding area that lies just outside of O (in $M \cap P$) will increasingly need the support of institutions that can accommodate less-stringent conditions for exchange viability.

Organizations allow many such exchanges to occur by extending exchange viability across their network of interdependent relations. Less-restrictive conditions for viability are possible, Coleman (1990) notes, when the viability of a relation can be ensured through its connections to other relations that are themselves connected to a common and influential third party. An organization acts, in this way, as the "implicit third party" to every exchange relation among its members (Coleman, 1993). Because the viability of any member's relation with any other in the organization can be provided indirectly through its relation with the organization itself, members are able to enter into and maintain exchange relations that may be beneficial to the organization, even if not to them directly.

Coleman (1990) refers to two such conditions of relatively less-restrictive viability as "independent viability," where each actor has a positive account balance with the organization but not necessarily with other members, and "global viability," where the system of relations that the organization has with its members is positive

but some relations it has with individual members are not. In both cases the viability of the organization itself depends largely on contributions from this internal network of relations, so we refer to all such relations that are not reciprocally viable as those requiring "interdependent viability."

Interdependent viability dramatically expands the circle of exchange that takes place among members inside their organizations. By permitting individuals and groups to enter into voluntary exchanges that benefit the organization but that benefit themselves only indirectly, organizations can open up and make accessible to their members a much broader range of resource deployments (including exchanges) than would be possible were each exchange required to satisfy the condition of the "multiple coincidence" via the more stringent demand of reciprocal viability.⁴ Because members can enter into exchanges whose value can be appropriated by the organization as a whole, their circle of appropriability is broadened to include more of the organization's own appropriability regime (Teece, 1986).

In this way social institutions, particularly those engendered by firms, bridge missing markets. But relaxing the constraint of reciprocal viability is not the only way that firms contribute to economic development. Firms, and social institutions more generally, provide an important link for understanding how market forces are challenged to adapt efficiently. We turn now to discuss how firms not only serve to bridge missing markets but also serve as purposive actors in the creation of new markets and in charting a course for adaptively efficient development.

Challenging and Changing the Course of Efficiency

Just the existence of a firm or of any organization or organizational subunit cannot help but change the economic structure that shapes resource deployment decisions. The formal and informal constraints and incentives that accompany the firm's organizational structure, poli-

