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# SUPPLY SPACE AND HORIZONTALITY IN FIRMS AND MERGERS

JOHN C. NARVER\*

Antitrust, confronted by a continuing boom of large, complex mergers, is presently in the position of aspiring to more enforcement than it easily can achieve.<sup>1</sup> Meager antitrust resources<sup>2</sup> undoubtedly may be the most important, although not the only reason for the difficulties, or indeed, irrationality in aspects of contemporary antitrust.<sup>3</sup> As will be pointed out, part of the problem may be involuntarily self-inflicted — an inadequate conceptual framework of mergers.

Theory and empirical evidence suggest two broad motivations for merger: (1) technological (“functional”) relationships in merger by which a firm may effect real economies; and (2) pecuniary (“financial”) relationships in merger by which a firm may effect pecuniary gains such as tax savings achieved by the use of debt instruments in acquiring another firm, the acquisition of a negative-profit firm, earnings-per-share gains via favorable price-earnings differentials, the acquisition of an under-valued firm (“bargain”), “improved” performance through use of the pooling-of-interest accounting method, or reductions in the per-unit price of inputs derived

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<sup>1</sup> The critical role of antitrust policy in the economy is well known and has frequently been pointed out. *See, e.g.*, JOINT ECON. COMM. REP. ON THE 1967 ECON. REP. OF THE PRESIDENT, S. REP. NO. 73, 90th Cong., 1st Sess. 25 (1967) [hereinafter cited as 1967 JOINT ECON. REP.] *See* the parallel emphasis in the 1968 JOINT ECON. COMM. REP. ON THE 1968 ECON. REP. OF THE PRESIDENT, S. REP. NO. 1016, 90th Cong., 2d Sess. 37-38 [hereinafter cited as 1969 JOINT ECON. REP.].

<sup>2</sup> *See, e.g.*, Shepherd, *Conglomerate Mergers in Perspective*, 2 ANTITRUST L. & ECON. REV. 15 (1968). As Shepherd points out, the Antitrust Division budget is approximately \$8 million, and according to the ABA Special Study Commission, the FTC's current budget is approximately \$15 million — very small amounts in light of the assigned roles of the agencies.

<sup>3</sup> Even supporters of antitrust, let alone less friendly observers, have questioned the resource allocation within the antitrust agencies. The agencies' very limited enforcement budgets, if anything, *should* continually remind them of the opportunity costs associated with each enforcement decision. However, many observers contend that maximum enforcement-dollar yield in terms of strengthened *market competition* neither is nor of recent has been the allocation criterion in the agencies. *See* ABA, REPORT ON THE FEDERAL TRADE COMMISSION (1969); 1969 WHITE HOUSE TASK FORCE REPORT ON PRODUCTIVITY AND COMPETITION, 115 CONG. REC. 6350 (daily ed. June 12, 1969) [hereinafter cited as STIGLER TASK FORCE REPORT]. For more general comments on the need to reevaluate and perhaps redirect governmental effort pertaining to competition, see the 1968 JOINT ECON. REP.; Address by Commissioner Elman, American Management Association, Oct. 1, 1968.

solely from market power.<sup>4</sup> Admittedly, a rational antitrust policy is not achieved easily when large firms merge in rapid succession into seemingly unrelated fields. Consequently, now more than ever, an adequate conceptual framework is critical. Received economic theory of the firm, a static theory emphasizing growth through jointedness in inputs and demand provides little guidance to antitrust agencies confronting numerous mergers between seemingly "dissimilar" firms. Moreover, some observers are fearful that the antitrust agencies out of frustration may misuse economic theory to strike down large "unrelated" mergers.<sup>5</sup>

While the present paper shares this concern for possible bad economics and consequently, bad law, its major point is that any single-firm or merger analysis which in the economic sense emphasizes short-run facts of firms will necessarily miss fundamental competitive implications. Accordingly, antitrust at present is *much weaker* and *less rational* than it would be under the suggested framework. An analytical myopia invariably results when undue attention is paid to how and to what a firm is specifically employing its resources at any one instant of time. More precisely, horizontal and vertical aspects of mergers are substantially overlooked if one focuses on the *particular* products a firm is currently buying and selling. An emphasis upon these short-run facts, including "short-run markets," obscures or ignores what for theory and antitrust is the most important fact of a firm — the *range* of demands to which a firm's resources could *easily* respond (assuming merely that price were somewhere above a competitive level).

The present argument reorients the focus from the particular current outputs of a firm to the potentiality embodied in its resources, and suggests *objective* data for making such determinations. The suggested concept, supply spaces, cast in terms of the output potentiality of resources, has several strengths. First, it focuses on supply capability, the fundamental essence of firms, and thereby serves as the appropriate theoretical and empirical basis for analyzing the real-world competitive implications of firms. Second, because the supply space concept is consistent with their own planning framework, the suggested concept is fully intelligible to rational businessmen. Accordingly, to the extent antitrust policy were to incorporate the supply space concept, businessmen's antitrust uncertainty would be lessened. Third, in that the concept of supply spaces more realistically and completely envelops the competitive implications of mergers, the framework points up horizontality in many "conglomerate mergers." As a result, in mergers and potentially in other situations, the suggested frame-

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<sup>4</sup> See these and other points in the discussion of the two broad types of merger motives in BUREAU OF ECONOMICS, FTC, ECONOMIC REPORT ON CORPORATE MERGERS (1969). See also THE CORPORATE MERGER (W. Alberts & J. Segall eds. 1966); PUBLIC POLICY TOWARD MERGERS (J. Weston & S. Peizman eds. 1969).

<sup>5</sup> See 1968 WHITE HOUSE TASK FORCE REPORT ON ANTITRUST, 115 CONG. REC. 5642 (daily ed. May 27, 1969) [hereinafter cited as NEAL TASK FORCE REPORT]; TURNER, *The Scope of Antitrust and Other Economic Regulatory Policies*, 82 HARV. L. REV. 1207, 1213-14 (1969).

work very much strengthens the rational hand of antitrust and in turn, the invisible hand of the market.

The paper first considers the antitrust agencies' approaches to mergers generally, and conglomerate mergers in particular. Then, in succession, the argument turns to firms as pools of resources; the concept and measurement of supply spaces; suggestions for antitrust merger policy using the concept of supply space; and an examination of some antitrust legal opinions which suggest the relevance of the supply space concept to section 7.

#### SECTION 7 AND THE CURRENT MERGER MOVEMENT

The prevailing opinion in the legislative history of the 1950 amendment to section 7 of the Clayton Act, and subsequently the continuing point of view of the Federal Trade Commission (FTC) and the Department of Justice, particularly in their merger-classification framework, is that the distinction between horizontal, vertical, and conglomerate mergers (and among conglomerate mergers) turns, in largest part, on the *current* production and marketing relationships of the parties to the merger.<sup>6</sup> The important point for the present discussion is not whether the Commission has labeled any particular merger "horizontal," "vertical," or "conglomerate," but rather that its basis for distinction rests on the *current* product and geographic relationships (including both production and marketing) of the merger parties. The classification framework is critical, for the initial classification sets the stage for the economic and legal analysis.<sup>7</sup> In contrast, the framework suggested in the present paper focuses on an actual range of input and output activities inferred from various objective data based on more than merely the characteristics of the particular parties in a merger.

The implications of the Commission's primarily short-run conception of firms are several. First, by emphasizing short-run markets and other short-run facts, one tends to maximize the differences among firms. Clearly, in any short-run assessment as in Chamberlin's essentially short-run static analysis, firms, not unlike people, are different.<sup>8</sup> But the "differences"

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<sup>6</sup> For an elaboration of the development and meaning of the concepts of horizontal, vertical, and conglomerate mergers in the framework of the 1950 amendment to section 7 of the Clayton Act, see J. NARVER, CONGLOMERATE MERGERS AND MARKET COMPETITION chs. 1, 3 (1967). It is clear that the Commission has continued to employ primarily a specific (present)-activities conceptualization of firms. See FTC, CURRENT TRENDS IN MERGER ACTIVITY, 1968 (1969), and similarly, the same approach is used in its ECONOMIC REPORT ON CORPORATE MERGERS, *supra* note 4.

<sup>7</sup> Using its own definitions, the Commission has described the current merger movement as overwhelmingly "conglomerate." Specifically, among large mergers (acquired firm assets \$10 million or more) in manufacturing and mining, conglomerate mergers in 1968 accounted for 88.5 percent of all assets acquired; whereas, in the period 1948-1951, conglomerate mergers accounted for only 37.5 percent of all large-merger assets. ECONOMIC REPORT ON CORPORATE MERGERS, *supra* note 4, at ch. 1. Within this 21 year period, among large mergers, pure (economically "unrelated") conglomerate mergers have increased from virtually none in 1948-1951 to approximately 50 percent of all large conglomerate mergers and to fully 43.6 percent of all types of large mergers in 1968. *Id.*

<sup>8</sup> E. CHAMBERLIN, THE THEORY OF MONOPOLISTIC COMPETITION (1933). Chamberlin's monopolistic competition, stressing the essential individuality of firms, although a very

are of course a function of the questions asked, for it is obvious that the more short-run one's view of firms (or people or most anything else for that matter) is, the more uniqueness one discovers. At the limit — the immediate instant — every firm to some extent is different, and mergers are especially "conglomerate."

