On the effects of customer conditions on distributor commitment and supplier commitment in industrial channels of distribution

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Abstract

Commitment in channel relationships has received increasing research attention lately. Although a number of driving forces of commitment have been identified, all of them are dyad-specific factors, and the potential influence of the environmental conditions on commitment has been ignored. The author broadens the scope beyond the distributor–supplier dyad and suggests that the commitment of channel members is affected by not only the dyadic factors, but also by the changes in customer conditions. The results of a national survey of industrial distributors and suppliers indicate that the impact of customer conditions on supplier commitment is different from their impact on distributor commitment. © 2000 Elsevier Science Inc. All rights reserved.

Keywords: Customer conditions; Channels of distribution; Commitment

During the past decade, practitioners and academics in distribution channel management have shifted their attention from conventional channel relationships toward relational exchange (Dwyer et al., 1987; Anderson and Narus, 1990; Ganesan, 1994). A firm’s commitment to its channel member is of extreme importance in the relational exchange paradigm (Morgan and Hunt, 1994). Commitment reflects the extent to which a firm is dedicated to an enduring relationship with another firm (Anderson and Weitz, 1992). High commitment promotes the ability of independent channel members to coordinate their activities and work together to serve the needs of customers better. Note that we use the term “customer” instead of “end-user” hereafter to indicate those customers that buy products from the distributors.

Lately, a series of empirical studies has contributed to our understanding of commitment in distribution channel relationships (Morgan and Hunt, 1994; Brown et al., 1995; Gundlach et al., 1995; Fein and Anderson, 1997; Ross et al., 1997). The partner firm’s commitment, trustworthiness, the firm’s own specialized investments, relationship termination cost, bilateral communication, manifest conflict, and shared values have been shown to be among the primary determinants of a firm’s commitment to its relationship with another channel member.

Despite the recent advances in research on commitment in distribution channels, the current knowledge base is limited on two fronts. First, commitment of a channel member is theorized as being driven solely by factors internal to a distribution channel dyad, sealed off from the surrounding environmental conditions. As a result, the effects of extra-dyadic conditions on commitment have been either minimized or ignored (see Oh et al., 1992 for an exception), though both organizational (Aldrich and Mindlin, 1978; Pfeffer and Salancik, 1978; Scott, 1992) and distribution channel (Stern and Reve, 1980; Achrol et al., 1983) researchers have long advocated the idea that the environment surrounding a distribution system has a significant bearing on channel relationships. This study intends to overcome this limitation by examining the effect of environment, namely customer conditions, on the commitment of channel members.

Another limitation of the extant literature is the lack of distinction between the distributor commitment and the supplier commitment (cf. Anderson and Weitz, 1992). The factors driving distributor commitment are suggested to
have the same effects on supplier commitment. Distributor commitment has been treated as the “flip side” of supplier commitment, and vice versa. Because channel members are theorized to develop commitment on the basis of dyad-specific factors and reciprocity, the driving forces of distributor commitment have not been distinguished from those of supplier commitment (Morgan and Hunt, 1994; Gundlach et al., 1995). When we broaden the scope beyond the boundary of a distributor–supplier dyad, the extant literature is fuzzy about whether a supplier and its distributor respond to environmental conditions in the same way. This study intends to address this limitation by examining the response pattern of distributors and suppliers to changes in environmental conditions.

Following the lead of Heide and John (1990) and Noordewier et al. (1990), this study contributes to distribution channels research by highlighting customer conditions as external, yet critical, driving forces of commitment between a distributor and its supplier. After the discussions of environment and supplier–industrial distributor relationships, hypotheses are offered on the effects of customer conditions on supplier commitment and distributor commitment. Then, the research method and proposed measures are described. Using the hypotheses test results as a basis, implications of the major findings, the limitations of the study, and future research directions are discussed.

1. Environment and industrial distributor–supplier relationships

1.1. Previous research findings

The environment of a distribution channel dyad refers to general social, economic, political, and technological forces that impinge on downstream channel relationships. An array of environmental sectors (Achrol et al., 1983; Tosi and Slocum, 1984) and environmental attributes (Lawrence and Lorsch, 1967; Jurkovich, 1974; Aldrich, 1979) has been suggested. In the channels literature, two empirical studies have examined the impact of environment on relational exchange.

Heide and John (1990) examine the continuity of Original Equipment Manufacturer (OEM)–supplier relationships (i.e., a firm’s perception that both exchange parties expect the relationship to continue into the future) and find that the unpredictability of technological requirements on the supplier side was related inversely to the continuity of an OEM’s relationships with its supplier. In contrast, the unpredictability of volume requirements on the customer side was unrelated to the continuity of an OEM’s relationship with its supplier. Although that finding helps us understand better the effect of a volatile environment on relationship continuity, the study examined the upstream channel relationships, not the downstream channel relationships, which are the focus of this study. Furthermore, it analyzed the continuity of the relationship only from the OEM’s perspective.

Oh et al. (1992), through a series of laboratory simulations of manufacturer–dealer bargaining under an asymmetric power structure, find that a munificent market condition leads to a higher level of system solidarity (an average of a manufacturer’s and its dealer’s pledges of relationship continuity), whereas a dynamic market condition leads to a lower level of system solidarity. The authors reason that a munificent output market shifts the balance of power from the ex ante power advantage of manufacturers to relative power symmetry, fostering a climate of cooperation and solidarity between channel members. In contrast, a dynamic market condition is posited to prompt manufacturers with an ex ante power advantage to reduce their dependence on dealers, further skewing the power structure to the manufacturer’s advantage and reducing system solidarity.