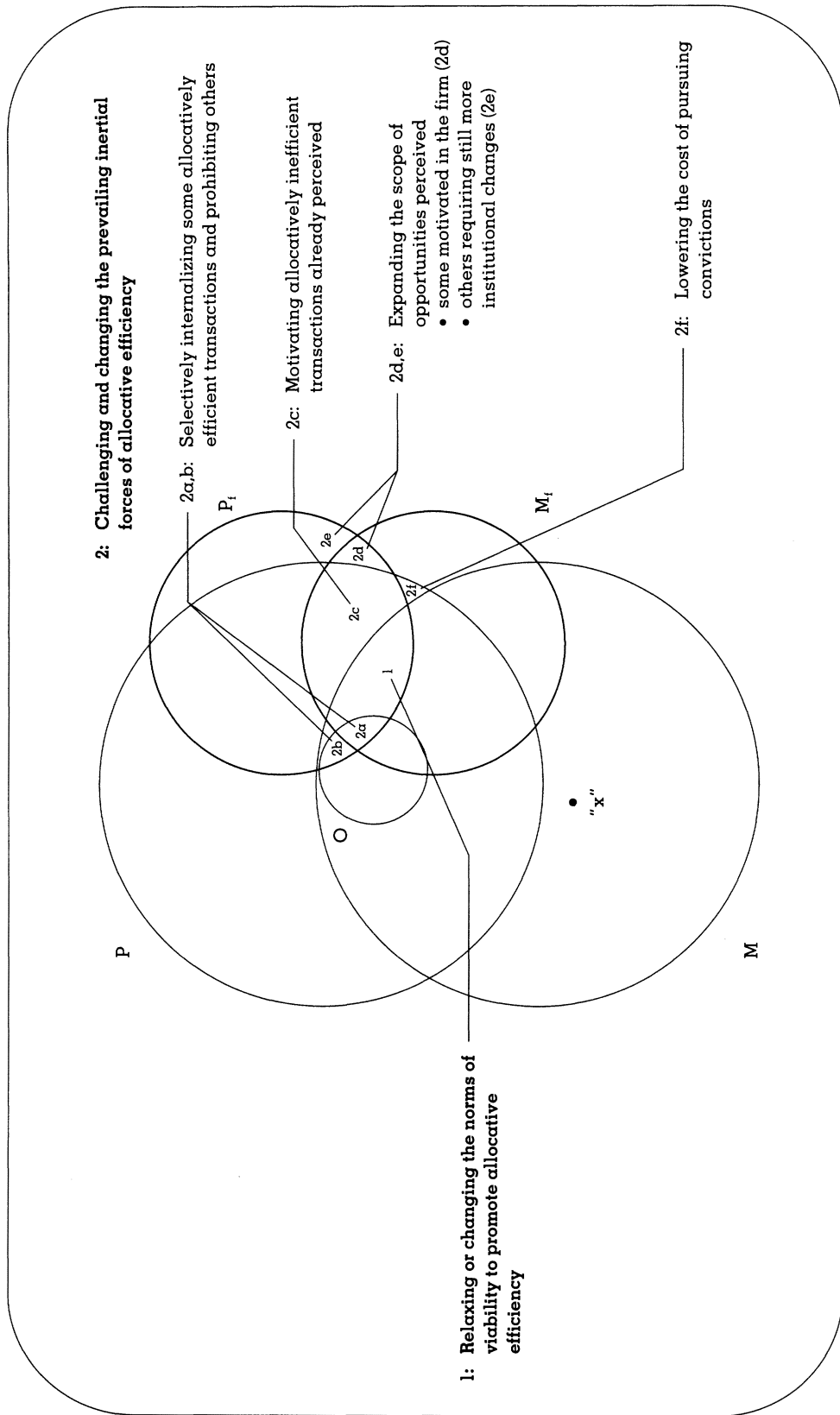
cies, and procedures collectively constitute an institutional context that parallels and augments the institutional matrix that exists for society as a whole (North, 1990b). 3M's policy to encourage researchers to spend up to 15 percent of their time pursuing projects of interest only to them is an example of the resource allocation context created by the firm to formalize and support an old "bootlegging" tradition in the firm (see Bartlett & Mohammed, 1995). By facilitating deployments that employees may see but otherwise would not have the means or motivation to execute, 3M has extended the appropriability of these deployments to the firm and its employees. In this way the institutional context accompanying each firm induces individuals to deploy resources in ways that at times complement, and at other times substitute for, other deployments that are induced by the institutional matrix that the firm itself is embedded in.

With the help of Figure 2, we now can pull the strands of our argument together to illustrate how this tendency manifests itself in any institutional framework and is overcome and/or changed when new institutional forms are introduced into the system, particularly those introduced by firms. The two largest circles and the smallest one in Figure 2 correspond identically to circles M, P, and O in Figure 1. They represent the status of the economic structure and its inertial forces, which specify those possible deployments that are motivated by, perceived in, and are likely to follow from any exchanges that may be purposively executed in the system, before the influence of any new institution is introduced. The creation of any new organization introduces into the system a unique institutional context with its own submatrix of rights, incentives, and rules (North, 1990b). This new context reconstitutes the elements of M, by eliminating (i.e., demotivating) some while adding (i.e., motivating) others.

The impact of a new firm is represented by M_f and P_f in Figure 2. M_f comprises all those deployment opportunities that are motivated as a result of the rules and norms embodied in the new firm's context. It differs from M in that some productive possibilities now motivated by the presence of the firm may not have been motivated in its absence (i.e., elements of M_f not contained in M) and others that may have been motivated without the firm are no longer motivated in the presence of the firm and of the

⁴ Nahapiet and Ghoshal (1998) explain how organizations, as institutional settings, are conducive to the development of social capital and, therefore, of interdependent viability.

FIGURE 2
Broadening the Scope of Deployments to Promote Both Adaptive and Allocative Efficiency



resources it may control (e.g., by controlling such resources as patents and complementary assets, firms can make some deployments—like related research—nonviable and, therefore, no longer elements of M). This unique set of possibilities made “productive” (i.e., motivated) by the firm (M_f) gives rise to a corresponding set of deployment possibilities that are perceived (P_f). As a result, P will expand (i.e., $P_{\text{new}} \sim P_{\text{old}} \cup P_f$), and O will be reconstituted in the process. This newly reconstituted productive opportunity (not shown) will contain some elements of $M_f \cap P_f$ that broaden the scope of exchange to include many deployments made viable by the new context, which otherwise would not occur in the firm’s absence. Let us consider some of the ways in which this broadening of the scope of exchange can occur.