Second, the short-run concept may necessarily increase reliance upon weaker economic arguments. That is, the short-run concept overstates to some degree (frequently considerable) the separateness of firms (and product and geographic markets), which to that extent increases reliance upon multi-product theory, one of the least developed areas of microeconomics. For example, the FTC has at times advanced some hotly contested concepts such as "cross-subsidization"; and the short-run focus has also led to reliance upon subjective evidence.<sup>9</sup> In addition, it may tempt one to reject, either wholly or in part, substitute offerings or otherwise redefine the markets along

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limited monopoly, is a useful framework for marketing analysis; however, due to its short-run character, it is not a useful apparatus for conceptualizing firms and capturing the essence of mergers.

<sup>9</sup> For a discussion of the theories most frequently used in conglomerate merger cases, see J. NARVER, *supra* note 6, at ch. 5. For a detailed discussion of the cross-subsidization argument, see ECONOMIC REPORT ON CORPORATE MERGERS, *supra* note 4, at ch. 6. Some economists strongly doubt whether there is or can be gathered any evidence that "cross-subsidized predation actually occurs — and, that its costs outweigh possible net gains in productivity." Campbell & Shepherd, *Leading Firm Conglomerate Mergers*, 13 ANTITRUST BULL. 1361, 1370 (1968). Similar doubts were expressed in Turner, *Conglomerate Mergers and Section 7 of the Clayton Act*, 78 HARV. L. REV. 1313, 1346 (1965).

A much more important aspect of a conglomerate or any other firm is that it is a *total-firm* ("global") maximizer, a mandatory decision-perspective if it is to maximize its total present value (or total long-run profits). J. NARVER, *supra* note 6, at 109 n.5. *Total-firm awareness*, in which "cross-subsidized predation" is but one possibility, is the most fundamental competitive aspect of "conglomerate market power," for awareness precedes behavior. Specifically, competitive possibilities in one portion of the firm are transmitted to the "peak coordinator," see note 17 *infra*, where from this overall vantage point, prospective gains and costs are related to determine objectively rational courses of action.

Oligopolistic interdependencies in one or more markets of the firm will be borne in mind in strategic decisions, such as when the firm contemplates entry or expansion in other markets. If in market *A*, a firm is highly interdependent with, say, firms 1-7, it may decide not to enter market *B* if one or more of firms 1-7 are already there. The firm would reason that if market *B* were concentrated and relatively static (although profitable), sales would be gained by the entrant at the *expense* and *awareness* of the current firms.

*Internal* entry by the firm into market *B* may have very much the same effect on the *A-B* competitors as a price cut, and because of their similar total-firm awareness, provoke from them in market *A* the same reaction as to a price cut in market *A*.

Consequently, the firm may perceive the expected increment to total profits from internal entry into market *B* as more than offset by the induced retaliatory warfare and costs in market *A*. Rationally, it will then decide either not to enter *B* internally, or not at all.

In terms of *expected* social benefits, internal entry (or toe-hold acquisitions) into concentrated markets is clearly superior to either leading-firm mergers or, obviously, forbearance. We consider public policy issues in a later section. See note 50 *infra* and accompanying text *passim*.

The thin theoretical basis of some of the multi-product arguments has prompted the Commission and the Antitrust Division to support their positions with subjective evidence. As we shall argue again later, subjective evidence, because of its ambiguous character as well as its expensiveness (relative to benefits), should be minimized by the agencies. See notes 30, 33 *infra*.

other short-run and frequently subjective aspects to permit use of the theoretically richer horizontal arguments.<sup>10</sup> Thus, from the vantage point of this writer, the symptoms of the original sin (a short-run conception of the firm) are visited upon the Commission and the Antitrust Division in the equally unhappy forms of either some (not all)<sup>11</sup> theoretically thin multi-market arguments, or an economically unrealistic stretching of product and geographic markets for argumentative expediency.

To summarize, under section 7 the antitrust agencies have primarily used a short-run conceptualization of a firm or a merger — a conceptualization which emphasizes a firm's specific current inputs or a firm's specific current outputs. In distinguishing between horizontal and non-horizontal mergers, their analysis has turned largely upon cross-elasticity of demand

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<sup>10</sup> See, e.g., Commissioner Elman's dissent in the FTC's cease and desist order against General Foods' acquisition of S.O.S. (steel wool soap pads). Although agreeing with the Commission that the relevant product market was "household steel wool," Elman decried the manner in which the Commission ignored the "non-steel wool products and the competition which they represent to firms in the steel wool market." General Foods Corp., [1965-67 Transfer Binder] TRADE REG. REP. ¶ 17,465, at 22,247-48 *passim* (FTC 1966). Market definitions are always difficult, and apparently under section 7 they may be based somewhat differently than under the Sherman Act. See *Brown Shoe Co. v. United States*, 370 U.S. 294 (1962). Whatever the particular competitive issue and statute, the central concern under all of antitrust is the diffusing of excess market power (excess control over supply or demand). And to make this analysis, one must recognize sooner or later fundamental substitutability on both demand and supply sides (including where relevant both domestic and foreign). To ignore predominant short-run or long-run substitutes is to beg the basic antitrust question. For reasons more obvious in the following section, this writer agrees with the result in *General Foods*, but among other aspects, not the product-market definition.

The *Neal Task Force Report* pointed out what it considered the three basic competitive issues in conglomerate mergers: (1) anticompetitive elimination of potential competition; (2) anticompetitive reciprocity; and (3) anticompetitive entrenchment of dominant firms. However, the Task Force cautioned:

These or similar objections to conglomerate mergers may be pressed beyond the point where they are well founded, perhaps because of quite different objections, such as fear of the growth of individual large firms or of concentration of assets in very large firms. . . . The existence of these different objections may also lead to other distortions; for example, market definitions may be distorted to treat a conglomerate merger as horizontal and therefore subject to a more easily established prohibition. Such distortions would result in uncertainties in enforcement and unfairness to those affected.

NEAL TASK FORCE REPORT at 5646.

<sup>11</sup> Potential competition and barriers to entry are *well accepted* by most economists as strategic market structure and hence, public policy elements. Though economists may disagree on what constitutes evidence of potential competition and when its elimination is anticompetitive, they strongly agree in principle that potential entrants on the periphery of a concentrated market induce more competitive behavior on the part of current competitors. The presence of potential competitors threatening entry if prices in a potential market rise relative to their other markets precludes many oligopolists and nominal "monopolists" from fully exploiting their monopoly positions, and thus forces them to seek satisfactory long-run returns rather than maximal short-run profits. Potential competitors are one reason for the asymmetrical and sometimes weak relationship between market concentration and profit rates. The best-known study of the implications of entry conditions for profit rates is J. BAIN, *BARRIERS TO NEW COMPETITION* (1956). For a comprehensive discussion of market structure-performance relationships, see N. COLLINS & L. PRESTON, *CONCENTRATION AND PRICE-COST MARGINS IN MANUFACTURING INDUSTRIES* (1968).

between the offerings of the two firms. The differences which the framework has focused on have been more often apparent than real, and consequently, the "conglomerate" proportion of all mergers has probably been overstated. The theory of the multi-product firm is not well developed; hence economic theory has offered little to the analysis of multi-market firms, which, because of the agencies' definitions, is the context in which analysis has had to begin. It is not surprising that, in the period 1951 to 1966, only 20 "large" conglomerate mergers were challenged (which amounts to only 2 percent of all large mergers in the period).<sup>12</sup> The critical question to which we now turn is how to portray firms and mergers more realistically than merely as sets of current inputs and outputs.

