STRATEGY, EXECUTION AND IDLE RATIONALITY

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Correspondence to:
Thomas C. Powell
Professor of Strategy, Oxford University
Said Business School
Park End Street
Oxford OX1 1HP UK
thomas.powell@sbs.ox.ac.uk

STRATEGY, EXECUTION AND IDLE RATIONALITY

- abstract -

Despite having the capability to act, firms sometimes lapse, blunder, or squander opportunities. Modern theories of the firm acknowledge the effects of uncertainty, transaction costs and agency problems on firm conduct, but they do not recognize the consequences of "execution holes" – the primitive failure to act. If execution holes exist, rationality is not bounded but "idle," and strategic heterogeneity emerges even in the absence of market imperfections such as mobility or resource imitation barriers. This paper contrasts the "barrier logic" of conventional strategy theory with an "execution logic" derived from the existence of execution holes. In a simulation model, the paper compares efficiency losses produced by market imperfections with those produced by execution holes. By analogy to x-inefficiency, the paper discusses "x-factors" – solvable unsolved problems – and identifies the opportunity costs of pursuing barrier-driven, market-sheltering strategies when fundamental strategic problems remain unsolved.

STRATEGY, EXECUTION AND IDLE RATIONALITY

"I see the better course and I approve of it – but I follow the worse." Ovid, *Metamorphoses*

It might happen that a firm neglects to capture an opportunity, or fails to imitate a perfectly imitable resource. Not that the opportunity is less attractive than the alternatives, or too risky, or that the rents are inappropriable. Rather, it seems possible that a firm might simply fail to act.

There is surprisingly little room in existing strategy theory for a primitive failure to execute. Economic theory accommodates agency conflicts, bounded rationality and decision biases (Ross, 1973; Simon, 1955, 1956; Kahneman and Tversky, 1973, 2000), and organizational research recognizes unstructured decision processes, "blind spots" and management misperception as sources of strategic error (Staw, 1976; Mintzberg, Raisinghani and Theoret, 1976; Zajac and Bazerman, 1991; Mezias and Starbuck, 2003). But these theories assume that once managers get their thinking straight, they go ahead and execute – the impediment is *thinking* rather than doing.

I believe this contradicts experience. I was once asked to provide consulting services to a university that had lost ground in the latest *U.S. News & World Report* rankings. I soon learned that the university had few contacts with its alumni network, and had not conducted a capital campaign in over 50 years. These actions seemed obvious to me, the kinds of things that go along with being a university. I could see that they were within the experience of the university's president and advisory board, and within the organization's capabilities. But actions have to be taken, and these had not. The actions had fallen into what I call an "execution hole."

This may be an exceptional case. Input and output markets may be relatively efficient, or inefficient in precisely the ways we emphasize in economic and strategy theories. In other words, markets may "fail" because entry, exit, diffusion and imitation processes are impeded by transaction costs, agency considerations, behavioral decision biases, economies of scale, strategic mobility barriers, or barriers to resource imitation.

But that is not the approach I take in this paper. I argue that even when all the customary barriers are removed, we are still faced with something like an execution hole – a primitive failure to execute. I suggest that the failure is "primitive" in the sense that it does not fall under any covering economic law or behavioral heuristic. The firm is not excluded, deluded, resource-deprived, culturally paralyzed or ineptly managed – the actions simply *do not occur*.

The following section defines and illustrates execution holes. It discusses the decoupling of decision processes from strategy execution, and develops a model of "idle rationality." The subsequent section formalizes this model in an evolutionary simulation of industry heterogeneity under idle rationality. In the final section, I operationalize execution holes as "x-factors" – solvable unsolved problems – and discuss the consequences of execution holes for strategy research and management practice.

The consequences are more wide-ranging than they at first appear. For example, execution holes preclude competitive equilibrium. In theories of the firm, an economic agent that has the means, motive and opportunity to act, *acts*. Firms always (and instantaneously) step into the breach – they capture producer's surplus and seize economic rents. Under idle rationality this does not occur, and outcomes do not approach any *ex ante* specifiable equilibrium.

For strategy research, this casts suspicion on the prevailing "barrier logic" of resources, dynamic capabilities and competitive advantage. If firms sometimes fail to execute industry

best-practice even when no barriers are present, then it is misleading to attribute the resulting performance differences to *market* failures. A more parsimonious account is that the *people* could do better – they could have acted, they should have, perhaps they knew they could and should have, but they did not.

There are also important consequences for managers. If strategic heterogeneity arises endogenously, then a firm's strategic problems are remediable by management action. In a world of execution holes, managers have the economic opportunity to act: to execute widely-known industry strategies, to exploit rivals' execution holes, and to drive organizational actions to conclusion. Although execution is relegated to "operational" status in current theory, and is less spectacular than creating sustainable advantages, it may be the more typical (and reliable) path to superior performance.

Execution holes

In economics and strategy theory, managers are perceptive but fatally constrained. In microeconomic theory, even perfect rationality does not enable managers to alter or override adverse market structures (Henderson and Quandt, 1980; Scherer and Ross, 1990). Strategic decisions such as price, quantity and product differentiation are imposed by exogenous market structures, and "perfect rationality" refers mainly to the correct perception of these structures. The manager's role is custodial, like a train conductor – to keep the firm operating smoothly on the rails of economic structure.

In strategy theory, firms earn economic rents by market-sheltering: achieving protected, rent-producing positions in product or factor markets (Caves and Porter, 1977; Wernerfelt, 1984; Rumelt, 1984, 1987). Markets seldom approximate perfect competition, and performance differences arise and persist due to economic, cultural, cognitive, or historical

barriers, which may include economies of scale, transaction costs, social embeddedness, or "causal ambiguity" (Porter, 1980; Williamson, 1985; Barney, 1986, 1991; Peteraf, 1993; Teece, 1998; Lippman and Rumelt, 1982). If the barriers are removed, and a valuable strategy is open to imitation, then rivals replicate and the rents are diffused (Barnett and Hansen, 1996; Teece, Pisano and Schuen, 1997).

Much of this is unobjectionable, and conforms with experience. If a firm locks up a unique location, then replication of that location is obviously barred. If a rival signs a ten-year contract with the industry's only customer, then the rival has an advantage. If installing automatic teller machines is a valuable, observable and replicable strategy, then banks have incentives to imitate the first-mover. All of this makes sense, as far as it goes.

But this "barrier logic" is self-referential unless it leaves the firm free to behave contrary to its predictions (Godfrey and Hill, 1995; Priem and Butler, 2001; Bromiley and Fleming, 2002). For the theory to have intellectual force, it must be logically possible for an economic agent to observe a rent-producing opportunity, have access to that opportunity, and then do nothing. We might think "execution holes" are rare, or foolish, or inconsistent with evolutionary processes in sophisticated capital or labor markets. But the theory must not *define* them out of existence. To have empirical content, the theory's converse – that a rent-seeking agent would, for no apparent reason, fail to imitate an available rent-producing strategy – should be empirically false, not nonsensical (Powell, 2001, 2002).

My position is that this proposition is not empirically false. I think economic actors behave this way all the time, and that this behavior persists in markets. Execution holes are not an exception to the rule, or confined to operational problems, or to inept and declining firms. I believe they exist in all firms at all times and places, and that they are strategically important, both in theory and practice.

It is not difficult to make an empirical case for execution holes. In the 1980s, WalMart and Southwest Airlines overtook unresponsive competitors in mature industries, and IBM destroyed billions in shareholder value through what CEO Louis Gerstner (2002) later diagnosed as poor "blocking and tackling." In the 1990s, Mattel lost its strategic bearings through widespread neglect of core products and markets, and Schwinn failed to react to domestic and foreign threats in the U.S. bicycle market. In Australia, market leader APPM failed to respond as new entrant APM steadily eroded its position in the fine paper market, eventually acquiring APPM (Hayes and Upton, 1998). In the years before its collapse, WorldCom notoriously neglected fundamentals such as customer service and billing, leading the industry in FCC long-distance complaints and billing errors (Finkelstein, 2003; see also Argenti, 1976; Miller, 1990; Lowenstein, 2000).

In accounting for these failures to act, many *ex post* "explanations" are possible. K-Mart had focused on upmarket retailing and corporate diversification, and its capital commitments precluded timely response to Wal-Mart's logistical and technological investments. Mattel was pursuing acquisition-driven market share in a rapidly-consolidating industry (to the point of attempting a hostile takeover of archrival Hasbro). Schwinn was lowering costs through overseas outsourcing, and mistakenly regarded mountain bikes as a specialty market. IBM's culture had grown inert and its largest businesses had commoditized.

