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ESSAY

The Resource-Advantage Theory of Competition

Toward Explaining Productivity and Economic Growth

SHELBY D. HUNT
Texas Tech University

The major thesis of this article is that combining the resource-based theory of the firm with Austrian economics and heterogeneous demand theory provides the foundations for a new theory of competition, the resource-advantage theory. This new theory has macro and public policy implications. Specifically, when compared with neoclassical perfect competition theory, the resource-advantage theory better explains productivity and economic growth.

Diverse views on the resource-based theory of the firm continue to develop (Barney, 1991, 1992; Barney & Hansen, 1994; Black & Boal, 1994; Brumagim, 1994; Collis, 1991, 1994; Dierickx & Cool, 1989; Grant, 1991; Lado & Wilson, 1994; Peteraf, 1993; Schendel, 1994; Schoemaker & Amit, 1994; Schulze, 1994; Wernerfelt, 1984). Nonetheless, there appears to be a consensus on at least one point: The resource-based theory of the firm differs markedly from neoclassical theory. As Conner (1991) argues, any satisfactory theory of the firm should explain why firm diversity exists. Because neoclassical theory views the firm as a combiner of homogeneous, completely mobile inputs, its production-function theory of the firm implies that large, diversified firms in market-based economies must result from firms restraining their "productive output through exercise of monopoly power or by colluding with other firms . . . [and] above-normal returns thus reflect nefarious firm behavior" (p. 124). In contrast, she notes, resource-based theory views the firm as a combiner of heterogeneous, imperfectly mobile, "costly to copy" resources. Therefore, "multiple, heterogeneous firms continue to exist [in market-based economies] because the assets with which they become mated are themselves heterogeneous, each making a better fit with (more specific to) some firms than with others" (p. 139).

Does resource-based theory have macro or public policy implications? The work of Hunt and Morgan (1995) extends the resource-based view to the macro arena. Specifically, they argue that if one joins Austrian economics (Jacobson, 1992) and heterogeneous demand theory (Alderson, 1965) with the resource-based theory of the firm, one has the basic elements of a new theory of competition. They examine the premises of this resource-advantage theory (hereafter, R-A theory), and like Conner (1991), contrast it with neoclassical perfect competition. They point out that market-based economies are premised on competition

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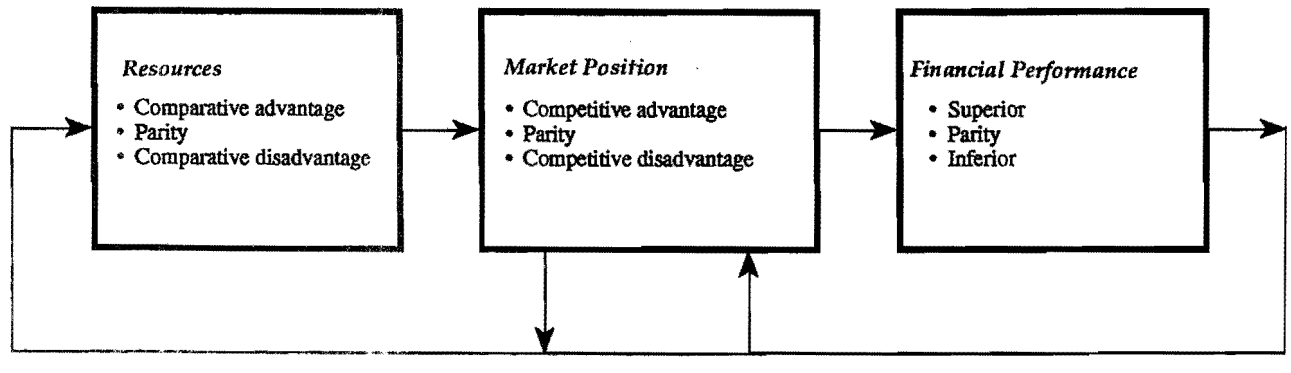

Figure 1: A Schematic of the Resource-Advantage Theory of Competition

NOTE: Competition is the disequilibrating, ongoing process that consists of the constant struggle among firms for a comparative advantage in resources that will yield a marketplace position of competitive advantage and, thereby, superior financial performance. Firms learn through competition as a result of feedback from relative financial performance "signaling" relative market position, which, in turn, signals relative resources.

among self-directed, privately owned firms, whereas planned or "command" economies are premised on cooperation among state-owned firms under the direction of a central planning board. Because, they argue, events in this century have revealed that market-based economies are more innovative, more productive, and have higher quality goods and services than command economies, a theory of competition should explain or contribute to explaining why economies premised on competition are superior to command economies on these dimensions. They conclude that R-A theory "performs much better than neoclassical theory in explaining why market-based economies are more bountiful and innovative and have higher quality goods and services than do command economies" (Hunt & Morgan, 1995, p. 10).

In brief, as diagrammed in Figures 1 and 2, the R-A theory of competition stresses the importance of resources, that is, the tangible and intangible entities available to the firm that enable it to produce efficiently and/or effectively a market offering that has value for some market segment(s) (cf. Barney, 1991; Lado & Wilson, 1994; Wernerfelt, 1984). Competition, then, consists of the constant struggle among firms for a comparative advantage in resources that will yield a marketplace position of competitive advantage and, thereby, superior financial performance. When one firm's comparative advantage in resources enables it to achieve superior performance through a position of competitive advantage in some market segment(s), competitors attempt to neutralize and/or "leapfrog" the advantaged firm by better managing existing resources and/or by acquisition, imitation, substitution, or major innovation, that is, by acquiring the advantage-producing resource, or imitating the resource, or finding an equivalent resource, or finding a superior resource. In R-A theory, disequilibrium, not equilibrium, is the normal state of affairs.

This article extends the R-A theory of competition. First, I explicate the foundational propositions underlying the theory. Second, although Hunt and Morgan (1995, p. 3) observe that neoclassical perfect competition could have potentially contributed to explaining the abundance of market-based economies by "focusing on the efficiency of perfect competition," I discuss how it came to be that neoclassicists interpreted perfect competition as providing no grounds for differentiating market-based from command economies. Third, I use R-A theory to explain productivity. Fourth, I use R-A theory to contribute to an understanding of economic growth, using the economic history of the Soviet Union as an example.

Before proceeding, however, three preliminary issues should be addressed. First, as to terminology, by *neoclassical theory* I mean the theory of perfect competition, its foundational propositions, and its derived implications. The term *neoclassicist*, then, is used here as equivalent to the *mainstream economist* of Samuelson and Nordhaus (1989) and Romer (1993a). Therefore, although some may use neoclassicist in a pejorative manner, no such meaning is intended here, nor should any be inferred.

