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CHANNEL STRATEGY ADAPTATION

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Abstract

Using transaction cost theory, considerable research in marketing has focused on conditions under which firms would use direct or vertically integrated versus indirect or arms-length channels of distribution. Data from the field, however, indicate that channel configurations are more varied and complex, with multiple channels and composite channels being just as common as direct and indirect channels.

In an attempt to explain this variety, this paper revisits the influence on channel structure of another contending variable, namely environmental complexity. We explore the role and influence of its two components, namely volatility (stability) and heterogeneity (homogeneity).

Our study of 139 firms in the healthcare industry reveals that firms facing highly volatile and customer-concentrated environments tend to use direct channels, while firms facing highly stable and heterogeneous environments tend to use indirect channels. Intermediate forms such as composite channels and multiple channels were favored by firms facing combinations of these two types of environments, where the intensity of one component is high and the other low. In general, firms seem to first choose a business strategy to address their external environment, and then choose a channel strategy to support that business strategy. Firms did not always adapt by making structural changes. Under certain conditions, they simply reallocated channel functions within the same structure, thus deriving virtually all the benefits of a new structure without having to actually create one.

CHANNEL STRATEGY ADAPTATION

1. Introduction

Since the publication of Williamson's influential transaction cost theory (TCT) (Williamson 1975, 1985), considerable empirical research in marketing has focused on conditions under which firms would use direct or vertically integrated versus indirect or arms-length channels of distribution (see, for example, Anderson and Schmittlein 1984, Coughlan and Wernerfelt 1989, John and Weltz 1988, and Klein, Frazier, and Roth 1990). Data from the field, however, indicate that channel configurations are more varied and complex than the dichotomy proposed by TCT (Anderson, Day, and Rangan, 1997; Rangan, Corey, and Cespedes 1993). Many firms use a combination of direct channels (e.g., salesforce) and indirect channels (e.g., distributors).

Consider, for example, the market for personal computers. IBM and Compaq, the market leaders, sell direct, through value-added-resellers and also through retailers, often to overlapping customer segments. Another example is Goodyear's multiple channels for selling tires—franchised dealers, tire discount chains (such as National Tire Warehouse), and mass merchandisers (such as Sears). Manufacturers in several other industries, even while using a distribution channel, may assume one or two critical channel functions directly—typically the demand generating or demand influencing functions. Called pull-through selling, this is quite commonly used by many industrial product firms, such as 3M Company and Becton-Dickinson—that is, the direct and indirect channels combining their efforts to serve the customer, rather than any one of them handling it all.

Theorists have argued that many of these intermediate forms are purely transitional and would eventually be replaced by the pure form, i.e. direct or indirect, in the long run, under stable conditions. Empirically that appears not to be the case. Many firms under stable market conditions have adopted a multiplicity of approaches of going-to-market, and these channel patterns have persisted long enough to be mistaken for an aberration. So there has to be some complementary explanation that transcends the TCT-based asset-specificity rationale (1).

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(1) According to TCT, when high levels of asset-specific investments (durable investments that cannot be redeployed without substantial loss of value) are required in downstream channels, vertical integration (or direct channels) are most transaction cost effective. Conversely, when low levels of asset-specific investments are sufficient, indirect distribution channels are the more efficient transaction cost alternative.

This paper attempts to revisit the influence on channel structure of another contending variable, namely environmental complexity, which has had a long tradition of research in the marketing and strategy literature. Influenced by the early work of Strategic Contingency Theorists (SCT) (Lawrence and Lorsch 1967, Pfeffer and Salancik 1978, and Thompson 1967), marketing scholars have attempted to study the impact of environmental complexity on various channel decision-making processes (e.g., Dwyer and Oh 1987, Dwyer and Welsh 1985, Spekman and Stem 1979). Several of these studies have focused on how the complexity of the external environment influences centralized, participative, or specialized channel decision-making processes. The Dwyer and Welsh (1985) study is particularly relevant to our research because, in addition to channel decision-making processes, it also addresses questions of channel configuration. The study concludes that in complex environments (characterized by varying customer demand), firms tend to use fewer intermediary levels and more direct channels. Curiously, there has been little further development of Dwyer and Welsh's (1985) ideas in the marketing literature, but marketing scholars have continued their investigation of the impact of environmental complexity on channel structures through the lens of TCT.

While not its central focus, TCT offers directions regarding the effect of environmental uncertainty (one component of environmental complexity) on channel structure. According to TCT, when high levels of uncertainty combine with high levels of asset specificity, the trend toward vertical integration is further strengthened. At low levels of asset specificity, uncertainty (regardless of whether it is high or low) has no significant impact on channel structuring (i.e., firms utilizing indirect channels will continue to use indirect channels). These predictions have found mixed validation in the marketing literature. Anderson (1985) reported that rather than external uncertainty, difficulty in evaluating channel performance (she labeled it "Internal uncertainty") was more influential in determining a higher level of vertical integration. Klein, Frazier, and Roth (1990) reported mixed results offering mild support. Only John and Weltz (1988) found that external uncertainty forces vertical integration.

In summary, while the TCT approach provides guidance on conditions under which firms would use direct versus indirect channels, its conclusions and verifications in the face of environmental uncertainty are somewhat equivocal. As pointed out earlier, SCT applications in marketing channels have declined after a brief flourish in the early 1980s. Moreover, most of that work focused on channel decision-making processes rather than channel structure (with the exception of Dwyer and Welsh 1985). Finally, there still does not appear to be a robust framework for understanding the variety of channels we observe in the field.

