

SUPPLY-SIDE AND TRANSVECTIONAL SEGMENTATION

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Market segmentation has focused on the demand side of the market as a means of dealing with heterogeneities in demand. Its advantages on the supply side have not been realized. We propose "supply-side segmentation", the management of heterogeneities in supplier characteristics, and propose a change in the orientation of market segmentation to better identify and exploit supply-side opportunities. For segmentation strategy to be optimal, it must serve to align demand segments with supply segments, targeting supply segments that satisfy the demand of the buyer. We call this alignment function, "transvectional segmentation strategy." The model is generalizable to any member of the distribution channel.

INTRODUCTION

There are few concepts of greater consequence to a retailer's marketing activities than market segmentation. Market segmentation is instrumental in defining a retailer's offerings, pricing, communication and distribution. It helps in the efficient utilization of the retailer's resources, the positioning of its offerings, the building of long-term relationships and the maximization of consumer satisfaction. While the concept of market segmentation is intuitive, it nonetheless has had a tremendous impact on retailing decisions. To a large extent, it has been used to simplify the heterogeneity of the marketplace, so that marketing decisions can better be specified, structured, organized and implemented.

A considerable body of literature on market segmentation has been developed since Smith's (1956) pioneering work. Various methodologies (e.g., Mahajan and Jain 1978, Winter 1979, Grover and Srinivasan 1987, Green and Krieger 1991, Novak et al. 1992) and implementation strategies (e.g., Hakansson and Wootz 1975, Lesser and Hughes 1986, Morwitz and Schmittlein 1992) have been proposed and discussed. In most discussions of the

concept, the focus has been on the *demand* side of the marketplace. Dickson and Ginter (1987) define market segmentation as "a state of *demand* heterogeneity, such that total market *demand* can be disaggregated into segments with distinct demand functions." Industrial segmentation (e.g., Rangan et al. 1992, Doyle and Saunders 1985, Shapiro and Bonoma 1984) has taken the concept up the channel, but the focus still has been down-channel, that is, on *downstream demand*.

As useful as the concept of market segmentation has been on the demand side of the marketplace, its applicability has not adequately been explored on the *supply* side. We suggest that the concept has been defined and applied too narrowly because of this demand-side orientation. The potential for the expansion of the concept to improve a retailer's performance in supply-side decisions could be considerable. Recently there have been calls for treating suppliers as customers (e.g., Sheth and Sharma 1997), for better organizing suppliers (Gahbauer 1998), and for better harnessing the enormous potential competitive advantage that can be derived from the supply side of the value chain. We believe that an expanded concept of market segmentation can provide the foundation in response to these calls. We advance a concept called "*Supply-Side Segmentation*"¹. In contrast to the current conceptualization of market segmentation (e.g., Smith 1956, Dickson and Ginter 1987), which

is confined to heterogeneity on the demand side of the marketplace, *supply-side* segmentation focuses on heterogeneity on the supply side. We also advance a concept called "*Transvectional Segmentation*," and suggest that *segments* of the marketplace (consisting of suppliers, intermediaries and consumers), aligned for the purpose of exchange, may be more appropriate for building long-term relationships and satisfying needs at different levels in the channel than the transactional approaches usually associated with market segmentation.

We first review the existing literature on segmentation and vendor analysis. We then propose and define several concepts related to the theoretical model of supply-side and transvectional segmentation which we present thereafter. Finally, we evaluate the managerial implications of the concepts proposed and suggest future research directions.

SEGMENTATION AND VENDOR ANALYSIS

Market Segmentation

Research on segmentation in marketing literature is considerable. Early studies dealt largely with defining and delineating the concept. Attention was also directed towards the distinction between segmentation and product differentiation. Smith (1956), in his seminal article, saw these concepts as different strategic approaches to similar ends, with product differentiation as a *promotional strategy* used by sellers to differentiate their products from those of competitors. By contrast, he saw market segmentation as a merchandising strategy in which demand was disaggregated and market offerings were adjusted to meet these separate demand functions. Market segmentation and product differentiation were activities that were directed *down-channel*. By contrast, Dickinson and Ginter (1987) see both product differentiation and market segmentation as *conditions of the market*. That is, both segmentation and differentiation are consumer driven and are perceptual responses to looking *up-channel* toward imperfect competition as seen through the consumer's own demand function.

A distinction can also be made between studies that focus on what actually happens in the market and

what managers should do to optimize their success—that is, between positive and normative theory. It may be fair to say that there has generally been more emphasis in the segmentation literature on normative segmentation theory. To date, essentially all of the segmentation studies in the marketing literature are concerned with the seller's perspective, and most have a *down-channel* focus. The retailer's perspective of the consumer is such a focus.

Vendor Analysis

The literature that is most closely related to the up-channel, buyer-to-seller focus of this paper is in organizational buyer behavior, and can be found under the general rubric of "vendor analysis." Vendor analysis is concerned with the evaluation of alternative vendors in a buying situation. There are also two general approaches to vendor analysis. One is a positive approach dealing with how organizations actually make buying decisions. Though positive, essentially all of these approaches focus on multi-attribute models and investigate a set of selected (*a priori*) attributes. The other is normative and is concerned with the development of optimal models for comparative analysis of alternative vendors—that is, how firms should evaluate suppliers.

Positive Analyses: Much of the focus in the positive studies of vendor analysis has been concerned with the relative weights that are placed on various attributes by organizational buyers. Most of the attributes selected for studies have been those that directly affect the buyer. Attribute importance has been noted to vary across buying situations and product categories. Lehmann and O'Shaughnessy (1982) used a four-category classification of choice criteria: "performance," "economic," "integrative," and "adaptive." Generally, economic criteria were found to be most important for standard products of simple make-up, standard application, and low dollar value, while performance criteria were found to be most important for products of complex make-up and/or novel application.

Several researchers have noted that relative attribute importance differs as a function of product purpose.