Second, some might question the use of perfect competition as a rival by Conner (1991), Hunt and Morgan (1995), and here. Indeed, some might consider perfect competition to be "straw man" because management scholars have never held perfect competition in high regard or because many economists them-

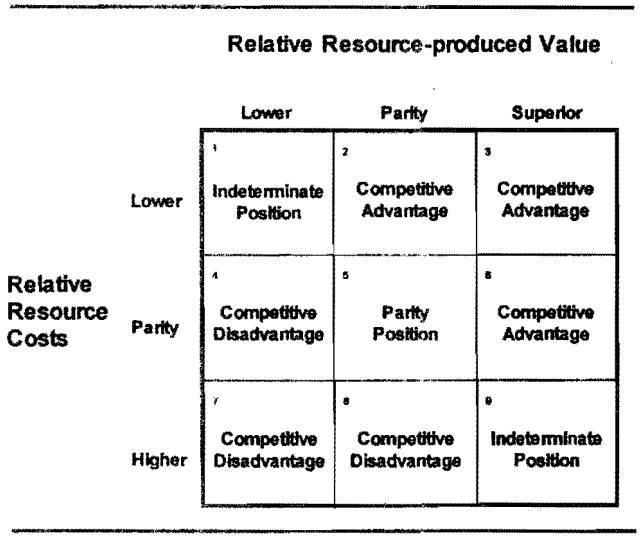

Figure 2: Competitive Position Matrix

NOTE: The marketplace position of competitive advantage identified as Cell 3 results from the firm, relative to its competitors, having a resource assortment that enables it to produce an offering for some market segment(s) that (a) is perceived to be of superior value and (b) is produced at lower costs.

SOURCE: Adapted from Hunt and Morgan (1995).

selves now question its applicability to real economies. For several reasons, I argue that perfect competition should be the point of departure for developing R-A theory. First, the foundational propositions of perfect competition are well developed and well known. Therefore, contrasting R-A theory with perfect competition efficiently communicates with great precision the foundations and, thus, the structure of R-A theory. Second, because neoclassical theory argues that perfect competition is *perfect*, it continues to serve as the ideal form of competition against which all others are compared. Even many of those who have come to question perfect competition's descriptive accuracy still hold it out as an *ideal form* of competition. Therefore, perfect competition underlies much public policy, especially antitrust law. Third, even though many economists question perfect competition theory on numerous grounds, because it dominates economics textbooks, it is the only theory of competition that most students ever see that is alleged to be socially beneficial. Such theories as oligopolistic and monopolistic competition are presented only as departures from the ideal of perfection. Indeed, as interpreted through the lens of perfect competition, much of management constitutes the purposeful creation of "market imperfections" for the economically dysfunctional objective of rent seeking. For these reasons perfect competition theory should serve as the point of departure for developing a new theory of competition.

As a final preliminary issue, numerous economists, referred to by Romer (1993a) as "dissident economists," are developing theories that depart in significant ways from neoclassical theory, including those working on evolutionary economics (e.g., Hodgson, 1993; Langlois, 1986; Nelson & Winter, 1982), transaction cost economics (e.g., Williamson, 1975), property-rights theory (e.g., North, 1990), Chicago school economics (e.g., Demsetz, 1973), endogenous growth theory (e.g., Romer, 1993a, 1993b), the attribute approach to consumer demand (e.g., Lancaster, 1991), socioeconomics (e.g., Etzioni, 1988), the economics of innovation (e.g., Freeman, 1990), and others. First, none of these alternatives constitutes a theory of competition, complete with foundational propositions, against which R-A theory might be evaluated. Second, I ask readers' indulgence as to what can and cannot be done in a single article. There are some obvious similarities and dissimilarities between R-A theory and these alternatives to neoclassical theory. Furthermore, the extent to which the alternatives are consistent or inconsistent with R-A theory is, indeed, important. However, the focus here must be on R-A theory. Although some cursory comparisons will be made in the conclusion section, detailed analyses of other alternatives must be left for future work.

FOUNDATIONAL PROPOSITIONS OF RESOURCE-ADVANTAGE THEORY

Table 1 displays the foundational propositions underlying the standard treatment of perfect competition found in microeconomic texts (e.g., Gould & Lazear, 1989) and the propositions that are posited as foundational for R-A theory. *Foundational* does not imply that they are the minimum set of axioms required for deriving theorems, but that these propositions are centrally important for understanding the two theories. Epistemologically, each proposition in R-A theory is considered a candidate for empirical testing. Premises found false should be replaced with ones more descriptively accurate. Even though R-A theory's epistemology differs from its neoclassical counterpart, perfect competition is not being criticized here for its unrealistic assumptions. This is not a philosophical treatise. Rather, the objective here is to develop a rival and identify its epistemology. Following the general line of reasoning in Hunt and Morgan (1995), I now articulate and argue for the propositional structure underlying R-A theory.

Table 1
Foundational Propositions of the Neoclassical and Resource-Advantage Theories of Competition

	Neoclassical Theory	Resource-Advantage Theory
P1. Demand is:	Heterogeneous across industries, homogeneous within industries, and static	Heterogeneous across industries, heterogeneous within industries, and dynamic
P2. Consumer information is:	Perfect and costless	Imperfect and costly
P3. Human motivation is:	Self-interest maximization	Constrained self-interest seeking
P4. The firm's objective is:	Profit maximization	Superior financial performance
P5. The firm's information is:	Perfect and costless	Imperfect and costly
P6. The firm's resources are:	Capital, labor, and land	Financial, physical, legal, human, organizational, informational, and relational
P7. Resource characteristics are:	Homogeneous and perfectly mobile	Heterogeneous and imperfectly mobile
P8. The role of management is:	To determine quantity and implement production function	To recognize, understand, create, select, implement, and modify strategies
P9. Competitive dynamics are:	Equilibrium seeking, with innovation exogenous	Disequilibrium provoking, with innovation endogenous

SOURCE: Adapted from Hunt and Morgan (1995).

Demand

For neoclassical theory, demand is (a) heterogeneous across industries, (b) homogeneous within industries, and (c) static. That is, at different configurations of prices across generic product categories, for example, footwear, televisions, and automobiles, neoclassical theory allows consumers to prefer different quantities of each generic product. Within each generic product category (or industry), however, consumers' tastes and preferences are assumed to be identical and unchanging through time with respect to desired product features and characteristics. Thus neoclassical works speak of the "demand for shoes," and the group of firms constituting the shoe industry are alleged to face, collectively, a downward-sloping demand curve. Each individual firm in each industry, however, faces a horizontal demand curve because of homogeneous intraindustry demand.