Our research attempts to pick up the investigative stream on the impact of environmental complexity. To that extent, it is a continuation of the application of SCT in marketing channels. In keeping with the research in the strategy literature, we conceptualize environmental complexity along the two dimensions of heterogeneity/homogeneity and volatility/stability (Aldrich 1979, Dess and Beard 1984, Leblebici and Salancik 1981, Miles and Snow 1978, Scott 1987). Heterogeneity is defined as the variability in the critical resources of a business. From a channels perspective, customers are the "downstream resource" that producers attempt to gain. Hence, marketing scholars have interpreted environments characterized by widely varying customer sizes, needs, and buying behaviors as heterogeneous (e.g., Achrol and Stern 1988, Anderson and Weltz 1983).

Volatility is a measure of unpredictability. Thus, fluctuations in customer demand that are hard to predict constitute volatility. Seasonality and cyclicality are predictable

changes and hence do not come under the definition. Competitive intensity (conduct) and behavior (entry and exit), as well as the effects of technological changes, cause uncertainty in the customer environment, and several marketing scholars have measured them directly as indicators of volatility (Achrol and Stern 1988, John and Weltz 1988, Klein, Frazier, and Roth 1990).

Klein, Frazier, and Roth (1990) argued that firms would use direct channels under conditions of increased "volatility" and more distribution channels under conditions of increased "heterogeneity". Their empirical study provided directional support even though the statistical effects were not significant. There is not much available in the literature, however, for interpreting channel structures that are neither direct no indirect. These are the multiple channels, composite channels and other combinations that are widely used by manufacturers to reach their customers. Multiple channels, as the name implies, give customers the option of sourcing products and services through more than one distribution channel. Note that as per our definition, a firm using two separate channels for two different customer segments would not be considered "multiple". The multiplicity has to be present at the customer end. Composite channels, on the other hand, involve two or more channel members who work in partnership to serve the customer. The customer has only one option, the composite option. Such a structure is also referred to as a hybrid channel in the literature. While attempts have been made to interpret these intermediate forms through the lens of "asset specificity" (see Rangan, Corey, and Cespedes 1993, Walker and Weber 1984), the role of the external environment in shaping such channels has been less studied.

In this paper, we attempt to explore the role and influence of the two components of environmental complexity, namely volatility and heterogeneity, on channel structure, defined broadly to include intermediate forms in addition to the traditionally studied "direct" and "indirect" alternatives.

As a preliminary hypothesis, based on extant research, we expect more direct channels in "volatile" environments and more indirect channels in "heterogeneous" environments.

Strategic Contingency Theorists have for long underscored (see Grandori 1987 for a review) the evolutionary aspects of organizational structure. According to this line of thinking, only the better adapted firms in terms of a fit with their chosen environments will succeed in the long run. This adaptation process has been studied in the strategy literature in the context of "differentiation" or "integration" of departments and the functions they form. In the context of this study, channel structure becomes the appropriate focus variable. Therefore, according to this SCT interpretation, only firms that have suitably adapted their channel structures to the needs of their output environment will be able to succeed. Most research has used firm performance as a surrogate for potential sustainability (for example, Lawrence and Lorsch 1967, Eisenhardt and Zbaracki, 1992). Accordingly, we offer a variation of our preliminary hypothesis: As a consequence of superior adaptation, we expect more direct channels in "volatile" environments and more indirect channels in "heterogeneous" environments only among firms that deliver superior performance. And as mentioned before, because of the lack of theory regarding hybrid and multiple channels, we have no predictions. It is one of the goals of this research to offer insights regarding other origins and evolution. With regard to the intermediate channel forms (i.e., composite and multiple channels), as the published literature does not provide directions, we approached the research with an open mind. We wished to develop, rather than test, theory.

The rest of the paper is divided into five parts. In Part 2 we briefly outline the empirical context of the study; in Part 3 we present the variables and their measures; in Part 4 we discuss the results of our empirical study; and finally, in Part 5 we provide conclusions and directions.

2. Data collection

We chose the healthcare industry as the venue for our empirical investigation, because our library research and knowledge from the popular press indicated that many firms in this industry perceived their environment to be complex and dynamic. Of course, there were other industries that qualified on this criterion as well, but using the pragmatic screen of data access, we settled for the healthcare industry as the appropriate research site.

Following Lehman (1985), who advocates sampling all significant customers in industrial surveys, we first compiled a comprehensive, national list of firms belonging to six sectors of the medical equipment and supplies industry with a market share of at least one percent in their respective sectors. *Dunn's Guide to Healthcare Companies* (1989-1990) and the *Medical and Healthcare Marketplace Guide* (1990) were used for this purpose. Together with phone verification, this yielded a total count of 294 firms. After seeking cooperation on the phone, questionnaires were mailed to individuals responsible for marketing strategy decisions (i.e., vice presidents, directors, and marketing managers) in each of the 294 firms. A total of 155 of 294 (52.7%) questionnaires were returned; however, sixteen cases had to be subsequently dropped because of incomplete questionnaires and other data problems. The effective sample size, therefore, was n=139, which converts to a final response rate of 47%.

Preliminary steps in questionnaire development and refinement included two rounds of pre-tests with healthcare marketing managers and several in-depth interviews with purchasing managers of area hospitals and marketing managers within the healthcare industry. The final version of the questionnaire, in addition to eliciting the firm's business context, asked respondents to assess the environmental complexity facing their firms, the channel types they used to reach their customers, the levels of business performance they had attained, and the extent of the channel's participation in distribution activities.

Following the empirical analyses, we structured follow-up field visits to selected firms from our sample to better understand the dynamics of their channel adaptation and evolution. This gave us an opportunity to more richly interpret our empirical conclusions. Their responses to our questionnaire served as a starting point to structure our field investigations. The field interviews attempted to understand the rationale for their channels' evolution, as espoused by key managers. The idea was to get a deeper understanding of some of the causal relationships identified by the survey results.