With the partial exception of “production process” products (component parts), most of the purposes considered were classified on the basis of internal (buying firm) use. For example, Kauffman (1994) found that service tends to gain in significance for product classes outside of production products. Wilson (1994) found that there has been a general shift in relative attribute importance over the past twenty years. Price and delivery were found to have become less important, while service and quality were found to have become more important.

Normative Models: Most normative models fall under one of three general vendor evaluation models that have been suggested for vendor selection (Giunipero and Brewer 1993; Timmerman 1987). These three models are the “categorical approach,” the “weighted-point plan” and the “cost-ratio approach.” In the *categorical approach*, suppliers are categorized (e.g., unsatisfactory, neutral, satisfactory) on a set of *a priori* dimensions (e.g., cost, product quality, speed of delivery). The *weighted-point plan* is similar, but here each *a priori* dimension is assigned a maximum number of points based on its perceived relative importance to the buying institution. Each supplier is then evaluated on every factor. The evaluation score is multiplied by the importance weight to determine a weighted-factor score, i.e., the supplier’s overall evaluation. In the *cost-ratio method*, evaluative factors (except selling price) are assigned weights derived from standard internal analysis of costs, and suppliers are then assigned performance weights based on standardized evaluative criteria. As in the positive studies, evaluative criteria are determined *a priori* and are usually concerned with the unique and often economic needs of the buyer, with little explicit concern for the specific needs of the down-line customer.

In summary, most of the literature on vendor analysis has some common characteristics. First, most studies have an almost exclusive “economic” focus. Even when non-price variables are considered, they are often viewed from a “cost” or “total cost” (to the buyer) perspective. Second, they tend to be very transaction oriented—that is, they deal mostly with single-decision purchases, usually in isolation from other variables and other channel members. Third,

the perspective is essentially entirely up-channel. That is, the decision criteria are usually those attributes of the supplier and/or the product that *directly* affect the purchaser. They deal with the unique demand attributes related to the immediate transaction and tend to ignore the relational and derived requirements of the purchaser based on other channel members.

In addition, the above discussion reveals a range of variations for analyzing suppliers. A systematic strategic framework that could aid a manager in strategic supply-side decisions does not exist. Lacking such a framework, a supply-side manager is forced to rely on an ad hoc, perhaps disjointed supply strategy. We believe that the concept of supply-side segmentation may help marketers create a more organized and integrated supply strategy.

In proposing the concept of supply-side segmentation, we strive to go beyond the limitations described earlier. We suggest that segmentation strategy must take into account: (1) a wider range of variables than purely economic ones; (2) both the unique demand function of the buyer (focal firm), as well as the demand derived from downstream customers; and (3) the demand requirements necessitated by the selection of other suppliers. In short, supply-side segmentation *strategy*, should be concerned with the optimal alignment of the needs of the intended customer with one or multiple suppliers while simultaneously meeting the unique needs (economic and non-economic) of the focal firm.

CONCEPTUAL DEVELOPMENT AND DEFINITIONS

Supply-Side Heterogeneity

Theoreticians and practitioners of market segmentation have focused almost exclusively on demand-side heterogeneity. It is clear that heterogeneity also exists among suppliers. Although Smith (1956), in his classic article, recognizes the issue of “diversity in supply,” the issue has largely been ignored in the literature. Differences in supplier characteristics have been discussed (e.g., Lusch and Vargo 1998, Burt 1989,

Hakansson and Wootz 1975), although never in the context of a framework that might be used to benefit channel members and consumers.

Some firms have informally recognized supply-side heterogeneity when selecting suppliers and building relationships with them. Honda, for example, seeks suppliers that can meet certain cost, quality and delivery requirements (MacDuffie and Helper 1997). Ford chooses suppliers that meet certain geographic requirements in order to reduce inventory-carrying costs and delivery time (Voorhees and Coppett 1986). Motorola selects suppliers partly based on their output capacity (Lewis 1995). Target selects suppliers who are willing to share extensive inventory data, sales trends, cycle time and quality assurance standards (Stein and Sweat 1998)². These efforts, however, have taken place without a systematic framework similar to the one developed over the years for demand-side segmentation. While there is an extensive literature on criteria for the selection of suppliers, the process of optimally managing the supply side of the marketplace, however, has been relatively disjointed, arbitrary or ad-hoc. Consequently, retailers have been inefficient in their supply decisions, and unresponsive to changing consumer needs.

The Importance of Understanding Supply-Side Heterogeneities: On the demand side of the marketplace, understanding heterogeneity among consumers helps to better specify, organize and implement a retailer's marketing strategy. Through a better comprehension of demand-side heterogeneities, retailers are able to more efficiently maximize their returns, while building better relationships with consumers. Similarly, through a systematic structuring of supply-side heterogeneities, retailers can make better supply-side decisions that maximize their returns, and enhance the quality of their relationships with both down-channel customers and up-channel partners. Such a framework may provide a basis for evaluating and modifying overall marketing strategy and benefit theory building. In the remainder of this section, we propose and define some concepts on which a theoretical model (in the next section) can be built. A summary of these concepts is presented in the table.

Supply-Side Segmentation can be defined as "a state of supply heterogeneity, where the total supply pool can be disaggregated into segments that may satisfy distinct demand functions in the marketplace." These disaggregated groups can formally be referred to as a *Supply-Side Segment*, or "supply segment," to distinguish them from traditional (demand-side) market segments. *Supply-Side Segmentation Strategy* is defined as "the use of information about supply segments to design a program to exploit the unique characteristics of suppliers to satisfy the distinct demand functions of a firm." It can be thought of as the proactive subdivision of suppliers into homogenous groups, where any member of a sub-group may be selected as a potential source to satisfy the needs of a retailer. Supply-side segmentation is "positive" in nature, concerned with actual conditions in the marketplace, while supply-side segmentation *strategy* is a "normative" issue of strategic concern to a retailer.