Because intraindustry demand is assumed to be homogeneous, the existence of firms having downward-sloping demand curves can only result from the rent-seeking behavior of product differentiation, as is assumed in monopolistic competition (Chamberlin, 1933/1962). In such circumstances, equilibrium product prices will be higher than in perfect competition, and output rates will not be at the lowest point on firms' long-run average cost curves (Chamberlin, 1933/1962, pp. 67, 77). Therefore, product differentiation is considered by neoclassical theory to be economically dysfunctional, which resulted in monopolistic competition theory being "defeated" as a rival for perfect competition theory (Stigler, 1957, p. 17).

Consistent with neoclassical theory, R-A theory accepts the premise of heterogeneous interindustry demand. However, intraindustry demand is posited to be both substantially heterogeneous and dynamic: Consumers' tastes and preferences differ greatly within a product category and are always changing (Alderson, 1965; Dickson, 1992). That is, not only are industries disintegrating on the supply side (Prahalad & Hamel, 1994), but they are fragmented on the demand side as well (Pine, 1993). Heterogeneous intraindustry demand implies that there are very few industry markets—there are only fragments or segments of demand *within* industries. There is neither a market for shoes, nor, more narrowly, a market for men's shoes, nor, more narrowly yet, a market for men's athletic shoes. For most product categories, demand is at a level of (dis)aggregation that would be too narrow to be meaningfully referred to as an industry. For example, one would not speak of the basketball shoe, or the 19-inch color television, or the minivan *industry*. Yet, for R-A theory, such market segments as these are central for understanding competition.

Consumer Information

For neoclassical theory, consumers have perfect information, which is costless to them, about the availability, characteristics, benefits, and prices of all products in the marketplace. In contrast, R-A theory, drawing on Austrian economics (Jacobson, 1992), posits that consumers have imperfect information concerning products that might match their tastes and prefer-

ences. Furthermore, consumer search costs, in terms of effort, time, and money, are often considerable.

Human Motivation

For neoclassical theory, all human behavior is motivated by self-interest maximization. Thus, in their roles as consumers of products and owners or managers of firms, people maximize their *utility*. Etzioni (1988) shows that neoclassical theory conceptualizes utility and *utility maximization* as being either (a) a pleasure utility (ethical egoism in moral philosophy terms), or (b) a tautology, or (c) a mathematical abstraction. He notes that only pleasure utility, or "P-utility," maximization is a substantive thesis that could potentially be empirically tested. Furthermore, in empirical works and public policy recommendations, P-utility is generally assumed.

In contrast, R-A theory posits that human behavior is motivated by constrained self-interest seeking. In ethical theory terms, deontological considerations constrain teleological considerations (Beauchamp & Bowie, 1988). This premise is similar to Etzioni's (1988) view that people have two *irreducible* guiding values: pleasure (P-utility) and morality. As Etzioni argues, because people pursue pleasure and they avoid pain, P-utility explains much behavior. However, consumers, owners, and managers are constrained in their self-interest seeking by their moral codes, that is, by considerations of what is right, proper, ethical, moral, or appropriate.

Constrained self-interest seeking implies that opportunism—that is, "self-interest seeking with guile" (Williamson, 1975)—is not assumed to prevail in all circumstances. For R-A theory, the extent to which people behave opportunistically in various contexts is a research question to be explored and explained—not presumed a priori (Donaldson, 1990). Constrained self-interest seeking also implies that if people share a moral code, then trust and commitment might exist, both among people and between them and their respective organizations (Hosmer, 1994). Furthermore, a firm's reputation for trustworthiness can be competitively advantageous (Barney & Hansen, 1994).

Firm's Objective and Firm's Information

For neoclassical theory, owner-managed firms have the objective of profit maximization because this maximizes the self-interest of the owner. Profit maximization (or wealth maximization, that is, the maximization of the net present value of future profits) occurs under conditions of perfect and costless information about product markets, production techniques, and resource markets. Only when (nonowner) managers face decisions where their personal interests conflict with the owners' interests in profit maximization do firms not profit maximize. Then, managers uniformly act opportunistically and the "principal-agent problem" arises.

In contrast, R-A theory posits that the firm's primary objective is superior financial performance, which, again consistent with Austrian economics, it pursues under conditions of imperfect (and often costly to obtain) information about customers, competitors, suppliers, and production techniques. This view parallels Porter's (1991), which equates firm success with "superior and sustainable performance . . . relative to the world's best rivals" (p. 96).

Superior financial performance is characterized as primary because there are, no doubt, other objectives, such as contributing to social causes or, as Porter (1991) puts it, individuals "enjoying slack" (p. 96). Nonetheless, R-A theory maintains that other objectives are not equal but are enabled by the accomplishment of superior financial performance. Indeed, prolonged inferior performance threatens the firm's survival and prevents the accomplishment of secondary objectives.

My use of *superior* implies that firms seek a level of financial performance that exceeds that of their referents, often their closest perceived competitors. Why superior instead of *maximum* financial performance? First, firms do not maximize profits due to the well-documented fact that they lack the information to do so, that is, they operate under bounded rationality (Simon, 1979). Second, firms do not maximize profits because morality considerations at times constrain them (or some of them) from doing so. In short, financial performance is constrained by managers' views of morality. For example, though some managers resist cheating or opportunistically exploiting their customers and suppliers only because of the P-utility fear of "getting caught," others resist because they believe cheating and exploitation to be deontologically wrong. They believe such actions would violate their duties or responsibilities, their sense of rightness or wrongness.

Financial performance is indicated by such measures as profits and return on investment, with the relative importance of specific indicators varying

somewhat from firm to firm, industry to industry, and country to country. For example, in Germany and Switzerland, where banks and other major shareholders rarely trade their shares, long-term capital appreciation is valued more highly than it is in the United States (Porter, 1990). Superior rewards flow to the owners, managers, and employees of firms that produce superior financial results. These rewards include not only such financial rewards as stock dividends, capital appreciation, salaries, wages, and bonuses, but also such nonfinancial rewards as promotions, expanded career opportunities, prestige, and feelings of accomplishment.