3. Measures

Environmental Complexity Measures. As previously noted, our environmental complexity measures were based on Achrol and Stern (1988), Dess and Beard (1984), Dwyer and Welsh (1985). Accordingly, a battery of sixteen items measuring volatility and heterogeneity was developed for this purpose.

Environmental complexity measures (see Table 1) were evaluated in terms of their reliability, unidimensionality (i.e., the evidence on congeneric measures; Hunter and Gerbing 1982; Jöreskog and Sörbom 1989), and discriminant validity. Unidimensionality was assessed in terms of internal and external consistency (cf. Anderson, Gerbing, and Hunter 1987), using procedures specified by Hunter and Gerbing (1982) (1), with the help of ITAN (Gerbing and Hunter 1988). Internal and external consistency are conceptually analogous to convergent and discriminant validities, respectively (Hunter 1973). Table 2 shows that reliabilities were in the acceptable range (Part A, diagonal entries), and exceed .65 in all cases. Internal consistency is demonstrated by the consistent non-significance of X^2 tests on residuals; similarly, the external consistency claim is supported by the high similarity coefficients (i.e., Ø indices) that equal or better .92 (Table 2, Part B).

Further evidence of discrimination is provided by the comparison of reliabilities and inter-trait correlations among item-summed scales (i.e., all correlations are lower than reliabilities; Table 2, Part A). However, the process of measure purification required the exclusion of three scale items (one volatility item and two heterogeneity items) originally included in the instrument. A final diagnostic of measures is provided by a Factor Analysis of the final thirteen items (Table 1), which shows the emergence of four factors which cumulatively accounted for 59.6% of the variance in the data. The factors were focused on *demand volatility, competitor volatility, customer heterogeneity*, and *customer concentration.* As can be seen from Table 1, the eight variables measuring volatility loaded onto two factors, one representing demand fluctuations and technological changes *(demand volatility)* and the other representing competitive behavior (*competitor volatility*). The five variables measuring heterogeneity loaded onto two factors, one representing *customer heterogeneity* in terms of their buying behaviors and the other representing low or high customer concentration (*customer concentration*).

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(1) *Internal consistency,* or the extent to which correlations among indicators of a trait are attributable solely to that common trait, was tested by evaluating the residual inter-item correlations with trait effects partialed out (Hunter and Gerbing 1982, p. 278). X^2 tests were performed to check the significance of residual correlations. Note that, in the latter case, *non-significant X^2* results signify internal consistency. *External consistency,* or the extent to which correlations among indicators of different traits are solely a function of correlations among the traits themselves, was verified by computing similarity coefficients (ø's) across the full set of items (Hunter and Gerbing 1982, p. 281). Table 2 reports mean ø indices (range ± 1.0), where ± 1.0 scores indicate perfect external consistency.

Table 1
Description of Environmental Uncertainty Measures

A. Varimax Rotated Factor Matrix

Variables ↓ / Factors →	Demand Volatility	Competitor Volatility	Customer Heterogeneity	Customer Concentration	Scale Anchors ↓
Principal Competitors	.03045	**.82427**	.07346	-.00922	1 = 1 - or More; 5 = None
Competitive Entry	.16210	**.81421**	.10109	-.12754	1 = 10 or More; 5 = None
Competitive Exit	.10093	**.68387**	-.08562	.13961	1 = 10 or More; 5 = None
Demand Patterns	**.46231**	.04327	-.11784	.11419	1 = Unpredictable; 3 = Stable
Technological Change (Past)	**.72319**	.03213	.03205	-.00678	1 = Rapid; 7 = No Change
Technological Change (Future)	**.85153**	.01798	.01633	-.02602	1 = Breakthroughs; 7 = No Change
Untapped Market Potential	**.73392**	.08855	.17812	-.05360	1 = Large; 7 = Small
Business Climate	**.44698**	.12381	-.10895	.01771	1 = Volatile; 7 = Stable
End-User Distribution	-.16539	.16509	**.64223**	.31910	1 = Scattered; 7 = Concentrated
End-User Identification	.04004	-.04224	**.83771**	-.01983	1 = Difficult; 7 = Easy
End-User Buying Process	.01052	.00604	**.77868**	.02541	1 = Widely Varying; 7 = Smaller
Large Customer Concentration	.07137	-.02738	.08974	**.90664**	1 = Less than 25%; 4 = 75%-100%
Small Customer Concentration	.01497	.03164	.08217	**.90538**	1 = 75%-100%; 4 = Less than 25%
Eigenvalues	**2.519**	**2.124**	**1.646**	**1.464**	**Cum.Var. Explained 59.6%**

Table 2
Assessment of Environmental Uncertainty Measures

A. Reliability and Inter-Trait Correlations

Constructs (No. of Items) ⟶	Demand Volatility T1 (5)	Competitor Volatility T2 (3)	Customer Heterogeneity T3 (3)	Customer Concentration T4 (2)
T1	.67			
T2	.2370 (p<.05)	.69		
T3	.0677	.0620	.66	
T4	.0681	.0300	.1953 (p<.05)	.83

B. Unidimensionality (1)

Internal Consistency

Residual Means	.0594	.0393	.0453	.0455
X^2 (p-value)	5.81 (p>. 10)	1.49 (p>. 10)	2.08 (p>. 10)	Not Applicable

External Consistency

Mean Ø Score	.9544	.9500	.9200	.9900

(1) Ø values and residual mean scores were computed using formulae proposed by Hunter and Gerbing (1982: 278-28 1) . The inferential X^2 test was mounted using $X^2 = \Sigma P^2 . \sqrt{n-2}$ where ΣP^2 is the sum of squared partials (i.e., residuals), n is the sample size, and df is defined as number of partials compared minus one. This X^2 test for two-item scales is not possible because df = 0.