Since "supply-side segmentation" is a *marketplace condition* (consistent with the terminology proposed by Dickson and Ginter [1987]), it need not be viewed from the perspective of any single channel member. Rather, supply segments inherently exist in the marketplace and may be relevant to multiple up- or down-channel members. This notion differs from "traditional" views of segmentation where market segments are implicitly assumed to exist down-channel, and only relevant to a channel member immediately higher up in the channel. The normative orientation of "Supply-Side Segmentation Strategy," however, requires a reference, or focal point in the channel, from which perspective strategic and tactical decisions can be made. To better understand the concept of supply-side segmentation *strategy*, and to distinguish it from demand-side segmentation strategy, we introduce, at this stage, the concept of the "focal firm."³

The Focal Firm: All firms deal with both supply and demand. Economic exchange occurs when supply meets demand. Different types of exchanges take place at different levels in the channel. From its own perspective, each firm in the supply chain is the "focal firm," whose goals are both self-serving and altruistic to its partners in the supply chain. A

major goal of each (focal) firm is to create and sustain long-term relationships, both up and down-channel⁴. To achieve this, the focal firm must make both up-channel and down-channel decisions. The concepts of both supply and demand-side segmentation strategy can best be understood and distinguished from each other if viewed from the perspective of the "focal firm." (See Figure 2A.) Definitions and discussion of other supporting concepts such as "the supply pot," "the supply configuration" and "supply modification" can be found in the table.

Transvectional Segmentation: The theory and application of market segmentation has implicitly assumed a "transactional" view of the supply chain in most past literature. We believe that such an approach is myopic. Relational behavior (e.g., Lusch and Brown 1996), based on interdependencies among channel partners that could result in long-term collective gains for all channel members, has largely been ignored in segmentation literature. Moreover, there is no model in the literature that provides a consistent basis for analyzing supply in the context of demand, aligning supply with demand, or changing supply with changes in demand.

Consider a channel consisting of manufacturers, intermediaries and consumers. If demand at one level in the channel is partially derived from a subsequent downstream level, then demand is derived from all subsequent *downstream* levels of the supply chain. Similarly, if supply-side segmentation involves the categorization of upstream suppliers, and if the offerings of upstream suppliers are a partial function of their respective categorization of suppliers further upstream, then segmentation is a function of the offerings of all upstream suppliers.

Thus, an appropriate, comprehensive approach to strategic segmentation requires taking into account the downstream demand beyond the immediate customer, while taking into account the upstream providers beyond the immediate supplier. We call this trans-supply-chain perspective "transvectional segmentation" — based on the notion of transvections suggested by Alderson and Martin (1965). Application of this perspective results in a

"transvectional segmentation strategy." The implication is that a firm is not just partnering with its immediate supplier in producing a product for the immediate downstream customer. Rather, the firm is in partnership with all upstream suppliers to conglomerate resources, as well as all downstream users of the offering in its various derivative forms.

A transvection is defined as the "outcome of a series of transactions," including the "complete sequence of exchanges," as well as the "various transformations that take place along the way" from source to end consumer (Alderson and Martin 1965). In a transvectional approach to segmentation, a firm views the entire channel simultaneously, as opposed to just concentrating on its immediate upstream or downstream transaction (See figures 3A and 3B). The focus is on "partnerships" among all channel members for collective mutual benefit, as opposed to "exchanges" observed from an individual point of view. Transvections are characterized more by long-term relationships than by short-term transactional exchanges. "Transvectional Segmentation Strategy" is based on the premise that since channel members are not isolated from each other and share common goals, the more they integrate their segmentation strategy the better will be their ability to satisfy demand in the channel.

A Theoretical Model of Supply-Side and Transvectional Segmentation

Positive Analysis: In past literature, segmentation has been viewed as a purposeful activity performed by a retailer or other seller in relation to the market, or as a more *passive* phenomena resulting from differential demand for retailer characteristics (including products offered) based on consumer perceptions. Dickson and Ginter (1987) identify the latter as *segmentation* and the former as *segmentation strategy*. According to Dickson and Ginter, segmentation occurs because consumers in the marketplace have different demand functions. From the retailer's perspective, the consumer's demand function is:

$$Q = f(p_c, x_1, \dots, x_n),$$

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where: "Q" represents demand for a particular product offered by a retailer
 "p_c" represents the price offered by the retailer to a consumer, and
 "x_{1-n}" represents consumer *perceived* product characteristics.

These demand functions can be thought of as consumer "ideal points," and the modes of their distribution represent segments (Figure 1). Thus, segmentation reflects consumer-derived demand, and is consequently a *marketplace condition*. It results from the consumer looking up-channel to the retailer (or equivalent intermediary).

By contrast, according to Dickson and Ginter (1987), what retailers do in the process of either responding to, or attempting to influence consumer demand, is *market segmentation strategy*. Market segmentation strategy, then, represents a down-channel perspective. Broadly speaking, it can take two forms. The retailer can either recognize the existence of segments and differentially position its offerings in such a way as to influence perceptions (product differentiation strategy), or it can try to influence the development of segments by influencing demand functions (segment development strategy).

As in consumer segmentation, supply-side segmentation is demand driven. The retailer is an interim customer that distinguishes among potential suppliers based on both its perceptions of supplier characteristics and the differential demand of its customers. Accordingly, the retailer's demand function is:

$$Q_r = g(p_r, y_1, \dots, y_n, p_c, x_1, \dots, x_n),$$

where: "Q_r" represents demand from the retailer for a particular product offered by an individual supplier (e.g., wholesaler),
 "p_r" represents the price offered to the retailer by the supplier,
 "p_c" represents the price offered by the retailer to its consumer,
 "x_{1-n}" represents customer *perceived* product/retailer characteristics, and

"y_{1-n}" represents retailer *perceived* product/supplier characteristics.

In other words, the demand function of the retailer reflects the "unique" demand function of the focal firm, and the "derived" demand from its consumers. More generally,

$$Q_r = g(p_r, y_1, \dots, y_n, Q_c),$$

where Q_c represents consumer demand. Thus, the retailer's demand has both a unique component and a component derived from its (down-channel) consumer. The focus of *supply-side segmentation strategy* concerns the optimization of supply to meet this demand function for a retailer or focal firm.