Superior financial performance should not be confused with the neoclassical concepts of abnormal profits or rents, which are departures from normal profits (i.e., the average firm's profits in a purely competitive industry in long-run equilibrium) and which result from various kinds of market imperfections. Although one can compute such things as the average profits of a group of rivals (or an industry) for comparison purposes, the construct of "normal profits" is absent from the lexicon of R-A theory. Long-run equilibrium is neither something that exists, nor something that groups of rivals are "tending toward," nor—as will be argued later—something that, if achieved, would be perfect. Rather, consistent with Austrian economics, markets seldom if ever are in long-run equilibrium, and activities that produce turmoil in markets are societally beneficial because they are the engine of economic growth: "Capitalism, then, is by nature a form or method of economic change and not only never is but never can be stationary" (Schumpeter, 1942/1950, p. 82).

Resources

For neoclassical theory, resources are factors of production and are classified as land, labor, and capital. In addition, all firms have access to a *production function*, that is, a technology that enables them to combine the factors of production to produce a product.

In contrast, R-A theory defines resources as the tangible and intangible entities available to the firm that enable it to produce efficiently and/or effectively a market offering that has value for some market segment(s) (cf. Barney, 1991; Lado & Wilson, 1994; Wernerfelt, 1984). In this view, resources need not be owned by the firm, but just be available to it. Furthermore, resources are not restricted to a firm's tangible "assets" but are anything that has an enabling capacity. For example, a firm's core competencies (McGrath, MacMillan, & Venkataraman, 1995; Prahalad & Hamel, 1990) are intangible, higher order resources that enable it to perform—better perhaps than its competitors—the activities in Porter's (1985) "value chain."

Drawing on Barney (1991), Day and Wensley (1988), and Hofer and Schendel (1978), the multitude of potential resources can be usefully categorized as financial (e.g., cash reserves and access to financial markets), physical (e.g., plant, raw materials, and equipment), legal (e.g., trademarks and licenses), human (e.g., the skills and knowledge of individual employees), organizational (e.g., competencies, controls, policies, and culture), informational (e.g., knowledge about consumers, competitors, and technology), and relational (e.g., relationships with competitors, suppliers, and customers). Thus a strategic alliance with a competitor to gain access to a new market would be a relational resource, but not a conspiracy with that same competitor to fix prices. Whereas the former enables the firm to provide value efficiently or effectively, the latter does not. In short, all entities that might provide a competitive advantage to a firm are not resources, only those that enable it to produce efficiently and/or effectively.

Resource Characteristics

For neoclassical theory, all resources are perfectly homogeneous and mobile, that is, each unit of labor and capital is identical with other units, and all units can move without restrictions among firms within and across industries. Furthermore, each firm within an industry uses the identical production function—no firm has access to a superior technology or organizational form.

R-A theory posits that resources are both significantly heterogeneous across firms and imperfectly mobile. Resource heterogeneity means that each and every firm has an assortment of resources that is at least in some ways unique. Imperfectly mobile implies that firm resources, to varying degrees, are not commonly, easily, or readily bought and sold in the marketplace (the neoclassical factor markets). Because of resource immobility, resource heterogeneity can persist through time despite attempts by firms to acquire the same resources of particularly successful competitors (Collis, 1991; Dierickx & Cool, 1989; Peteraf, 1993).

When a firm has a resource—or, more often, a specific assortment of resources or a "compound asset"

(Schendel, 1994)—that is rare among competitors, it has the potential for producing a comparative advantage for that firm (Barney, 1991). A comparative advantage in resources exists when a firm's resource assortment enables it to produce a market offering that, relative to extant offerings by competitors, (a) is perceived by some market segment(s) to have superior value and/or (b) can be produced at lower costs. As used here, *value* refers to the sum total of benefits that consumers in a market segment perceive they will receive from a market offering. Perceived value, then, depends on (a) the tastes and preferences of consumers in the segment and (b) the resources that produce the offering. As Conner (1991) puts it,

> Distinctiveness in the product offering or low costs are tied directly to the distinctiveness in the inputs—resources—used to produce the product, much as the quality and cost of boeuf bourguignonne depend on the particular ingredients used and the way in which they are mixed. (p. 132)

Relative to its rivals, a firm's resource assortment can at any point in time be at a state of comparative advantage, parity, or comparative disadvantage (Figure 1). Although a comparative advantage in resources can result in a marketplace position of competitive advantage (and, thereby, superior financial performance), such a favorable outcome is not assured.

Figure 2, a key diagnostic contribution specific to R-A theory, shows nine possible competitive positions for the various combinations of a firm's relative (to competitors) resource-produced value for some segment(s) and relative resource costs for producing such value. Ideally, of course, a firm would prefer the competitive position of Cell 3, where its comparative advantage in resources produces superior value at lower cost. As Hunt and Morgan (1995) note, the Japanese automobile companies had this position in the United States throughout the 1970s and into the 1980s because their more efficient and more effective manufacturing processes produced higher quality products at lower costs. Positions identified as Cells 2 and 6 also bring competitive advantage and superior financial returns, whereas Cell 5, the parity position, produces average returns. But firms occupying the indeterminate positions of Cells 1 and 9, although they have a comparative advantage in either value or costs, may or may not have superior returns.

In Cell 1, the advantage of lower relative resource costs is associated with (or results from) a sacrifice in relative value perceived by consumers. Consequently, the offerings of firms in such a position will generally have lower prices than those, say, in Cell 2. Depending on the extent to which the price reductions are less than, equal to, or exceed their relative advantage in resource costs, Cell 1 firms are at positions of competitive advantage, parity, or competitive disadvantage, respectively. For example, whereas American car companies in the 1970s and 1980s occupied Cell 7, in the 1990s they have a relative cost advantage over (imported) Japanese makes (Lavin, 1994). Nonetheless, because many consumers still perceive American cars to be of (somewhat) lower quality, they occupy Cell 1 and competitive advantage is not assured. Cell 9, on the other hand, is equally indeterminate and describes the German car companies in the 1990s. Although the resources of the German auto manufacturers continue to produce products of superior perceived value, they do so at much higher resource costs (Keller, 1993). Unlike the 1970s and 1980s, when the German car companies occupied Cell 6, competitive advantage is now no longer assured.

Cell 5, the parity position, is the marketplace situation providing the focus for perfect competition theory. If no firm has a resource assortment that can produce either superior value for some particular market segment(s) or a cost advantage, then all firms will have parity marketplace positions. The parity position prevails only when all innovation ceases, whether as a result of collusion, complacency, institutional restrictions, or governmental fiat. For R-A theory, the persistent absence of innovation constitutes a market failure. If this situation persists through time, an equilibrating theory of competition might apply. An advantage of R-A theory, then, is that it shows the minimum marketplace conditions that must prevail for neoclassical theory to be applicable: All innovation must have stopped.