Channel Type Measures. We asked respondents to indicate the channel type/combinations used by them to sell a majority of their sales volumes for the particular product sector under investigation.

Thus, the channel data reported in this study are at the level of a product segment. The responses were coded into four channel types in decreasing order of manufacturer participation in channel activities.

Traditionally, the first two channel types would be considered direct and the last two indirect, but because of our broader interest, we have categorized them into four types:

Direct: When manufacturers sold exclusively through their own salesforce and/or through company-owned distributors.

Composite: When manufacturers sold through a combination of company-owned salesforce and independent distributors, with the two working together to effect common sales. The channel activities in this instance were shared; the activities associated with generating the sale were usually effected by the company-owned salesforce with support from the distributor, and the activities associated with fulfilling the sale were effected by the distributor with help from the manufacturer.

Multiple: When the company-owned salesforce and/or independent distributors and/or agents each sold to the targeted customer segment. It is the overlap of two or sometimes three channels with access to the same customer segment that defined this alternative.

Indirect: When all sales to end-users were exclusively handled by outside distributors or agents. The company did not extend its effort beyond the distributor.

Performance Measures. The performance of the firm was evaluated using two self-reported measures. Respondents were asked to provide their approximate market share rank in their product group (response range was: first, second, third, fourth, and fifth or lower), and their overall profitability (response categories were: below industry average, about industry average, and above industry average) in the last three years. Firms with a market share rank of first, second or third with higher than industry average profitability were classified as *Better Performing* firms (51 firms), and the remainder were designated *Worse Performing* firms (88 firms) (1). While this performance classification may appear somewhat subjective, it has precedents in both the PIMS literature (Buzzell and Gale 1987) and the more recent work within marketing (Deshpande, Farley, and Webster 1993; Noordewier, John, and Nevin 1990). We would have liked more precise information on sales, profits, and market share, but when pre-testing, we learned that many respondents considered such information too sensitive to reveal. However, in order to confirm its validity, we also gathered data on indirect measures of performance. These consisted of measures of the firms' strengths vis-à-vis competition along several dimensions, such as strength of distribution network, sales network, product quality, product line breadth, channel leadership and price leadership. While these measures were also self-reported, they provide a valuable cross-validation of our performance measures. We expected the better-performing firms to manifest their strength through higher scores on these attributes. A MANOVA revealed significant

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(1) As an exception, three firms with high market share who reported only "average profitability" were included in the *Better Performing* category.

differences between the better-performing and the worse-performing groups (Pillal's Trace .14, p<.001), confirming our grouping criteria.

4. Data analyses and interpretation

Recall that, supporting our *a prior*i expectations, the factor analysis of the environmental uncertainty measures had yielded four factors, labeled as *demand volatility, competitor volatility, customer heterogeneity,* and *customer concentration* (Table 1). We next composed factor scores for each firm along these four dimensions (i.e., the four factors), using coordinate information from the factor solution. Using these factor scores as the independent variables and the four channel options as the dependent variable, we estimated two logit models; one for the entire data base of 139 firms, and one only for the 51 high performance firms. Both models offered only a modest degree of fit. As mentioned before, there was no *a priori* theory to support the multinomial channel choice model, and the lack of a fit merely underscored the need to better understand the data from a theory-building rather than a theory-testing perspective. With that in mind, we used a data-analysis approach that helped us understand the variation in our sample in a contingent framework.

We performed a hierarchical cluster analysis (Table 3) based on the four factor scores to identify clearly differentiated environmental groups (1). The cluster analysis isolated three distinct groups in the sample. As the means of Table 3 attest, these groups differ in how they perceive the environments facing their firms. The inferential statistics also suggest differences amongst the three groups (Table 3, lower half). MANOVA points to the overall differences, while ANOVAs show significant group differences along all four factors. Finally, Duncan's tests find most group comparisons to be significant in specific paired comparisons. In sum, cluster analysis yielded clearly demarcated, internally valid industry groups with significant differences along the theoretically meaningful variables of perceived heterogeneity and volatility.

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(1) The hierarchical clustering approach initially designates each respondent as a unique cluster, and then successively merges respondents/clusters until all respondents that display similarity of response patterns are included within single clusters. Squared Euclidean distance and Ward's linkage method, respectively, were used as the proximity measure and the clustering algorithm; their choice appearing appropriate for the current task (cf. Hair, Anderson, and Tatham 1987; Punj and Stewart 1983). Since cluster solutions are not inferentially based, successful internal and external validation using probabilistic statistics acquires critical significance (cf. Speece, McKinney, and Appelbaum 1985). Consequently, both forms of validity were checked for and found to hold (Table 2).

Table 3
Cluster Analysis Results: Description and Internal Validation

	Description of Clusters (1)		
	Cluster 1	Cluster 2	Cluster 3
Cluster Size ⟶	N = 58	N = 5	N = 36
Cluster Label ⟶	**Volatile-Large Customers**	**Stable-Large Customers**	**Volatile Small Customers**

Constructs ↓

Description	Means	Std. Dev.	Means	Std. Dev.	Means	Std. Dev.
Demand Volatility	2.997	.655	4.515	.553	3.515	.805
Competitor Volatility	3.339	.701	3.958	.371	3.784	.430
Customer Heterogeneity	4.880	.775	5.283	.722	4.821	1.039
Customer Concentration	3.107	.448	3.125	.449	1.898	.585

Internal Validation

Univariate Summary (ANOVA)	F-Ratio (p-value)	Power of Test (1-ß)	Duncan's Paired Comparisons Significant at .05
Demand Volatility	59.04 (.00)	.99	All Pairs
Competitor Volatility	18.18 (.00)	.99	Clusters 1&2, 1&3
Customer Heterogeneity	3.76 (.03)	.68	Clusters 1&2, 2&3
Customer Concentration	103.69 (.00)	.99	Clusters 2&3, 1&3
Multivariate Summary (MANOVA)	47.82 (.00)	.99	

(1) Smaller mean values show greater levels of volatility and heterogeneity.