First and foremost, the establishment of any firm governs many deployments that are already perceived somewhere in the system (P). Although many of these deployments may already be motivated ($M \cap P$) as well, they may require some coordination or prerequisite combination or exchange to align the requisite resources with the appropriate rights and ideas for executing and benefiting from them. Facilitating these otherwise allocatively efficient deployments (see area 1 in Figure 2) is generally considered to be the *raison d’être* of firms in contemporary economic theory (Barney, 1991; Coase, 1991; Williamson, 1985). But, although firms often do respond adaptively (i.e., in allocatively efficient ways) by providing appropriate safeguards from freeriding, shirking, or malfeasant behavior (Alchian & Demsetz, 1972; Williamson, 1985), they also respond in ways that are difficult to classify as allocatively efficient. For example, when the firm internalizes (2a) or proscribes (2b) deployments that are already externally induced (in O), it is thwarting the market’s allocative forces, often intentionally, to encourage deployments that otherwise would not likely be made (Holmstrom & Milgrom, 1991).

More generally, firms also broaden the scope of deployments far beyond the foresight of their managers or the designers of their structure. They do this by creating conditions that shift related but unspecified deployments into O —for example, by motivating them through the promotion of teamwork (Alchian, 1993), by stimulating their perception via more efficient patterns of communication (Monteverde, 1995), or by mak-

ing the necessary resources more accessible (Rajan & Zingales, 1998; see also Cohen & Levinthal, 1990, 1994). When the firm induces deployments that are otherwise motivated (but for some reason are not executed) without the firm (as in area 1), the firm may be said to promote allocative efficiency (by moving them from M to O).

But the same cannot be said of those deployments that are “productive” only by virtue of the constraints and incentives engendered by the firm (i.e., in M_f but not in M). Yet, by motivating deployment possibilities that benefit no one without the firm’s unique institutional context, firms induce behavior that would not occur otherwise. Some of this new behavior may be induced by the interdependent viability of deployments that is engendered by the firm’s institutional context. More will stem from the reconstitution of those deployments that are reciprocally viable. For example, one unit may be induced by the firm’s internal transfer pricing system to supply or be supplied by another. These deployments are allocatively *inefficient*, as independent transactions that are not induced by market prices or by existing institutions, but they may be essential for the viability of other deployments critical to the firm. In this way firms challenge the inertial forces of adaptation that generally prevail in the institutional matrix.

Another way in which firms directly challenge the prevailing forces of efficiency is in enabling entrepreneurs to exercise their own initiative and to elicit that of others in ways that are complementary. The alert entrepreneur sees opportunities that no one else sees (Kirzner, 1973; Schumpeter, 1934) and expands P in the process. To the extent the discovered possibility is already motivated (e.g., like the element of M , labeled “x” in Figure 2), its execution would push the system closer to some equilibrium of greater allocative efficiency. But if no current organizational setting sufficiently motivates the possibility (e.g., as none does for any deployment that is not already an element of M), the entrepreneur must create one that does. As Langlois (1995), has observed, this is often done only with great reluctance on the part of the entrepreneur. The need to circumvent the “ruts of established practice” is indeed the essence of Schumpeter’s view of entrepreneurship (1947: 152) and perhaps

marks the point of departure that separates Kirzner's (1973) view from his.

The combination of 3M's "make a little, sell a little" policy with its renowned flexibility and support for individual initiative has allowed the firm to shape and have a stake in literally scores of new products and technologies. Despite the widespread availability of many similar resources, the economic structure provided by most alternative organizations (i.e., the constellation of resources and institutions within their reach) is inadequate to accomplish what 3M does routinely. In markets key resources generally are so dispersed they are inaccessible, whereas in firms appropriability demands often dictate larger-scale returns than are either possible or attractive, relative to deployment alternatives (cf., Christiansen, 1997).

