SUPPLY CHAIN ALLIANCES: EXPLORING THE DRIVERS OF PERFORMANCE VALUE AND BUYER SATISFACTION

URSULA Y. SULLIVAN, Northern Illinois University
TIMOTHY W. AURAND, Northern Illinois University

In this paper, the authors investigate the value gained from supply chain alliances. As companies determine whether or not to partner and effectively shut-out competition, it is imperative to know that an alliance will drive value for the firms involved. Archival data from the food service industry are examined to understand where suppliers can add value in a partnership and to learn whether these relationships affect customer satisfaction. Exploratory results indicate there are factors that allow a supplier to both directly and indirectly contribute to the value customers may gain from forming an alliance. Furthermore, providing value to customers through a supply chain alliance does result in greater customer satisfaction. In deriving the results, this paper extends the research on supply chain alliance value by measuring what the value represents to buyers as well as to suppliers.

INTRODUCTION

Much has been discussed and conceptualized about managing collaborative buyer-supplier partnerships and alliances in the supply chain (Jap 1999; Jap and Ganesan 2000; Terpend, Tyler, Krause and Handfield 2008). Indeed, Terpend, et al. (2008) recently completed a review of the buyer-supplier relationship literature that spanned 20 years. Their review concluded that more needs to be done to understand the *value* that these types of relationships deliver. Anecdotal evidence suggests suppliers are invaluable in aiding customers with product and process innovations, costs savings projects, and even helping their customers overcome natural disasters. In the case of the latter situation, suppliers proved to be critical in Procter & Gamble's ability to get its New Orlean's coffee operations back on track after Hurricane Katrina pummeled the entire Mississippi River basin (Schildhouse 2006). From diverting raw materials away from the storm's path to helping access shelters for P&G employees who lost their own homes in the catastrophe, suppliers rose to the challenge on behalf of their customer.

The Marketing Management Journal
Volume 21, Issue 2, Pages 46-53

While the P&G example may be extreme, it showcases the importance of maintaining well-managed supplier collaborations and alliances and how tremendous their value can be to the buyer. Therefore, this paper proposes two key research questions to develop a greater understanding of how alliances contribute to performance value and how that value can lead to greater satisfaction for the buyer. As a consequence, the authors seek to: 1) determine which types of operating variables affect the performance of the firm; 2) measure the *relative* impact of these operating variables; and 3) learn whether supply chain alliances have a *differential* impact on buyers' satisfaction.

UNDERSTANDING SUPPLY CHAIN ALLIANCE VALUE

Supply Chain Management (SCM) has been defined in various ways by academic researchers (Mentzer, et al. 2000). A generally well-accepted definition from the Global Supply Chain Forum defines SCM as "the integration of business processes from end-user through original suppliers that provides products, services, and information that add value for customers" (Lambert, Stock and Ellram 1998, p. 504). Others such as Cavinato (1991) and Kotzab and Schnedlitz (1998) define SCM as a special form of strategic partnership between buyers and suppliers, with

positive effects on the overall performance of the channel.

Alliances are used to describe relationships that intertwine the needs of partners who come together for mutual interests and eventually, profitable market performance. The key element of supply chain alliances is activity integration between buyers and suppliers. In fact, Bechtel and Jayaram (1997) present an integration-continuum between "pure awareness" and "pure integration" of supply chain activities; they champion the view of a supply chain as a "seamless demand pipeline" with the end-user as the driving force in the entire system (Bechtel and Jayaram 1997, p. 18).

The *performance value* gained from integrating customers and suppliers takes on many forms. Flynn, Huo and Zhao (2010) catalogue a large number of performance measures from supply chain integration. In most of the buyer-supplier relationships discussed in their paper, there are some variables that suppliers can directly or indirectly affect and others which are inherent to the company's operations—more structural in nature—that can only be managed by the company itself. For example, OfficeMax®--an office supply firm--contends they can offer customers optimized purchasing and inventory management for their office supplies (www.OfficeMax.com) and they probably can have a direct impact on costs of the materials used in an office setting and may even have an indirect impact on the usage patterns of the supplies. However, it is very unlikely that OfficeMax® will have any effect on the wages earned by the office employees of the customer.