Role of Management

For neoclassical theory, the role of management is to determine the quantity of the firm's single product to produce and to implement its (standardized) production function. Because all firms are profit maximizers, all firms in an industry will inexorably produce at an output rate where marginal cost equals marginal revenue (the product's market price). In the short run, where such resources as plant and equipment are relatively "fixed," each firm will incur profits (or losses) depending on whether price exceeds (or is less than) the average total cost of producing the profit-maximizing quantity.

R-A theory posits that the role of management in the firm is to recognize and understand current strategies, create new strategies, select preferred strategies, implement or manage the strategies selected, and modify strategies through time. "Recognize and understand" acknowledges that firms sometimes (often?) fail to recognize accurately their respective marketplace positions and/or fail to understand the nature of the resources that led to such positions (McGrath et al., 1995; Schoemaker & Amit, 1994). Indeed, many strategies emerge through time and, thus, may be implicit (Mintzberg, 1987).

Strategies that yield a position of competitive advantage and superior financial performance will do so when they rely on those resources in which the firm has a comparative advantage over its rivals. *Sustained* superior financial performance occurs only when a firm's comparative advantage in resources continues to yield a position of competitive advantage despite the actions of competitors.

Competitive Dynamics

For neoclassical theory, in the long run, all resources are variable, and each firm in each industry adjusts its resource mix (e.g., its capital/labor ratio) to minimize its cost of producing its profit-maximizing quantity. These adjustments inexorably lead to a long-run equilibrium position, where each firm produces the quantity for which market price equals long-run marginal cost, which itself equals the minimum long-run average cost. The position of long-run equilibrium is a "no profit" situation—firms have neither a pure profit (or rent) nor a pure loss, only an accounting profit equal to the rate of return obtainable in other perfectly competitive industries.

Each industry stays in equilibrium until something changes in its environment. Thus all forms of innovation are exogenous factors and represent "shocks" to which each industry responds. Therefore, the firm's environment strictly determines its performance (i.e., its profits). Pure profits or rents occur only temporarily—just long enough for equilibrium to be restored. Through time, market-based economies have "moving" equilibria.

Because both product and factor markets are interdependent, the possibility of a general equilibrium for an entire economy arises. Walras (1874/1954) first identified the system of equations that an economy would have to "solve" for general equilibrium to exist. Conceptualizing a fictitious, all-knowing "auctioneer" who "cries" prices, that is, "bids" for all products and resources, Walras theorized that an economy characterized by perfect competition "gropes" toward general equilibrium. Walras's work was acknowledged as the "Magna Carta of economic theory" by Schumpeter (1954, p. 242), and precisely specifying and successfully analyzing the "Walrasian equations" is considered to be the crowning achievement of 20th-century economics—as Nobel prizes to Kenneth Arrow in 1972 and Gerard Debreu in 1983 attest.

The welfare economics literature investigates the conditions prevailing at the position of Walrasian general equilibrium. If—and only if—all industries in an economy are perfectly competitive, then at general equilibrium, every firm in every industry has the optimum-size plant and operates it at the point of minimum cost. Furthermore, every resource or factor employed is allocated to its most productive use and receives the value of its marginal product. Moreover, the distribution of products produced is Pareto-optimal at general equilibrium because the price of each product (reflecting what consumers are *willing* to pay for an additional unit) and its marginal cost (the extra resource cost society *must* pay for an additional unit) will be exactly equal. Therefore, the adjective *perfect* is taken literally in neoclassical theory: Perfect competition is perfect. It is the ideal form. All other forms of competition are departures from perfection, that is, imperfect.

In contrast, R-A theory maintains that competition is disequilibrium provoking and innovation is endogenous. Instead of the firm's environment, particularly the structure of its industry, strictly determining its conduct (strategy) and its performance (profits), R-A theory maintains that environmental factors only influence conduct and performance. Relative resource heterogeneity and immobility imply that strategic choices must be made and that these choices influence performance. All firms in an industry will not adopt the same strategy—nor should they. Different resource assortments suggest targeting different market segments and/or competing against different competitors.

R-A theory focuses on groups of rivals competing for the patronage of consumers in market segments. For each market segment, firms will be distributed at any particular time throughout the nine positions in Figure 2. Those firms having a comparative advantage (disadvantage) in resources will occupy positions of competitive advantage (disadvantage) and will enjoy (suffer) financial returns that are superior (inferior).

However, there is no stable configuration of positions. Competition does not lead to equilibrium. To the contrary, it prevents an equilibrium from occurring.

Because all firms seek superior financial performance, the competitors of a firm having a comparative advantage attempt to neutralize that advantage by better managing their existing resources (Brumagim, 1994), by obtaining the same or equivalent value-producing resource, and/or by seeking a resource that produces superior value. If the resource is mobile, that is, readily available for sale in the marketplace, then it will be acquired by competitors, and the comparative advantage is neutralized quickly and effectively. If it is immobile, then competitors innovate. The innovating behavior can be either imitating the resource or finding a substitute resource that is strategically equivalent (Barney, 1991). A third alternative is major innovation, that is, finding a new resource that produces value that is superior to—not strategically equivalent to—the advantaged competitor. Whereas neutralizing a competitor's advantage through imitation or substitution produces only parity returns (Cell 5 in Figure 2), identifying and obtaining a new resource can result in a position of competitive advantage and superior returns (Cells 2, 3, or 6). Innovation is therefore endogenous in R-A theory.

Competition, then, is a disequilibrium-provoking process. It consists of the constant struggle among firms for a comparative advantage in resources that will yield a marketplace position of competitive advantage and, thereby, superior financial performance. Once a firm's comparative advantage in resources enables it to achieve superior performance through a position of competitive advantage in some market segment(s), competitors attempt to neutralize and/or leapfrog the advantaged firm through acquisition, imitation, substitution, or major innovation. The R-A theory of competition is, therefore, inherently dynamic. Disequilibrium, not equilibrium, is the norm, in the sense of normal state of affairs. Although market-based economies are moving, they do not grope toward anything, let alone the supposedly ideal state of Pareto-optimum general equilibrium.