Although their reasoning about the effect of environmental conditions on system solidarity through changes in interfirm power structure is insightful, the question of whether their findings would hold true for distributor–supplier relationships in a real channels setting remains open. In addition, their analysis was conducted at the dyad level, leaving the issue of potential differences between suppliers and distributors unexplored. Given the contributions and limitations of the two aforementioned studies, examining the effects of environmental conditions on distributor commitment and supplier commitment in downstream channel relationships appears necessary to further our understanding of commitment.

1.2. Customer conditions and commitment of channel members

Of the several environmental sectors surrounding a distributor–supplier dyad, customers of the focal product line are arguably the most critical element in distributor–supplier relationships (Achrol et al., 1983; Dwyer and Oh, 1987; Achrol and Stern, 1988). Customers are the sine qua non of any distribution system, and satisfying the needs of customers is the primary reason for a distribution system to exist. Both a supplier and its distributor may need to adjust their commitment to each other to serve customer needs better. It is axiomatic, therefore, that the constraints imposed by customer conditions affect a distributor–supplier dyad (Hambrick and Lei, 1985).

Although several environmental attributes have been suggested (Lawrence and Lorsch, 1967; Child, 1972; Aldrich, 1979), unbundling an environmental sector into three fundamental attributes — heterogeneity, munificence, and volatility — has been shown to capture major environmental effects on organizations (Achrol and Stern, 1988). Accordingly, the effects of these three aspects of customer conditions on distributor commitment and supplier commitment are examined.
2. Research hypotheses

The major thrust of this study is that customer conditions bear differently on a distributor and its supplier. Suppliers and industrial distributors occupy different positions and perform different roles and functions in a distribution system. The functions performed by a supplier firm are not simply the flip-side of those performed by a distributor (Heide and John 1990, p. 34). Accordingly, industrial distributors and suppliers are likely to be affected by customer conditions in different fashions.

2.1. Supplier perspective

Suppliers of industrial products, which are large-scale manufacturers with national and often global business operations, regard industrial distributors as part of the downstream channel system through which customer needs are fulfilled. From a supplier's point of view, both distributors and customers are members of its downstream distribution channel. To suppliers, the essence of a distribution channel arrangement is to satisfy anticipated customer requirements by gaining access to the customers in the most efficient and effective way. Hence, the decision to use a direct salesforce, independent distributors, or agents/brokers and the extent of the commitment to a particular distributor firm, if one is used, hinges on achieving those goals. The supplier perspective is illustrated in Fig. 1a.

The customer focus in distribution channel arrangement is well documented in the marketing literature. Anderson et al. (1997, p. 67) propose that “designing channels from the market [customer] back” is the first step of strategic channel design, thus highlighting the importance of considering customer conditions. Similarly, Stern et al. (1996, p. 196) suggest “learning what customers want” as the basis of channel structure development. Note that these researchers recommend channel design based on the supplier’s perception of customer needs, not the distributor’s. Given a supplier’s essential need to anticipate and meet customer requirements, customer conditions are bound to have an impact on a supplier’s distribution channel arrangement, including the extent of commitment to its distributors.

2.2. Industrial distributor perspective

Industrial distributors are likely to treat suppliers and customers of the product as two separate environmental entities, one in the upstream channel and the other in the downstream channel. In the purchasing function for the upstream channel, a purchasing manager is most interested in securing a supply of quality products in the most efficient way and gaining marketing support from the supplier. In contrast, the sales and marketing personnel of a distributor firm, who serve customers, focus on satisfying customer needs by providing the optimal mix of products and services to fit the customers’ requirements (Stern et al., 1996).

Because of the different goals and incentives of the purchasing function and the marketing/sales function in a distributor firm, customer conditions are unlikely to have significant effects on a distributor firm’s interface with a supplier firm and the extent of its commitment to that supplier. The distributor perspective is illustrated in Fig. 1b.

Another significant cause for a gap between a distributor’s customer interface and supplier interface is recent changes in industrial distributor operations. In addition to providing an assortment of products to customers, industrial distributors in the 1990s fabricate, assemble, and customize suppliers’ products to meet customer requirements, as well as provide consulting, maintenance, and repair services to customers (Chase, 1995; Adams, 1997). Rather than simply buying products from suppliers and reselling them to the customers, the majority of distributors now are offering customers an array of value-added services (Alliota, 1995). A recent survey of industrial distributors suggests that 25% of distributor sales come from value-added ser-
vices to customers (Industrial Distribution, 1996). For an industrial distributor that adds significant value of its own to a supplier’s product and generates substantial revenue from its own value creation, a change in the customer condition is likely to have less impact on its interface with the supplier than it would for a distributor that simply buys the supplier’s product and resells it to the customers.

2.2.1. Customer heterogeneity and commitment of channel members

Customer heterogeneity is the extent to which customers for a focal product line are dissimilar to one another (Jurkovich, 1974; Scott, 1992). It is evidenced by the diversity in customer needs and preferences. For suppliers, complex and diverse market demand requires more resources to (1) collect and process market information with which to specify customer needs (Alderson, 1965), (2) develop a variety of product lines to serve different market needs, and (3) develop sales/service personnel to interface with market segments that have different needs (Scott, 1992). A supplier that has heterogeneous customer requirements is likely to develop relationships with multiple distributors, each with expertise in serving the needs of a specific market segment (Miller, 1987), to cope with these heterogeneous customer demands (Anderson et al., 1997). As a supplier increases the total number of distributors, its relationship with one particular distributor is likely to become relatively less important, and its dedication to a particular distributor may be lessened (i.e., commitment may be reduced).