The value of such explanations depends on our theoretical predispositions, and on our tolerance for hindsight rationalization. For example, WalMart has been variously construed as an example of scale economies, cost leadership, service differentiation, mobility barriers, corporate culture, technological innovation, value-chain management, and entrepreneurship.

In developing the notion of "execution holes," the emphasis is not on *ex post* accounts of corporate success or failure, but on the failure to enact strategies that were known *ex ante* to

be viable. This is better illustrated in a case I experienced first-hand. Glasco, a diversified consumer products manufacturer, was canvassing its growth opportunities in a mature market segment.[1] Annual demand growth in this segment had slowed to 3%, but the firm distributed its product only in Massachusetts and Rhode Island, less than 1% of the U.S. market. I was asked by the CEO to conduct an analysis, and naturally I inquired whether the firm had contemplated expanding its geographic coverage.

In fact, the firm had contemplated it, but had not done it. Consider the following facts:

- Revenue growth was a strategic priority for Glasco's CEO and board of directors.
- Revenue growth had been slowing for ten years.
- Glasco always had the financial resources and internal capabilities to expand.
- The discounted cash flows for expansion were positive (they had twice been computed in recent years), and ranked highly among alternative investments.
- Glasco had successfully distributed other consumer products in the new territories.
- The CEO had extensive direct experience and expertise in this market.
- The CEO had led successful expansion strategies in other product markets.
- Glasco's largest competitor had begun regional expansion eight years earlier, and was now a successful national competitor.

Geographic expansion is probably the most fundamental growth strategy in mature consumer products industries. For Glasco, there was no apparent barrier to expansion, and they might have acted five to ten years earlier. Two years later Glasco did execute this strategy, albeit as a very late mover and at a competitive disadvantage. The CEO developed a distribution strategy for the mid-Atlantic states, and within five years had expanded Glasco's

[1] The name of the firm is disguised.

distribution as far west as Illinois. During this period, profit margins rose and Glasco's average annual sales growth in this segment exceeded 20%.

Glasco illustrates the main features of execution holes:

1. Managers recognize a strategic issue.
2. Managers believe the issue requires action.
3. Satisfactory solutions exist (the issue can be addressed, the opportunity can be captured, the problem can be solved)
4. Managers have the resources to act, and there are no financial, cultural, cognitive or competitive impediments to execution (no barriers of scale or scope, no property rights or contractual constraints, no internal resource constraints, no barriers to resource imitation).
5. No action is taken.

Faced with such a scenario, most scholars feel compelled to rationalize the firm's failure to act, and indeed this is what economic theory urges us to do. For example, Glasco did not expand because managers were risk averse; or because utility functions were not aligned with shareholder interests; or because managers were boundedly rational and minimized search costs by pursuing "satisficing" strategies; or because alternative strategies had less uncertainty or higher NPV; or because of "cultural inertia"; or because competitors had superior distribution capabilities, relationships with suppliers, or other early-mover advantages. The list is infinitely expandable, and open to many theoretical perspectives.

It would be fruitless to insist that such claims are always false. In some cases, what first appeared to be a primitive failure to act may, in fact, be better explained as a case of costly search, principal-agent conflict, or resource imitation barriers. The problem is not with the explanations *per se*, but with the habitual *post hoc* invocation of standard economic explanations, even in accounting for balks, lapses, and other behavioral non-events. As already noted, the intellectual integrity of barrier logic requires its adherents to reason non-

tautologically, i.e., to acknowledge the empirical possibility that a firm may fail to act due to primitive or random neglect; or, more succinctly, *for no reason whatsoever*. Upon empirical inspection, we may conclude that this never happens, or is sufficiently uncommon to justify its exclusion, or, if execution holes do exist, that they are suppressed by selection pressures. But this has not been the approach either in economics or in strategy research, where empirical work is designed not to test whether a theory of structural barriers is true, but to determine *which* barriers can plausibly be invoked to explain a known result.

If execution holes do exist, they imply the decoupling of a firm's actions both from the firm's optimal strategy, and from the strategic intentions of its decision-makers. There is evidence to suggest this decoupling actually occurs, and it has attracted considerable interest in political science, sociology and organization theory. In the public policy setting, Lindblom cited the difficulty of literal strategy execution owing to conflicting values between planners and implementers (Braybrooke and Lindblom, 1963; Lindblom, 1968). Lipsky (1978) argued that, in decentralized contexts, it is impossible for implementers to understand the strategic intentions of executives; and Wildavsky argued that self-interest, along with the fallibility of human perception and communication, precludes conformity to strategic plans and executive decisions (Wildavsky, 1971, 1979; Majone and Wildavsky, 1978).

March (1988) coined the expression "technology of foolishness" to describe the importance of playfulness, experimentation and intuition in strategic action. Cohen, March and Olsen's (1972) "garbage can" model viewed decisions as a bin into which various problems and solutions are dumped by participants. Applying this model to university decisions, Cohen and March (1974) concluded that, although universities generally improve themselves over time, they seldom implement rational or even boundedly-rational choices. According to Cohen and March (1974, pgs. 86-87), "University decision-making frequently

does not "resolve" problems. . . Decision makers and problems often seem to track one another through a series of choices without appreciable progress in solving problems."

March and Simon (1958) argued that many organizational actions, and nearly all routine tasks, emerge from programmed behavior. Programs are derived from education, experience, training, traditions, norms and procedures, and organizations execute well-worn programs whether or not they fit the problem at hand. Programs also arise in Nelson and Winter's formulation of tacit knowledge and "routines" (1982), and in Starbuck's (1983) model of "action generation," which shows how organizational actions emerge ritually, prompted by a symptom or event, but rarely by a conscious decision to act.

Brunsson (1982) argued that decision-making processes are inherently irrational, and cannot produce rational content or execution. In any case, "making decisions is just one way among several of initiating actions in organizations," the others including commitment, ideology, and the motivation to act. Brunsson argued that shared ideology produces more consistent actions than planning, particularly in unstable environments. Similarly, Weick (1987, p. 230) suggested that improvisation and commitment can be effective "substitutes for strategy," concluding that "Execution *is* analysis and implementation *is* formulation."

One of the more sustained arguments for the separation of intentions and execution is Mintzberg's model of "deliberate" and "emergent" strategies, supported by his empirical work on strategy formation (Mintzberg, Raisinghani and Theoret, 1976; Mintzberg and Waters, 1982; Mintzberg and McHugh, 1985). Mintzberg (1994) described a "grassroots" model of strategy formation, with strategies emerging from actions rather than plans. According to Mintzberg, "Strategies grow initially like weeds in a garden, they are not cultivated like tomatoes in a hothouse." (p. 287)

A similar idea emerges, but rather idiosyncratically, in the "x-efficiency" economics of Leibenstein and his followers (Leibenstein, 1966, 1976, 1978, 1983; Frantz, 1988; Primeaux, 1977). In Leibenstein's theory, each individual in a multi-person firm chooses an "APQT bundle," deciding what activities to attend to (A), a pace of work (P), a quality standard (Q), and the time devoted to each activity (T). Employees are concerned about the firm's success, and for each employee there exists an APQT bundle that maximizes firm profitability. But individuals have private motives and "effort discretion," and will not generally choose the profit-maximizing APQT bundle. Events or contractual arrangements (e.g., the threat of bankruptcy, or piecework incentives) may nearly align individual and firm interests, but the gap between the firm's best strategy and the actions taken by self-interested individuals can never be fully bridged by writing better contracts or rearranging property rights.

Leibenstein's original papers predated the modern development of agency theory, and some of his "x-efficiencies" can now be framed more parsimoniously as agency problems or transaction costs (see Stigler, 1976; DeAlessi, 1983; Jensen and Murphy, 1990; Holmstrom and Milgrom, 1994). However, Leibenstein went beyond these theories in urging economists to use the principal of maximization non-tautologically. For example, Leibenstein claimed that individuals in multi-person firms vary in their propensities to compute the costs and benefits of their own actions, and therefore that few people actually perform the computations necessary for utility maximization. This "computation-aversion" is not attributable to the costs of utility calculations exceeding their benefits, or to a preference for leisure over work, or to any other sub-form of maximization. It is simply a propensity not to calculate. And if individuals do not perform utility calculations, then utility maximization is accidental, and profit-maximization by the firm is improbable.