#### THE FIRM AS ONE OR MORE POOLS OF RESOURCES

We contend a long-run conception of firms is more realistic than the antitrust agencies' fundamentally short-run conception of firms as specific embodiments of resources in the form of particular goods and services. In particular, a firm essentially is one or more pools of resources, the inputs to which and the output of which are determined by management.<sup>13</sup> That is, a firm is one or more pools of resources possessing the ability to respond to a range of wants — but at any one instant manifesting its resources in a specific form (specific goods and services). However, the particular embodiment of the resources at any one time is of far less analytical and competitive significance than the range of demands to which the one or more pools of resources could easily respond. As Suits has stated:

The commodity is merely the physical "embodiment" of the service of the establishment. The economic power possessed by an establishment inheres in the service it can provide, and to measure this service purely on the basis of the particular application being made of it at a given moment would be clearly wrong.<sup>14</sup>

The conception of firms as one or more pools of productive resources implies (1) that resources are indeed flexible as to specific output (and the parallel argument with respect to inputs), and (2) that management willingly alters the variations of specific output in order to increase profits. There is ample evidence that resources are substantially flexible as to specific outputs, and that management possesses no emotional attachment to any specific embodiment of the resources.<sup>15</sup> If, as theory and evidence suggest, management

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<sup>12</sup> W. MUELLER, *THE CELLER-KEFAUVER ACT: SIXTEEN YEARS OF ENFORCEMENT*, STAFF REPORT TO THE ANTITRUST SUBCOMMITTEE, COMMITTEE ON THE JUDICIARY, H. REP. NO. 1123, 90th Cong., 1st Sess. (1967).

<sup>13</sup> The concept of the firm as one or more pools of productive resources is well articulated in E. PENROSE, *THE THEORY OF THE GROWTH OF THE FIRM* 24-25, 75-76, 149-50 (1959).

<sup>14</sup> Suits, *Comment on "Census Principles of Industry and Product Classification, Manufacturing Industries,"* in *BUSINESS CONCENTRATION AND PRICE POLICY* 36, 49 (Nat'l Bureau Econ. Research ed. 1955).

<sup>15</sup> E. PENROSE, *supra* note 13, at 75 *passim*.

is interested only in maximizing long-run profits (or more precisely, maximizing the present value of the firm), then management is committed only to continually altering the array of activities to achieve this goal. If no *specific product* is sacrosanct to management, it follows then, as we have said, that no *specific embodiment* of the resources is of analytical relevance — unless of course there is no resource flexibility.

But resource flexibility is by far the rule rather than the exception for most non-failing, non-trivial firms, and certainly is the case for the 500 largest industrials, and most probably, the thousand largest.<sup>16</sup>

For reasons of technological relationships and perceived economies, as well as competitive advantages, firms typically diversify into economically related activities to develop or exploit broad bases of specialization. Specialization, occasionally as subtle as the mere development of a particular ability in widely defined areas, is rational and pervasive in an uncertain world. With the advent of sophisticated operations research techniques, management increasingly has become a generalized input. Hence, specialization in some firms may occur largely in the managerial resource — in effect, a broad specialization in the management of assets, leaving the tactical and operating decisions to lower-level specialists.<sup>17</sup>

In a study which complements Gort's, an analysis by Berry revealed that

<sup>16</sup> A well known analysis of 111 large manufacturing firms provides substantiating evidence that resources are flexible. Not surprisingly, the study also indicated that firms, as a whole, diversify into economically related activities. M. GORT, *DIVERSIFICATION AND INTEGRATION IN AMERICAN INDUSTRY* (1962).

<sup>17</sup> One theoretical framework for the concept of managerial specialization is Papan-dreou's concept of the "peak coordinator" in a firm — the authoritative and conscious coordination carried on with sense of the *whole* and in view of the total complex relationships of the firm to its social and physical environment. (A related concept that in order to maximize their total present value, firms are *global* "maximizers," is discussed in note 9 *supra*. Papan-dreou, *Some Basic Problems in the Theory of the Firm*, in 2 *SURVEY OF CONTEMPORARY ECONOMICS* 183, 190-91 (B. Haley ed. 1952). Many large firms today intentionally seek managerial economies through various management science approaches incorporating systems concepts. For considerable discussion of managerial and other intended economies in large, complex firms, see R. AVERITT, *THE DUAL ECONOMY: THE DYNAMICS OF AMERICAN INDUSTRY STRUCTURE* chs. 3, 4, 6 (1968).

Specialization, either by functional activity or in broad product lines, is the probable form of diversification, but specialization within diversification is overlooked by those whose allegiance to single-product models of the firm leads them to conclude that diversification and specialization are always mutually exclusive. See, e.g., Kaldor, *Market Imperfection and Excess Capacity*, 2 *ECONOMICA* 33 (1935). For a discussion and illustrations of firms' diversification designed to exploit bases of specialization (including management as one possible basis), see Penrose, *supra* note 13, at 120-26. See also notes 27-29 and accompanying text *infra*; Narver, *supra* note 6, at ch. 4.

Specialization occurring *jointly* with horizontal growth, vertical integration, or diversification, assists in explaining why new industries are *not* always attended by "disintegration," *i.e.*, a reduction in the number of commodities produced by single firms. Cf. Stigler, *The Division of Labor is Limited by the Extent of the Market*, 59 *J. POL. ECON.* 185 (1951). Similarly, it assists in explaining why many marketing channels involving multiple products are internalized in single firms rather than characterized by intervening intermediate (specialists) sellers. See Coase, *The Nature of the Firm*, 4 *ECONOMICA* 386 (1937). Cf. W. ALDERSON, *MARKETING BEHAVIOR AND EXECUTIVE ACTION* 211 (1957).



plants of the 494 largest corporations are not tied to particular products.<sup>18</sup> According to his findings, the hypothesis that companies add and drop products chiefly by closing old plants and acquiring new ones "must be judged incorrect." Berry found substantial evidence that entry and exit among industries occur without the elimination or addition of separate plant facilities.<sup>19</sup> This conclusion is reinforced by the fact that these plants are highly specialized in terms of products, and that no significant change in the degree of plant specialization occurred over the five-year period. Berry concluded:

The capital represented by plant facilities is evidently more mobile than the theory underlying some recent investment models has assumed . . . [and] [a]t least part of the fixed capital of modern manufacturing can be reallocated among industries.<sup>20</sup>

#### SUPPLY SPACES: THE CONCEPT

For economic analysis in general and antitrust in particular, the significance of firms as one or more pools of resources is the output potentiality of the resources. The concept of supply space expresses the potentiality of resources for current and future supply in response to demands: "A supply space is the range of demands to which a pool of resources can respond."<sup>21</sup>

The supply space implications of a pool of resources are twofold: (1) the ability of the resources to supply a variety of products in the present period; and (2) the ability of the resources to supply a variety of products in future

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<sup>18</sup> Berry, *Corporate Bigness and Diversification in Manufacturing*, 28 OHIO ST. L.J. 402 (1967).

<sup>19</sup> The concept of *internal entry*, *i.e.*, entry into additional accessible markets by firms whose pools of resources are already in other supply-related markets, has been under-emphasized in theories of potential competition. One interesting treatment of internal and external entry is an unpublished paper by R. Smith, *A Barrier Theory of Markets: A Long Run View*, 1968 (unpublished paper written at the U. of Ore.). See also Kottke, *Market Entry and the Character of Competition*, 5 W. ECON. J. 24 (1966).

<sup>20</sup> Berry, *supra* note 18, at 418-20. He finds the largest industrial firms are spread across broad areas of manufacturing and that the increased diversification of the firms is indicated at all levels of product aggregation, *i.e.*, the 2-digit through the 5-digit levels. *Id.* at Table XI. This finding of the broad spread of diversification is of interest in the analysis of corporation research and development. As Nelson has pointed out, the incentives for private investments in basic research are significantly related to diversification: "It is for this reason that firms which support research toward the basic-science end of the spectrum are firms that have their fingers in many pies." Nelson, *The Simple Economics of Basic Science Research*, 67 J. POL. ECON. 297, 302 (1959).

<sup>21</sup> An analogous concept is "demand-space"—the range of inputs which could be utilized relatively easily as the pool of resources. The concept of demand space includes all types of inputs, *i.e.*, all goods and services—from products for resale to consummable supplies, to capital, labor, and raw materials. Certainly, some demand spaces are broad, *i.e.*, inclusive, for many merchants, manufacturers or even non-commercial agencies can relatively easily use various input combinations to achieve stated objectives.

Demand space has many implications for antitrust, including implications for the analysis of vertical integration, reciprocity, and competitive behavior within marketing channels. We will not analyze demand space in the present paper, but note in passing that much of the analysis of supply space has implications by analogy or otherwise for demand space analysis.

periods. The ability to supply in the near-term we shall call the *technological capability* of the resources. For us, the technological capability is the most important, for it can be determined strictly on objective grounds. The ability to supply in future periods we shall call the *logic of supply* — which is the secular direction of growth of the industry. Although replete with supply implications, it is necessarily more speculative, and hence of less value for antitrust analysis and policy.

Supply space, therefore, comprehensively covers pools of resources and their ability to supply, treating primarily the relatively near-term potentiality of the resources. Supply spaces may be perceived from two perspectives. First they may be determined for a given firm (or group of firms), which would be the initial framework for classifying a merger. Or starting with a specific demand, the supply space, *i.e.*, the particular pools of resources which could easily respond to the want, may be determined, which is simply a variant of traditional market analysis. We shall now consider more specifically the ability to supply in the near-term — the technological capability of the resources.