Of course, these challenges to allocative efficiency can easily fail. But when they succeed, they redefine what is efficient, and they redirect the course of efficiency. Once the new context of the firm is created and institutionalized into a coherent incentive structure, it becomes part of the institutional matrix (i.e., reconstituting M to include most of the old M , as well as M_f). This revised institutional matrix, in turn, initiates a cycle of new deployments. Some will be induced immediately by the firm's context, whether they were heretofore perceived but unmotivated deployments (2c) or are newly perceived and motivated (2d) as a result of the firm. Others that are newly perceived must await yet another round of Schumpeter's (1934) brand of entrepreneurship and organizational restructuring (2e) to motivate their execution. Still others, although motivated by the firm and perceived elsewhere, must await either the arrival of outsiders to pursue convictions that the firm enables or the discovery of the opportunity by those already inside the firm (2f).

The new resources and complementarity in services that emerge from many of these deployments enhance the creation and realization of new value. To the extent these new resources and complementarities are valued substitutes for existing resources, old value that once existed for particular firms is diminished, and the inertial forces that once held those old resources in place are weakened. Over time, more resources are reallocated as part of the old economic structure is destroyed and the newly

emerging one is reinforced with more resources and more complementary institutions.

Each unique institutional context that is created by the existence of a firm or organizational subunit provides a potentially hospitable environment for others who may perceive deployment opportunities unknown to current members of the firm (i.e., the area designated as 2f). To the extent these others join the firm and pursue their convictions at a lower cost than is available anywhere else (North, 1990b), they expand $M_f \cap P_f$. This entrepreneurial process of motivating known but currently unproductive deployment possibilities and of stimulating the perception of new ones provides generally more productive opportunities at lower cost than would otherwise be possible. As many firms of different forms and sizes engage in this process, each broadens the scope of exchange in ways that allow it to focus on some fragmented bits of the knowledge that Hayek (1945) talked about, and more of the knowledge that resides in the system is used—in a way that also promotes adaptive efficiency.

To the extent M_f induces the execution of deployments that fall outside of $M \cap P$ (as in 2c, d, e, and f), this induced use of resources occurs in defiance of the forces of allocative efficiency that prevail in the firm's absence. If the execution of these deployments leads to the realization of value, which then brings about a change in market incentives or resource rights, that deployment and the firm responsible for motivating its execution will have challenged and changed the path-dependent trajectory (Dosi, 1982, 1988) of resource deployment possibilities that are allocatively efficient in the market. It is this ability to unstick the inertial forces favoring the allocative efficiency of the status quo that results in greater adaptive efficiency.

Institutional Pluralism

With the framework we have developed, it is clear why no fixed institutional matrix that naturally accompanies any organization of resources (whether in a single firm, a centrally planned economy, or even a chaotic unorganized market) can contribute as much to economic development as a diverse mix of firms and markets. The advantage of any institution—a system of decentralized prices, centralized authority, or some other set of complementary

conventions and norms—is its tendency to focus on certain activities while ignoring others. Its disadvantage is the cost incurred in overcoming that focus to do other things.

Thus, while reducing some of the constraints that markets place on individual transactions, firms simultaneously restrict the set of deployments that are motivated and likely to be perceived. In other words, the added costs that institutions impose on one's ability to access certain resources or to deploy them in certain ways can either facilitate or frustrate entrepreneurs' attempts to challenge the prevailing institutional matrix. In terms of our framework, this means that the ability to support the scope of exchange needed to systematically promote all value-adding resource deployment opportunities gets lost in any *single* institution, regardless of whether that institution is associated with a market or a firm.

In the face of the limitations inherent in any coherent web of institutions, institutional pluralism remains the viable solution for any economic system. Institutional pluralism, enriched by a multitude and variety of firms, each representing a different institutional context—that is, a different set of convictions and bets—contributes to the process of achieving adaptive efficiency in several ways. First, the scope of exchange is broadened to include more opportunities that are not exploited elsewhere. Second, some resources that are currently deployed elsewhere are made available for deployment within the firm under a different set of motivating conditions. By replacing those motivating forces that encourage certain deployments with forces that motivate alternative patterns of deployment, firms make it easier for value-creating new combinations to be discovered and executed.

North avers that "institutions, by reducing the price we pay for our convictions, make ideas, dogmas, fads and ideologies important sources of institutional change" (1990b: 85–86). Because all organizations (through the unique institutional context they engender) differentially impact the cost of pursuing one's convictions, raising the costs for some while lowering the costs for others, we will always need organizational alternatives to offset the inertial forces of any single institutional matrix—whether it is itself governed autonomously (like a market) or more

purposively (like a centralized firm or government).