Leibenstein pointed out that, even if employees and managers maximize utility, their utility functions may include an aversion to utility maximization and thus yield a contradiction: utility maximization would require that utility not be maximized. It is better, he argues, to release the theory from the illogic of maximization, by simply acknowledging that individuals may not maximize their own utility – and, as a consequence, that firms may not maximize their profits. This observation, epistemological rather than economic in character, has not been preserved in agency or transaction economics, and is ignored in the barrier logic of contemporary strategy theory.

If economic actors sometimes lapse, balk, neglect, daydream, or otherwise fail to enact intentions, then existing strategy theories significantly overexplain strategic heterogeneity and firm performance differences. To see this, it is instructive to consider strategic heterogeneity and economic efficiency in conventional models of competition. Under perfect competition, price-taking firms costlessly obtain market information and choose profit-maximizing strategies, instantaneously clearing economic inefficiencies and eliminating rent-producing heterogeneity. In models of imperfect competition, structural barriers (e.g., barriers to entry, indivisibility of inputs) introduce monopoly or monopsony power, and structural (or "allocative") inefficiencies exist. A monopolist, for example, may underutilize capital or labor, or monopolistic competition may produce persistent product differentiation. But execution remains efficient, with firms executing optimal strategies subject to the constraints of exogenous economic structures and rival behavior.

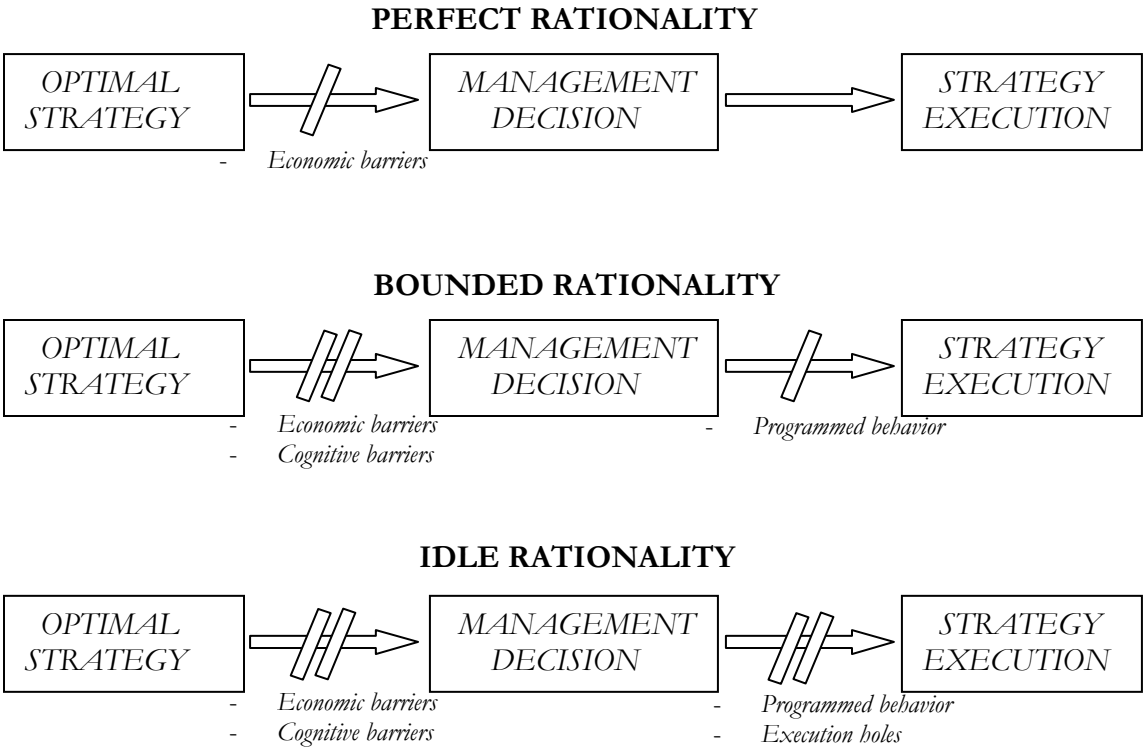
In strategy theory, market imperfections may enable some firms to achieve superior market positions or resource endowments, giving rise to significant economic inefficiency and intra-industry strategic heterogeneity. Some firms fail to implement optimal strategies because of cognitive or economic barriers, but the failures are never *behavioral*. A firm that

fails to execute was always precluded by a cognitive, product market, or factor market barrier – decision bias, mobility barrier, causal ambiguity, social imbeddedness, asset complementarity. As such, market inefficiencies remain allocative, not executional.

There is little doubt that firms are less than efficient in selecting and implementing strategies, and indeed much of modern economics – bounded rationality, transaction analysis, agency theory, evolutionary economics, x-efficiency theory, behavioral decision theory – arose to account for this anomaly in traditional theory. In light of these developments, it is surprising that mainstream strategy research has retained the market-sheltering logic of the original theory. On the one hand, strategy theory acknowledges bounded rationality, decision biases, blind spots, management misperception, and organizational routines, but on the other it uses these only to produce a wider array of *ex post* explanations for allocative inefficiency. Strategic heterogeneity is always attributed to structural barriers, and the theory has no mechanism for recognizing the independent and behavioral character of strategy execution.

Figure 1 compares the leading models of decision rationality. Under perfect rationality, strategic decisions are well-informed and pass frictionlessly from thought to action. Bounded rationality introduces both cognitive and execution fallibility – decision-makers engage in costly, myopic search for strategic alternatives, evaluate them using simple heuristics and favoritism, and choose a "good enough" alternative (Simon, 1955, 1956; March and Simon, 1958; Cyert and March, 1963). This boundedly-rational decision is then conveyed into economic action, mediated by the existence of "programs," "routines," or "rituals," which may introduce execution inefficiencies.

FIGURE 1: THREE MODELS OF ECONOMIC ACTION



Although bounded rationality is a descriptive improvement, strategy execution is still tightly-coupled with thought, and failures to execute are interpreted as by-products of "programmed" behavior. Execution may not follow plans, but there are no unexplained lapses, and no significant departures from the logic of "intendedly rational" search heuristics and behavior programs – in short, no execution holes.

In one sense, idle rationality extends bounded rationality by introducing execution holes. However, if execution is decoupled from intentions, it matters little whether we accept bounded rationality, even in preference to perfect rationality – perfect certainty and optimal strategic decisions would still leave us with significant strategic heterogeneity. Unlike earlier models, the main emphasis in idle rationality is not on the rationality of decision processes, but on the independence of strategic decisions and execution, irrespective of beliefs about

cognitive biases or decision processes. Under idle rationality, even when firms *can* execute optimal strategies, they sometimes *don't*. Managers ignore decisions (including their own), fail to enact company policies, or let perfectly viable opportunities lapse. At the limit, execution is divorced from any output of boundedly or perfectly rational decision processes, and for explaining execution inefficiency the former is only marginally preferable to the latter.[2]

In sum, whereas strategy theory emphasizes structural inefficiency, barriers to imitation and sustainable advantages, idle rationality suggests that a firm's best strategies are sometimes close at hand and actionable. If firms fail to execute these strategies, responsibility cannot be assigned to luck, history or economic structures, and the remedy is not to be found in the pursuit of sustainable competitive advantages. The problem is a primitive lack of execution, and the solution is to execute.

This is not to say that structural advantages do not exist, or that strategy theory is misguided – sometimes, economic barriers are precisely where we should focus our causal explanations. The problem is that leading strategy theories *always* draw attention to competitive advantages and barriers to imitation, even when the problem is elsewhere. If firms are heterogeneous, the theory has little recourse but to locate the most plausible *ex post* structural explanation. As a matter of proportion, idle rationality draws attention to execution, a region of the strategic landscape largely inaccessible to current theory.

[2] Though it supports the existence of execution holes, the Carnegie-influenced research – the garbage can model, programmed behavior, routines, substitutes for strategy, emergent strategy – tends, in its accumulated weight, to overrationalize execution failure. The studies show us that actions need not follow plans, but this does not imply that execution *failures* require further rationalization. In this paper I do not rationalize execution holes, but emphasize the *fact* of the break between thought and action, and the theoretical and practical consequences of that fact.