The contrasts between the clusters is evident from Table 3 and Figures 1(a) and 1(b). Cluster 1 is composed of firms that perceived a high degree of volatility (as opposed to stability) and a moderate degree of heterogeneity in their environment. Firms in this cluster reported a high level of demand and competitive volatility. The mean scores of the variables composing the homogeneity/heterogeneity construct indicated that firms in this cluster had a high concentration of large customers. The buying behavior variations were less significant. We therefore label this segment **Volatile-Large Customers.** In contrast, Cluster 2 is composed of firms that perceived a high degree of stability in their environment, especially with respect to demand fluctuations. There were minimal buying behavior variations, and the customer base was even more skewed in the direction of large customers. We label this segment **Stable-Large Customers.** In contrast to Clusters 1 and 2, Cluster 3 is characterized by a modest degree of customer heterogeneity, but certainly a higher concentration of small end-users. This segment displayed moderate demand volatility as well. We therefore label this segment **Volatile-Small Customers.**
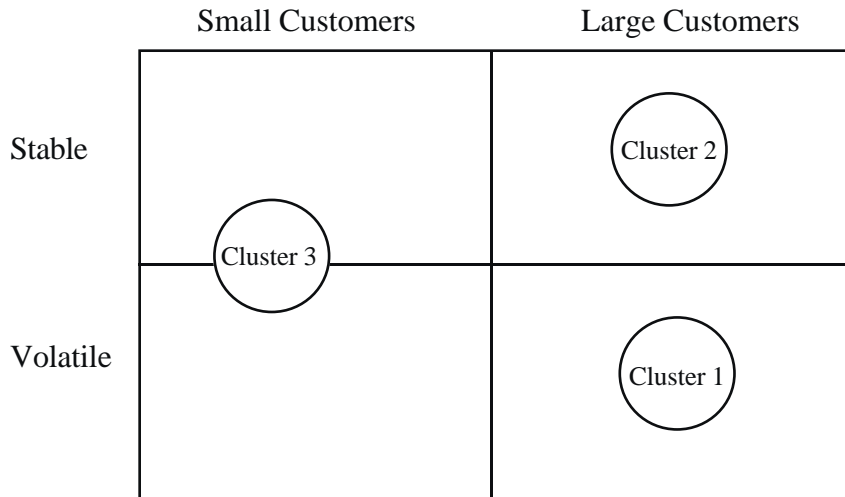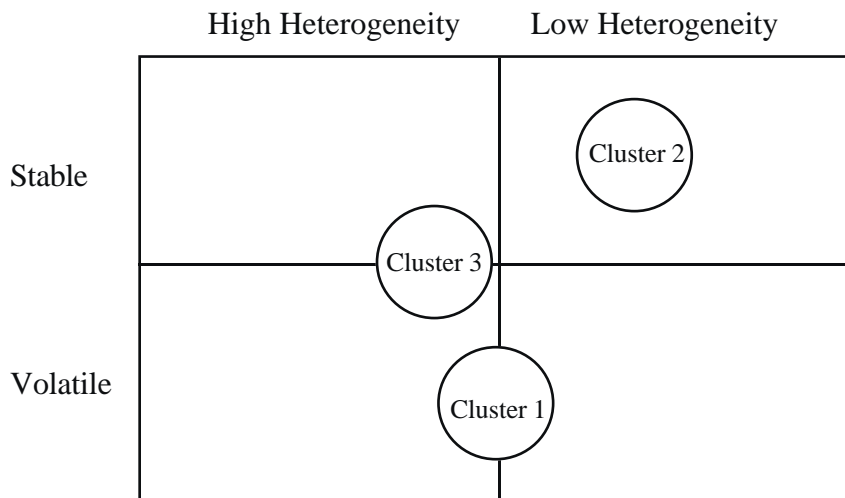
Figure 1a
Cluster Locations

Figure 1b
Cluster Locations

The channels of distribution used by the firms in each of these three segments is indicated in Table 4. Firms in Clusters 1 and 2 as compared to firms in Cluster 3 used a significantly higher proportion of direct channels, and conversely, firms in Cluster 3 used a significantly higher proportion of indirect channels. We believe this difference is driven by the dispersion and size of customers in Cluster 3. They are on the average smaller, and moderately more heterogeneous compared to their counterparts in the other clusters. Interestingly, at a first blush, Clusters 1 and 2 displayed more or less similar distribution patterns, even though one was characterized by a volatile environment and the other by a stable environment. We believe that the composition of these clusters—large, identifiable customers—skews them both in the direction of direct channels, drowning out the effects of the volatility-stability dimension.

Table 4
Channels of Distribution: Adaptation by Environment

	Cluster 1 Volatile - Large Customers h = 58	Cluster 2 Stable - Large Customers n = 45	Cluster 3 Volatile - Small Customers n = 36
	%	%	%
Direct[a]	34.5	31.1	19.4
Composite[b]	29.3	42.2	27.8
Multiple[c]	19.0	17.8	22.2
Indirect[d]	17.2	8.9	30.6

At p = .05, z test for difference is significant for the following pairs:

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[a] Clusters 1,3 and 2,3.
[b] Clusters 1,2 and 2,3.
[c] None.
[d] Clusters 1,3 and 2,3.