The nested traditional view of segmentation could be extended up the supply chain, resulting in what might be viewed as "transvectional" (Alderson and Martin 1965) demand-generation, as opposed to the more "transactional" demand-based segmentation discussed by Dickson and Ginter (1987). For example, taking into account the producer, wholesaler, retailer, and consumer, the transvectional demand function becomes:

$$Q_w = h(p_w, z_1, \dots, z_n, Q_r, Q_c),$$

where: "Q_w" represents demand from the wholesaler for a particular product offered by an individual manufacturer or supplier,
 "p_w" represents the price offered to the wholesaler by the manufacturer,
 "z_{1-n}" represents wholesaler *perceived* product characteristics (founded on partial information),
 "Q_r" represents demand from the retailer for a particular product offered by an individual wholesaler, and
 "Q_c" represents demand from the consumer for a particular product offered by an individual retailer.

Or, more generally,

$$Q_i = f(p_i, y_{i1}, \dots, y_{ik}, Q_{i-1}, \dots, Q_n),$$

where: "Q" represents demand for a particular product offered by an individual supplier, "p" represents price offered to a downstream channel member, "y" represents perceived product characteristics (by the downstream supply-chain member), and " $Q_{i-1}, \dots, Q_n$ " represents the demand functions of successive downstream members of the supply-chain.

Supply segments at different levels of the channel can thus be identified *a priori*. Because of a better defined supply market, the whole supply chain can be taken into consideration *simultaneously*, and transvectional segmentation strategies can be developed at all levels of the channel to optimally satisfy demand in the channel. Reactions to changes in demand can also be more efficiently facilitated at various levels of the channel, because segments at all levels of the channel have already been identified. A marketing information system can be established to continuously monitor supply and demand, so that a retailer's transvectional segmentation strategy can be constantly optimized.

Similar to Alderson and Martin's (1965) contention that the number of steps in a transvection are optimized when the cost can not be reduced by increasing or decreasing steps, we propose that a transvectional exchange is fully exploited when it simultaneously optimizes the demand functions of all the parties involved. This notion implies then that exchange should be viewed as a collaborative (Speckman et al. 1998) effort across the supply chain. We call this collaboration "*transvectional partnering*," a notion consistent with, but more extensive than the notion of supplier partnering (e.g., Anderson and Narus 1991; Ellram 1995; Speckman, Kamauff, and Myhr 1998) that is popular in the business-to-business literature. The proactive optimization of the joint-demand function is transvectional segmentation *strategy*.

Normative Model: A *market* is the "arena within which exchanges take place" (Buzzell 1999), though the term has been more commonly used to refer to "a set of all actual and potential buyers of a market

offer" (Kotler 2000, p118). A *marketplace* is defined as a "region from which goods can be bought and sold" (Webster's New World Dictionary 1987, also see Buzzell 1999). It is suggested that, in some cases, the term "marketspace" may be more appropriate than "marketplace," as it transcends geographic limitations, and also encompasses electronic marketing activities (Rayport and Sviokla 1994).

Figure 2A represents a hypothetical marketplace/marketspace consisting of 9 suppliers and 35 customers. The focus of the marketing concept has been on determining and satisfying the needs of a buyer (Levitt 1975, Kohli and Jaworski 1990, Slater and Narver 1998). Generally, a retailer devises a "market segmentation strategy" to proactively divide consumers into groups with similar demand functions. In doing so, it aims to minimize within-group variance and to maximize between-group variance. The relatively homogenous groups are referred to as "market segments" (segments 1 to 5 in figure 2A). The retailer then evaluates the opportunities associated with each segment, and chooses one or more segments as its target market(s). Based on the offerings required to satisfy the demand functions associated with each relatively homogenous group, the retailer then selects suppliers.

We suggest that the efficiencies associated with such a process may be sub-optimal for various reasons. First, vendor analysis, primarily transactional in focus, is concerned with the evaluation and selection of alternative vendors in relatively isolated *buying situations*, rather than with an *a priori* understanding and optimal grouping of suppliers along various dimensions. Second, a wide range of variations exists in the evaluation and selection of suppliers. Third, the various activities of the retailer on the supply and demand side are often disjointed from each other, which may result in a misalignment of demand and supply. A transactional approach, characterized by separate up-channel and down-channel transactions is often the norm. Even if relational approaches are practiced, up-channel and down-channel relationships are often independent of each other.

Fourth, the retailer selectively withholds information of its consumers from its suppliers. In some cases, this aggregation of information is treated as a trade secret or competitive advantage in the channel. Fifth, the retailer often places the interests of the supplier below the interests of the consumer and itself. For all these reasons, the flow of offerings in the channel may be less than optimal.

We suggest that a better way of managing supply and demand exists through the broadening of market segmentation theory through the use of the concepts of supply-side and transvectional segmentation. Figure 2B is a graphical representation of our proposed model. It consists of a set of substantive assumptions and relationships aimed at explaining the concept of supply-side and transvectional segmentation.

The relevant participants in the model include (i) the retailer, (ii) a pool of suppliers and (iii) a pool of consumers. The major goal of the retailer (the focal firm) is to *optimally align supply with demand in the marketplace*. In doing so, the retailer *simultaneously* optimizes its up-channel and down-channel decisions, as opposed to separately optimizing them. Stated otherwise, the retailer simultaneously optimizes the transactional utilities of its suppliers and consumers with its own transactional utilities, consequently optimizing the “*transvectional*” utility in the channel. This may result in seemingly sub-optimal transaction, but an optimal transvection.

To achieve the goal of “optimally aligning supply with demand in the marketplace,” the retailer should follow the following steps (see Figure 2B):

1. Analyze Demand and Supply-Side Heterogeneities: The retailer should simultaneously analyze (identify, quantify, characterize and organize) both demand and supply heterogeneity that exists in the marketplace. The marketplace, which is the dyadic intersection of supply and demand, can be disaggregated into consumer segments (henceforth termed demand segments) with distinct demand functions, and into supplier segments (henceforth termed supply segments). The former *marketplace condition* has been referred to as “market segmentation” (Dickson

and Ginter 1987), and we term the latter *marketplace condition*, “supply-side segmentation.”