In comparison with suppliers, however, industrial distributors have less concern about heterogeneous customer requirements because of the diversity and assortment of product lines they carry, the high replaceability of one supplier with another, and the subsequently low dependence on one supplier (Frazier and Rody, 1991; Fein and Anderson, 1997). In fact, the heterogeneity of customer needs is the very reason industrial distributors are in business, and providing assortment for a product line is the key benefit of distributors (Weitz and Jap, 1995). They already are dealing with multiple competitive suppliers in a product category in order to meet the diverse needs of multiple customers. Because industrial distributors are unlikely to be dependent on one supplier and add significant value to a supplier’s product, customer heterogeneity is unlikely to have a significant effect on a distributor’s commitment to its supplier.

H1. Customer heterogeneity has (a) a negative effect on supplier commitment to a distributor and (b) no effect on distributor commitment to a supplier.

2.2.2. Customer munificence and commitment of channel members

Customer munificence is the extent of opportunities and resources in the customer market for a focal product line (Gundlach and Achrol, 1993). Because the key component of customer munificence is the state of demand (Achrol and Stern, 1988), this study examines demand conditions for a focal product line. As munificence of a local market decreases, supplier firms, most of which are conducting business across the country, appear able to exit that local market without much difficulty and reallocate their resources to other geographic markets or different market segments that are more munificent. Suppliers are able to lower their commitment to local distributors as munificence decreases in a local market. Conversely, if local market demand becomes munificent, a supplier can increase its commitment to the local distributor or deploy its own salesforce. In summary, suppliers appear to have more strategic options and mobility than distributors in coping with changing demand conditions (Stern et al., 1996).

The business of most industrial distributors, in contrast, is embedded in a local market or particular product/market segment (Corey et al., 1989). Their business territory is often limited geographically, their expertise is geared toward local industry, and their mobility is constrained by lack of managerial and financial resources (Harper, 1986). The latest census of distributors (U.S. Department of Commerce, 1992) indicates that industrial distributors are typically small firms in terms of both sales and number of employees. The great majority are privately held, and 88% operate with fewer than 20 employees. The average firm had annual sales of US$3.1 million and operated from 1.3 sales locations. Given these business conditions, industrial distributors choose to cope with lean local market conditions by working more closely with customers (e.g., providing value-added services) to revive demand and drum up business, rather than simply moving their business to other locations, switching to other product lines, or lowering their commitment to a certain supplier. Hence, a change in customer demand conditions is unlikely to have a significant impact on a distributor’s commitment to its supplier.

H2. Customer munificence has (a) a positive effect on supplier commitment to a distributor and (b) no effect on distributor commitment to a supplier.

2.2.3. Customer volatility and commitment of channel members

Customer volatility is the extent to which customer needs and preferences for a focal product change rapidly and abruptly (Aldrich, 1979). A highly volatile customer condition is manifested by the unpredictability of changes in customer needs and preferences, and it presents greater risks to both industrial distributors and suppliers (Achrol and Stern, 1988). Frequent and sudden changes in customer needs and preferences create difficulties for channel members in long-range planning, coordination, product mix, and inventory decisions. In effect, customer volatility makes it difficult for a firm to project the relationship with its channel member into the future.
Unlike the effects of customer heterogeneity and customer munificence, we submit that customer volatility has a comparable effect on both supplier commitment and distributor commitment. The unpredictability of customer requirements and difficulty of adapting to them are likely to alter the incentive structure of channel members, which affects the extent of a firm’s commitment to its exchange partner (Pfeffer and Salancik, 1978). In a situation of rapidly changing customer conditions, sustaining high commitment to a particular exchange partner increases the risk of losing adaptability, which is essential for survival in volatile environmental conditions. For example, a distributor that is highly committed to one supplier will be most vulnerable to sudden changes in customer needs and preferences (Jacobs, 1974). Similarly, a supplier that is committed to a particular distributor in a local market is likely to have difficulty adapting to unexpected changes in customer requirements. What channel members need in highly volatile conditions is more autonomy and flexible distribution arrangements to exit easily from an existing relationship and switch to more appropriate partners (Balakrishnan and Wernerfelt, 1986). Hence, both a distributor and its supplier are likely to be better off when they are loosely coupled and keep the level of commitment relatively low.

**H3.** Customer volatility has a negative effect on (a) supplier commitment to a distributor and (b) distributor commitment to a supplier.

**3.2.4. Dyad-specific factors**

Three dyadic factors identified in previous studies were included in this study to account for the effects of these factors and prevent potential model specification error. First, Morgan and Hunt (1994) reason that firms seek relationships only with trustworthy partners because commitment entails vulnerability. Second, Anderson and Weitz (1992) find that a firm’s specialized investment in a relationship alters its incentive structure and creates a strong incentive to maintain the relationship (i.e., commitment). Third, Kumar et al. (1995) find that resellers commit to a relationship with a supplier on which they are dependent.

**H4.** Trustworthiness of the partner firm, specialized investment, and dependence have positive effects on both distributor commitment and supplier commitment.

Two other variables were included in this study as control variables: product characteristics and age of the relationship. Previous studies have shown that product characteristics such as complexity and customization (Anderson and Coughlan, 1987), frequency of purchase (Lilien, 1979), and significance to customer (Jackson et al., 1982) have important implications for distribution structure and management. Accordingly, the nature of the focal product line itself may impose a certain level of commitment on its supplier and distributor. Although the longevity of a relationship cannot foretell its future, success in overcoming vicissitudes in the past seems likely to strengthen the participants’ desire to continue the relationship in the future (Anderson and Weitz, 1989; Lusch and Brown, 1996). Thus, age of the relationship is considered.

**3. Method**

**3.1. Research context**

The industries chosen for this empirical study are distributors for industrial machinery and equipment (SIC code 5084) and industrial supplies and hardware (SIC codes 5085 and 5072, respectively). The dependence levels of distributors on suppliers are moderate because of the multiple number of suppliers used by a distributor and the tendency for many distributors to carry competing lines. In effect, distributors in the industries studied have a reasonably high level of independence and autonomy, which engenders symmetric interfirm power conditions (Frazier and Rody, 1991).