Factors of Performance Value

Therefore, the first research objective is to determine where suppliers can add the most value in a relationship (Anderson and Narus 1998). The factors that can be directly or indirectly impacted by the supplier are termed as "controllable" while those not directly affected by the supplier are discussed as "structural." *Structural* variables are defined as those that are company- or industry-specific and therefore suppliers would have very little, if any, effect on these variables. Flynn, et al. (2010) highlight studies that have investigated different types of performance measures to determine their impact on performance standards. However, very few studies have actually measured the extent to which controllable versus non-controllable variables are more or less impactful to operational performances of customers. The overarching research question to answer is: "do certain types of operating variables impact customer performance?" The second follow-up question is then, "among these variables, which ones are more impactful?"

Previous research has established that suppliers can have an impact on customer performance (Anderson and Narus 2004; Flynn, et al. 2010). However, this research has not uncovered the extent to which these variables can impact the value customers can gain from an alliance. In this paper, the authors suggest that *Structural*—or non-controllable—variables will have the most impact on operational performance of the customer; however, suppliers will have the least ability to affect these variables. Conversely, suppliers will have higher effects on *Controllable* variables; however, these variables will have less of an impact than structural variables. Moreover, it is expected that Directly-controllable variables will have greater effects on the operational performance of alliance customers than Indirectly-controlled variables. From the office supply company example offered earlier, the Structural variable is the average wage paid by customers to their employees; the Directly-controllable variable is the cost of the materials; and, the Indirectly-controllable variable is the usage pattern of the materials. Therefore, the authors expect the operating variables to have the following effects:

Structural operating variables will have the most impact on performance value;

Directly-controlled operating variables will have the second-most impact on performance value;

Indirectly-controlled operating variables will have the least impact on performance value.

Predicting Alliance Satisfaction

The final research question addressed in the paper is: *Are alliance customers (buyers) more satisfied than non-alliance customers?* Customer satisfaction has a long history of being the focus of marketing practitioners as well as scholars (Kotler, Kartajaya and Setiawan 2010). But, to really understand whether an alliance is viewed as valuable to customers, an assessment of the satisfaction level of both the alliance partners and non-partner customers is necessary. That is, a supplier must determine whether or not the act of having an alliance has an impact on satisfaction levels. If not, then simply maintaining a certain level of overall satisfaction should suffice since managing alliances is hard work and can take a great deal of resources from both the supplier and the customer (Thomas and Esper 2010). Therefore, the final research question to address in this exploratory study is: *"Will customer satisfaction be higher for alliance partners than for non-alliance customers?"*

METHODOLOGY

The authors determined that an in-depth exploratory study, along with examining archival data, would reveal much about the performance value derived from supply chain alliances. The data were gathered by the focal supplier for the purpose of providing more concrete evidence of the benefits partners could achieve by working more closely with said supplier. Therefore, the data were not gathered for purely research purposes; rather, the authors planned to gain deeper understanding of alliance relationships by objectively examining the data and seeing what the patterns revealed. This is one of the appeals of using archival data that were not gathered for the researchers' purposes only: the data provide a level of objectivity to the research process and also gives a quantifiable way to understand the research questions at hand.