*Technological Capability: Ability to Supply in the Near-term*

It is clear that for a firm to satisfy a given demand or variety of demands, it must possess human, financial, and physical resources which in some combination possess the capability to supply some good or service which matches the want. For any firm, the ability to supply in the present period is a question of whether the firm either owns, leases, or has immediate access to the required management, finance, production, and marketing inputs to respond effectively to a demand or variety of demands.

Building on the preceding, the critical issue in the ability to supply is the *breadth* of the technological capability of the resources; that is, the range of demands or geographic markets to which a firm has the ability to respond in the near-term.

The larger the number of specific demands subsumed by the resources, the broader the technological capability of a pool of resources, and accordingly, for that pool of resources, the larger is the supply space. Most large firms, as discussed earlier, have several bases of specialization and thus, in effect, possess several pools of resources. The technological capability of a firm is the qualitative and quantitative aspects of its human and physical resources in terms of technical know-how, production capacity, raw material supply, financial strength (including financial assets and access to the capital market),<sup>22</sup> marketing know-how and distribution channels, and so on.

To summarize, the ability to supply in the present period is the tech-

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<sup>22</sup> The greater a firm's access to the capital market, *i.e.*, the lower its cost of capital, the more important is financial strength in the whole of a firm's one or more pools of resources. As we shall discuss more fully later, there is evidence that the cost of capital is lower for large firms. See Hall & Weiss, *Firm Size and Profitability*, 49 REV. ECON. & STATS. 319-31 (1967).

nological capability of current resources. One may perceive supply spaces in two ways: (1) supply spaces for a given *firm*, in which one determines the variety of demands subsumed by each pool of resources in the firm; and (2) the supply space for a given *demand*, in which one determines the number of firms possessing the ability to respond to the demand.<sup>23</sup>

*Logic of Supply: Ability to Supply in Future Periods*

The logic of supply means the demands which a firm or firms in an industry will eventually have the capacity and desire to supply. However, as mentioned above, while technological capability can be objectively determined, the logic of supply is determined by some combination of objective and subjective evidence. Fortunately for antitrust analysis, the large majority of the antitrust implications of supply space reside in technological capability.

There is in effect a finite number of specific demands to which a pool of current resources has the technological capability to respond. The ability to supply in future periods is the issue of the alterations and enlargements a firm will make in its set of productive resources to provide it with the ability to respond to two types of additional demands: (1) certain *extant* demands presently beyond the firm's scope, and (2) *unforeseen* demands which emerge as the result of changes in technology, taste, income, and other factors.

To understand the output potentiality of current resources in future periods, one must deduce the direction and character of growth of current resources. Hence, one must infer the logic of supply from the current resources of a firm and supporting industrial evidence.

There are sound objective bases for inferring the supply potentiality of resources in future periods. In largest part, the determination rests in accurately conceiving of the industrial context of the current resources. In particular, the logic of supply is inferred from features of supply and demand bearing on the set of resources.

For example, on the supply side and all other things being equal, it is clear that resources will be altered to provide additional types of supply which will further exploit the bases of specialization and thereby engender efficiencies in production or marketing. On the demand side and all other things being equal, it is also clear that resources will be altered or augmented to provide the types of output which demanders expect a supplier in the particular industry to offer.

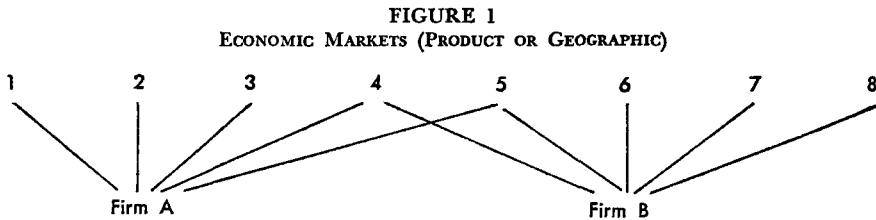
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<sup>23</sup> The technological capability of current resources has not been widely discussed in the literature. When mentioned, the treatments have been based largely on the flexibility of resources and absorbing idle capacity. See, e.g., J. DEAN, *MANAGERIAL ECONOMICS* 115-20 (1951); Clemens, *Price Discrimination and the Multiple-Product Firm*, in *READINGS IN INDUSTRIAL ORGANIZATION AND PUBLIC POLICY* 262, 263-66 (R. Heflebower & C. Stocking eds. 1958); Holton, *Price Discrimination at Retail: The Supermarket Case*, 6 *J. IND. ECON.* 13 (1957); Keyes, *The Bethlehem-Youngstown Case and the Market-Share Criterion*, 51 *AM. ECON. REV.* 643, 655 (1961).

*Illustrations of Supply Spaces and Horizontality in Mergers*

Assume there are two firms and each has but one pool of resources. The two firms (pools of resources) are *A* and *B* respectively. Suppose one determines that Firm *A*'s resources can respond to demands (markets) 1-5 and Firm *B*'s resources have the technological capability with respect to demands (markets) 4-8 (Figure 1). The example implies *different* physical offerings competing in the same product market.

Recall that the assessment of technological capability is independent of the particular embodiment of the resources at any one instant of time. Thus, although Firm *A* can respond to demands 1-5, at any time it may in fact be actively selling in all or some smaller number than 5 because of near-term relative profit possibilities.<sup>24</sup>



Similarly, *B* may currently be selling in some or all of the markets 4-8 subsumed by its resources. Assume Firm *A* and Firm *B* merge. Regardless whether either or both are selling in markets 4 and 5 at the time of merger, this merger nevertheless realistically is a *horizontal* merger. It is obviously horizontal because the merger is a combination of two pools of resources possessing, at least in part, *identical* supply capability. In the instant example, if we further assume that, in principle, market opportunities among markets 1-5 are essentially of equal magnitude for Firm *A*, and the same for Firm *B* with respect to markets 4-8, then for both Firm *A* and Firm *B*, markets 4 and 5 represent 40 percent of each firm's market opportunities. We have said nothing about the relative sizes of *A* and *B*; rather we have only established that for both *A* and *B*, markets 4 and 5 represent a substantial proportion (40 percent) of their total supply space. Thus, the horizontality in the merger of *A* and *B* is non-trivial.

By altering the assumptions one can conceive of various intersections of the supply spaces *A* and *B*. For example, suppose Firm *A*'s resources had technological capability for markets 1-5, but *B*'s resources could respond to markets 4-23. Retaining the assumption of equal market opportunities respectively for *A* and *B*, a merger of *A* and *B* represents horizontality of

<sup>24</sup> We repeat: The short-run manifestation of a pool of resources in terms of specific current inputs and outputs is the incorrect focus for capturing the essence of a firm or merger.

40 percent for *A*, but only 10 percent for *B*, since the latter has 20 equal-sized market opportunities. Or assume *B*'s technological capability subsumes markets 4-43, in which case the merger represents a horizontality of only 5 percent for *B*, while that of *A* remains constant.

It would appear that the analytical framework of supply spaces is far more realistic and comes much closer to the essence of firms and mergers than any short-run conception. However, the supply-space framework is still confronted with certain problems. The preceding examples raise the issue of when, in terms of proportions, a merger should be categorized as horizontal. To this writer, a merger (especially if one or both parties are large firms)<sup>25</sup> with a supply space intersection of approximately 10 percent for one of the parties establishes horizontal substantiality (assuming vertical relationships are proportionately smaller). More specifically, if both firms are large, and assuming virtually no verticality, one justifiably can argue horizontal substantiality at an intersection of even less than 10 percent for each of the firms. Obviously, the smaller a firm is, both relative to its merger partner and especially relative to its various supply-space competitors, the more the merger may be pro-competitive, or at least, not anticompetitive.<sup>26</sup> Mergers with considerable horizontality involving a relatively small partner that is also small relative to its supply space competitors, are obviously horizontal, but may hold few anticompetitive implications. We will consider supply-space mergers and public policy in a subsequent section.

Either from the perspective of a firm or from the perspective of a demand, examples of supply spaces which illustrate in largest part the technological capability (and to some extent the logic of supply) are numerous. For instance, among the largest firms in the lumber and paper industries, the appellation "forest products company" has emerged, characterizing those firms whose primary objective is simply to make whatever lumber or paper commodities offer them the highest economic return on their basic raw material: standing timber (or logs). Notably, such "forest products companies" lead in return on equity and projected earnings growth. The days of the large *lumber* or *paper* company per se are virtually gone. For reasons of supply economies and maximum responsiveness to changes in costs and demand, the supply space for large firms engaged in converting logs into various other forms would now appear to be the whole of forest products, a space encompassing SIC 24 and SIC 26.<sup>27</sup>

Procter & Gamble's acquisition of Clorox, a liquid bleach manufacturer,

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<sup>25</sup> Large firms are singled out *not* for socio-political reasons, but because some *hard* economic evidence suggests that the behavioral opportunities for large firms exceed those for small firms. For example, there is considerable evidence that the cost of capital is lower for large firms (which some argue raises the capital barrier to entry). See Hall & Weiss, *supra* note 22. See also Berry, *supra* note 18. We shall return to this point in a later section. See text accompanying note 44 *infra*.