Firms or markets alone, left untempered by the countervailing force of the other form of organization, subject us to institutional straight-jackets—one an iron cage of bureaucracy; the other, a treadmill of ever-tightening competition. Neither offers sufficient freedom to perceive, experiment with, and evaluate new ways to create and to realize value. Institutional pluralism (i.e., a rich variety of institutional forms and sizes) helps to overcome the institutional straightjacket. Both markets and firms are needed for adaptively efficient economic development. Operating together, in a dynamic state of creative tension, they provide the necessary checks and balances to bring about adaptive efficiency. As development ensues, institutional pluralism and the dynamic tension made possible by a wide variety of firms (rather than by a multitude of atomistic, independent actors) matters even more.

DISCUSSION

As we stated in the introductory section, our objective in this article was to lay the groundwork for a theory that would relate the role of firms to the process of economic development. In developing our arguments, we have drawn from several strands of literature, of which Douglass North's work on institutions has perhaps been the most influential. While North (1990b) focuses almost exclusively on those institutions that exist outside of firms, we have drawn attention to the rules created by firms and followed by their employees, which are also institutions. Our extension of his perspective to these institutions carries some important implications both for economic theories and for the theories of firm-level strategy often derived from them. In this concluding section we briefly highlight some of these implications and the opportunities they create for further development and testing of theory.

Implications for Economic Theory

Scholars often conceptualize the ideal structure of an economy as a market comprising as many decentralized independent actors as possible—each acting autonomously to best exploit its own knowledge (Hayek, 1945). Firms, cast as

the organizing form "of last resort, to be employed when all else fails" (Williamson, 1991: 279), are needed only to the extent they can satisfy market demands for efficiency better than markets themselves can (Coase, 1991). In other words, they are seen as a means of containing the damage of market failures (Williamson, 1975).

In contrast, we have shown in this article why the value-creation potential and value-realization potential of atomistic, autonomous agents are severely limited when these agents can only engage in bilateral exchanges that must be reciprocally viable. When the complementary characteristics that make for efficient markets (i.e., large numbers of independent participants) are confronted with (1) strong uncertainty, which masks the true value potential of resources, (2) pervasive transaction costs, which distort perceptions of the nature of available resources and their accessibility, and (3) the pressures of competition, which favor resource deployments that are as efficient as possible, the outcome is a relatively conservative set of resource deployment decisions that facilitate allocative efficiency, but often at the cost of adaptive efficiency.

Organizations in general and firms in particular counterbalance the institutional constraints imposed in markets by muting, replacing, or otherwise modifying market incentives, thereby redefining the motivation for and efficiency of the economic activities they influence. In other words, each firm creates a unique subsidiary context, consisting of its own unique mix of incentives that encourages the assimilation, sharing, and combination of resources, including knowledge, in ways that a market cannot. The more plentiful and varied the contexts, the more opportunities individuals have to challenge and to change the forces of development. In a narrow equilibrium sense, any collective disregard of market incentives is inefficient, at least allocatively. However, although some, perhaps many, of these challenges undoubtedly go wrong and lead, *ex post*, to complaints of waste and inefficiency (cf., Jensen, 1993), it is out of this defiance of prevailing forces that emerge many of the value-creating innovations (essentially new resource deployments) that enhance the wealth of societies and lead to adaptive efficiency.

At the heart of these different perspectives on the role of the firm lies the distinction between allocative and adaptive efficiency and, more broadly, a differing view about the concept of efficiency itself. In much of conventional economics, efficiency is a static concept, as is appropriate in a contextual, equilibrium analysis. However, in a more contextual and dynamic view, the notion of efficiency is much more problematic. As Coleman has argued,

The concept of efficiency of an economic system is defined only within a particular distribution of resources or as I will call it, a particular constitutional allocation of rights and resources. If in a given system, with a given constitutional allocation, all externalities are internalized and transaction costs are reduced to zero, the system has achieved efficiency. But if rights are allocated differently, to persons with different interests, then the "efficient" outcomes of the system may differ (1993: 85–86).

Economic progress is achieved through both the improvement of efficiency, within an existing constitutional allocation, and changes in the rules that define what is efficient, via a change in that constitutional allocation. To achieve adaptive efficiency, any system—whether a firm or a society—must have the flexibility to pursue both these routes to progress. Yet, much of economic theory, including industrial organization theory, which pertains to the conduct of firms, and much of growth theory, which addresses the development of nations, historically has tended to focus on the former, often by ignoring the latter.