The company that developed the database is a large US food services provider to various restaurants, hotels, and healthcare facilities. Its revenue at the time of the study was approximately $6.6 billion. In the Supplier's quest to quantify its own value to its customers, it undertook an exhaustive survey of its hospital/healthcare customers. The objective of this survey was primarily a benchmarking study. The company wanted to determine the average cost of providing food services to end customers across the US as well as identify the performance metrics that customers could then use to compare the Supplier's performance to other suppliers so as to identify the best service providers. Potential alliance partners were identified from the pool of customers. In the process of indentifying partners, the Supplier was able to develop a representative sample of the company's customers. Indeed, the Supplier strongly felt that the potential partners must be a fairly representative group of all customers versus focusing on just one type of facility (e.g., size, volume, profit or not-for-profit, etc.). Over 300 facilities, out of the 1,204 approached, were willing to provide detailed data for the analysis. This resulted in approximately 25 percent participation rate.

Participating facilities were primarily non-profit (86 percent), community (74 percent) hospitals and healthcare centers located throughout the US. The facilities were mostly in the Southeast (32 percent) and Midwest (27 percent) while some were located in the Southwest (20 percent) and Northeast (15 percent). The remainder could be found in the Northwest (six percent). Approximately 25 percent were considered to be "large" (>202 beds) facilities; 37 percent were "small" (<90 beds); and, the remaining 38 percent were classified as "medium". Facilities were somewhat evenly distributed among Rural (29 percent), Urban (27 percent), and Suburban (34 percent) locations with ten percent not identified.

These potential partners (buyers) had to agree to 'open their books' to the Supplier for a thorough account audit. In return, hospitals/ facilities received a detailed report comparing their performance with that of the industry (reported as averages) as well as what the Supplier considered to be a 'stretch goal' of performing at the level of top hospitals in the dataset. The plan was that this benchmarking study would alert customers to their performance levels and if customers so chose, they could then decide to work more closely with the Supplier to gain the value that the Supplier was proposing to offer in an alliance.

Measuring Performance

Contributors to overall food facility costs are summarized in Table 1. Importantly, Table 1 shows the average costs per operational component for the entire set of respondents along with the average costs for the top ten percent and top 25 percent of the best performers. However, costs are not the entire story. Based on discussion with the focal Supplier, it was determined that *Cost Net of Cash* "…is the single most important comparative standard between hospitals" in attempting to manage their cafeteria operations. The metric calculates the amount of a hospital's daily costs that are covered by the cash earned from their cafeteria operations. In an analysis of the data, only nine percent of the total hospitals analyzed had sufficient cafeteria cash revenue to cover costs of operating. Therefore, opportunities for the Supplier to assist hospitals with managing costs and increasing revenues for greater value and better performance definitely existed. The primary concern was to determine which of the independent variables would be most impactful in improving hospitals' *Cost Net of Cash,* the study's dependent variable.

Performance Predictors

In reviewing the literature on supply chain management (Monczka, Handfield, Giunipero and Patterson 2009) and in conjunction with marketing and operating employees from the Supplier firm, a list of variables were developed to operationalize the focal predictors that were potentially the most impactful to customer performance (*Cost Net of Cash*). The authors were then able to classify the variables as being either Non-controllable (*Structural*) by the

TABLE 1:
Participating Customer Facility Costs ($US)*

Expected Direction	Variable and Type	Definition
-	Facility Size (S)	The total number of patient beds in the facility.
+	Subsidy (S)	Discount provided to employees, others for eating meals at café.
+	Average Wage (S)	Average wage rate for the labor force.
+	Patient Meal Costs (C-D)	The average cost of patient meals (excludes cafeteria meals).
-	Café Meals (C-I)	The total number of cafeteria meals (excludes in-patient meals)
-	Labor Productivity (C-I)	Number of productive labor hours divided by total labor hours.

*Dependent Variable is *Cost Net of Cash,* defined as the daily total cafeteria costs minus the revenue from the cafeteria operations.
S = Structural/Not-controllable by the Supplier
C-D = Directly-controllable by the Supplier
C-I = Indirectly-controllable by the Supplier

supplier and Controllable (*Directly* and *Indirectly*). Table 2 lists and defines each of the variables. Also included in the table is the expected impact (positive or negative) on the dependent variable (*Cost Net of Cash*) and the classification (Structural, Directly-controllable, Indirectly-controllable) of each of the variables used in the analysis.