**3.2. Operational measures**

Measurement items used to represent the constructs are described in Appendix A. Commitment is defined as the extent to which a firm is dedicated to a stable, long-term relationship with its partner firm. It was operationalized as a firm’s desire to develop an enduring business relationship (Dwyer et al., 1987; Scheer and Stern, 1992; Morgan and Hunt, 1994; Gundlach et al., 1995). Note that our focus was on the continuance element of commitment. Four measurement items on the continuance aspect of commitment were adapted from Anderson and Weitz (1992), Morgan and Hunt (1994), and Scheer and Stern (1992).

Customer heterogeneity was operationalized as the extent to which needs and preferences were dissimilar among customers. The measurement items from Achrol and Stern (1988) and Klein et al. (1990) were adapted to develop five Likert-type items pertaining to the similarity of customer needs and preferences. Customer munificence was operationalized as the state of previous and future demand for the focal product line. To measure this, we used four Likert-type items on the state of demand for the focal product line (Achrol and Stern, 1988). Customer volatility was operationalized as the extent to which the major elements of customer needs and preferences change rapidly and abruptly. Five Likert-type items from Achrol and Stern (1988) and Klein et al. (1990) were adapted.

Trustworthiness of the partner firm refers to the extent to which an exchange party is reliable and sincere to its partner firm. This study focused on the belief aspect of trust, which was operationalized as a firm’s belief about the credibility and sincerity of the other firm, and used four measurement items from John (1984) and Anderson and Weitz (1989).
Specialized investment is the “actual” investment by channel members in physical assets, procedures, and people that are specifically tailored to a focal relationship. Four measurement items adapted from Anderson (1985) and Heide and John (1990) were used for the study.

Dependence indicates the degree of difficulty in replacing an incumbent partner firm with other, alternative firms (Kumar et al., 1995). It was operationalized as the degree to which a firm would need to spend resources to find a new partner firm and develop a relationship, as well as the degree with which the firm could replace the sales/profit currently generated by the product line from the partner firm. Five items from Heide and John (1988) were adapted for the study. Covariate measures were (1) a four-item measure of product characteristics in terms of product complexity, the extent of customization, technical sophistication, and frequency of purchase and (2) the age of the relationship measured as logarithm of the number of years the supplier had been doing business with the focal distributor firm, and vice versa (Heide and Miner, 1992).

3.3. Sample and data collection

3.3.1. Distributor data collection

The sampling frame for the empirical test consisted of a list of industrial distributors for three industrial product categories (SIC codes 5072, 5084, and 5085). A random sample of 1000 distributors was acquired from Dun’s Marketing Services. Each distributor was contacted by telephone to check the accuracy of directory information and identify the most knowledgeable person. After deleting those distributors that could not be located or for which a knowledgeable key informant could not be identified, a letter introducing the research project was sent to the remaining 945 distributors. A few days later, the first wave of questionnaires was sent with a cover letter. A follow-up questionnaire was sent 2 weeks later to distributors that had not responded to the original questionnaire. Each informant was asked to complete the questionnaire with reference to a certain supplier (e.g., largest, third-largest, or fifth-largest supplier of the focal product line in terms of its contribution to the distributor annual sales volume) to avoid respondent self-selection bias.

To ensure the selection of an appropriate key informant, all informants were asked to complete self-report scales on their degree of knowledge of and involvement in distributor–supplier relationships (Heide and John, 1990). The final response rate, after two mailings and two telephone calls, was 33.7% (319 of 945 mailed). After eliminating 33 of the returned questionnaires because of either incomplete information or company-specific situations (e.g., going out of business), the final sample consisted of 286 distributors.

3.3.2. Supplier data collection

The distributors were asked to provide the name of the major contact person in the focal supplier firm. Of the 286 respondents, 155 identified the contact person in the focal supplier firm, and those suppliers were contacted by telephone to obtain exact addresses and verify their ability to provide the needed information. After eliminating those who either could not be located or refused to participate in the study, the supplier version of the questionnaire was sent to 144 people in the supplier firms. After callbacks and a second mailing, 67 usable questionnaires were returned (response rate = 46.5%). From the second mailing to the distributors, 129 out of 286 responses were obtained, and 31 of 67 responses were from the second mailing to the suppliers.

Of the 286 distributor respondents, approximately half (135) were distributors for such capital equipment items as machine tools and air compressors, and the rest dealt in lower-priced items, such as hand tools and abrasives. The average annual sales volume of the distributor respondents was US$9.5 M, and the average number of employees was 27.3. Supplier respondents were larger, national manufacturers of industrial products; their average annual sales were US$361.4 M, and the average number of employees was 2771.8. The average age of the relationships was 14 years.

3.3.3. Key informant bias check

Of the 286 distributor respondents, 213 indicated that they made the final decision on major distribution issues. Seventy-three distributor respondents identified someone other than themselves who made the final decision. Those people were contacted by telephone and asked to complete a short version of the questionnaire. The combination of two mailings and a telephone call yielded 59 responses (response rate = 80.8%). Examination of covariance matrix equivalence between the key informant group (n = 59) and the second informant group (n = 59) by LISREL 8 (Jo¨reskog and S¨orbom, 1993) indicated that the two covariance matrices were similar (χ²(10) = 10.30, p = 0.41), corroborating the quality of the key informant responses.