This is not to say that exceptions do not exist. An increasing number of microeconomists have begun to focus on the link between market structure and innovative activity (e.g., Archibugi, Evangelista, & Simonetti, 1995; Bughin & Jacques, 1994; Caballero & Jaffe, 1993; Kamien & Schwartz, 1982; Smulders & van de Klundert, 1995). Others have marshaled empirical evidence to demonstrate that the resource-combining capability of firms that leads to firm-level innovations also has a significant aggregate effect on macroeconomic growth (Carlson, 1991; Eliasson, 1991). Theorists also are pushing to explore the role firms play in influencing one's access to and deployment of resources (cf., Rajan & Zingales, 1998) and to explain its effects. Together with the work on the so-called neo-Schumpeterian growth models that we referred

to in the introductory section, this emerging literature is beginning to provide the formal analytical infrastructure that is needed to accommodate and build on Schumpeter's pioneering work on creative destruction.

Yet, despite these advances in the adoption of more heterodox assumptions by economic theorists, many unexplored issues remain, including some that we have highlighted in this article. Most notably, theories of economic growth ought to incorporate the role of institutions and of transaction costs in the process of economic development. Of particular relevance is the possibility that emerges from our analysis that, with regard to transaction costs, less is not always better than more. To be sure, the assumption of zero transaction costs has been enormously useful to the development of economic theory. But, frequently (cf., Coase, 1988, 1992), the concept is taken not only to mean "cost-free" exchange (which is a meaningful and sometimes helpful concept) but also to mean cost-free *institutional change* (which is not).⁵

Indeed, as long as these two notions remain lumped together in one assumption, it is difficult to explore how lower cost exchange might sometimes impede, rather than facilitate, adaptive efficiency, and how conditions like bounded rationality and some cost for certain transactions may actually be useful in helping actors initiate some productive institutional changes. Similarly, theories of the firm need to move beyond the market failure framework and recognize the positive role of organizations in the process of identifying and exploiting new resource combinations. Formal incorporation of the different kinds of viability and of their antecedent conditions will be particularly useful in this regard.

Implications for Strategy Theory

Historically, in theories of firm-level strategy, scholars have tended to focus relatively more on the issues of value appropriation (sustainable

competitive advantage) and its distribution (shareholder wealth) than on the issue of value creation (i.e., creation of new rent sources). This focus has been sharpest in those theories grounded in traditional industrial organization (IO) economics, which arguably represent the earliest and most rigorous efforts, to date, in formalizing strategic concepts in theoretical terms. Standard economic theory holds that, unless otherwise obstructed, the competitive forces driving rivalry among firms in any given industry will also tend to force performance across industries and among firms within industries toward convergence at equilibrium. Firm differences—that is, heterogeneities in their performance—that persist at equilibrium are attributed to the barriers to entry that characterize different industries (Bain, 1956) and to mobility barriers that restrict rivalrous behavior and promote strategic interaction among groups of firms within the same industry (Caves & Porter, 1977).

The objective of strategic management, both as positive and as normative theory, according to this IO perspective has been seen to be one of gaining and maintaining market power to appropriate as much of the value that accrues from these economic rent-sustaining barriers as possible. Indeed, the prescriptions that flow from Michael Porter's (1980, 1985) five forces model of competitive strategy and value-chain analysis are all centered around steps to gain competitive advantage by positioning a firm in its industry in ways that facilitate the appropriation of as much value as possible from the firm's suppliers, buyers, competitors, potential entrants (to its industry or strategic group), and producers (and potential producers) of substitute products and/or services.

The more recent emergence of the resource-based view (RBV) of the firm has extended this IO perspective to explain behavior at the level of the individual firm, particularly in the markets for a firm's factor inputs or resources (Rumelt, 1984; Wernerfelt, 1984). At least in the initial formulation of the RBV, scholars viewed isolating mechanisms (Rumelt, 1984, 1987) as mobility barriers that restrict the extent to which, essentially, all firms are able to mimic any particular firm's behavior and, thereby, to replicate that firm's performance and, ultimately, appropriate some or all of its rent streams. The strategic behavior that is implied

⁵ Coase suggests that "in the hypothetical world of zero transaction costs . . . the parties to an exchange would negotiate to change any provision of the law which prevents them from taking whatever steps are required to increase the value of production" (1992: 233). Note that in such a world of costless "contracting around the law," not only are all exchanges assumed to be free to occur without cost but so too are all necessary institutional changes.

by this perspective (both prescriptive and normative) is very similar to the one implied by the IO perspective: strategy focuses more on appropriating the rents of others and preventing them from appropriating your rents, and less on finding and exploiting the sources of these rents.