Performance Findings

Table 3 shows the results of the regression analysis, including the standardized betas which tell which of the significant variables are the most critical to determining performance. As originally surmised, one of the Structural measures (*Subsidy*) was indeed the most impactful to performance. Significance level was high ($p < .001$) and it had the highest standardized beta (0.366). However, one of the Directly-controllable variables (*Patient Meal Costs*) was significant and it was ranked higher than the other Structural variables (*Average Wage* and *Facility Size*). Indeed, *Facility Size* was not even significant in the analysis. The two Indirectly-Controllable variables' standardized betas were ranked as 4th (*Labor Productivity*) and 5th (*Café Meals*) out of the six variables tested. Therefore, somewhat contrary to what was expected, variables that are directly controlled by the supplier can have as much of an impact, if not more, than structural or non-controllable variables.

Measuring Alliance Satisfaction

Having learned more about the extent to which a supplier can impact a customer's performance, the next question was to determine whether having an alliance with a customer leads to greater satisfaction on behalf of the customer. On an annual basis, the Supplier had fielded a satisfaction survey to all customers. After one year of completing the Performance Value Audits (from which the performance measures were tested), a simplified version of the annual survey was sent out to the 1,204 customers who were originally asked to participate in the study. Of this total, 406 (33 percent) replied and 356 (30 percent) had usable responses. The surveys were examined for positive signs of some of the changes instituted from the alliances developed.

The comparison is made between those buyers who were involved in the audit and agreed to be Alliance Partners (124 of the usable responses, or 35 percent) versus those buyers who were Non-alliance customers (232 of the usable responses, or 65 percent). There were five areas measured to test the satisfaction level of each participating client. The five variables are

TABLE 2:
Performance Predictors*

Expected Direction	Variable and Type	Definition
-	Facility Size (S)	The total number of patient beds in the facility.
+	Subsidy (S)	Discount provided to employees, others for eating meals at café.
+	Average Wage (S)	Average wage rate for the labor force.
+	Patient Meal Costs (C-D)	The average cost of patient meals (excludes cafeteria meals).
-	Café Meals (C-I)	The total number of cafeteria meals (excludes in-patient meals)
-	Labor Productivity (C-I)	Number of productive labor hours divided by total labor hours.

*Dependent Variable is *Cost Net of Cash*, defined as the daily total cafeteria costs minus the revenue from the cafeteria operations.
S = Structural/Not-controllable by the Supplier
C-D = Directly-controllable by the Supplier
C-I = Indirectly-controllable by the Supplier

TABLE 3:
Performance Results

Expected Direction	Variable	Estimate (SE)	T-value	STB	Variable Rank
N/A	Intercept	5.298*** (1.25)	4.26		
-	Facility Size (S)	-0.001 (.001)	-0.93	-0.076	NS
+	Subsidy (S)	2.34*** (0.362)	6.48	0.366	1st
+	Average Wage (S)	0.186*** (0.036)	5.10	0.301	3rd
+	Patient Meal Costs (C-D)	0.167*** (0.029)	5.71	0.343	2nd
-	Café Meals (C-I)	-000* (5.77E-7)	-1.75	-0.137	5th
-	Labor Productivity (C-I)	-6.170*** (1.268)	-4.87	-0.278	4th

F-value: 41.31***; *Adj-R^2*: 0.6575; 127 observations
* = $p<.10$; ** = $p<.05$; ***=$p<.01$
*Dependent Variable is *Cost Net of Cash*, defined as the daily total cafeteria costs minus the revenue from the cafeteria operations.
S = Structural/Not-controllable by the Supplier
C-D = Directly-controllable by the Supplier
C-I = Indirectly-controllable by the Supplier

listed in Table 4 along with the means of each item. The mean differences were tested to compare satisfaction levels of each type of customer (Alliance Partner and Non-alliance Customer) and a regression was run to understand which variables were able to predict overall satisfaction level in the relationships. Results are listed in Table 4.