Specifically, then, the homogeneity/heterogeneity dimension appears to influence a firm's choice of direct versus indirect channels, confirming previous speculations (Dwyer and Welsh 1988, and Klein, Frazier, and Roth 1990). Direct channels appear to be the preferred alternative in homogeneous markets composed of large customers, and indirect channels in (moderately) heterogeneous markets composed of many small customers. To put it even more simply, direct channels are preferred when selling to large customers and indirect channels when selling to a more dispersed set of smaller customers. This result is intuitive, simple, and makes perfect managerial sense. But it is important to underscore that it is the combination of large customers with fairly similar buying patterns that seems to drive direct channels; just as it is the combination of small customers with varying buying behaviors that seems to drive indirect channels.

TCT scholars could argue that this result is perfectly explained by TCT's asset specificity construct (see Anderson 1985). The argument is that deep customer knowledge and a close relationship is a prerequisite when dealing with large customers, and that such knowledge is unique and nothing but a manifestation of human asset specificity (i.e., the specialized account manager). However, this raises the question of whether "asset specificity" is the causal or caused construct. Our findings indicate that environmental complexity is the more appropriate antecedent. The construction of an account-specific salesforce is simply an adaptive response to the environment. In other words, the nature of the environmental complexity affects the choice of downstream asset specificity, which in turn defines channel structure.

Our results do not dispute the influence of the other dimension of environmental complexity (namely, volatility) on channel integration (i.e., the higher the volatility, the higher the level of vertical integration); they merely indicate that market homogeneity and customer size appear to be strong causes as well.

When the clusters are further divided into better-performing and worse-performing firms, some interesting nuances become discernible; and the role of volatility emerges more clearly, as can be seen in Table 5.

A significantly higher percentage of the better-performing firms in Clusters 1 and 2 (i.e., the large end-user environment) use either a direct or a composite channel to reach their customers (84%) than the worse-performing group. Our speculation is that when serving large customers, because of the order sizes involved, suppliers prefer to take control of their distribution channel. There is too much business at stake. They could do this by selling directly or by a composite arrangement where they manage the up-front selling functions themselves, while the back-end fulfillment functions are managed by the distributor. In either case, the supplier is directly involved in generating the sale.

Table 5
Channels of Distribution: Adaptation by Environment and Performance Group

	Cluster #1 Volatile - Large Customers	Cluster #2 Stable - Large Customers	Cluster #3 Volatile - Small Customers
Better Performing Group	n=23	n=19	n=9
	%	%	%
Direct	52.2[a]	21.1	22.2
Composite	30.4	63.2c	22.2
Multiple	13.0[b]	10.5	33.3
Indirect	4.3	5.3	22.2
Worse Performing Group	n=35	n=26	n=27
	%	%	%
Direct	22 .9[a]	38.5	18.5
Composite	28.6	27.0[c]	29.6
Multiple	22.9	23.1	18.5
Indirect	25.7[b]	11.5	33.3

[a,b] At p = .05, the z test for difference is significant for direct as well as indirect channels across the better and worse performing groups.
[c] At p = .05, the z test for difference is significant for the composite channel across the better and worse performing groups.

Because of the small n for the high performance group, tests for differences were not computed.

When comparing channel preferences among Clusters 1 and 2, it is clear that the preference for the direct channel is stronger among the better-performing firms in the volatile environment than among those in the stable environment. This is very much in keeping with the predictions of TCT regarding the impact of uncertainty on vertical integration. To start with, large customers are crucially important for the business because of the volumes they bring. In addition, when the environment is volatile because of both competitor activity and demand uncertainty, it may make sense for the manufacturer to be in a position to control its own destiny by vertically integrating (or going direct). This way it would not be subject to the vagaries of the middlemen and their opportunism or lack of commitment to the manufacturer's brand.

It is interesting to note, however, that the better-performing firms in Cluster 2 preferred composite to direct channels, even though they served large customers as well.

Firms in Cluster 2 face a tug-of-war between the environmental effects of stability versus large customer concentration and homogeneity. On the one hand, the stable environment drives them towards distribution channels, because under such circumstances it would be possible to specify and manage every eventuality in a third-party contract instead of resorting to the costlier internal option. On the other hand, because of the large customer concentration and little variation in their buying behaviors, a direct channel is preferred. The end result is a hybrid, with some functions being performed directly and others being delivered through the intermediary. The composite channel, then, is a useful way to tap into the economies of transportation, scope, and other conveniences that distributors bring to the customer, without giving up the effectiveness of accessing and negotiating with the large customers directly. In spite of the large order sizes, distributors may be the more cost-efficient route for order fulfillment when scope economies are involved, especially the larger distributors. That is because distributors are able to put together an assortment for the customer that is much broader than any one supplier's product range, thus economizing on the multiple order processing and shipment costs that customers would have to bear if they ordered directly from their respective suppliers. Such an approach seems to be more successful in a stable rather than a volatile environment, vertical integration being the preferred option in the latter. As discussed before, in a volatile environment, it would be impossible to write a contract that predicts every eventuality. Thus, a firm may wish to control many of the distribution channel functions in order to gain the necessary agility in the marketplace. At the extreme it leads to vertical integration.