<sup>26</sup> See, e.g., Campbell & Shepherd, *supra* note 9.

<sup>27</sup> See FORBES, Jan. 1, 1966, at 46-48. See also notes 30-34 *infra* and accompanying text.

is an example of a merger within a supply space. Both firms were in SIC 28, Chemical and Allied Products, but the supply space includes not only a part of SIC 28, but parts of other major groups which also relate to household items in grocery stores. Thus, one Procter executive said that although bleach was a completely new product for them, the company nevertheless was "thoroughly at home in the field of manufacturing and marketing low-priced consumer products."<sup>28</sup>

The Federal Trade Commission's announced policy on product-extension mergers in grocery products *implicitly* illustrates a supply space — all grocery products. In emphasizing the resource flexibility of large grocery product firms, the policy correctly turns from a short-run analysis of specific commodities to a dynamic view — that of pools of flexible resources with supply capability and logical connection to a variety of demand.<sup>29</sup>

#### DEFINING SUPPLY SPACES

Determining technological capability is an empirical task. Moreover, supply space analysis will best assist antitrust policy, and in particular, section 7 policy, by employing factual analyses which, insofar as possible, are objective and simple.<sup>30</sup>

We recall that supply spaces may be perceived both from the perspective of a given firm or merger and from the perspective of a want (the firms whose supply spaces include the particular want). In section 7 and other analyses, both the firm and market perspectives must be utilized. We will discuss primarily determining supply spaces for a firm, for it is from this basic analysis that one can then portray any given want vis-à-vis firms' supply spaces to determine what firms are in the particular market, and thus, to determine market concentration, and so on.<sup>31</sup>

<sup>28</sup> Procter & Gamble Co., [1963-65 Transfer Binder] TRADE REG. REP. ¶ 16,673, at 21,558 (FTC 1963).

<sup>29</sup> FTC, ENFORCEMENT POLICY WITH RESPECT TO PRODUCT EXTENSION MERGERS IN GROCERY PRODUCTS MANUFACTURING (1968) [hereinafter FTC, ENFORCEMENT POLICY].

<sup>30</sup> The definitional criteria of supply spaces suggested in this paper are objective tests — those a careful but *outside* observer could utilize. The concept of supply space will assist neither the enforcement agencies in simplifying merger analysis, nor businessmen in reducing their uncertainty under antitrust, *if* rather than using objective data such as industry structure and behavior evidence for defining spaces, one resorts to analyzing motivations and stated intentions of businessmen. The latter approach is virtually without merit, for it is necessarily more subjective, the findings more ambiguous, the whole effort time-consuming and seemingly inconsistent with the Congressional intent in amending section 7. See United States v. Pabst Brewing Co., 384 U.S. 546, 549 *passim* (1966). There is obviously a softness and ambiguity attached to anyone's stated intentions to enter a market. See, e.g., P. AREEDA, ANTITRUST ANALYSIS 519 (1967). The appropriateness of objective data is vehemently pointed out by the STIGLER TASK FORCE REPORT at 6354-55.

<sup>31</sup> Because supply spaces are employed in two perspectives, the particular meaning may not be immediately clear. Thus, one speaks of the one or more pools of resources in a firm and the corresponding supply spaces of the firm. On the other hand, when one starts with a specific demand, he is interested in defining the structure of the product (geographic) market. In particular, he desires to know in which firms' supply spaces the particular want is located, so he can identify the suppliers in the market. Essentially the latter amounts to "product-market supply space" in contrast to "firm supply space(s)."

There are two broad types of objective data useful in inferring the ability to supply, and hence, supply spaces: (1) diversification patterns of firms primarily classified in the respective product sectors of the subject firm; and (2) inter-market or inter-industry merger patterns of and by firms engaged in the same broad lines of activity as the subject firm. In short, the objective data are *market data* with respect to diversification patterns and merger patterns. What is the justification for using diversification and merger data when firms can, and to some extent do, grow and especially merge anywhere they choose?<sup>32</sup> Given this fact, what can market data tell us about supply spaces — the range of demand to which a given pool or pools of resources can respond?<sup>33</sup> The questions are fair. The response is that the only diversification or merger patterns of value in inferring supply spaces are those that are *significantly different* from a random pattern. That is, if for a class of firms primarily engaged in supplying market 1, there is a significant pattern of diversification into "market 2," then we may infer a supply space 1-2.

The basic assumption in using diversification-pattern and merger-pattern data to determine the supply space of a pool of resources is that the subject pool of resources is representative of the class of firms whose patterns are being investigated. Obviously some possible distinctions in the data must be considered on the assumption there are probably some increasing returns to size at the small scale end of the scale curve.<sup>34</sup>

#### *Inferences from Diversification Patterns of Firms*

Utilizing the concept of firms as pools of resources, and assuming that in the long-run firms attempt to maximize their present value, one may conclude that firms engage in whatever activities they perceive as yielding

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<sup>32</sup> However, the overwhelming evidence is that growth by internal investment tends to be highly related to a firm's production and marketing inputs and demand. M. GORT, *supra* note 16.

<sup>33</sup> The use of *market data* underlies Stigler's survivor technique for inferring private efficiency scale curves. Stigler, *The Economies of Scale*, 1 J. LAW & ECON. 54 (1958). Stigler's framework, which he later stresses deals with private rather than social efficiency, is obviously parallel in spirit to the present suggested analysis of supply spaces, for in both cases there is a belief that *significant* patterns among market data can be instructive. Stigler admits to several analytical and procedural problems in the use of market data and the survivor technique. See Stigler, *Addendum: Drawing Inferences From Size On The Economies of Scale*, in THE ORGANIZATION OF INDUSTRY 89-94 (G. Stigler ed. 1968). Joe Bain offers some reservations on the use of market data and Stigler's technique (many of which Stigler acknowledges). Bain, *Survival-Ability as a Test of Efficiency*, 59 AM. ECON. REV. 99 (1969). Several economists have found merit in using market data and the survivor technique for inferring efficiencies at the plant level. See, e.g., Saving, *Estimation of the Optimum Size by the Survivor Technique*, 75 Q.J. ECON. 569 (1961); Weiss, *The Survival Technique and the Extent of Suboptimal Capacity*, 72 J. POL. ECON. 246 (1964). The use of market data rather than "introspection" as the correct basis for inferring entry was also argued in the STIGLER TASK FORCE REPORT at 6354.

<sup>34</sup> There is considerable evidence that in most industries, scale curves are L-shaped, and that the minimal optimal scale occurs at a relatively small output level, See, e.g., J. BAIN, INDUSTRIAL ORGANIZATION ch. 5 (1959); Stigler, *The Economies of Scale*, *supra* note 33.

the highest expected returns on their resources. Consequently, supply spaces may be deduced by examining the diversification patterns — product assortments — of firms engaged primarily in the same general area as the subject pool or pools of resources.

Inferring supply spaces from industry diversification data implements the frequently-made point that persistent behavior tendencies among firms provide evidence of conditions of entry and economic relationships.

If companies based in industry A have shown an ability to enter industry B by means other than merger, one must presume the same opportunities exist for other firms in industry A.<sup>35</sup>

One primary source of these data is *Enterprise Statistics*,<sup>36</sup> which provides, among other data, an industry breakdown of all multi-industry companies,<sup>37</sup> both in terms of the approximately 3-digit industry group which accounts for the majority of their employment and all secondary industry categories in which the firms engage. These data do not distinguish between diversification achieved internally and that achieved by merger.

In a large universe of multi-industry firms, such as in the *Enterprise Statistics* data, significant diversification patterns undoubtedly reflect technological relationships. Within this large population, one may reasonably assume that the pecuniary motivations for diversification by merger (mentioned previously) are randomly distributed (which assumption we will discuss below).

Another source of data on diversification patterns is *Fortune Plant and Product Directory*, a publication listing the SIC 5-digit products and other information for the thousand largest industrial firms in the United States. For example, if one wishes to deduce supply spaces for large firms engaged in canning and preserving fruits and vegetables, he can construct a diversification profile for such firms by obtaining their names from industry sources or otherwise. The profile will indicate the 2-, 3- and 4-digit activities in which these firms engage.