3.3.4. Nonresponse bias check

Nonresponse bias was assessed in two ways. First, the covariance matrix equivalence between the first-wave respondents and the second-wave respondents was tested by LISREL 8. The results indicated that the two covariance matrices were similar for both the distributor group and the supplier group (χ²(10) = 13.01, p = 0.22 for distributor data; χ²(10) = 13.37, p = 0.20 for supplier data). Second, the response group was compared with the nonresponse group on certain demographic characteristics, such as annual sales volume and number of employees. For distributors, no significant differences were found for either sales volume (US$9.5 M for the response group vs. US$5.4 M for the nonresponse group, t = −1.36, p = 0.17) or number of employees (27.3 for the response group vs. 24.2 for the nonresponse group, t = −0.68, p = 0.50). Similarly, no differences were found for the suppliers on sales volume (US$361.4 M for the response group vs. US$370 M for the...
nonresponse group, \( t = 0.04, p = 0.96 \) or number of employees (2771.8 for the response group vs. 2955.8 for the nonresponse group, \( t = 0.12, p = 0.90 \)). Therefore, nonresponse bias did not appear to be a problem.

### 3.3.5. Self-selection bias check

Because we assigned each distributor respondent randomly to one of the three supplier groups (largest, third-largest, or fifth-largest supplier) to reduce self-selection bias, each distributor’s response on the extent of the focal supplier’s contribution to the distributor’s annual sales volume was compared across the three groups. The percentage of sales contribution from the focal supplier was 40.17% for the largest supplier group, 17.83% for the third-largest supplier group, and 8.57% for the fifth-largest supplier group. This result strongly suggests that distributor respondents did not self-select the focal supplier and followed the instruction provided in the questionnaire.

### 3.4. Measure validation

#### 3.4.1. Unidimensionality and reliability check

Each construct in the model was measured by a multi-item scale, and the measurement items showed equally high item-to-total correlations for both distributor data and supplier data for all but the specialized investment scale. Two items were dropped from that scale for the supplier data because of low item-to-total correlations. The resulting pool of items was subjected to confirmatory factor analysis and a four-factor measurement model of the reflective scales (but not the three formative scales for customer conditions) was estimated. The analysis suggested significant overall fit of the model (\( \chi^2 = 252.80, df = 98, p = 0.00 \) for distributor data; \( \chi^2 = 124.06, df = 71, p = 0.0001 \) for supplier data), yet other fit indices showed an adequate level of fit for the distributor data (Goodness-of-Fit Index [GFI] = 0.91, Root Mean Square Error of Approximation [RMSEA] = 0.08, Non-Normed Fit Index [NNFI] = 0.90, Comparative Fit Index [CFI] = 0.92). The fit of the model for the supplier data was modest (GFI = 0.81, RMSEA = 0.11, NNFI = 0.85, CFI = 0.89). Note that confirmatory factor analysis was used for the measure validation of both data sets to ensure the consistency and comparability of analysis results, despite the potential problem of using such analysis on the small sample supplier data (Bagozzi, 1981; Fornell, 1983).

The reliability of the measurement scales was tested by coefficient alpha, which was in the 0.7–0.8 range for all but the specialized investment scale for the supplier data (see Appendix A). The scale properties and pairwise correlations are reported in Table 1.

#### 3.4.2. Convergent validity check

The convergent validity of the measurement scales was tested in two ways. First, the correlations between survey measures and convergent measures were calculated. A variety of single-item convergent measures were used for that purpose. For example, the sales trend of the focal product line in the previous 3 years was used as a convergent measure of customer munificence. For the specialized investment scale, respondents were asked whether they had bought special equipment or hired specialists to sell the focal supplier’s product line. All correlation coefficients between the survey measures and the convergent measures were significant at the 0.01 level (see Appendix A for the correlations). Second, each item’s pattern coefficient (\( \lambda \)) on its posited underlying construct from the confirmatory factor analysis was examined to determine whether it was significant (>2\( \sigma \)) (Anderson and Gerbing, 1988). All pattern coefficients were greater than twice their standard errors, thus establishing the convergent validity of the measures.

#### 3.4.3. Discriminant validity check

The discriminant validity of the reflective scales was checked in two ways. First, with the base model from the confirmatory factor analysis, a \( \chi^2 \) difference test was performed for each pair of the four reflective scales. All \( \chi^2 \) differences were significant, indicating high discriminant validity between the measures. For example, the test of...
4. Analysis and results

4.1. Model estimation

The hypotheses posit that the effects of customer heterogeneity, customer volatility, and customer munificence are significant for supplier commitment, whereas volatility is the only significant customer condition for distributor commitment. Hierarchical regression analysis was used to test those hypotheses (see Kohli and Jaworski, 1994, for a detailed explanation of hierarchical regression). The conceptual model was specified as follows:

\[
DC = a + b_1 \text{HE} + b_2 \text{MU} + b_3 \text{VO} + b_4 \text{ST} + b_5 \text{DI} + b_6 \text{DS} + b_7 \text{PR} + b_8 \text{AG} + e, \quad \text{and} \\
SC = a + b_1 \text{HE} + b_2 \text{MU} + b_3 \text{VO} + b_4 \text{DT} + b_5 \text{SI} + b_6 \text{DD} + b_7 \text{PR} + b_8 \text{AG} + e,
\]

where \(DC\) (\(SC\)) = distributor commitment (supplier commitment); \(HE\) = customer heterogeneity; \(MU\) = customer munificence; \(VO\) = customer volatility; \(ST\) (\(DT\)) = supplier trustworthiness (supplier trustworthiness); \(DI\) (\(SI\)) = distributor’s specialized investment (supplier’s specialized investment); \(DS\) (\(DD\)) = dependence to a supplier (dependence to a distributor); \(PR\) = product characteristics; and \(AG\) = ln (age of the relationship).