PERFECT COMPETITION AND PRODUCTIVITY

Returning to what a satisfactory theory of competition should explain, can perfect competition theory potentially explain the greater productivity of market-based economies? Although Hunt and Morgan (1995) state that "neoclassical theory could potentially explain abundance by focusing on the efficiency of perfect competition" (p. 3), they remark in a footnote that this is not the view of neoclassical specialists in comparative economic systems. The neoclassical view stems from neoclassicists' interpretation of the "socialist calculation debate" that pitted the Austrians (principally Hayek, 1935, 1935/1948d, 1935/1948c, 1937/1948b, 1940/1948a, 1945/1948e; Mises, 1920, 1922/1936; Robbins, 1934) against advocates of socialism (principally Dickinson, 1933; Lange, 1936/1964; Lerner, 1934, 1936, 1937, 1938; Taylor, 1929/1964). The debate's question was, "[Can] one central authority . . . solve the problem of distributing a limited amount of resources between a practically infinite number of competing purposes . . . with a degree of success equating or approaching the results of competitive capitalism?" (Hayek, 1935/1948c, pp. 130-131). Both the Austrians (Hayek, 1978, p. 235) and the socialists (Sweezy, 1949, p. 231) claimed they won the debate.

Neoclassical specialists in comparative economic systems agreed that the socialists had shown that perfect competition theory provides no grounds for believing that market-based economies would be more productive than command economies (Balassa, 1965, p. 5; Landauer, 1947, p. 51). For example, Lekachman (1959) concludes that socialist economists have "proved that a Central Planning Board could impose rules upon socialist managers which allocated resources and set prices as efficiently as a capitalist society of the purest stripe and more efficiently than the capitalist communities of experience" (pp. 396-397). Nobel laureate Knight (1936), who is credited with formalizing perfect competition theory (Stigler, 1957), concludes that "the problems of collectivism are not problems of economic theory . . . and the economic theorist, as such, has little or nothing to say about them" (p. 255). Because (a) Knight's conclusion of "little or nothing to say" is so counterintuitive, (b) R-A theory draws so heavily on the "losing" side, that is, Austrian economics, and (c) there are invaluable lessons to be learned from the debate as to how a theory of competition can differentiate economies premised on competition from command economies, a (ruthlessly brief) synopsis of the debate is necessary.[1]

The Socialist Calculation Debate

Mises's (1920, 1922/1936) original challenge was to Marxian socialism, which demanded, among other

things, the abolition of all "bourgeois" economic institutions: private property, money, and prices, for example. Indeed, the Soviet Union experimented with vouchers and other alternatives to money and prices in the "War Communism" period (pre-1920). Mises (1920) argued that the capitalist institutions excoriated by Marx were essential for "economic calculation" because the efficient allocation of capital goods required prices determined in a marketplace characterized by competition among privately owned firms. Therefore, "rational economic activity is impossible in a socialist commonwealth" (Mises, 1920, p. 130).

Socialist economists countered Mises by claiming, in direct contradiction of Marx's specific writings, that Marxian socialism did not imply the abolition of money and prices. They then interpreted Mises's use of competition as meaning perfect competition (instead of Mises's rivalrous competition) and his use of economic calculation and rational economy as meaning solving the Walrasian equations. Therefore, they argued, Mises's position had already been refuted by Barone (1908), who had demonstrated that a Pareto-optimum solution for a socialist economy would involve solving the same kind of Walrasian equations as for a capitalist economy. Socialism simply substitutes the real, live, central planning board for the fictitious Walrasian auctioneer. Indeed, instead of the wasteful groping for Pareto-optimality under competition, the planning board would solve the equations directly. Because neoclassicists had come to equate efficiency with Walrasian equation solving, they found the socialists' counter to be theoretically correct and a proper response to Mises's challenge (Lavoie, 1985).

Hayek (1935, 1935/1948d, 1935/1948c, 1937/1948b, 1940/1948a, 1945/1948e) entered the debate next. He argued that Mises had been fully aware of Barone's work on static equilibrium under socialism but believed it was irrelevant to the economic problem of efficiency because markets in real (contrasted with theoretical) economies are always in a disequilibrium state. Although Hayek believed general equilibrium theory to be an impressive analytical achievement, he viewed competition as a process, not a theoretical state, like perfect competition. It is through the process of competitive rivalry that firms in market economies gain the knowledge of what works, what doesn't, what is efficient, and what is not. Therefore, argued Hayek, as a practical matter, central planning boards would lack the knowledge required for efficient resource allocation.

Socialist economists interpreted Hayek's argument as a retreat from, as they saw it, Mises's position that socialist equilibrium is theoretically impossible to the new view that it was possible but impracticable (Lavoie, 1985). They then argued for the practicality of socialist equilibria. Lange (1936/1964) showed that socialist and capitalist equilibria were equally practicable by relying, in part, on the fact that Walrasian equilibrium uses the "as if" procedure. That is, because the Walrasian auctioneer is a fiction, equilibrium is reached (if reached at all) through a series of successive trials or *tâtonnements*, that is, as if it were groping. Similarly, argued Lange, socialist equilibrium could just as easily be reached by Taylor's (1929/1964) "trial and error" method. Starting from an initial guess as to equilibrium prices, product surpluses (or shortages) would indicate to the central planning board that prices are too high (or too low) and prices could be adjusted accordingly. As to factors of production, Lange argued that production would be just as efficient as in capitalism because plant managers would be instructed (a) to combine factors of production so that average cost is minimized and (b) to produce at the quantity where marginal cost equals marginal revenue. After Lange articulated this "closely reasoned economic theory of socialism" (Kuhn, 1970, p. 455), socialists claimed victory.

Thereafter, a wide body of literature developed, called *planometrics*, which attempted to systematize the trial and error planning process. It was believed that the advent of linear, nonlinear, and integer programming, with the aid of computers, would enable planners to efficiently allocate resources. Such sophisticated techniques, it was alleged, further demonstrated how wrong Mises and Hayek were (Lavoie, 1985). As Lange (1967), writing retrospectively, put it:

> Were I to rewrite my essay today, my task would be much simpler. My answer to Hayek and Robbins would be: So what's the trouble? Let us put the simultaneous equations on an electronic computer and we shall obtain the solution in less than a second. The market process with its cumbersome tâtonnements appears old fashioned. Indeed, it may be considered as a computing device of the pre-electronic age. (p. 158)

Similarly, Cave (1980) said,

> The potential impact of computers on economic planning is enormous. To appreciate this one only has to recall one of the arguments made in the debate in the 1930s on the feasibility of central planning. It was asserted then that an efficient allocation of resources in a centrally planned economy was inconceivable