Idle rationality and strategic heterogeneity: A simulation model

This section develops a simple production-function model of idle rationality. The model is not intended as a "proof" of idle rationality or execution holes. Rather, the model shows that execution holes lead to a form of inefficiency neglected in conventional theory, and to distributions of strategic heterogeneity at least as plausible as those produced by structural barriers and sustainable competitive advantages.

For the analysis in this section, it will be useful to think of an industry as a "problem space" (Newell and Simon, 1972). Every industry poses unique problems, and what competitors in the same industry hold in common is their presence in a substantially similar problem space. Here, I use the term "problem" expansively, to include issues, opportunities, dimensions of competition, key success factors, and so forth. For example, firms in the hard disk drive industry face similar engineering problems (and opportunities) around packing increasing memory onto small disk surfaces, and linking fast-cycle technological possibilities with slower-cycle customer requirements (Christensen, 2000). Hospitals face problems of public health funding, community relations, capacity management, and the management of professional staff. Banks face problems of pricing, customer access, asset management, government deregulation, and value chain disintermediation.

No two firms approach the problem space with identical problem-solving capital. Firms emerge from idiosyncratic founding events with unique resource and capability endowments (Fichman and Levinthal, 1991). Influenced by these "imprinting" effects (Stinchcombe, 1965), they adopt different product-market positions and geographic locations, have different structures, cultures, and functional area strengths and weaknesses, emphasize different primary and supporting activities along the value chain, and control different tangible and intangible assets (Levinthal, 1991).

The grand sum of a firm's strategic attributes at a point in time I refer to as its *strategic capital*. Strategic capital is a stock (or state) variable that arises out of a firm's origins and accumulated experience, representing the firm's evolved capacity to solve problems presented by its industry.[3] The model focuses on the dynamic fit between a firm's strategic capital and the industry problems it faces.[4]

For analytical convenience, I consider an industry with only two strategic problems and two competitors. I assume that the industry presents "distribution" and "technology" problems, and that firms succeed (and increase their strategic capital) by solving these problems. Each period, a firm controls a fixed quantity of *strategic work* (a flow quantity), which it allocates across the two problems. I assume that strategic capital is increasing in strategic work (the partial derivatives are positive for work applied to solving either problem), with constantly diminishing returns over all values of distribution and technology capital.[5]

I initialize the firms' strategic capital by assigning a random number from a folded standard-normal distribution for the distribution and technology problems.[6] This satisfies the assumption that firms begin with idiosyncratic strategic capital reflecting their unique conditions of founding. An example of this is shown in Figure 2 for firms Alpha and Beta.

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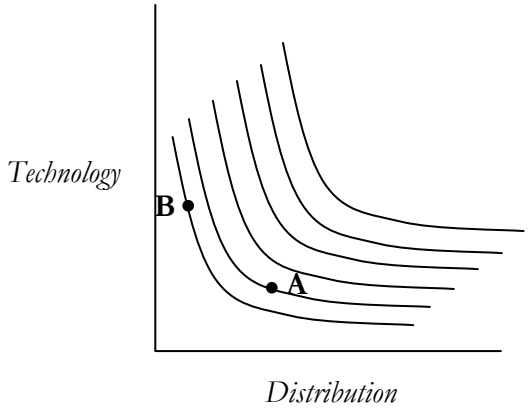
[3] Strategic capital is the firm's evolved capacity to solve its problems, broadly-construed, whether those problems are expressed as assets to be acquired, knowledge to be gained, skills, competitive dimensions, key success factors, value-chain stages, strengths, weaknesses, opportunities, or threats. The model does not assume any single-source theory of strategy or firm performance (e.g., a theory based on resources, activities, commitments, knowledge, dynamic capabilities, or competitive positions).

[4] Strategic capital is consistent with some existing concepts. Two that come to mind are Levinthal's (1991) "organizational capital," and Amit and Shoemaker's (1993) "strategic industry factors." As noted earlier, it might also be consistent to assume that firms develop "routines" to solve their problems (Nelson and Winter, 1982; Winter, 2000), so that strategic capital comprises (among other things) these routines.

[5] The strategic capital production function is strictly concave and homogeneous. For illustration, I use the Cobb-Douglas function $S=D^{½}\,T^{½}$, where S is total strategic capital., D is distribution capital and T is technology capital.

[6] This is equivalent to drawing a random value from a standard normal distribution, then taking its absolute value. The premise is that entrants are initially "above average," and improve over time.

FIGURE 2: INITIAL STRATEGIC CAPITAL



Descriptively, Figure 2 implies that Alpha has more strategic capital for solving the distribution problem, Beta has more strategic capital for solving the technology problem, and Alpha has more overall strategic capital than Beta.[7] The strategic capital assignments in Figure 2 are as follows:

Firm	*Distribution capital*	*Technology capital*	*Total strategic capital*	*Strategic capital shares*
Alpha	.92	.61	.75	62.0%
Beta	.17	1.24	.46	38.0%

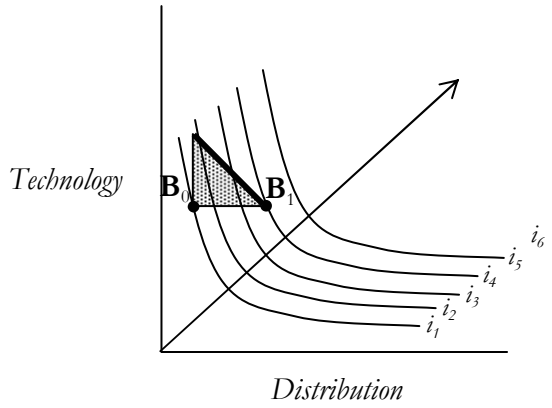
In period 1, each firm allocates a fixed quantity of strategic work to the distribution and technology problems. Strategic work corresponds to strategy execution. If a firm allocates its entire quantity of strategic work to distribution, then its distribution capital and total strategic capital increase, but technology capital remains unchanged (for simplicity, I assume firms can create, but not destroy, total strategic capital). In the model, the firms allocate one unit of strategic work across the distribution (D) and technology (T) problems.

Figure 3 illustrates these ideas for Beta. I assume that D and T have equal implementation costs, and that these costs are the same for both firms and constant over

[7] Presumably, Alpha also performs better than Beta. I assume that performance is increasing in strategic capital, but there is no need to specify a function here.

time. The industry has an optimal problem-solving strategy along a 45-degree ray from the origin, as shown. Beta begins at B_0, and can choose any D-T combination on a line segment at the frontier of the shaded area (shown in bold). In allocating one unit of strategic work, Beta's optimal strategy for period 1 is a pure allocation to the distribution problem, and none to technology.[8] Beta's total strategic capital is increased from isoquant i_1 to i_4.

FIGURE 3: BETA'S STRATEGY IN PERIOD 1



In theories of competitive advantage, insurmountable barriers prevent the execution of optimal strategies, e.g., a rival may have privileged access to distribution channels. In this case, shown in Figure 4 as a reflecting barrier at d_1, Beta cannot achieve the capital-maximizing combination of D and T – in period 1, Beta allocates strategic work as shown at B_1. Beta's total strategic capital is now on i_3 rather than i_4. In period 2, Beta has no better option than to allocate strategic work entirely to T, moving to B_2. Since Alpha has privileged access to distribution, it is not constrained at d_1, and can exploit a distribution-based

[8] In Figure 2, it would not be difficult to accommodate two or more equifinal paths (a fixed-proportion production function), or to depict the space as a "rugged" landscape (Levinthal, 1997, Rivkin, 2000), with local and global optima; but no purpose would be served for illustrating the current problem. The Figure 2 landscape has no global maximum (it is ever-increasing), but there is an optimal strategy in any given period.

competitive advantage. The evolution of strategic capital shares for periods 1 to 10 is shown in Figure 5.[9]