The variance explained by a model that included three dyad-specific predictors (dependence, specialized investment, and trustworthiness) and two covariates (product characteristics and age of the relationship) was determined; then, the change in explained variance in commitment when three customer condition predictors (heterogeneity, munificence, and volatility) were added to the first model was determined. The \(F\)-statistic associated with the increase in explained variance in the second equation (Pindyck and Rubinfeld, 1981) was 6.00 \((p < 0.01)\) for supplier commitment. That result suggests that the model including customer conditions explains significantly more variance for supplier commitment than the model with dyad-specific factors and two covariates. In contrast, there was no difference in the \(R_{adj}^2\) between the first and the second equations for distributor commitment, which suggests that customer conditions have no impact on the level of distributor commitment; all variance is captured in the dyad-specific factors. The estimation results are reported in Table 2.

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<th>Table 2: Estimation results of the hypothesized model</th>
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<td>The regression coefficients are standardized values with (t)-values in parentheses.</td>
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\(\ast p < 0.10.\)  
\(** p < 0.05.\)  
\(*** p < 0.01.\)

4.2. Hypotheses tests

4.2.1. Customer conditions and commitment

Customer heterogeneity has a negative effect on supplier commitment \((b = -0.14, p < 0.10)\), but no effect on distributor commitment \((b = 0.01, \text{n.s.})\). Hence, both Hypotheses 1a and 2a are supported. As was hypothesized, customer munificence has a positive effect on supplier commitment \((b = 0.42, p < 0.01)\), but no effect on distributor commitment \((b = 0.02, \text{n.s.})\). The magnitude of the beta coefficient for customer munificence indicates that customer munificence is the crucial factor for supplier commitment, in support of Hypothesis 2a. In contrast, customer munificence does not have any significant impact on distributor commitment, in support of Hypothesis 2b. As was posited in Hypothesis 3a, customer volatility has a negative effect on supplier commitment \((b = -0.14, p < 0.10)\). In contrast, it has no effect on distributor commitment \((b = -0.02, \text{n.s.})\), and Hypothesis 3b is not supported.

4.2.2. Dyad-specific factors and commitment

As was hypothesized, trustworthiness of the partner firm has a positive effect on both distributor commitment \((b = 0.56, p < 0.01)\) and supplier commitment \((b = 0.34, p < 0.01)\). Specialized investment has a positive effect on distributor commitment \((b = 0.09, p < 0.05)\), but the effect is nonsignificant for supplier commitment \((b = 0.06, \text{n.s.})\). The extent of dependence on the partner firm has positive effect on both distributor commitment \((b = 0.26, p < 0.01)\) and
supplier commitment \((b = 0.32, p < 0.01)\). The effects of the control variables are significant on distributor commitment, but they are insignificant on supplier commitment. Age of the relationship has a positive effect on distributor commitment \((b = 0.08, p < 0.05)\), whereas product characteristics have a moderate, negative effect on distributor commitment \((b = -0.07, p < 0.10)\).

5. Discussion

The objective of this study was to enhance understanding of the effect of the channel environment (customer conditions in particular) on distributor commitment and supplier commitment. The results of hypotheses tests show support for all but the effect of customer volatility on distributor commitment (Hypothesis 3b).

5.1. Implications

Previous research on commitment in distribution channels focused on dyadic determinants of commitment (Morgan and Hunt, 1994; Gundlach et al., 1995). In contrast, these study results suggest that the extent of supplier commitment is driven by factors outside the dyad, namely customer conditions.

5.1.1. Supplier commitment

The results clearly indicate that both distributor-related factors and customer conditions are important for supplier commitment. A supplier is most likely to commit itself to a relationship with a distributor when customer conditions are homogeneous, munificent, and stable. In contrast, it is likely to lessen commitment when customer conditions become more heterogeneous, leaner, and more volatile.

A distributor can help a supplier deal with customer heterogeneity, thereby inducing supplier commitment, in at least two ways. First, as customer heterogeneity increases, suppliers need to spend more resources to grasp and satisfy different customer requirements. A distributor can have a closer interface with customers on behalf of its supplier and relay heterogeneous market information to the supplier, thereby helping the supplier develop products/services that satisfy heterogeneous customer needs. A distributor’s interface with customers on behalf of the supplier helps the supplier deal with heterogeneous customer requirements. Accordingly, a supplier is likely to commit itself to the relationship with the distributor.

Second, the distributor can develop various value-added services and bundle them with the supplier’s products, enabling the supplier to achieve differentiation and deal with heterogeneity. By bundling the supplier’s product with the distributor’s value-added services, the supplier can satisfy heterogeneous customer requirements through a differentiated product/service package, and the distributor can enjoy more sales and a higher profit margin. Thus, a supplier is likely to commit itself to the relationship with the distributor.

For volatile customer conditions, a distributor’s ability to make customer demand more stable through customer bonding efforts (Heide and John, 1988; Weiss and Kurland, 1997) will encourage a supplier to commit itself to that distributor. A supplier’s effort to make the market more munificent through aggressive marketing and promotion activities is also likely to induce stronger supplier commitment to the distributor (Shapiro, 1977).

5.1.2. Distributor commitment

The insignificant effect of customer conditions on distributor commitment proves that a distributor treats customer conditions and the relationship with its suppliers as two separate issues. This finding is comparable to the finding by Heide and John (1990) that volume uncertainty in the customer market (customer-related factor) was unrelated to an OEM’s relationship continuity with the supplier firm.