> because such an allocation would require the solution of "millions of equations." At the time, of course, no electronic computers were available. Today the situation is quite different and the computational objection would have much less force. (p. vii)

Neoclassicists have agreed uniformly that socialist economists provided "an answer acceptable to economists" when they "decided to meet von Mises on his own terms" (Goldman, 1971, p. 10).[2] Even Schumpeter (1942/1950)—usually considered an ally of Austrian economists—found the trial and error solution to be "eminently operational" (pp. 186, 188). Indeed, for him "there is a strong case for believing in its [i.e., socialism's] superior economic efficiency." The conclusion that socialism is equally as efficient as capitalism became textbook conventional wisdom:

> But it would be a mistake to dwell on the shortcomings. Every economy has its contradictions and difficulties. . . . What counts is results, and there can be no doubt that the Soviet planning system has been a powerful engine for economic growth. (Samuelson & Nordhaus, 1989, pp. 840, 842)

Four lessons emerge from the socialist calculation debate concerning the requirements for a satisfactory theory of competition. First, the efficiency problems of economies cannot be approximated by a series of equations. Second, competition is a process that cannot be approximated by a series of moving equilibria. Third, the institutions of capitalism, particularly private property, contribute essentially to the efficiency-producing characteristics of competition. Fourth, organizational learning should be endogenous in a theory of competition. These lessons are heeded in R-A theory.

RESOURCE ADVANTAGE AND PRODUCTIVITY

Because productivity is a ratio of outputs to inputs, increases in productivity can result from increases in efficiency or effectiveness, that is, from (a) *more efficiently* creating value or (b) efficiently creating *more value*. Therefore, the R-A theory of competition contributes to explaining the superior productivity of market-based economies on the basis that superior rewards flow to those firms (and their owners, managers, etc.) that discover resource assortments that efficiently and/or effectively produce market offerings. In contrast, the absence of competition means that socialist planners lacked the means and motivation for discovering (a) the relative efficiency and effectiveness of extant resource assortments, (b) when and how to manage existing resources more efficiently and effectively, (c) when and where to seek alternative resource assortments, (d) when and where to redeploy existing resources, and (e) when and how to create new resource assortments.

Recall that, in R-A theory, firms seek to occupy marketplace positions identified as Cells 2, 3, or 6 in Figure 2 because these positions of competitive advantage yield superior financial performance and, thereby, superior rewards. Note that firms in Cell 2 have a comparative advantage in resources such that they can more efficiently (i.e., at lower costs) produce a valued market offering. In contrast, firms in Cell 6 are more effective because they can efficiently produce a market offering that is more valuable (e.g., having higher quality). Finally, those fortunate firms in Cell 3 can produce both more efficiently *and* more effectively. Thus it is only by occupying competitive positions in the marketplace that firms know whether they are producing efficiently and/or effectively. This knowledge comes after competing, not before. By competing, firms learn. As Austrian economists put it, competition is a "knowledge discovery" process (Hayek, 1935; Lavoie, 1981).

When firms occupy the positions of competitive disadvantage identified as Cells 4, 7, and 8, they learn that they must use existing resources more efficiently or more effectively, or that they must seek other resources. Thus they will be motivated to neutralize and/or leapfrog advantaged competitors by better managing existing resources and/or by acquisition, imitation, substitution, or major innovation. Should these efforts at innovation succeed, then all firms serving a market segment become more efficient and/or effective. Should these efforts fail, firms seek market segments for which their resource assortments might provide comparative advantage—thus redeploying these resources will promote efficiency/effectiveness in other segments. Should these efforts also fail and financial performance fall below minimum acceptable standards, firms or parts of firms are dissolved or sold and their salvageable resources redeployed by other firms. This redeployment, again, promotes efficiency/effectiveness elsewhere.

Because neoclassical theory assumed perfect knowledge of all possible production functions and all possible resource assortments for producing all prod-

ucts, it deprived itself of a powerful means for differentiating market-based from command economies. Organizational learning must be endogenous in a satisfactory theory of competition.

Note that R-A theory expands the concept of resources (from neoclassical land, labor, and capital) to include such resources as organizational culture, knowledge, and competencies. The intangible nature of these resources implies that, although they may be rare (Barney, 1991), such resources are not scarce in the neoclassical sense of "economics is the science of allocating scarce resources." For example, when a firm successfully imitates the competency of another, the imitated firm's competence doesn't decrease (as would a scarce resource). When two firms innovate by forming a strategic alliance, an organizational form is created, not allocated. In R-A theory, a comparative advantage in intangible resources, for example, a new organizational form, can yield a marketplace position of competitive advantage. Thus rewards flow to firms that successfully create new resources, providing them with a powerful motivation to innovate. In contrast, command economies, by lacking competition, lack the means and motivation not only for efficiently/effectively allocating existing resources, but also for creating new resources.

In comparing market-based versus command economies, what is the relative importance for productivity of allocating scarce physical resources (the sole focus of neoclassical theory) versus creating new tangible and intangible resources (an important component of R-A theory)? R-A theory suggests that resource creation is by far the most important factor. To understand why, consider why economies grow. In particular, consider the case of explaining the growth of the Soviet Union's economy.

THE CASE OF THE SOVIET UNION

Three questions are central to understanding the economic history of the Soviet Union:

1. How much did the Soviet economy actually grow?
2. What explains the growth that occurred?
3. Why did growth stop?

The work of Easterly and Fischer (1994) represents the most comprehensive econometric effort to date on these questions. As to Question 1, Easterly and Fischer found that the growth rate per year of Soviet industrial production (output per worker) was only 3.4% (1928-1987), instead of the inflated 6.3% "official" rate that many had relied on when they maintained that "the Soviet planning system has been a powerful engine for economic growth" (Samuelson & Nordhaus, 1989, p. 842). Furthermore, Easterly and Fischer (1994) found that most of the growth occurred prior to 1960. Indeed, after 1960, "the Soviet economic performance conditional on investment and human capital formation was the worst in the world" (p. 6).

As to Question 2, Easterly and Fischer (1994) found that the growth that did occur in the Soviet economy resulted almost exclusively from *extensive growth*, that is, as a consequence of large increases in capital investment per worker. The massive investments in machinery and equipment were, of course, commanded by the central planning board.

As to Question 3, Easterly and Fischer (1994) explored whether the Soviet economy stopped growing because of *capital deepening*, which hypothesizes that at high ratios of capital to GDP in extensive growth, the marginal product of capital will decline sharply. (For example, although the first tractor added to a farm increases output greatly, the second tractor increases it less, and so on.) Indeed, Easterly and Fischer found high ratios of capital stock to GDP after 1960.