FIGURE 4: A DISTRIBUTION BARRIER

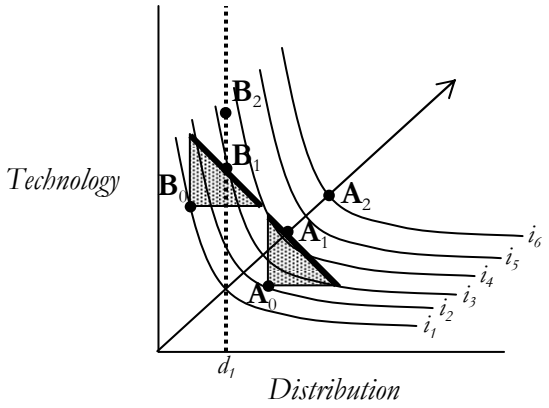


FIGURE 5: STRATEGIC CAPITAL SHARES WITH COMPETITIVE ADVANTAGE

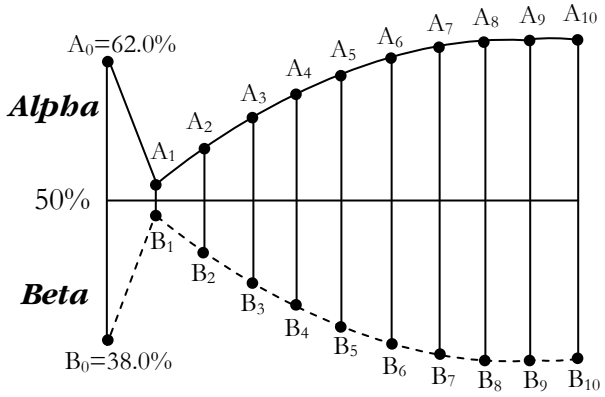


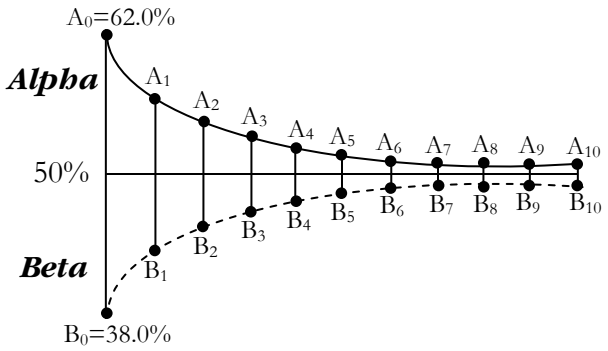
Figure 5 shows strategic heterogeneity when a competitive advantage exists, a situation that existing strategy theories are well-equipped to explain. The following analysis develops alternative scenarios, comparing strategic heterogeneity under perfect rationality, bounded rationality and idle rationality. I assume that Alpha and Beta are initially endowed as in

[9] In Figure 5, I assume the existence of a perfect imitation barrier at d_1=1.0. Alpha chooses optimally throughout, while Beta's distribution capital cannot exceed 1.0. Shares nearly equalize in period 1 as Beta approaches d_1; but once the barrier is reached, Alpha steadily increases its share.

Figure 2, with no reflecting barriers in the competitive space; neither Alpha nor Beta has a competitive advantage, though Alpha has an endowment advantage.

Perfect rationality. Under perfect rationality, given the strategic capital surface in the example, Alpha and Beta would attempt to equalize distribution and technology capital.[10] Each firm has the means to find and execute optimal strategies, and they do so. In period 1, Alpha allocates .35 units to distribution and .65 units to technology, and Beta allocates one unit to distribution. Within three periods, the two firms find identical strategies, and total strategic capital shares steadily equalize, as shown in Figure 6.

FIGURE 6: STRATEGIC CAPITAL SHARES UNDER PERFECT RATIONALITY



Figures 5 and 6 correspond to expectations under standard models of competition. In figure 5, we have market failure and increasing industry heterogeneity, and in Figure 6 we have perfect competition (illustrated for two firms), and increasing homogeneity. In the latter, the industry evolves to an asymptotic competitive equilibrium with identical D and T allocations and equal capital shares. In neither case have I assumed execution holes or efficiency losses associated with idle rationality.

[10] The production function was chosen for analytical convenience only. It would be a simple matter to weight the strategic dimensions differently (e.g., $S=D^{1/3}T^{2/3}$), or to assign them different costs. This would produce different optimal strategies, but the principles remain the same.

Bounded rationality. To model outcomes under bounded rationality, I make four assumptions about firm behavior:[11] (1) *Goal pursuit* – firms are motivated to maximize total strategic capital; (2) *Limited search* – search is costly and firms evaluate only a small subset of all possible strategic work vectors; (3) *Limited computational capacity* – Firms imperfectly estimate the payoffs for strategic alternatives; (4) *Satisficing choice* – Firms do not insist on optimal moves, but accept the first alternative that achieves their goals.

Given its initial capital, I assume that Alpha searches its immediate environment for strategies that increase total strategic capital. There is no convenient rule for how comprehensively or for how long Alpha will search, but under bounded rationality firms are constrained by search costs. I assume that good strategies are more difficult to find (more costly) than poor ones, and that firms stop searching when either (a) a "good enough" strategy is found, or (b) the "search budget" is exhausted.

Consider Alpha's choice in period 1 (see Figure 7). Alpha begins at A_0 and inspects a random point along the line segment of positive allocations of one unit of strategic work. Alpha's capital-maximizing strategy is at A_m. I assume that Alpha cannot compute the payoffs to any strategy, but can tell whether a strategy's payoff falls in the first, second, third or fourth quartile of payoffs.[12] If the first randomly-inspected strategy falls in the upper quartile, then Alpha adopts this strategy. If the strategy falls outside the upper quartile, the search was less costly, and the firm can inspect another random point. If the newly-inspected strategy falls within the upper quartile, Alpha adopts this strategy; if not, it inspects a third

[11] See Simon (1955, 1956, 1972), March and Simon (1958), Cyert and March (1963)

[12] In the example, the frontier of possible strategies can be construed as the proportion of strategic work allocated to distribution (the allocation to D also determines the allocation to T). In Figure 7, the optimal allocation for period 1 is .35. I define the upper quartile of strategies as all strategies within the nearest .25 of this optimum. In the example, Alpha will adopt any strategy that allocates from .23 to .47 of strategic work to distribution; otherwise it will search again. If the optimal strategy is 100% distribution, the firm will adopt any strategy that allocates from .75 to 1.00 to distribution.

random strategy. If none of the three strategies falls in the upper quartile, the "search budget" is exhausted, and Alpha adopts its best strategy from the three alternatives.

FIGURE 7: STRATEGIC CHOICE UNDER BOUNDED RATIONALITY

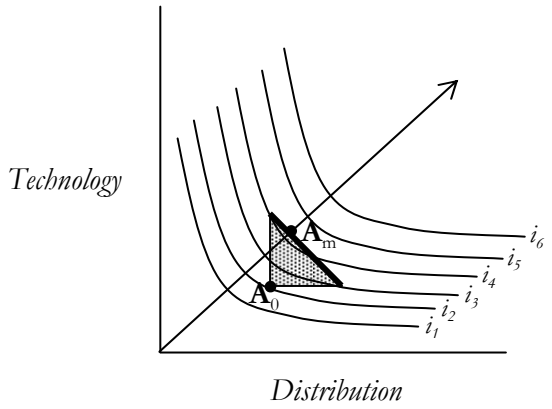
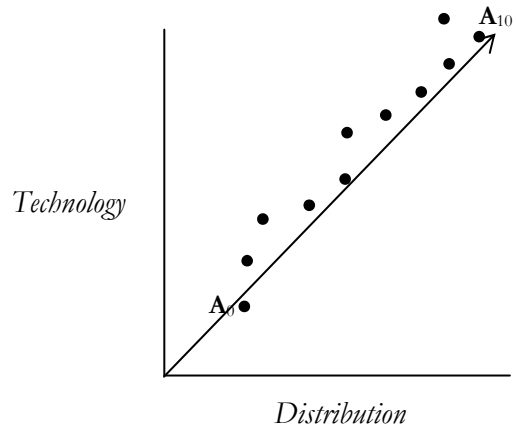


Figure 8 shows a typical evolution for Alpha's strategic moves under bounded rationality. Alpha's moves take on a stochastic character, and bounded rationality prevents Alpha from adopting and retaining optimal strategies. However, we observe surprisingly little "wandering" over the competitive landscape. If Alpha had adopted optimal strategies throughout, its strategic capital after ten periods would be 5.77, with 50% of its final strategic capital allocated to distribution. In Figure 8, Alpha's final strategic capital is 5.76, and its distribution capital is 48% of total capital. After period 2, Alpha's distribution of capital never deviated from optimality by more than 4%. In brief, despite alternative assumptions about decision processes, there is no significant loss in economic efficiency relative to perfect rationality.