2. Select Potential Demand and Supply Segments: The retailer should then evaluate the external opportunities presented on both the demand and supply side of the marketplace with its own internal capabilities to select *potential* demand and supply segments. This involves eliminating segments that are not compatible with the retailer’s capabilities or mission, or do not present sufficient potential long-term opportunity to the retailer.

3. Assess the Benefits of Potential Transvectional Segments: The retailer should then evaluate individual supply and demand segments that may potentially form trans-intermediary alignments called “transvectional segments.” A “transvectional segment” can be defined as “a cross-section of the marketplace, consisting of suppliers, intermediaries and consumers, optimally aligned for the purpose of exchange.” This involves simultaneously using information about supply segments, demand segments and intermediaries to evaluate if a cross-sectional market alignment would be mutually beneficial to all parties involved. Inherent in this analysis is the maximization of consumer satisfaction and the minimization of “total costs.”

4. Design a Transvectional Segmentation Strategy: The retailer should then use this information about transvectional segments to design a program that optimally aligns one or more supply segments with one or more demand segments, within the boundaries of its internal capabilities, to satisfy specific needs in the marketplace. This is referred to as a “transvectional segmentation strategy.” The retailer (who, in this case, is the “focal firm”), thus plays the role of “focusing” potentially unfocused (up-channel) supply to potentially unfocused (down-channel) demand. In doing so, it matches external opportunities with its internal capabilities.

5. Monitor and Evolve with the Environment: The retailer should constantly monitor the environment, and accordingly change with the environment by modifying its segmentation strategy to satisfy its customers. The modification of its segmentation

strategy could include changes in its demand-side segments, supply-side segments and transvectional segments. This process is dynamic.

The steps described in the above theoretical model are a set of statements aimed at describing the optimal marketplace environment, the main participants and relationships between them, and the marketing phenomena in question. The main purpose of a theoretical model is to explain certain phenomena (Lilien et al. 1992); in this case, marketing phenomena. It should be noted that a small number of successful organizations such as Dell, Amazon.com and the Limited follow some variation of the steps described in the model, but most other organization do not do so, or do so in an ad hoc, haphazard manner. Our aim was to model the embryonic practices of the successful organizations, and build on them to provide a basic framework that can be modified to apply to most organizations and channels.

Managerial Implications

We have outlined a framework that may help to better identify and exploit supply-side opportunities. In this section, we briefly identify the important managerial implications and benefits of such a framework. These are: (i) *More Precise Identification of Suppliers*: As supply-side segmentation involves understanding supplier heterogeneities and homogeneities, it helps in more precisely defining and identifying suppliers to meet the different demand functions of a firm. (ii) *Strengthen Capabilities to Adapt to Change*: Supply-side segmentation helps in strengthening a firm's ability to change on the supply-side, as demand or other elements in the environment change. As the firm already has an in-depth, organized knowledge of the characteristics of its suppliers, it can easily shift demand from one supply segment to another, or even from one supplier to another within a single segment. Moreover, an information system can constantly monitor changes in demand, and suggest appropriate changes in the supply configuration. (iii) *Supply Modification*: Supply-side segmentation helps suppliers by better identifying what kind of changes they need to accomplish to satisfy the changing or

future needs of their customers. By knowing their supply segment profile based on the perceptions of the customers, suppliers can more easily assess themselves. If necessary, they can make the changes needed in perceptions or actual offerings to place themselves in a supply segment that is more desirable to their customers. Of course, a focal firm can actively facilitate this change through "supply modification." (iv) *Efficient Allocation of Resources*: Supply-side segmentation helps in the effective allocation of a firm's resources, both by making the supply process more efficient, and by shifting functions to the most optimal supply segments in the value chain. (v) *Better Management of Costs*: Through better understanding of supplier characteristics, supply-side segmentation helps channel members to acquire deeper knowledge of the costs incurred by suppliers to perform various functions. With this knowledge, costs can be shifted to the most efficient level in channel. For example, a firm might undertake to perform certain functions like storage or delivery when dealing with foreign suppliers (segment 1), as opposed to domestic ones (segment 2), because of greater cost efficiencies. In addition, supply-side segmentation helps to properly discern the relative costs involved in dealing with different suppliers. Firms can therefore shift demand across suppliers, depending on the cost-benefit ratio of different supply segments. Moreover, in many cases, a firm has little control over prices in the marketplace. A firm is therefore generally more likely to enhance its margins through cost-effective supply decisions than through increase in prices. (vi) *Enhancement of Customer Satisfaction*: The more precise alignment of supply with demand allows for the enhancement of downstream customer satisfaction. Moreover, because of the better structural understanding of supply heterogeneities, demand can be moved across suppliers with relative ease to maximize customer satisfaction. (vii) *Assess Channel Member Strengths and Weaknesses*: Supply-side segmentation helps to better assess the strengths and weaknesses of both the focal firm, its suppliers and its customers, with respect to the functions performed by each member. Strengths of individual members can be leveraged, while weaknesses can be handled through a change in the supply

configuration or through supply modification. (viii) *Better Utilization of Supplier Resources*: Through enhanced knowledge of the characteristics of suppliers, supply-side segmentation helps to better utilize supplier's resources to the advantage of both the focal firm and the supplier. (ix) *Higher Responsiveness to Demand*: A firm gains improved capability to respond to new demand or changes in demand, if it has better understanding of its suppliers' characteristics, and the abilities of different supply segments to meet that demand. (x) *Helps Suppliers in Positioning Themselves*: In addition to helping a firm select appropriate suppliers to satisfy their needs, the concept of supply-side segmentation can also be used by suppliers to position themselves into distinct segments, where the benefits they offer can easily be perceived and utilized by (down channel) firms. In choosing the segment(s) they wish to be identified with, suppliers should consider the largest relative advantage they can obtain by belonging to a particular segment, and differentiating themselves from other segments. (xi) *Response Cycle Time*: The *a priori* segmentation of suppliers helps both firms and their suppliers decrease their response cycle time to take advantage of opportunities in the marketplace. (xii) *Improve Strategic Planning*: Understanding in detail supply segments could assist a firm in its strategic planning. For example, a firm can project long-term changes in its current markets, and make strategic plans on how those changes in demand can be aligned with supply. (xiii) *Creation of Long-term Relationships*: Knowing better the characteristics of its suppliers, a firm can build more viable long-term relationships with them. (xiv) *Competitive Purchasing*: By analyzing the strengths and weaknesses of its competitors, and through better understanding of its suppliers, a firm can devise a purchasing strategy that can specifically help it gain strategic advantages over its competitors.