The reason for this bias in favor of rent appropriation over rent creation stems not from any notion that appropriation is or should be preferred, but from a reflection of the view that purposive action is more usefully applied in the protection of rents than in their creation. Indeed, the RBV explicitly recognizes heterogeneity among firms as the source of all rents, but this view has tended to remain atheoretical in regard to explaining the value-creation process, because it attributes the source of rents and, by association, the source of value to unexpected changes (Rumelt, 1984) or luck and foresight (Barney, 1986). The general consensus has been that firms could not benefit from any recipe-like strategy for creating rents, even if one did exist, because once such a strategy were identified and implemented, its value would soon be eroded through others' attempts to imitate it. Therefore, no systematic theory of rent creation exists or can exist (see, for example, Barney, 1986, and Schoemaker, 1990).

As we indicated in the introductory section, a number of scholars have begun to challenge this focus on value appropriation as the essence of strategy and to contest the underlying theoretical framework that has been the source of this bias. Dierickx and Cool (1989), for example, have argued that to create sustainable competitive advantage, firms need to develop and accumulate strategic resources and capabilities—an argument that is echoed and extended in Teece et al.'s (1997) conceptualization of the firm's dynamic capabilities. Indeed, Jay Barney, a key contributor to the earlier strand of the RBV that focused on an explanation of sustained profitability through the avoidance of erosion, imitation, or substitution of specific rent streams (1991), has now broadened his theory to include an innovation-based explanation of creating new, albeit transient, rent streams (1997). Similarly, Michael Porter (1996) also has expanded on his earlier work to acknowledge the need for both value appropriation and value creation for effective firm strategy.

The framework we present here draws on this work but also suggests at least two important

areas of future research. First, our arguments suggest that it is not resources per se, but the ability to access, deploy, exchange, and combine them that lies at the heart of value creation. Although much of the work on the RBV has focused on defining, categorizing, and theorizing about resources, we believe that the theory-building agenda needs to be broadened to include a greater degree of attention to the selection mechanisms that influence the use (and, therefore, the accumulation and further development) of resources. What antecedent conditions are necessary for establishing interdependent viability? What structures and processes facilitate "combinatorial capacity" (Kogut & Zander, 1992) and the development of dynamic capabilities (Teece et al., 1997)? We believe that a broadening of focus from value appropriation to value creation will require a greater attention to these questions.

Further, we have focused here on the issue of value creation, but firm-level strategies require *both* the creation and the appropriation of value. Although we have a relatively well-developed understanding of the former and have made at least some progress in understanding the latter, we still know very little about how the requirements of both can be reconciled. Appropriation strategies may interfere with innovation, but so too may competition avoidance (Roberts, 1997). Potentially, the conditions for each might conflict; as Dorothy Leonard (Leonard-Barton, 1992) has argued, core competencies have a negative flipside that makes them also core rigidities. Yet, in a hypercompetitive environment (D'Aveni, 1994) it is precisely this ability to balance value creation with value appropriation that lies at the heart of effective firm strategy. Systematic analysis of how this balance might be reached provides an important avenue for further work.

Finally, our knowledge of what conditions make for adaptively efficient structures is still largely incomplete. Hence, it is very difficult, perhaps impossible, to tell whether or when any organization, particularly a large firm like Microsoft or a nation like the United States, is embracing enough of the possibilities that are available from the resources it controls to allow it to stay economically viable for very long in a competitive environment. As Schumpeter notes,

Since we are dealing with a process whose every element takes considerable time in revealing its true features and ultimate effects, there is no point in appraising the performance of that process *ex visu* of a given point of time; we must judge its performance over time, as it unfolds through decades or centuries (1942: 83).

Our argument suggests that an organization that is not adequately enabling and motivating new possibilities is more likely to witness its own decline—a destruction of its own economic structure that will have been induced from within. This manifestation of creative destruction may take decades, or even centuries, to materialize, but decline will come as long as someone, somewhere, is better structured to embrace the possibilities that emerge. If the organization does remain viable, it will be because its economic structures encourage the institutional changes that would support the creative response. Such structures, whether they exist within a firm or a nation, are likely to be characterized by institutional pluralism.

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