Alliance Satisfaction Findings

Overall results suggest that Alliance Partners are significantly more satisfied with the Supplier than are Non-alliance customers. In particular, the *Account Manager* seems to be the driving force of that satisfaction level. This is not surprising, given that the *Account Manager* is very likely to be the one suggesting and implementing projects that may lead to generating the value expected by the Alliance Partners. *Customer Service* was also a contributor of *Overall Satisfaction*, suggesting that the Supplier was carrying through with its promise of delivering value to its Partners.

MANAGERIAL IMPLICATIONS, STUDY LIMITATIONS, AND DIRECTIONS FOR FUTURE RESEARCH

One of the primary implications from the results is that suppliers can have a definite effect on customers' performance. Based on these exploratory results, the Supplier will add the most value where they can *directly* impact (lower) the costs of meals. Some ideas for doing so with the Alliance Partner would be for the hospital facility to use more local and seasonal ingredients; to decrease waste and obsolete food items; and to develop other cost management projects to improve their cost position.

The Supplier could also help *indirectly* by assisting the Partner with improving labor productivity through Supplier Managed Inventories, thereby alleviating some of the work by hospital staff. In addition, labor productivity might be improved through an increase in Supplier's order fulfillment

TABLE 4:
Customer Satisfaction: Mean Difference Tests and Regression Results

Satisfaction Item†	Means Alliance Partner (n=124)	Means Non-Alliance Customer (n=232)
Delivery	3.29	3.31
Customer Service (*)	3.89	3.73
Driver	3.87	3.89
Account Manager (**)	4.09	3.69
Overall Satisfaction (**)	3.69	3.51

† Measured on a five-point scale with 1=Not at all Satisfied to 5=Extremely Satisfied
The mean difference is statistically significant for Customer Service, Account Manager, and Overall Satisfaction.
F-value: 195.68***; R^2= 0.71 for the regression of Delivery, Customer Service, Driver, and Account Manager leading to Overall Satisfaction.
* = p<.10; ** = p<.05; ***=p<.01

accuracy (e.g., items, quantities, billing). Improved accuracy would free customer employees from working through billing and shipment errors caused by suppliers. Another way for the Supplier to assist partners indirectly would be through helping alliance customers increase the number of cafeteria meals sold. Some ideas for doing so would be to provide fresher ingredients so meals taste better and to provide appealing recipes and presentation ideas to attract more cafeteria customers. Importantly, size *doesn't* matter in this study; all customers are seeking value from suppliers.

Finally, from the satisfaction results, there is value in developing alliances with customers. Overall satisfaction was higher for Alliances Partners than it was for Non-alliance Customers. Not surprisingly, the critical role of account managers in developing and supporting relationships should not be underestimated as level of satisfaction with the Account Manager generated the most difference between satisfaction levels of Alliance Partners and Non-alliance Customers.

There are several study limitations. First, the results, while encouraging, are not generalizable since only one supplier from one industry is analyzed. Indeed, the data were actually gathered by the Supplier for its own interests. Nevertheless, having this kind of secondary data, while unique, gives much greater insight into the dynamics of buyer-supplier relationships. Gathering similar data from suppliers in other industries would help make the findings more appealing to a larger audience.

Second, the data are cross-sectional in nature. While the performance data are quite detailed, having additional years of data to actually measure performance longitudinally would be ideal. Another idea would be to take a more qualitative and process-oriented approach. Heide's recommendation for understanding the lifespan of an alliance partnership from initiation to termination would be much more revealing about the value a supplier provides to a partner (Heide 1994).