CONCLUSION

Since 1956, a sizable body of work on market segmentation has been developed in the literature. A systematic framework for demand-side segmentation exists from both theoretical and applied viewpoints. The framework for the study of supply-side heterogeneities has been less well developed. The

goal of this paper is to outline an initial framework to better identify and exploit potential supply-side opportunities.

The introduction of the concept of segmentation in marketing literature by Smith in 1956 has had a tremendous impact on marketing thought and practice. This does not, however, mean that consumer markets were not segmented prior to 1956. Rather, many organizations practiced segmentation, but did so in an unsystematic and potentially sub-optimal manner. The formal introduction of the concept of market segmentation led to systematic thought on the matter, as well as to a framework and guidelines for practitioners to segment their consumer markets. We believe that this paper may make a similar contribution by facilitating systematic thought and practice about the potential efficiencies and competitive advantages that exist on the supply-side of the value chain. Supply segments exist inherently in the marketplace and firms have used various informal heuristics to select and manage their supply pool for years. This paper provides an initial basis for a more formal and systematic theoretical and managerial framework.

The contribution of this paper should not, however, be overstated. In-depth empirical validation, beyond the scope of this paper is, of course, needed. Similarly, a more in-depth examination of the concept and implications of "transvectional segmentation strategy" from both a demand- and supply-side perspective need to be carried out. No doubt, further conceptual and empirical work is needed to obtain a comprehensive theory of supply-side segmentation. It seems to be a fair conclusion, however, to say that this paper makes a reasonable contribution towards a better understanding of the identification and exploitation of supply-side opportunities.

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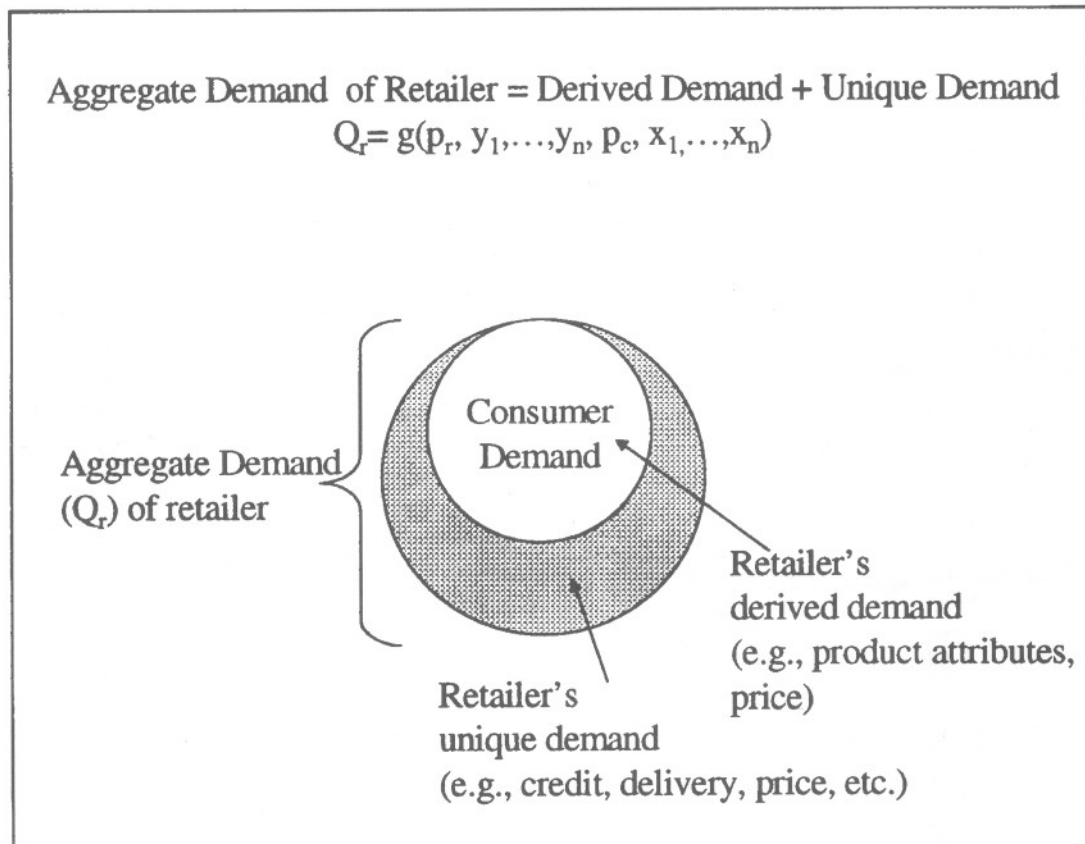
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- ¹ We define the term "supply-side" as the up-channel perspective of a firm, and "demand-side" as the down-channel perspective. "Up-channel" and "down-channel" are relative terms from the reference point of any firm in the supply chain.
 - ² The use of an approach prior to its identification and development in academic literature is not unusual. A similar situation existed with "traditional" market segmentation when Smith formally introduced the concept. Smith (1956), in addition to "officially" recognizing these activities as falling under the rubric of "segmentation," helped in providing a framework for further thought and systematic development of this concept.
 - ³ An analogous concept called the "focal company" has been used by Spekman et al. 1998.
 - ⁴ As stated before, "up-channel" and "down-channel" are relative terms from the reference point of any firm in the supply-chain.
 - ⁵ The demand function of a firm includes both unique and derived demand components.
- The authors would like to acknowledge the contributions of Gunter Wessels for his assistance and useful suggestions during the writing of this paper.**