Because of the small number of better-performing firms in Cluster 3, we hesitate to make definitive inferences. But following the logic developed for the other clusters, we hypothesize that environmental volatility drives towards direct channels, whereas customer size (small) and buying behavior variation drives towards indirect channels. The end result is that no single channel or combination seems to dominate. Interestingly, in a Cluster 2 environment, when there was a tug-of-war between the opposing channel implications of the two dimensions of environmental complexity, we saw the predominance of the composite channel. Why not in this case (Cluster 3) as well? Why multiple channels?

We believe the reason centers around manufacturers' advantage in scale economies as opposed to distributors' advantage in scope economies. Small, dispersed customers are inherently unattractive for manufacturers. The costs of constructing a direct selling system outweigh the benefits of direct customer orders. Customers are small and place only small orders; distributors may be better poised to sell and service them. But if these small customers are not varied in their buying behaviors, direct selling approaches like telemarketing could well work. Also, if the product is such that customers' need for a complementary assortment is minimal, then there is the possibility of distributors (or manufacturers' reps) writing the order for direct drop-shipment by the supplier. In effect, a different kind of composite channel could emerge in Cluster 3 environments not constrained by the business parameters of the industry under research (i.e., the healthcare industry).

Building on the logic of the observed channels for the three clusters, one could attempt to predict the channel form for a stable environment, characterized by small, dispersed customers. It would largely be served by indirect or distribution channels. A stable environment would enable the producer to write a contingent claims contract with a third party without fear of subversion, and customer dispersion and size would further encourage the choice of local distributors in order to accomplish the required coverage. Thus, both forces would work hand-in-hand to reinforce the choice of a third party distribution channel.

Our summary conclusions are best captured by Table 6. The different combinations of the dimensions of environmental complexity indicate different dominant channel forms. Our results indicate that by carefully identifying the source of complexity as customer heterogeneity and/or size or market volatility, one can attempt to explain the variety of channels we observe in the real world. A word of caution: such a generalization is only meaningful in those settings that have the characteristics of the healthcare industry studied in this research. For example, the role of the distributor and associated scope economies become meaningful only if customers seek product complements and assortments. That may not be the case in all industries. But even working within this limitation, it is possible to see the implications of our findings.

From Table 6, it is clear that there is so much that we do not know. One can hazard a guess as to the appropriate channel form for the empty cells, but given that our one-industry application did not unearth the environments indicated by the empty cells, it would be an exercise in speculation. For example, in cell 1, environmental stability and the small customer segment would indicate an indirect channel, but because of similarity in buying characteristics (low heterogeneity) among the customers, it may be possible to sell direct or via a hybrid form as well, depending on the nature of the product and the complementary assortment within which it is bought. This is precisely our point. The underlying reasons guiding a firm's channel choice are far more complex than suggested by extant theory. In fact, Table 5 and Figure 2 tell us a very important story. Even though 84% of the better-performing firms in Cluster 1 used direct or hybrid channels, a good 17% used other forms. Similarly, 16% of the firms in Cluster 2 attained high performance without using a direct or a hybrid channel.

Table 6, therefore, is best interpreted as providing guidance on the dominant channel form. A significant minority of other channel forms also appear to deliver equally good results, perhaps because of business reasons that subsume the channel adaptation hypotheses offered here.

Table 6
A Contingency Framework

	Small Customer		Large Customer	
	Lo. Hetero	**Hi. Hetero**	**Lo. Hetero**	**Hi. Hetero**
Stable	(Cell 1)	Indirect	Hybrid	?
Volatile	?	Multiple	?	Direct

5. Conclusions

There are many limitations to the research discussed in this paper, not the least of which is our longitudinal inference on channel adaptation from cross-sectional data. While we stand by our inferences, a more compelling case could have been made had the data

tracked channel transitions as firms' strategic choices and external environments changed. Several field research visits gave us confidence in our conclusions, but we would be remiss in not acknowledging this methodological liberty taken by our research. Moreover, one should always view with caution the generalizability of any study based on data from one industry at one period in time. However, as our major purpose here is to build rather than test theory, we believe that our methodological liberties are not fatal.

In this concluding section, we would like to draw our readers' attention to the broader and more important implications of our research. Although we have not offered undisputed proof of its veracity, if our directional conclusions hold up to further replications and extensions, then we believe we have offered significant new directions for channel research as a whole. We have uncovered environmental conditions under which composite channels and multiple channels could be optimal. These channels, while widely prevalent in the field, have not received much scholarly attention.

Company X, a participant in this study, sold its medical supplies through a network of 65 company sales representatives and about a dozen large national distributors. Traditionally, its salesforce called on the end-users and educated them on product detail and built brand loyalty; however, all customer orders were effected by the distributors, including price/quantity negotiations.

Because of the commodity (low-technology) nature of the product —blood collection needles and tubes— not many competitors had entered this market. According to this company's Sales VP:

> Frequently purchased supply items like ours came in for much closer price scrutiny. Hospitals facing severe cost pressures at their end stalled to put spec. items like ours on bid too. They were aligning themselves into buying groups to get purchasing power ... This was a big transition for us because even though our products are low value supplies, we have worked very hard to differentiate them in the eyes of the end-users.

> We had no choice but to work directly with our hospital customers to ensure that we made it to the shortlist; in fact, most of our 65 salespeople took on the price and contract negotiating role. They had never done that in the past. Their job then was to influence the end-user to specify our products. In the old system, our distributors booked the orders. Even in the new system, our large national distributors are very much in the picture. They perform the actual physical distribution and order fulfillment tasks. In short, we haven't altered our distributors. We are very supportive of them, but our salesforce is considerably more active in negotiating the sale. We book orders directly. This way, we are better able to control our market share and market volume.