In general, if among all firms (or all large firms as the case may be) in the same basic supply area, one finds some particular and strong similarities in their diversification, one reasonably may conclude that (1) all the firms in the class (ignoring scale effects) possess the technological capability to engage in the evidenced set of activities, because a substantial proportion of them for reasons of perceived profit *are* doing so, and (2) to other firms on the

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<sup>35</sup> *Hearings on Econ. Concentration, Before the Subcomm. on Antitrust and Monopoly of the Sen. Comm. on the Judiciary*, 89th Cong., 1st Sess., pt. 2, at 678 (1965) (testimony of Michael Gort).

<sup>36</sup> ENTERPRISE STATISTICS 1963, Table 6, at 326-34 (1968). These data are from the Census of Business, Manufactures, and Mineral Industries. A similar edition of *Enterprise Statistics* was published in conjunction with the 1958 census.

<sup>37</sup> Specifically, it includes data on such companies only in the fields of manufacturing, minerals, extraction, public warehousing, wholesale and retail trade, and selected services which operated one or more establishments in the 50 states and the District of Columbia in 1963. *Id.* at 1.



periphery of this industry and to smaller, more specialized firms in the industry, such patterns of diversification, broadly defined, constitute a logic of supply.

Thus, significant diversification patterns at the inter-2-digit, 2-, 3- or 4-digit level provide inferences for supply spaces, for they indicate a technological capability. Once again, regardless of whether all firms in the class are currently so engaged, a substantial diversification by firms in industry *A* into industry *B* implies a supply space *A-B*.

#### *Inferences from Merger Patterns*

For reasons identical to the preceding argument on general diversification data, statistically significant numbers of mergers at one or more levels of detail — inter-2-digit, inter-3-digit, or inter-4-digit — are relevant in inferring supply spaces. We have indicated that there are two broad sets of reasons for mergers—technological and pecuniary relationships.<sup>38</sup> In inferring technological capability from merger data we are interested only in those mergers undertaken for technological (“functional”) reasons. Mergers undertaken for pecuniary (“financial”) reasons hold no implications for the technological capability of pools of resources. As indicated, pecuniary relationships in mergers include “bargains,” tax advantages, price-earnings differentials (given the stock market’s recent infatuation with earnings-per-share growth), pooling-of-interest accounting advantages, and so on.<sup>39</sup>

How does one in inferring supply spaces from merger data eliminate or control for mergers undertaken for pecuniary reasons? It would appear entirely legitimate to assume that the *purely pecuniary* reasons for inter-industry mergers would *not* produce systematic merger patterns. That is, over time, firms exploiting purely financial opportunities, such as merger bargains, would be inclined to acquire firms in *any* industry. Accordingly, we may conclude that any stable, systematic patterns of interindustry mergers between pairs of industries imply technological reasons — production or marketing, input or demand — complementary relationships between the two industries. On the other hand, we may suppose the purely pecuniary mergers are randomly distributed across all industries.<sup>40</sup> Of course, one could argue that certain pecuniary relationships, such as bargains, *would* lead to stable, systematic patterns of mergers between pairs of industries. However, this is very doubtful, for if in fact one or more industries were characterized by a steady emergence of under-priced firms (or some such bargain or other

<sup>38</sup> See text accompanying note 4 *supra*.

<sup>39</sup> There is of course no absolutely clear distinction between technological and pecuniary relationships, for certain merger “bargains” may offer opportunities for real economies, and certain technological relationships and real economies may enhance market power. A good discussion of bargains in mergers is found in THE CORPORATE MERGER ch. 11 (W. Alberts & J. Segall eds. 1966). Nevertheless, for the most part, the distinction between technological and pecuniary relationships is useful.

<sup>40</sup> Penrose concurs, endorsing the view that, in the absence of “bargains,” interindustry mergers imply technological relationships. E. PENROSE, *supra* note 13, at 127.

pecuniary advantage), it is extremely unlikely that only one or more specific industries alone would exploit the opportunity. The numerous merger brokers and the extensive search activities of merger-hungry firms would soon lead to discovery of the financial opportunities, thereby randomizing interindustry pecuniary merging.

The analysis of merger patterns for purposes of inferring supply spaces requires one to assess *actual* interindustry merger frequencies against a purely *random* interindustry merger frequency in order to determine significant frequencies. Merger data on large acquisitions (acquired firm \$10 million assets or more) are the mergers most easily assessed due to the ample FTC data, and moreover, for antitrust questions, they are by far more relevant than acquisitions of and by small firms.

A preliminary investigation of 2-digit large-merger patterns by this writer suggests one possible approach. First, with respect to the purely random frequency distribution of mergers, this theoretical distribution is based upon the premise (null hypothesis) that all industries are equally related to each other. Thus, the total mining and manufacturing acquisitions by each industry are distributed among *all* mining and manufacturing industries (including the subject industry) in proportion to their relative size. We are concerned only with acquisitions of firms with assets of \$10 million or more. The relative size of industries is simply the ratio of the number of an industry's large firms (prospective acquirees) to the number of all large firms in the stated universe. More precisely, let

$A_{ij}$ , represent the expected number of acquisitions by the  $i$  th industry, of firms in the  $j$  th industry

$S\#_j$ , the number of firms with assets greater than \$10 million in the  $j$  th industry

$S\#_T$ , the total number of large firms in mining and manufacturing

$A\#_j$ , the number of acquisitions recorded by firms in the  $i$  th industry

Thus,

$$A_{ij} = \frac{S\#_j}{S\#_T} \cdot A\#_j$$

To illustrate: Food and Kindred Products (SIC 20) recorded 62 large acquisitions in manufacturing and mining for the period 1960-1968. Chemicals (SIC 28) accounted for 9 percent of all large firms in mining and manufacturing. Thus, the *expected* number of acquisitions of chemical firms by food firms would be 9 percent of 62 or 6 acquisitions.

Obviously, in the dynamics of real-world markets and industries, technologies are always undergoing some change. Accordingly, merger data for long periods of time, such as for a 20 year period, are relatively meaningless. However, merger data for periods on the order of five to eight years or so are based on sufficiently short periods of time to reflect real technological

relationships.<sup>41</sup> Such periods are sufficiently long to take into account the lags in merging: (1) once a firm has investigated various growth patterns and decided upon merger, identified a specific prospective merger partner, negotiated the transaction, and received stockholder concurrence, upwards of three years may have passed;<sup>42</sup> (2) some firms are more alert, progressive, and innovative, and once they have successfully explored and demonstrated new utilizations for their pools of resources, more conservative firms "learn" and then begin to follow suit;<sup>43</sup> and (3) changing of technologies, similarly, is not an immediate process. Thus, for all three preceding reasons the merger-data analytical period of approximately five to eight years would appear reasonable.

Actual merger frequencies are juxtaposed with the theoretical distribution to reveal the instances of significant departures. In the study, an arbitrary "significance" was used — specifically, "significant" merger patterns were those that were 300 percent or more of the expected number. As one would expect, intra-2-digit mergers (for example, acquisitions of SIC 20 firms by SIC 20 firms) were significant in every industry. Far more interesting was the corroboration of other diversification evidence which the analysis provided. In particular, the analysis pointed out significant inter-2-digit mergers (in some instances, significant two-way merging) between food (SIC 20) and tobacco (SIC 21); textile mill products (SIC 22), apparel (SIC 23), and leather products (SIC 31); crude petroleum and natural gas (SIC 13), chemicals (SIC 28), petroleum refining (SIC 29) and rubber and plastics (SIC 30); and multi-laterally within the group of primary metals (SIC 33), fabricated metal products (SIC 34), non-electrical machinery (SIC 35), electrical machinery (SIC 36), and transportation equipment (SIC 37). None of the preceding is necessarily surprising, *but* that is precisely why the analysis cannot be dismissed. By corroborating what other data tend to show, this analysis of large-merger data increases one's confidence in the technique of

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<sup>41</sup> Berry's study of diversification patterns gives support for such an analytical time framework. Berry, *supra* note 18.

<sup>42</sup> For a discussion of the complexities of the merger decision, see W. Alberts & J. Segall, *supra* note 39; Alberts, *The Merger Decision*, in ALTERNATIVES FOR AGRI-BUSINESS FIRM GROWTH (1969).

<sup>43</sup> The forest products industry, a supply space combining the lumber, paper and other industries, is a case in point. Boise Cascade, diversifying and integrating both through internal investment and merger, led the way. Georgia Pacific is a close parallel. More recently Weyerhaeuser has similarly expanded its supply spaces, such that in 1968 a financial publication commented:

The most successful in the forest products industry were those like Boise Cascade, Georgia-Pacific and Weyerhaeuser. In an effort to achieve the fullest and most profitable utilization of their timber resources, they had expanded beyond their original lumber or plywood businesses into paper and packaging. . . . G-P and Boise compounded their initial advantage by concentrating wherever possible on specialty rather than commodity products and so reduced the hazards of price competition that lacerated the earnings of most of the industry's other big producers. More important, both companies brought financial sophistication to an industry that had never had much of it. . . . Never before did the balancing of operations between paper and wood products make so much sense.