FIGURE 8: ALPHA'S STRATEGIC EVOLUTION UNDER BOUNDED RATIONALITY



Under bounded rationality, we also see very little variation in the joint evolutions of Alpha and Beta. As in perfect rationality (see Figure 6), the firms converge very quickly on near-optimal strategies, and the industry is virtually homogeneous within a few periods. The industry evolves stochastically to the same asymptotic competitive equilibrium.

Idle rationality. To model the effects obtained under idle rationality, I make no assumptions about how firms search or make decisions about the competitive landscape. I assume that firms are "action-rational" only in the sense that they do not destroy total strategic capital.[13] Within that constraint, I assume that whatever Alpha or Beta should do, or intend to do, is uncorrelated with what they actually do. The firms deploy strategic work in some generally uphill direction, without regard to the rationality of underlying decision processes.

[13] Even this may be conceding too much. Assuming that firms can and do destroy strategic capital would support the point I am making. The point would be supported further by assuming that Alpha and Beta do not exert full "strategic effort," i.e., they allocate less than a full unit of strategic work (move anywhere into the shaded area of Figure 9, rather than on the bold lines). This is the approach adopted in x-efficiency and "efficiency frontier" research, but the current point can be made without these assumptions.

Figure 9 illustrates the strategic position of Alpha under idle rationality. In Figure 9, the shaded areas indicate all moves requiring no more than one unit of strategic work. A_0 is Alpha's initial position, A_m is its optimal strategy in period 1, and, as in previous models, the firm always deploys strategic work at the frontier (i.e., allocates the full unit of strategic work along the possibility set indicated in bold). However, unlike previous models, I do not restrict Alpha to moves consistent with perfect or bounded rationality. I assume only that Alpha does not move to any isoquant below i_2.[14] For whatever "reasons," Alpha moves randomly onto the possibility set.

FIGURE 9: STRATEGIC CHOICE UNDER IDLE RATIONALITY

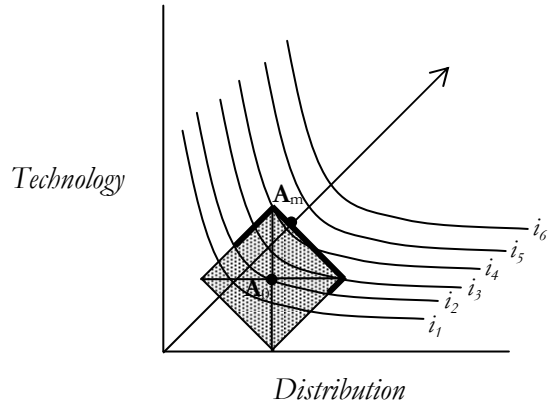
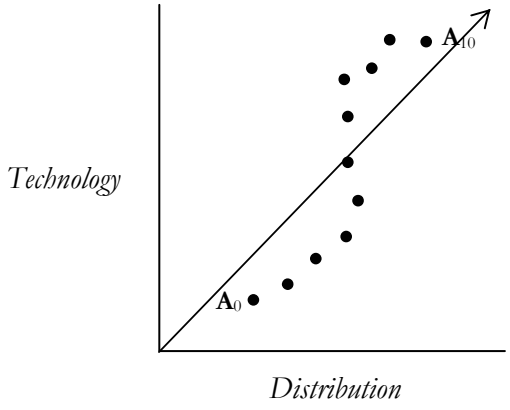


Figure 10 shows a typical evolution for Alpha's strategic moves under idle rationality. In this model, Alpha shows no tendency to execute perfectly rational or boundedly rational strategies. The firm simply executes in an uphill direction on the strategic capital surface. Indeed, it is not quite correct to think of the Figure 10 evolution as "typical," since any evolution is possible so long as Alpha deploys one unit of strategic work per period and does

[14] The model allows Alpha to destroy capital in either distribution or technology, but not both, and not to destroy total strategic capital. It assumes that destroying capital in technology or distribution (e.g., losing a marketing team) absorbs strategic work. Thus, the perimeter of the shaded square in Figure 9 represents all possible deployments of one unit of strategic work, and the bold lines represent the possibility set, i.e., all deployments that do not destroy total strategic capital.

not destroy total strategic capital. There is short-run path dependency,[15] as observed in actual industry evolutions (Arthur, 1994), but in the long run a wide range of outcomes is possible.

FIGURE 10: ONE STRATEGY EVOLUTION UNDER IDLE RATIONALITY



Under idle rationality, not only do the firms' strategies stray from the optimal line, but relative competitive positions can change over time. Figure 11 shows three sample evolutions of strategic capital shares. In 11a and 11b, Alpha maintains a significant "advantage," which fluctuates over time. In 10c, the firms are more closely matched - Alpha loses its "advantage" in period 5, but regains it in period 8.[16] The probability of observing such "crossovers" decreases with disparities in initial capital shares, but a very wide range of outcomes is possible irrespective of initial conditions.[17]

[15] The restriction to a single unit of strategic work per period precludes "long jumps."
[16] For comparison to earlier figures: under perfect and bounded rationality, total strategic capital at period 10 was 5.77 and 5.76, respectively; under idle rationality, strategic capital at period 10 was 4.96. For periods 1-10, Alpha's proportion of distribution capital under idle rationality ranged between .41 and .70; under perfect rationality, this proportion is fixed at .50; under bounded rationality, the proportion varied between .46 and .52.
[17] Figure 11 illustrates a range of possible outcomes. Over a very large number of runs using the initial conditions in the example, the probability that Beta leads Alpha after 10 periods is .18.

FIGURE 11: EVOLVING STRATEGIC CAPITAL SHARES UNDER IDLE RATIONALITY

Figure 11a

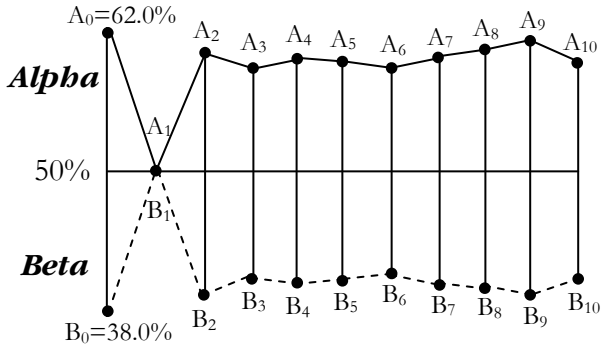


Figure 11b

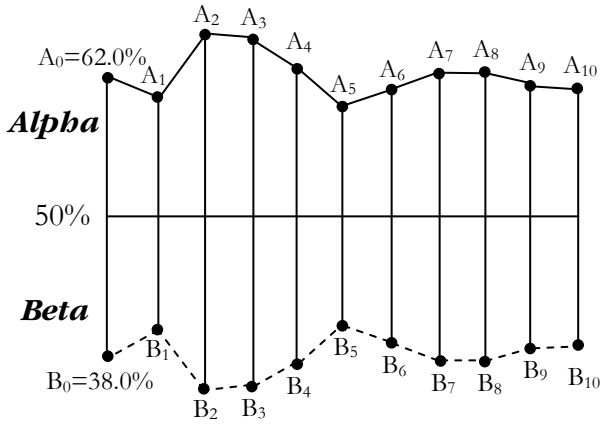
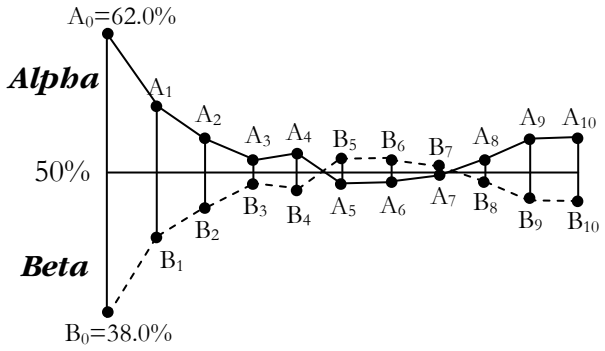


Figure 11c



These models do not attempt to replicate empirical distributions – to do so would require assumptions about entry, exit, regulation, technological change, etc. However, they do show that idle rationality is capable of producing a wide range of strategic outcomes, including

outcomes virtually indistinguishable from those produced under competitive advantage and economic barriers. Certainly, if entry conditions, technological change, and other variables were introduced, it would be difficult to distinguish these effects.[18]

Neither perfect nor bounded rationality produces such outcomes – both lead, *ceteris paribus*, to industry homogeneity and competitive equilibrium, though bounded rationality introduces stochasticity. Only in the presence of structural barriers or idle rationality does strategic heterogeneity emerge and persist.