TABLE 1
Supply-Side Segmentation: Concepts and Definitions

Concept	Definition	Comments
Market Segmentation	Heterogeneity in demand functions exists such that market demand can be disaggregated into segments with distinct demand functions (F_i 's). (Dickson and Ginter 1987)	$Q = F(p, x_1, \dots, x_n)$ $= \sum_I Q_i$ $= \sum_I F_i(p, x_1, \dots, x_n)$
Supply-Side Segmentation	A state of supply heterogeneity, where the total supply pool can be disaggregated into segments that may satisfy distinct demand functions in the marketplace.	A positive condition of the marketplace. $Q_r = g(p_r, y_1, \dots, y_n, p_c, x_1, \dots, x_n)$
Supply-Side Segment (Supply Segment)	A relatively homogenous sub group of the supply market, where any member of the sub group is a potential source to satisfy distinct demand functions in the marketplace.	The supply segment results from the perceptions of homogenous sub groups within the supplier market.
Supply-Side Segmentation Strategy	The use of information about supply segments to design a program to exploit the unique characteristics of suppliers to satisfy the distinct demand functions of a firm ¹ .	A normative issue of strategic concern to the focal firm, which can also be thought of as a supplier performance optimization strategy.
Supply Pot	A comprehensive aggregation of supply segments that potentially could satisfy different distinct demand functions ⁶ of the focal firm (in this case, the retailer).	A supply pot consists of a number of supply segments that can potentially be used to satisfy distinct demand functions of the retailer.
Supply Configuration	An optimal subset of suppliers from the supply pot that is selected at any specific time to satisfy the distinct demand functions of a focal firm.	A retailer can change its supply configuration at any time in response to changes in the environment.
Supply Modification	The alteration of supply to satisfy demand.	The result of a desire by the focal firm to bring about changes in its suppliers and their offerings in a manner that is most favorable to the focal firm and its consumers.
Transvectional Segmentation	Heterogeneity exists at different levels of the supply chain, such that market demand at each level can be disaggregated into segments with distinct demand functions.	A positive condition of the marketplace. A geometric expansion of heterogeneities.
Transvectional Segment	A cross-section of the marketplace, consisting of suppliers, intermediaries and consumers, optimally aligned for the purpose of exchange.	The transactional utilities of suppliers, intermediaries and consumers are simultaneously optimized.
Transvectional Segmentation Strategy	The use of information by about transvectional segments by a retailer (focal firm) to design a program that optimally aligns one or more supply segments with one or more demand segments, within the boundaries of its internal capabilities, to satisfy specific needs in the marketplace.	The retailer plays the role of "focusing" potentially unfocused supply to meet potentially unfocused demand.

FIGURE 1
The Aggregate Demand Function of a Focal Firm (e.g., retailer)



The retailer's aggregate demand function consists of "dervied demand" from its consumers and its own "unique demand."