FORBES, Jan. 1, 1968, at 103.

drawing inferences about technological capabilities and supply spaces from merger data.

### *Large Firms' Supply Spaces*

Large firms' supply spaces are the easiest to determine, and moreover, for antitrust purposes, they are certainly the most relevant. There is considerable evidence (part of which was cited earlier) that large firms have more behavioral opportunities than small firms; their resources are more flexible, in part due to: (1) an apparently lower cost of internal and external capital;<sup>44</sup> (2) a greater variation and combination of resource employments as a result of multiple pools of resources;<sup>45</sup> and (3) much greater discretion in choosing between internal and external growth, for large publicly traded firms simply have a broader information sphere due to their greater visibility in both the capital and product markets.<sup>46</sup> In sum, both merger data and general diversification data strongly suggest the propriety of a distinction between some size-level of the large firms and other firms, a distinction dependent in part on the particular industrial context.

The major implication of the fact that large firms have qualitative and quantitative opportunities exceeding those available to small firms — by definition, their supply spaces are broader — is that many product-market supply spaces do not, and in antitrust analysis *should not*, include small firms. Thus, the universe in which the competitive implications of an intra-supply-space merger is assessed, will, in many instances, consist only of some number of large firms. This is a critical point, for within a supply space, which is, as we have noted, essentially a long-run market, there are many short-run markets. If one is assessing competition in such a short-run market, his product-market universe will consist both of narrow specialists (frequently small firms) in that market, as well as other firms whose supply spaces include that short-run market. Realistically, both types are obviously suppliers vis-à-vis the particular demand.

On the other hand, if one is assessing competition in a broad market supply space, which by definition incorporates some number of specific

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<sup>44</sup> Hall & Weiss, *supra* note 22. See Benishay, *Variability in Earnings-Price Ratios of Corporate Equities*, 51 AM. ECON. REV. 81 (1961).

<sup>45</sup> Data strongly suggest a disproportionate increase in numbers of output activities relative to firm size, *after* firms reach some threshold size. For example, among the 200 largest food manufacturers there is impressive evidence of substantially more output activity by the largest 50 than by the next 150. Among 78 large multi-establishment food industry firms in 1954, the four largest firms were in 15 4-digit industries; the next four were in 10 4-digit industries; and the remaining 70 in succeeding smaller-firm classes were in only about 3 or 4 4-digit industries. For these and other data on conglomeration and firm size, see Narver, *Conglomeration in the Food Industries*, in *ECONOMICS OF CONGLOMERATE GROWTH* (L. Garoian ed. 1969). See also M. GORT, *supra* note 16; Berry, *supra* note 18.

<sup>46</sup> W. Alberts & J. Segall, *supra* note 39. For a lengthy discussion of the opportunities open to large, process-oriented firms (what Averitt calls "center" firms), see R. AVERITT, *THE DUAL ECONOMY: THE DYNAMICS OF AMERICAN INDUSTRY STRUCTURE* (1968).

demands, it is a much smaller universe of firms possessing technological capability with respect to the entire space. After all, maintaining and encouraging competition, which is what antitrust should be all about, is in principle a concern with responsiveness in both demand and supply as utility or profit opportunities arise. The firms possessing total supply responsiveness are primarily those with broad technological capability with respect to many short-run markets.<sup>47</sup>

The obvious *public policy* implication is that the emphasis should be on maintaining competition in supply spaces, a policy which, in turn, *will* maintain competition in specific short-run markets. But the reverse, which has been the traditional antitrust focus, is *not* necessarily true. Antitrust policy focused strictly on short-run markets would maintain competition in the long-run market only accidentally. We turn now specifically to supply spaces and public policy.

#### SUPPLY SPACES AND APPROPRIATE PUBLIC POLICY

It is not necessary to emphasize that a merger of any two firms in the same supply space is no different from a merger of any two firms in any specific product market: the number of supply units vis-à-vis demand has been reduced. Nor need we do more than remind that there is no long-run economic difference between a merger in which both firms are presently producing the same product, and a merger in which both firms are identical in their ability to supply, but at present are not producing the same product.

The overriding public policy implication of supply spaces is that within a supply space, antitrust must maintain a relatively *low* concentration of resources — in particular, a low concentration of total assets, the relevant dimension in a conception of firms as pools of resources. By ensuring low concentration of assets at the proper aggregative level — which in some instances will be *two or more* 2-digit industries, in other instances a single 2-digit industry, and in yet other circumstances, perhaps a 3- or 4-digit level — one will maintain competition in the specific short-run markets in the supply space.<sup>48</sup>

This obviously stringent policy of maintaining low asset concentration in a supply space will promote competition by encouraging *independent* behavior, the most important of which is entry into any specific product market in which there is an expected return exceeding a firm's cost of

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<sup>47</sup> The literature on potential competition stresses the importance of on-going firms as potential entrants into other markets — in our sense, other short-run markets within a supply space. See, e.g., Hines, *Effectiveness of "Entry" by Already Established Firms*, 71 Q.J. ECON. 132 (1957). See also Kottke, *supra* note 19; Smith, *supra* note 19; text accompanying notes 27-29 *supra*.

<sup>48</sup> The *general* tendency for high concentration among suppliers to be associated with higher profit levels is well recognized. See, e.g., N. COLLINS & L. PRESTON, CONCENTRATION AND PRICE-COST MARGIN IN MANUFACTURING INDUSTRIES (1968); NEAL TASK FORCE REPORT.

capital.<sup>49</sup> Moreover, within supply spaces, the short-run product markets in which there is high seller concentration are among the *most likely* targets for entry, and entry or a real threat thereof will occur *if* there is sufficiently low concentration to encourage independent action — for market power yields excess profits, and excess profits are an attractive inducement to firms interested in increasing their return on investment. Consequently, and assuming no absolute entry barriers, a *substantial* number (implies low asset concentration) of large viable competitors with strong technological capability — cruising the supply space as it were — tends constantly to force rates of return to competitive levels in all short-run markets. The downward pressure on profits occurs either by other firms in the space entering any specific short-run market with excess profits and eliminating the excess through competition, or from the mere threat of entry which induces current suppliers of the specific product to price below monopoly levels to ward off actual entry. In either event, excess profits are less, and resource allocation more efficient, because of the sufficient number of viable competitors. In a supply space consisting of even some non-minimal number of “large sharks,” the loss of *one* shark can be critical, let alone the loss of such a firm in a highly concentrated supply space.<sup>50</sup> This point of view is entirely consistent with both economic analysis and legal precedents.<sup>51</sup>

#### SUPPLY SPACES AND THE JUDICIAL GROUNDWORK

Though this writer is not an attorney, a rather limited search of section 7 cases and opinions provided some evidence that “supply spaces,” if the concept were explicitly utilized, would be congenial to existing section 7. Specifically, an examination of section 7 cases reveals some advocacy and opinions related in varying degrees to the spirit of the concept of pools of productive resources and the derivative concept of supply spaces. It is only in the courtroom that the agencies, by design or otherwise, have approached the concept of supply spaces, but even then, there certainly has been no frontal incorporation of any such concept.

<sup>49</sup> FTC, ENFORCEMENT POLICY, *supra* note 29, at 10-13; Clemens, *supra* note 23.

<sup>50</sup> The total interface — hence, climate for cooperation — among large diversified firms occupying in common one or more supply spaces is frequently very substantial. Even if firms strenuously avoid an explicit contact with others in the space, the multiple specific contacts nevertheless promote awareness, which promotes interdependence, which in turn encourages forbearance. Thus, the concentration standards in supply spaces should be extremely strict in order to preserve a maximum of independent decision making. For a discussion of the total interface among large firms see FTC, ECONOMIC REPORT ON CORPORATE MERGERS (1969). See also note 9 *supra*.

<sup>51</sup> Four Supreme Court merger decisions provide strong precedents against any concentration-increasing merger in a line of commerce. See *United States v. Pabst Brewing Co.*, 384 U.S. 546, 552-53 (1966); *United States v. Von's Grocery Co.*, 384 U.S. 270, 276, 278 (1966); *United States v. Philadelphia Nat'l Bank*, 374 U.S. 321, 362 (1963); *Brown Shoe Co. v. United States*, 370 U.S. 294, 315-16, 317, 333, 343-44 (1962). See also Campbell & Shepherd, *Leading Firm Conglomerate Mergers*, 13 ANTITRUST BULL. 1361, 1370 (1968); NEAL TASK FORCE REPORT.