This case illustrates the subtle evolution of a channel system in direct response to changes in the buying environment. On the one hand, Company X faced a stable environment (mature product and no new entrants), suggesting the appropriateness of a distribution channel; but on the other hand, the cost-containment environment caused customer consolidation, which eventually influenced how customers purchased such products. Thus, the large customer's buying response, especially with respect to price sensitivity, dictated a direct channel. The firm's adaptive response involved a further shift towards more direct execution of certain channel functions by its salesforce, without altering its existing distribution structure. Such a concept of channels as a collection of tasks, was first proposed

by Bucklin (1966), but not widely studied, perhaps because most channels in the 60s, 70s, and early 80s were pure. Composite or hybrid channels are somewhat more common in the 90s.

While some firms in our sample, under similar circumstances, chose to adapt by vertically integrating, Company X adapted by virtual integration. It carefully took on responsibility for certain key channel functions which would enable it to maintain its competitive posture with its customers. In other words, channel adaptations need not always be structural. By assuming responsibility for critical channel tasks even while external agents fulfill other tasks, one can mimic the effect of an integrated channel structure. This is an especially important adaptive mechanism in the channels context because of the difficulty in retiring historically strong distribution relationships. The composite channels approach gives producers the chance to be responsive without necessarily severing old ties.

Multiple channels emerge under quite different circumstances. First of all, they seem to emerge under conditions of volatility. Many of the firms in this environment operate in a rapidly growing market, the growth rate being unpredictable. Simultaneously, or because of it, customer buying behaviors also appear varied. And perhaps because of the rapidly growing environment, customers also appear to be varied in their size. Given this high degree of uncertainty and variation, and lack of a clear winning channel form, firms appear to be betting on a variety of outcomes, both in terms of customers and in terms of channels. According to Anderson, Day and Rangan (1997), "In coping with turbulence, channel diversity pays ... a bundle of options also allows a firm to move faster, as it recognizes and seizes opportunities."

While one can appreciate the validity of this finding just by looking around at channels for high-technology products, an important unanswered research question is "What happens when growth settles out?" Our study indicates that channel forms such as indirect or hybrid could emerge as winners. But then the firm has to consciously adapt its multiple channel as the environment evolves.

This means the proactive retirement of one or the other channel or a reallocation of channel functions.

We offer the following account of the process by which firms design their channels of distribution. First, they formulate a business strategy in response to their external environment. Channel structure then is a support mechanism to implement the chosen business strategy. Thus, effective channel structures are a reflection of the environmental complexity faced by the business and the strategy chosen by the firm.

Company Y, at the time of this study, sold its range of ultrasound equipment and respiratory therapy products through its direct salesforce of nearly 150 representatives. It registered some token sales through a handful of distributors, but the proportion of sales through this channel was minimal. However, until two years before, the company had sold its products through the combined efforts of nearly 100 salespeople and almost 100 distributors, with distributors accounting for nearly 25-30% of total sales. But at that time, in addition to its ultrasound and respiratory therapy products, the company had also sold medical supplies and gases as well. According to its CEO:

We made a strategic decision to exit from the commodity end of our business.

We were not making money on the supplies and the gases, and it made sense to exit those businesses ... But if all you have is value-added equipment, a salesforce

is a much better way to sell those products in our industry. First of all, these products are high-technology, requiring careful and sophisticated presentation to the end-user, especially the large teaching hospitals. Over the years, our salesforce was actually performing most of this customer education anyway ... And in any case, as part of our overall product strategy, we were planning to launch a series of high-technology products like CPU Ventilators and Patient-Care Monitors, all of which would have required a concerted educational effort, because we were creating, not merely fulfilling demand.

Our channel strategy was a sensible projection of our own product-market strategy ... The uncertainty of a high-technology, high value-added business combined with our focus on large, urban hospitals is better handled by our salesforce than by our distributors.

The adaptive response of Company Y sheds light on the intertwining of business strategy and channel structure. To a large extent, by choosing to focus on high-technology new products rather than commodities, this company entered into a more volatile environment than the one it had operated in previously. Both the nature of the technology and its potential user, the large teaching hospitals, increased the unknowns for this company. Because its distributors were unable to help in the course of its new strategy, the company chose to expand its salesforce and dramatically shrink distribution. In addition to exemplifying the tendency of firms to vertically integrate in the face of volatile - homogeneous - large customer environments, this case illustrates that a channel structure is not a mere adaptation to external environmental forces, but in fact an adaptation to the company's strategic choice of which environment it wants to play in. A firm's channel structure, then, is a calculated response in support of its long-term business strategy.

We suggest that this environmental adaptation is perhaps the deeper link that is played out through the widely accepted "asset specificity" variable of transaction-cost theory. Future research would be better served by focusing on these antecedents rather than continuing with the attempts to fine-tune the operational indicators of transaction-specific assets. Moreover, an approach like the one we have attempted to show in this paper has the potential to offer a rational explanation for the variety of channels that producers use to access their respective markets. The direct versus indirect dichotomy, while conceptually convenient and elegant, is too narrow in practice.

We conclude that vertical integration in its purest form is an attempt to manage and control environmental uncertainty. In practice, however, owing to the difficulty of changing channel relationships or perhaps because of evolutionary cost advantages (such as a distributor's economies of scope and transportation), a perfectly acceptable form of virtual integration might involve a composite of direct and indirect channels performing a web of interdependent tasks. This clever adaptation under certain environmental conditions could be long-run optimal.

Channels are far more complex, amorphous, and dynamic (in spite of their reputation for being sticky) than our interpretation of extant theories would allow. Theories such as transaction cost theory and strategic contingency theory have provided us with initial trajectories. The time has now come to build a theory-in-use of channel configuration and adaptation. We strongly believe that only such a grounded exploration could enhance our understanding of contemporary channel structures.

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