FIGURE 2A
Current Framework in the Marketplace

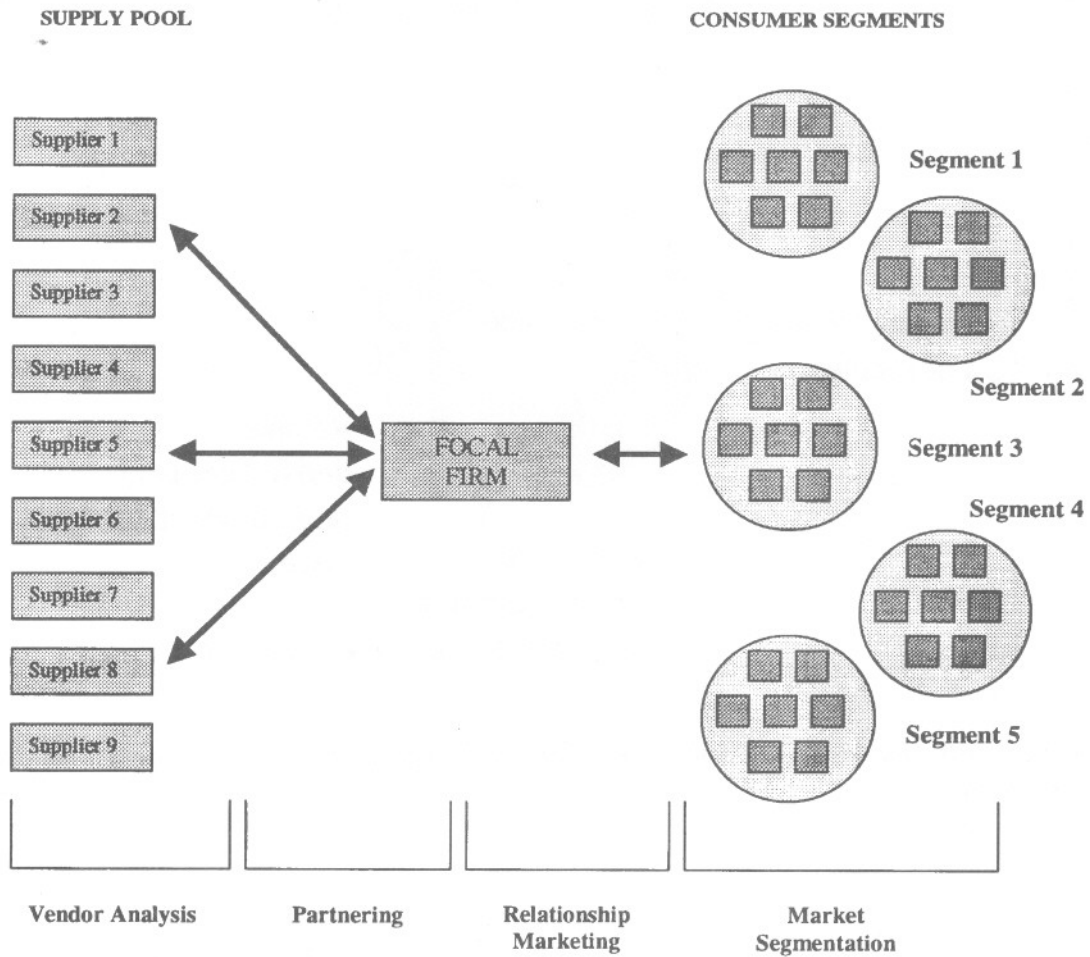


FIGURE 2B
Proposed Framework for the Marketplace

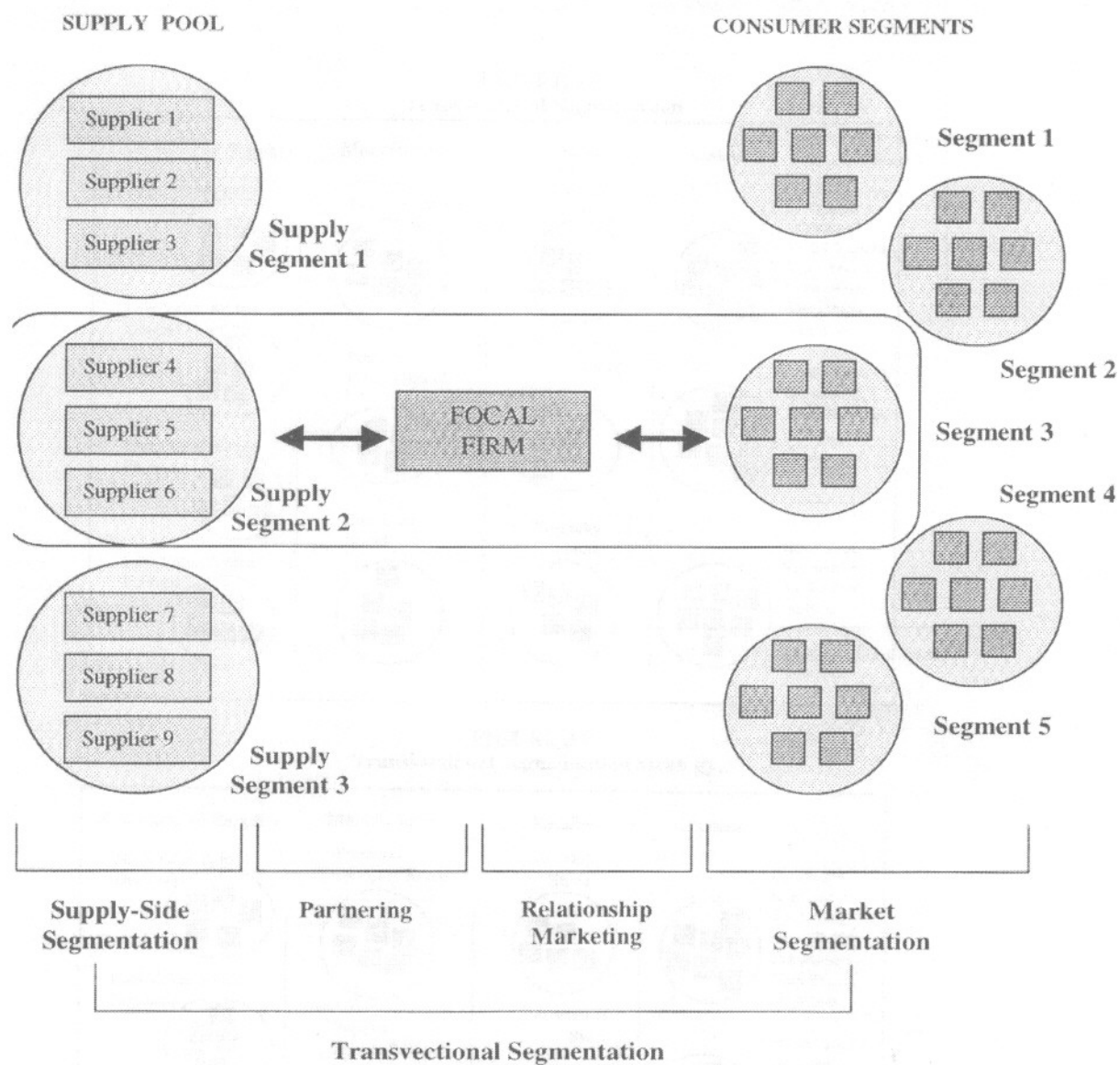


FIGURE 3A
Transvectional Segmentation

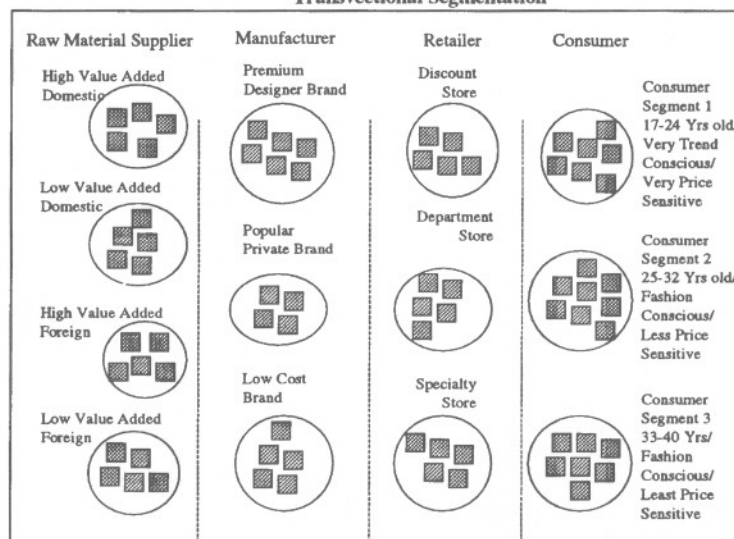


FIGURE 3B
Transvectional Segmentation Strategy