If, however, capital deepening stopped Soviet economic growth, why, Easterly and Fischer (1994) asked, did it not also stop the growth of the market-based economies, which *also* had large increases in capital investment in the same time period? Why were growth rates in total factor productivity (labor plus capital) negative in almost every decade from 1928 to 1987 for the Soviet Union but not for the market economies? Easterly and Fischer found the "excess defense spending" hypothesis providing no answer; their results showed that increases in defense spending only lowered productivity growth by minute amounts. Similarly, the "lack of research and development (R&D) spending" hypothesis failed because Soviet R&D spending actually rose (from less than 1.5% of GDP in 1950 to over 3.0% in 1986). Therefore, Easterly and Fischer concluded, "Our results . . . indicate that the planned economic system itself was disastrous for long-term economic growth in the USSR" (p. 24), and they

> conjecture [that] under an autocratically directed economic system . . . some forms of physical or human capital . . . were missing, . . . [such as] market-oriented entrepreneurial skills, marketing and distributional

skills, and information-intensive physical and human capital. (p. 23)

The case of the Soviet Union warrants four conclusions. First, economic growth in an underdeveloped economy can result from a reallocation of physical resources from consumption to investment—as it did in the Soviet Union. Thus allocating scarce resources, the sole focus of neoclassical theory, can help us understand some cases of short-term economic growth. Second, for long-term growth the key element is not tangible resource allocation (or reallocation), but tangible and intangible resource creation. Particularly important is creating complex, interconnected combinations of tangible and intangible resources (Barney, 1986; Dierickx & Cool, 1989; Nelson & Winter, 1982) or, in the words of Easterly and Fischer (1994), "market-oriented entrepreneurial skills, marketing and distributional skills, and information-intensive physical and human capital" (p. 23). It is by creating new resources, for example, new organizational forms, skills, competencies, and production processes, that overall societal productivity, and hence wealth, increases. Third, R&D spending in an economy provides no assurance that productivity-enhancing innovations will be forthcoming.

The fourth conclusion is that, because innovation is endogenous to R-A theory, it—unlike perfect competition—can help explain why the Soviet economy stopped growing: Lacking competition, Soviet planners and managers lacked the means and motivation for creating the new resources required for overall productivity growth. That is, they lacked the means to know that innovation is required (which in market-based economies is provided by occupying positions of competitive disadvantage in Figure 2) and the motivation to innovate (which in market-based economies is provided by rewards flowing to those who create new resources). Marketplace positions serve as "signals" for innovation. Lacking both signals and motivation, command economies stagnate.

It is important to keep in mind what is being argued here. It is not being argued that R-A theory can explain the collapse of the Soviet Union, for that resulted from a constellation of social, political, and economic factors. What is being argued here is that R-A theory can help explain and, therefore, help understand the factors that limit the growth of command economies, when compared with market-based ones. On this issue, perfect competition theory has "little or nothing to say" (Knight, 1936, p. 255).

CONCLUSION

In summary, the R-A theory of competition stresses the importance of resources: the tangible and intangible entities available to the firm that enable it to produce efficiently and/or effectively a market offering that has value for some market segment(s). Competition, being disequilibrium provoking, consists of the constant struggle among firms for a comparative advantage in resources that will yield a marketplace position of competitive advantage and, thereby, superior financial performance. When one firm's comparative advantage in resources in some market segment(s) enables it to achieve superior financial performance through a position of competitive advantage in some market segment(s), competitors attempt to neutralize and/or leapfrog the advantaged firm by better managing existing resources and/or by acquisition, imitation, substitution, or major innovation.

Any satisfactory theory of competition should explain (or help explain) why economies premised on self-directed, privately owned firms competing with each other are more productive than command economies. R-A theory explains the superior productivity of market-based economies on the basis that in market-based economies superior rewards flow both to those firms that discover relatively efficient/effective resource assortments and to those that discover (a) when and how to manage an existing resource assortment more efficiently, (b) when and where to seek alternative resource assortments, (c) when and where to redeploy resources, and (d) when and how to create new resources. In contrast, because they lack competition, socialist planners and managers lack the means to acquire and motivation to implement the knowledge necessary for a productive and growing economy.

How does R-A theory relate to the works of the dissident economists? Although detailed analysis must await future research, some preliminary observations can be made. R-A theory obviously shares much with evolutionary economics. Most important, both view competition as a process, not a state. Indeed, Nelson and Winter's (1982) work on the importance of organizational routines is an important precursor of the resource-based theory of the firm (Grant, 1991). Also, Lancaster's (1991) view that products are "bundles" of attributes accords well with R-A theory's view that intraindustry demand is heterogeneous. Likewise, the view of human motivation found in Etzioni's (1988) socioeconomics is consistent with R-A theory's

constrained self-interest seeking. It also appears that R-A theory can provide a theoretical grounding for endogenous growth theory, especially that being developed by Romer (1990, 1993a, 1993b).

What next? First, we encourage an extensive dialogue and critique of R-A theory. Is each foundational premise correctly specified? Are other premises required? Is the logic correct that brings the premises together to form the theory? Second, what are the implications of the theory for the other branches of management (and vice versa)? In this regard, note that R-A theory's explicit denial of the opportunism assumption would seem to provide opportunities for useful synergies between strategic management and organization theory (Barney, 1990; Donaldson, 1990). Third, empirical testing of the premises and implications of the theory must be done. Fourth, detailed comparisons of R-A theory and dissident economics should be made. Finally, the social welfare and public policy implications need to be developed. In this regard, note that the theory does not imply complete laissez faire. (Recall that a price conspiracy, although it yields competitive advantage, does not constitute a resource.) At the same time, note that the ability to carefully modify one's product to better match the tastes and preferences of a market segment constitutes a socially beneficial resource—and not economically dysfunctional product differentiation, at least as that term is used in neoclassical theory.

In conclusion, does resource-based theory have macro or public policy implications? As a key component of the R-A theory of competition, I argue yes. Further developing the theory and determining exactly what those implications are would seem to be a project worth pursuing.

NOTES

1. The most comprehensive review of the debate can be found in Lavoie (1981, 1985). The treatment here draws extensively on his analysis, as well as that of Hodgson (1992) and Keizer (1989).

2. For numerous examples of neoclassical economists who endorsed this "standard account" of the debate, see Lavoie (1981, 1985).

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