Based upon the findings in this study, a subsequent analysis of similar data for companies in other industries is important to do. A follow-up study would help to definitively establish the extent to which suppliers can impact their own customers' performance. Knowing the type of operating variables most affected by suppliers would assist customers and suppliers in developing projects with the greatest return on investment for both parties. Another study that has potential for helping suppliers and customers would be to isolate the characteristics of

alliance pairs most likely to gain from in-depth data gathering projects. These kinds of projects take many resources (e.g, time, knowledge, money, etc.) to develop and implement. For reluctant customers and suppliers, knowing *a priori* which characteristics would be important to have in place would go a long way in alleviating many concerns.

REFERENCES

Anderson, James C. and James A. Narus (1998), "Business Marketing: Understand What Customers Value," *Harvard Business Review*, Nov/Dec98, Vol. 76 Issue 6, pp. 53-65.

___ and _____ (2004), *Business Market Management: Understanding, Creating, and Delivering Value*, Upper Saddle River, NJ: Pearson Education, Inc.

Bechtel, C. and J. Jayaram (1997), "Supply Chain Management: A Strategic Perspective," *International Journal of Logistics Management*, 8, 1997, 1, pp. 15-34.

Cavinato, J., (1991), "Identifying Interfirm Total Cost Advantages for Supply Chain Competitiveness," *International Journal of Purchasing and Materials Management*, Vol. 27, No. 4, 1991, pp. 10-15.

Flynn, Barbara B., Baofeng Huo and Xiande Zhao (2010), "The Impact of Supply Chain Integration on Performance: A Contingency and Configuration Approach," *Journal of Operations Management*, 28 (2010), pp. 58-71.

Heide, J.B. (1994), "Interorganizational Governance in Marketing Channels," *Journal of Marketing,* 58 (January), 71-85.

Jap, S.D. (1999), "Pie-Expansion Efforts: Collaboration Processes in Buyer-Supplier Relationships," *Journal of Marketing Research*, 36 (November), 461-475.

Jap, S.D. and S. Ganesan (2000), "Control Mechanisms and the Relationship Life Cycle: Implications for Safeguarding Specific Investments and Developing Commitment," *Journal of Marketing Research*, 37 (May), pp. 227-245.

Kotler, Philip, Hermawan Kartajaya, and Iwan Setiawan (2010), *Marketing 3.0: From Products to Customers to the Human Spirit*, Hoboken, NJ: John Wiley & Sons, Inc.

Kotzab, H. and P. Schnedlitz (1998), "Retailing, Don't Forget It In Your Supply Chain Management Concept," Working paper of the Department of Retailing and Marketing, Vienna School of Business.

Lambert, Douglas M., James R. Stock and Lisa M. Ellram (1998), *Fundamentals of Logistics Management*, Boston, MA: Irwin/McGraw-Hill, Ch. 14.

Mentzer, John T., William DeWitt, James S. Keebler, Soonhoong Min, Nancy W. Nix, Carlo D. Smith and Zach G. Zacharia (2001) "Defining Supply Chain Management," *Journal of Business Logistics*, Vol. 22, Issue 2, pp. 1-25.

Monczka, Robert M., Robert B. Handfield, Larry C. Giunipero, and James L. Patterson (2009), *Purchasing and Supply Chain Management*, Mason, OH: South-Western Cengage Learning.

Schildhouse, Jill (2006), "One on One: An Interview with Richard A. Hughes," *Journal of Supply Chain Management*, Spring 2006, Vol. 42, No. 2, p. 2.

Terpend, Regis, Beverly B. Tyler, Daniel R Krause and Robert B Handfield (2008) "Buyer–Supplier Relationships: Derived Value over Two Decades," *Journal of Supply Chain Management*, May2008, Vol. 44 Issue 2, pp. 28-55.

Thomas, Rodney W. and Terry L. Esper (2010), "Exploring Relational Asymmetry in Supply Chains: The Retailer's Perspective," *International Journal of Physical Distribution & Logistics Management*, Vol. 40, No. 6, pp. 475-494.