For distributors, it is the dyadic factors with their suppliers that drive the extent of commitment to the supplier. Thus, a supplier needs to pay extra attention to dyadic factors to induce distributor commitment. Trustworthiness of the supplier firm is the crucial determinant of distributor commitment, though distributor dependence also is important (Morgan and Hunt, 1994). Hence, a supplier should enhance and convey an image of a trustworthy partner through open, two-way communication (Morgan and Hunt, 1994), procedural fairness (Kumar et al., 1995), cooperation (Anderson and Narus, 1990), and provision of support and emphasis of goal congruence (Anderson and Weitz, 1989) to induce distributor commitment.

5.1.3. Comparison with upstream channel relationships

These study results suggest strong correspondence between the upstream channel relationships (Heide and John, 1990) and downstream channel relationships examined in this study. The hypotheses test results suggest that the extent of supplier commitment is driven by both dyad-specific factors and customer conditions, whereas distributor commitment is driven solely by dyad-specific factors. Similarly, Heide and John (1990) find that an OEM’s relationship continuity with its suppliers in upstream channel relationships is affected by supplier-related technological uncertainty, but not by customer-related volume uncertainty. Although Heide and John (1990) did not examine suppliers’ perception of relationship continuity, we infer, on the basis of our results, that suppliers’ relationship continuity is driven by both OEM-related factors and customer-related factors because demand for the supplier’s product is derived from the demand for the final product by OEMs.

Integrating the findings by Heide and John (1990) with our study results, we can generalize on the effects of customer conditions on interfirm relationships. A firm that
is in a seller’s position, a supplier for OEM in upstream channel or a supplier for industrial distributor in downstream channel, considers both immediate buyer conditions (OEM or industrial distributors) and customer conditions to decide on the extent of commitment to the immediate buyer firm because the level of demand for the supplier’s product is derived from the demand for the final product.

In contrast, a firm that is in a buyer’s position, an OEM or an industrial distributor, considers only seller-related factors to decide on the extent of commitment to the seller because it treats the purchasing function toward the sellers and the sales/marketing function toward customers as two different issues. Because we propose a close correspondence between the downstream channel and the upstream channel for the effect of environmental conditions, future research needs to span a whole supply chain, including suppliers, OEMs, industrial distributors, and customers, to examine fully the veracity of this proposition.

5.2. Limitations

The scope of this study was limited to only one element of commitment, continuance commitment, though recent studies suggest that commitment itself consists of multiple elements (Brown et al., 1995; Gundlach et al., 1995; Kim and Frazier, 1997). Hence, the other elements of commitment may be related to environmental conditions in a different way. For example, affective commitment and continuance commitment may have different effects on customer munificence (Kumar et al., 1995). Another potential limitation is that dyad-specific forces of commitment were not examined fully. Recent studies have identified partner firm’s commitment (Anderson and Weitz, 1992), communication (Mohr et al., 1996), use of power (Brown et al., 1995), and shared values (Morgan and Hunt, 1994) as driving forces of commitment. Failure to incorporate those factors may have affected the empirical results of this study.

From a methodological point of view, the number of respondents from the supplier group is significantly smaller than that of the distributor group, due to the use of sequential sampling method. However, the disparity in sample size does not appear to be a major problem for two reasons. First, the analysis was at the level of individual firms, not dyads, because the focus was on an individual firm’s commitment, not dyadic commitment. That is why separate analyses were conducted for distributor data and supplier data. Second, the results in Table 2 indicate that the effects of customer conditions on supplier commitment are significant, despite the small sample size of suppliers, whereas the effects of customer conditions on distributor commitment are nonsignificant, despite the much larger sample size of distributors. As an additional check for the potential effect of the suppliers’ small sample size, a power analysis was conducted (Cohen and Cohen, 1983, p. 117). The number of cases necessary to test the hypotheses at the strictest level \((\alpha = 0.01, \text{ power } = 0.99, R^2 = 0.50)\) is 47.

Therefore, the number of supplier responses was adequate for testing the hypotheses.

The scales for customer conditions of heterogeneity, munificence, and volatility, though they were adapted from previous studies, were not subjected to a discriminant validity check. Thus, their use in the industrial distributor–supplier setting entailed a risk of low construct validity. However, the low pairwise correlations between the environmental conditions in Table 1 suggest that the survey measures have a reasonable level of discriminant validity. Finally, the low reliability of the specialized investment scale for the supplier group suggests that we may have failed to tap the full domain of specialized investment by suppliers. Therefore, the hypothesis test result for the effect of supplier specialized investment on supplier commitment must be interpreted with caution.

5.3. Future research directions

The results of this study highlight customers as the ultimate driving force of supplier commitment to distributors. Given that the multiple elements of commitment exist, further research is needed to expand the scope to other elements of commitment and explore how customer conditions affect attitudinal commitment and behavioral commitment. The scope of this study is limited to the effects of customer conditions on a qualitative outcome, namely commitment, in distribution channel relationships. Whether higher commitment leads to enhanced economic performance for channel members remains to be studied.

Future studies should examine the effect of commitment on economic performance in different environmental conditions. Expanding on Noordewier et al.’s (1990) work in upstream channel relationships, future studies should examine how distributor commitment and supplier commitment, in different environmental conditions, help or hinder each channel member in reducing costs and achieving competitive advantage.

The present and previous studies on commitment have used a reactive research method (mail survey or laboratory experiment) that forces the subjects to construct the perceived effect of environmental conditions on channel relationships. In future research, use of a nonreactive method, such as participant observation or in-depth interview, might afford further insights on the effect of environmental conditions on commitment (Rangan et al., 1993). Finally, the results of this study clearly illustrate the difference between suppliers and distributors in their response to customer conditions. From a methodological point of view, these results warn of the danger of either examining only one side of the distribution channel dyad or collapsing the distributor response and supplier response on commitment. Both distributor response and supplier response should be examined to account fully for the effect of environment, including customer conditions, on channel member commitment.
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Appendix A. Definitions and operational measures of constructs

1. Commitment: The extent to which a firm is dedicated to a stable, long-term relationship with another firm. Respondents were asked about desire to develop a stable business relationship with the focal partner firm and confidence in the stability of the relationship ($\alpha = 0.83$ for distributor commitment, and $\alpha = 0.81$ for supplier commitment).