Moreover, idle rationality induces a source of strategic heterogeneity not found in the other models. Structural barriers and competitive advantage (Figure 5) produce unequal outcomes and an efficiency loss in total strategic capital, the magnitude of which depends on the restriction imposed.[19] However, idle rationality produces an efficiency loss even in the absence of structural barriers,[20] and thus offers an alternative account of strategic heterogeneity. The following section develops these results further, and discusses their implications for strategy research and practice.

Strategy, x-factors and management practice

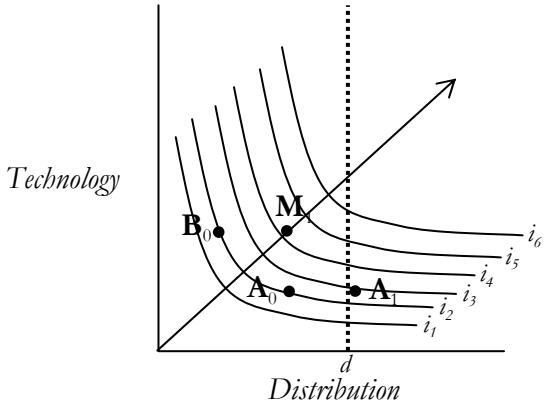
Much of strategic management and industrial organization research is concerned with strategic heterogeneity (Nelson, 1991; Miles, Snow and Sharfman, 1993; Knott, 2003), and the resulting skewness in industry performance distributions (Jacobsen, 1984; Cubbin and Geroski, 1988; Waring, 1996; Roberts, 1999; Powell, 2003a; Ruefli and Wiggins, 2003). The above analysis suggests that, although leading theories have much to say about this, the task

[18] Arguably, entry would reduce heterogeneity under idle rationality. However, entry would require enough initial strategic capital to exert selection pressure on incumbents. This may be plausible in early periods, but (for all economic models) becomes unlikely as strategic capital accumulates (Spence, 1981, Lieberman, 1989).
[19] Setting the barrier at d_1=3 yields total strategic capital for Alpha and Beta (at period 10) of 10.79, an efficiency loss of 6.3%. In Figures 4 and 5 d_1 is set at 1 and SC=8.99, an efficiency loss of 22.0%.
[20] In the examples in Figure 11, the average total strategic capital after ten periods was 9.14, an efficiency loss of 20.7% relative to perfect rationality.

does not always require imperfect product or factor markets, or sustainable competitive advantages. Heterogeneity also arises when execution is decoupled from decision processes.

Does it matter whether we attribute firm performance to economic barriers or execution holes? I think it does. Consider the position of firm A in Figure 12. A and B are endowed with equivalent strategic capital (on i_2), but different proportions for distribution and technology. At A_0, Alpha's managers believe the firm could dominate distribution channels (as first-mover) by moving to A_1, thereby gaining a market-sheltered competitive advantage. Allocating the entire unit of strategic work to distribution is not optimal in the current period (the optimal strategy for both firms is M_1), but would ensure that B's distribution strategy would be constrained in the future.

FIGURE 12: THE PERILS OF PURSUING COMPETITIVE ADVANTAGE



It is possible that Alpha's managers are mistaken about distribution barrier *d*. For example, the advantage may be unachievable, uncertainly achievable, or achievable only at unacceptable cost or risk; managers may be overconfident, the rents may be inappropriable, or the advantage may provoke resource substitution (Camerer and Lovallo, 2001; Coff, 1999; McEvily, Das and McCabe, 2000).

More importantly, the move to A_1 entails significant opportunity costs through the neglect of other allocations of strategic work (in this case, to technology). These foregone gains are undervalued when executives pursue sustainable competitive advantages. By assumption, there are no barriers to making a full allocation to technology, and indeed this is the optimal strategy for A if the distribution advantage is not achievable. By moving to A_1, Alpha temporarily concedes industry leadership to Beta, and if A_1 is the wrong bet this concession becomes permanent (unless Beta also blunders). In Figure 12, the move to competitive advantage is perpendicular to the optimal allocation for Alpha, and *whether or not the advantage is achieved*, A has created an execution hole in technology.

I believe strategy research understates the risks and opportunity costs of pursuing market-sheltering strategies and sustainable competitive advantages. Because alternative strategies never present themselves for inspection, their benefits are easily neglected, and executives are not inclined to assign blame to their own pursuit of competitive advantages (Miller and Ross, 1975; Bettman and Weitz, 1983; Salancik and Meindl, 1984). Strategic leadership requires confidence, but overconfidence is an even greater threat: executives overestimate the achievability and half-lives of future advantages, fail to compare forecasts with realistic reference points, understate time horizons, risks and direct costs of achieving advantages, and do not count the opportunity costs of strategies foregone (Kahneman and Lovallo, 1993). In the above scenario, executives in firm A are more likely to attribute A's decline to exogenous factors (e.g., market demand, regulation, a technology shift) than to the misguided pursuit of distributional advantage – and researchers predisposed to a mental

picture in which the competitive advantage is an unambiguous "good" are unlikely to contradict this attribution.[21]

Mainstream strategy theories may also overstate the incidence of sustainable competitive advantages. If all firms but one fail to execute, the prevailing view leaves no choice but to attribute competitive advantage *ex post* to that firm – even if its "advantage" arises entirely from the endogenous execution holes of its rivals (Barney, 2001; Arend, 2002). Because behavioral and performance heterogeneity are prevalent, the mental picture is of an industrial landscape where structural barriers are commonplace, and firms can only succeed by pursuing competitive advantages.

Clearly, some firms do (or did, in retrospect) have sustainable competitive advantages – e.g., Microsoft's established network in operating software, and Harley-Davidson's brand recognition in the U.S. motorcycle market. But these may be exceptional cases, and the publicity these firms receive probably leads us to overestimate the frequency of competitive advantage. If execution holes exist, the vast majority of industries may have *no firms* with sustainable competitive advantages, and heterogeneity will arise almost entirely from execution holes and stochastic variation. Even when competitive advantages do exist, a theory without execution holes will misinterpret their effects, as when firms with competitive advantages squander them by falling into execution holes – as Harley-Davidson did in the 1970s and early 1980s, failing on basic dimensions like product quality and customer service (Darnell and Rumpf, 1996).

[21] The situation is probably worse in the popular strategy literature. Popular strategy books routinely incite executives to acts of daring, reinvention, chaos or revolution. If executives are attracted to these admonitions (as book sales volumes suggest they are), we should not be surprised if firms neglect fundamental execution, or the opportunity costs of pursuing sustainable competitive advantages. In some cases, firms might neglect fundamentals such as social responsibility or conformance to the law (as in the case of Enron, a firm once highly-praised for strategy daring by popular strategy authors and management consultancies).

At the same time, a theory based on execution holes may seem an unsatisfying alternative to barrier logic. If strategic heterogeneity exists, it may seem unusual to leave it "primitive," rather than rationalizing it as fully as possible, using either the standard barrier arguments, or – if we accept execution holes – explaining their origins using organizational or economic theories of inertia, political conflict, agency, utility maximization, leadership, goal-seeking, routines, motivation or leisure-effort tradeoffs.

I believe such rationalization is epistemologically unsound. As already noted, some of these "explanations" (structural barriers, maximization, leisure-effort tradeoffs) lead to tautology. Others are either very partial accounts of execution inefficiency (routines, programming, agency), or do not break new economic ground (motivation, leadership, inertia). In general terms, attempts to "explain" execution holes suffer from four inadequacies: (1) The "square peg" problem – Because they were not designed to account for non-events (execution holes), existing theories are ill-suited to the task; at best they "explain" execution holes as a by-product of events that did occur; (2) They are *ad hoc* – Any of the above theories might give an *ad hoc* insight in one case or other, but no causal path or covering law comes consistently into play; (3) Execution holes are causes, not effects – The proposition that execution holes cause strategic heterogeneity and firm performance differences is not dependent on an underlying account of the existence (ontology) of execution holes; they are causes, not effects, and no explanatory power is lost by treating them as ontological primitives; and (4) Explaining a negative (nonexistence, non-action) is not the same as explaining a positive (existence, action) – A strategy (e.g., vertical integration) may have a cause, and an *ex post* account may help us understand what happened. But a non-strategy need not be caused: sometimes, the most profound thing you can say about a negative is that it *is not*.