One aspect of *United States v. Bethlehem Steel Corp.*<sup>52</sup> is an antecedent to a theory of supply spaces. The Government in its argument against Bethlehem's acquisition of Youngstown urged both broad and narrow lines of commerce, contending in part that the entire iron and steel industry is a line of commerce. It advanced a similar industry-wide line of commerce with respect to oil field equipment.<sup>53</sup>

In *Brown Shoe Co. v. United States*,<sup>54</sup> the first Supreme Court review of a case under the revised section 7, the Court laid a strong foundation for the concept of supply spaces. The Court stated that the outer boundaries of a product market are determined by the cross-elasticities of both demand and production; furthermore, it indicated that there may be "sub-markets" within the outer limits, but, significantly, the Court did not require a finding of sub-markets.<sup>55</sup> This is consistent with our dual employment of long-run and short-run markets.

Although the defense in *Brown Shoe* argued for narrow lines of commerce, the Court accepted the district court's judgment of three lines of commerce: men's shoes, women's shoes, and children's shoes. In a concurring opinion, Mr. Justice Clark believed that only *one* broad line of commerce — shoes of all types — would have been more realistic in this merger.<sup>56</sup> In another separate opinion, Mr. Justice Harlan emphasized both supply and demand cross-elasticity in defining the line of commerce. Stressing the flexibility of Brown's resources, he pointed out that the company's history revealed that a single plant "may, without undue difficulty, be shifted from the production of children's shoes to men's or women's, or vice versa."<sup>57</sup> Mr. Justice Harlan concluded that the line of commerce "might more accurately be defined as the complete wearing apparel shoe market."<sup>58</sup>

Of special relevance to the concept of supply spaces, Mr. Justice Harlan pointed out that *supply capability* has competitive significance at least equal to that of demand:

Such an analysis, taking into account the interchangeability of production, would seem a more realistic gauge of the possible anticompetitive effects

<sup>52</sup> 168 F. Supp. 576 (S.D.N.Y. 1958).

<sup>53</sup> *Id.* at 589. Of only minor relevance is the version of resource flexibility employed in *Bethlehem. Id.* at 596. See also *Crown Zellerbach Corp. v. FTC*, 296 F.2d 800, 812 (9th Cir. 1961).

<sup>54</sup> 370 U.S. 294, 325 n.42 (1962).

<sup>55</sup> *Id.*

<sup>56</sup> Mr. Justice Clark also stressed that there is no requirement to demonstrate certainty under section 7, but rather the test of illegality in section 7 is merely "whether there is a 'reasonable probability' that competition *may* be lessened." *Id.* at 355 (Clark, J. concurring). Employing the "reasonable probability" test and the single, broad line of commerce, he concurred in the Court's decision, stating: "On the record but one conclusion can follow, i.e., that the acquisition by Brown of the 400 Kinney stores . . . created a 'reasonable probability' that competition in the sale of shoes on a national basis might be substantially lessened." *Id.* at 356 (Clark, J., concurring).

<sup>57</sup> *Id.* at 367 (Harlan, J., concurring in part, dissenting in part).

<sup>58</sup> *Id.*

. . . than the District Court's compartmentalization in terms of the buying public.<sup>59</sup>

A broad line of commerce was successfully argued in *United States v. Philadelphia National Bank*,<sup>60</sup> in which the Supreme Court accepted all of "commercial banking" as a line of commerce, which of course is a cluster of specific products and services. The very pronounced relevance to supply spaces is that the focus in *Philadelphia Bank* was not on a particular specific product or service, but on the general ability to supply within a range of demand.<sup>61</sup>

The Supreme Court's decision in *United States v. Continental Can Co.*<sup>62</sup> provides two implications for supply spaces. First, glass and metal containers were deemed sufficiently competitive to induce a conclusion of a broad line of commerce combining the glass and metal container industries and all end uses for which they compete. In the language of the present argument, Continental Can and Hazel Atlas occupy at least one supply space in common.<sup>63</sup> Second, from *Continental Can* the inference is easily drawn that firms may be perceived as occupying the same supply space even though there is *not* complete overlap of either the technological capability or the logic of supply. As the Court said:

There may be some end uses for which glass and metal do not and could not compete, but complete interindustry competitive overlap need not be shown. We would not be true to the purpose of the Clayton Act's line of commerce concept as a framework within which to measure the effect of mergers on competition were we to hold that the existence of noncompetitive segments within a proposed market area precludes its being treated as a line of commerce.<sup>64</sup>

#### SUMMARY AND CONCLUSIONS

A firm in essence is one or more pools of productive resources, the particular output of which at any time is determined by management. A supply space is the range of demands to which a pool of resources can easily respond.

An antitrust merger policy based on a perspective of firms occupying one or more supply spaces would capture *much more fully* the competitive implications of firms and mergers, and in addition, by being more comprehensible to businessmen, would reduce some of their antitrust uncertainty.

<sup>59</sup> *Id.* Mr. Justice Stewart dissenting in *United States v. Aluminum Co. of America*, 377 U.S. 271, 283 (1964), similarly emphasized both supply and demand aspects in defining the line of commerce. See also Keyes, *supra* note 23.

<sup>60</sup> 374 U.S. 321 (1963).

<sup>61</sup> *Id.* at 327, 356-57.

<sup>62</sup> 378 U.S. 441 (1964).

<sup>63</sup> *Id.* at 457. However, the logic by which plastic, paper, foil, and other competing containers were excluded is less clear. To understand the legal reasoning in defining "submarkets" under section 7, one must trace the precedents beginning with the discussion in the *Brown Shoe* case. 370 U.S. at 325-28.

<sup>64</sup> 374 U.S. at 457.



The conception of firms as pools of resources occupying one or more supply spaces is precisely the model long held by sophisticated growth companies.

Many mergers which in a static framework are classified as conglomerate are in fact horizontal mergers when viewed in terms of supply spaces. A supply space is correctly the line of commerce for assessing the probable effects of *any* merger. If both firms in a merger occupy the same supply space in part or in whole, the merger, by definition, combines firms possessing *identical* ability to supply. Without any inaccuracy, such a merger may be described as *horizontal*. Even if the merging firms do not occupy the same supply space, supply-space analysis, through its concern with objective data, may reveal one of the firms to be a potential entrant into the supply space of the other; or one of the firms to be a potential supplier or customer of the other; or both firms to be potential entrants into a common third supply space. The concept of supply spaces strengthens antitrust enforcement, for this more realistic analysis avoids *underestimating* the competitive implications of *any* merger.

In addition to strengthening antitrust enforcement, the supply-space concept has many implications for economic analysis in general. The antitrust policy relationships between supply spaces (long-run markets) and short-run markets is straightforward. One maintains competition in specific short-run markets by strictly enforcing low concentration at the more aggregate level of the supply space — inter-2-digit, 2-, 3-, or 4-digit, whichever accurately reflects the ability to supply. This policy thereby channels merger activity into and among the smaller firms. Based on the strong Supreme Court precedents in horizontal mergers, especially *Brown Shoe* and *United States v. Von's Grocery Co.*,<sup>65</sup> it follows that no intra-supply-space merger would be legal if it occurs in a context of "incipient-monopoly," *i.e.*, a context of increasing concentration.

If fully implemented, the suggested supply-space policy under section 7 will yield two socially desirable results. First, *within* a supply space, relatively large firms will be compelled to meet the test of the market (*i.e.*, internal investment and demonstrating superior utility to consumers) rather than attaining through merger further growth in the space. A stringent anti-horizontal merger policy is easily justified by the substantial evidence indicating that at a relatively small size, large firms have realized almost all of the possible economies of scale; and coupled with this, there is no evidence that merger is more profitable than internal investment.<sup>66</sup> Second, the policy freely permits relatively small firms in a supply space to merge, which in many cases may increase their resource productivity and help them

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<sup>65</sup> 384 U.S. 270 (1966).

<sup>66</sup> The social cost of such a stringent intra-supply-space merger policy would appear to be virtually zero, *but* the social benefit could be substantial through the resulting enhanced competition. See Campbell & Shepherd, *supra* note 51; NEAL TASK FORCE REPORT. Both take the point with which this writer concurs; merging should be extremely *open* to relatively small firms in, as well as between, supply spaces.

attain scale economies. The merging of relatively small firms will generally not increase asset concentration in a supply space defined, as it should be, somewhere between an inter-2-digit and a one or more 3-digit or 4-digit level. If anything, mergers between firms relatively small in their product-market supply space tend to increase competition.<sup>67</sup>

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<sup>67</sup> The desirability of small firms being free to merge to increase their efficiency and competitive strength has been pointed out frequently. *See, e.g.*, *United States v. Von's Grocery Co.*, 384 U.S. 270, 301 (1966) (Stewart, J., dissenting); *In re Beatrice Foods*, No. 66, 53 (FTC, April 26, 1965); FTC, ENFORCEMENT POLICY. *See also* FTC, ECONOMIC REPORT ON CORPORATE MERGERS (1969); NEAL TASK FORCE REPORT; Campbell & Shepherd, *supra* note 51.