We are committed to the relationship with this supplier [distributor].

We intend to continue the relationship with this supplier [distributor] for many years.

We may have to sever the business relationship with this supplier [distributor] soon. (r)

I am uncertain whether our relationship with this supplier [distributor] will last a long time. (r)

Convergent item (correlation with the survey measure is $0.57^2$ for distributor data and $0.42^2$ for supplier data):

We want the business relationship with this supplier [distributor] to last a long time.

2. Customer heterogeneity: The extent to which customers for the focal product are dissimilar to one another. The respondents were asked about the similarity of the customers in terms of their needs and preferences. The five items were measured on a 7-point scale, ranging from 1 = very similar to 7 = very different.

We have different needs and preferences for this product line.

Customer's preferences for product features,

Customer's preferences for brands,

Customer's preferences for price range,

Customer's purchasing policies,

Need for after-sale services.

Convergent item (correlation with the survey measure is $0.60^2$ for distributor data and $0.60^2$ for supplier data):

Customer requirements for this product line have been changing frequently and abruptly.

3. Customer munificence: The extent to which the customers provide opportunities and resources to the respondent firm. The respondents were asked about the state of previous and future demand for the focal product line.

Customer demand for this product line will show considerable improvement in the near future.

Sales for this product line have not increased significantly for the last 3 years. (r)

Future sales growth of this product line will be high.

Demand for this product line has been flattening for the last 3 years. (r)

Convergent item (correlation with the survey measure is $0.43^2$ for distributor data and $0.46^2$ for supplier data):

What is the sales trend for this product line in your sales area over the past 3 years?

4. Customer volatility: The extent to which the customers for the focal product change rapidly and abruptly. The respondents were asked about the frequency of change in terms of customer needs and preferences. The five items were measured on a 7-point scale, ranging from 1 = no change to 7 = very frequent change.

Customer requirements for this product line have been changing frequently and abruptly.

Customers’ preferences for product features,

Customers’ preferences for brands,

Customers’ preferences for price range,

Customers’ purchasing policies,

Customers’ purchasing volume.

Convergent item (correlation with the survey measure is $0.65^2$ for distributor data and $0.59^2$ for supplier data):

Customer requirements for this product line have been changing frequently and abruptly.

5. Trustworthiness of the partner firm: The extent to which a partner firm is reliable and sincere to the distributor firm. The respondents were asked about the extent of confidence in the credibility and sincerity of the other firm ($\alpha = 0.80$ for supplier trustworthiness, and $\alpha = 83$ for distributor trustworthiness).

I can expect this supplier’s salespeople [distributor] to tell me the truth.

This supplier [distributor] follows through on its promises.

I can believe what this supplier [distributor] says with confidence.

This supplier [distributor] promises to do things without actually doing them later. (r)
Convergent item (correlation with the survey measure is $-0.59^2$ for distributor data and $-0.49^2$ for supplier data):

This supplier is not trustworthy.

6. Specialized investment: The extent to which a firm has invested in resources that are tailored specifically to a business relationship. It was operationalized as the degree of a firm's actual investment in physical and human assets for the business relationship with the focal partner firm ($\alpha = 0.72$ for distributor investment, and $\alpha = 0.66$ for supplier investment).

Distributor side:

1. We have put in a good deal of effort to get to know this supplier firm’s organization and people.
2. A lot of tasks we perform to market this supplier’s product line are quite unique compared with those we perform for other suppliers’ products.
3. It took a lot of resources to develop the sales territory for this supplier’s product line.
4. It took a long time for our salespeople to learn about this supplier’s product and customers thoroughly.

Supplier side:

1. We have put in a good deal of effort to get to know this distributor firm’s organization and people.
2. We have devoted a lot of effort to develop sales programs appropriate for this distributor.

Convergent item (dichotomy coefficient with item (1) is 0.65 for distributor data and 0.51 for supplier data; dichotomy coefficient with item (2) is 0.68 for distributor data and 0.44 for supplier data):

Distributor side

1. We bought special equipment/facility to sell this supplier’s product line ___ ___
2. We hired technical specialists to provide field assistance to the customers for this supplier’s product line ___ ___

Supplier side

1. We provided special equipment to this distributor to sell this product line ___ ___

2. We set up separate personnel or organization to deal effectively with this distributor

7. Dependence: The extent to which it is easy to replace an incumbent exchange partner with alternative firms. Respondents were asked about the amount of effort it would take to replace the focal exchange partner with others. The items were measured on a 7-point scale, ranging from 1 = very little effort to 7 = great amount of effort ($\alpha = 0.88$ for distributor dependence, and $\alpha = 0.84$ for supplier dependence).

1. Dismissing this supplier [distributor] and finding a good alternative supplier [distributor] for this product line.
2. Compensating for the loss of this supplier [distributor] by switching efforts to the other lines [distributors].
3. Developing a profitable business relationship with a new supplier [distributor] if we sever the relationship with this supplier [distributor].
4. Diversifying into selling new products if we drop this supplier’s product line.
5. Dismissing this distributor and using our own company salesforce to sell this product line.

Convergent item (correlation with the survey measure is 0.55$^2$ for distributor data and 0.31$^2$ for supplier data):

How much would be the percentage of dollar loss in sales over a year period if your relationship with this supplier [distributor] were terminated?

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3 Statistical significance of the correlation coefficients was not calculated for dichotomy coefficients.

4 Items used only for the distributor respondents.

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