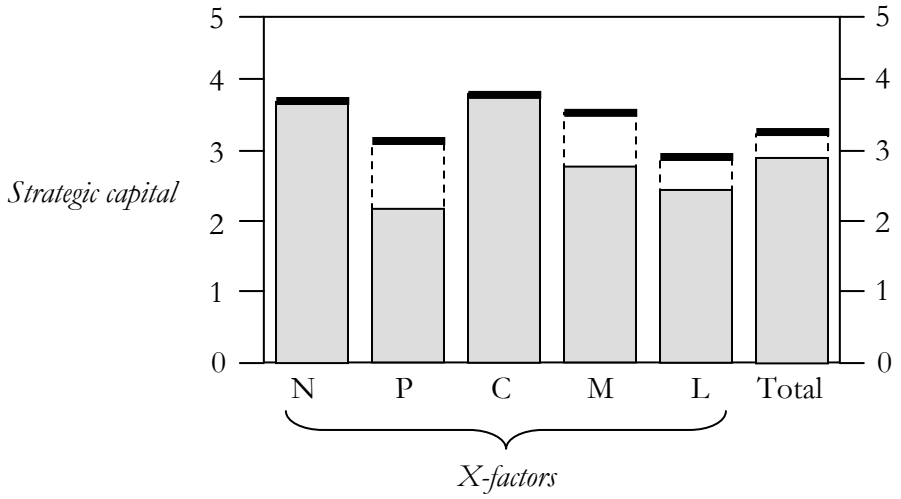
Philosophical issues aside, there are empirical questions involved, and it will be possible in future research to estimate the relative magnitudes of efficiency losses due to economic barriers and execution holes. The most promising benchmark for this work is the sizeable empirical literature on x-efficiency, which compares efficiency losses attributable to allocative and organizational inefficiency (e.g., Jameson, 1972; Shen, 1973; Bergsman, 1974; Button, 1985; Button and Weyman-Jones, 1992; Leibenstein and Maital, 1992; Frantz, 1992; Peristiani, 1997). These studies employ a variety of empirical and statistical methods, from on-site observation to industry studies to large sample, cross-industry studies using existing databases. They have produced impressive evidence of inefficiencies not attributable to economic structures or market imperfections. For example, Salter (1960) measured delays in the adoption of widely-available cost-savings, finding 20-year delays in the adoption of cost-saving rail technologies in the copper mining industry. In a large-sample study, Johnston (1963) found that consulting engagements produced permanent efficiency gains averaging over 200%. Primeaux (1977) found that electrical utility cost structures were significantly lower in duopoly than in monopoly markets, and Shelton (1967) found that franchise outlets were significantly more efficient than comparable company-owned stores. Reviews comparing empirical work on x-efficiency and market structures concluded that remediable internal inefficiencies were ten to fifty times as prevalent as inefficiencies attributable to imperfect product or factor markets (Leibenstein, 1966; Frantz, 1988). These studies support a presumption of execution holes, and suggest methods for testing the comparative effects of structural barriers and execution holes.

A better understanding of execution inefficiency can also help executives manage strategy more effectively. For example, Figure 13 gives a stylized depiction of the problem space in the mobile network segment of the telecommunications market. For convenience, this

problem space is reduced to five dimensions: network management (N), product development (P), customer service (C), marketing (M), and logistics (L). How a firm experiences these dimensions depends on its unique endowments. The dimensions may arise as problems, opportunities, threats, issues, key success factors, value chain requirements, and so forth. The firm's task is to deploy strategic work across the dimensions.

I assume there are no structural barriers to adoption or imitation, and each of the five dimensions is a potential receptacle of strategic work. I also assume the existence of execution inefficiency, and the possibility of remedial action. I refer to the dimensions as "x-factors": fundamental dimensions that require action and accumulate strategic capital, but that are not protected by structural barriers to imitation.[22] In the firm's problem space, x-factors are highly-leveraged, solvable problems.

FIGURE 13: X-FACTORS AND STRATEGIC WORK



[22] X-factors are dimensions of an industry's problem space. They are not attributes of firms (assets, resources, capabilities, knowledge), but problems (or dimensions) that require action - solvable unsolved problems. I define them in such a way as to preclude economic barriers. They are not, in resource-based parlance, "difficult to imitate." With that proviso, they may bear some similarity to "key success factors" (Vasconcellos and Hambrick, 1989) or "strategic industry factors" (Hofer and Schendel, 1978; Amit and Schoemaker, 1993), but I have defined them without reference to any specific model or theory.

In Figure 13 the five x-factors are shown for Gamma, a hypothetical telecommunications firm. Gamma has accumulated a profile of strategic capital in these factors, and must decide how to allocate the next period's strategic work. For comparison, the dark horizontal bars represent the strategic capital accumulations of the leading firm (other than Gamma) on that x-factor. In two x-factors (N and C) Gamma leads the industry, but on the others a rival (not necessarily the same rival) leads.[23]

Figure 13 illustrates the strategic dilemma managers often face. They control limited, time-sensitive resources (strategic work), and must allocate those resources across "x-factors," some of which are relative strengths, others of which are opportunities, threats or relative weaknesses. There are no formulas for the allocations, other than the imperative to increase strategic capital as much as possible.

Though highly stylized, Figure 13 makes the pragmatic point that *strategic capital is not fungible*. Firms cannot fill a deficiency in logistics by allocating an excess of strategic work to customer service. If logistics is an x-factor, then the firm must execute on that factor, either by direct allocation of strategic work or by outsourcing logistics (and managing an external relationship). In identifying logistics as an x-factor, we say, in effect, that it is a necessary but not sufficient condition for performance, and therefore an essential element of the industry's performance code. The manager's job is to unlock the performance code and execute accordingly. In the example, logistics is responsive to strategic work, and it must not be neglected – and it cannot be compensated for, either by increased allocations to other x-

[23] In common parlance, Gamma is not "hitting the bar" on those factors. Numerically, Gamma's total strategic capital is 2.99, computed using the function $S=(NPCML)^{.2}$. In practice, the factors would not have equal weights, and the allocation of strategic work would not follow any rule of thumb. In the example, if we assume equal weights and disregard competitors' moves, the optimal allocation of one unit of strategic work is .64 units to P, .23 units to L, and .03 units to M. This increases total strategic capital to 3.20, and fills the execution holes in P, L and M.

factors, or by the pursuit of inimitable advantages on other dimensions. Whatever else the firm does, it must execute on logistics.

Under idle rationality, Gamma might diagnose its industry correctly, but still fail to allocate strategic work to logistics – this defines an execution hole. In failing to execute, Gamma may also lose ground to competitors, even if those competitors do not have competitive advantages. Of course, it would be possible to argue that these rivals now have a competitive advantage in logistics, but this argument is not only tautological, but ignores the fact that the so-called "advantage" has no economic foundation (e.g., no scarcity, no barriers to imitation), and can be vitiated by a different allocation of strategic work. This distinction has practical consequences for managers, and is not merely a matter of emphasis or semantics. In the problem spaces managers actually face – characterized by execution holes and idle rationality – execution matters more than choice, and success depends not on market-sheltering (or not *only* on market-sheltering), but on strategic work directed across a small number of highly-leveraged, solvable problems and opportunities.

Someone might insist that execution holes are already part of mainstream strategy theory, or can be easily incorporated into the prevailing "barrier logic." I don't agree. When we define strategy as exploiting imperfections in product or factor markets, we inevitably urge executives to be bold and different, and to make their positions impenetrable by building walls around them. These images have dominated strategy theory for at least twenty-five years, and this is what we still convey to executives. I think these images are misleading to managers and factually incorrect, and are becoming increasingly so. As essential global manufacturing and service industries – such as financial services, energy, telecommunications, transportation, pharmaceuticals, and resources – continue to mature into the 21st century, strategy theory needs to recognize the ever-increasing importance of

productivity and execution, and the strategic consequences of the decoupling of execution from strategy processes. In my observations of 21st century competition thus far, success requires a great deal of fundamental work, and is fairly indifferent to hyperbole. Firms that excel seem to do so not by shattering paradigms or leading revolutions, but the "old-fashioned way" – through the everyday discipline of hard, smart work.

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