

**EXPLORATION, EXPLOITATION AND SATISFACTION
IN SUPPLY CHAIN PORTFOLIO STRATEGY**

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INTRODUCTION

Building cooperative relationships has become a core strategy in supply chain management (Andraski 1998; Stank, Keller, and Daugherty 2001). In fact, Wal-Mart, attributes a major part of its success to the relationships with its suppliers (Schaffner 1996). However, growing end-user expectations, technological advancements, and changing market dynamics all cause environmental uncertainties that need to be managed by the firm when maintaining inter-firm relationships (Ghosh and John 1999). Transaction cost research suggests that the greater the uncertainty, the more likely it is that firms will seek to control activities through vertical integration rather than through some form of supply chain relationship (Williamson 1975; Balakrishnan and Wernerfelt 1986; John and Weitz 1988; Rindfleisch and Heide 1997). Due to their limited resource base, small-to-medium-sized enterprises (SMEs)¹, many of which are third party service providers (3PL), seldom find vertical integration to be a legitimate option. This is the case with US and European based 3PLs that focus on a core competency to add value to the overall supply chain. These firms only have the option of cooperative relationship formation. Moreover, firm performance is increasingly dri-

¹Small Business Administration in Greece (where this study is conducted) defines an SME as a firm that employs 10 to 250 employees. This is consistent with 3PLs in other developed markets.

ven by competition among cooperative supply chain relationships rather than competition among individual firms (Achrol and Kotler 1999; Hakansson and Persson 2004). Hence, joining in cooperative relationships remains a necessity for many SMEs, 3PLs, and larger firms to survive in the global marketplace.

As the strategic focus of a firm shifts from short-term transactions to a portfolio strategy of diverse relationships, relationship management of multiple organizations becomes an important capability for supply chain managers (Cooper, Ellram, Gardner, and Hanks 1997; Min and Mentzer 2004). SMEs manage cooperative relationship portfolios to gain access to resources across the various phases of their value chain and to gain resource security provided by partners (George et al. 2001). For instance, Cold Stone Creamery manages a large set of relationships with developers and construction companies to gain access to highly valuable retail locations and call these "alliance portfolios" (Commercial Property News 2005). Despite the increasing popularity of these multiple cooperative relationships, previous research on cooperative relationships confirms that a firm's level of satisfaction with its collection of cooperative relationships have been less than optimal (e.g., Chattarjee 2004; Park and Russo 1996; Shamdasani and Seth 1995; Mohr and Spekman 1994). Lack of satisfaction with the cooperative relationship is one of the major reasons cited for the failure of many cooperative relationships (Hamel, Doz, and Prahalad 1989). Yet, little attention has been paid to SME satisfaction with supply chain cooperative relationship portfolios.

In this research, we address an important gap in the supply chain literature by focusing on SME satisfaction with their cooperative relationship portfolio. Extant research on cooperative relationships has generally employed either a macro-perspective (e.g., examining alliance networks), or a micro-perspective (e.g., examining individual agreements). This research employs a meso-perspective that examines the totality of a firm's agreements and the importance of coherently managing these agreements for maximum firm performance. This is key to supply chain strategy, as leveraging synergies among cooperative relationships to optimize the value of the entire portfolio is more than a simple summation of the values created by each cooperative relationship individually (Parise and Casher 2003). Moreover, satisfaction is a proactive indicator of the effectiveness of the cooperative relationship portfolio (Van de Ven and Ferry 1980; Saxton 1997). It can trigger stability in cooperative relationships resulting in the sustained financial benefits most firms seek (Beamish and Inkpen 1995; Gill and Butler 2003). Given this logic, many SMEs and 3PLs are likely to seek out access to valuable resources through cooperative relationships rather than through equity investments (Dickson 1997).

Our contribution to the literature and practice addresses a gap in the study of supply chain management related to the relationship between strategy and satisfaction. As such, we examine the relationship between two core relational strategies that portfolio members employ (exploitation and exploration) and supply chain partner satisfaction. To do this, first we address the role of the portfolio and exploitation and exploration oriented cooperative relationships between firms (March 1991). We also include the role of environmental hostility in our analysis as an interaction effect complicating the relationship (Covin and Slevin 1989). We examine levels of satisfaction regarding

cooperative relationship portfolios and assess the impact of environmental hostility. Finally, we suggest a rubric for managers to employ in governing these relationships. Under this perspective, we will start with a brief discussion of previously developed cooperative relationship types by which supply chain portfolios are structured.

CONCEPTUAL DEVELOPMENT

Definitions of cooperative relationships range from those who view them as a relationship that necessitates the sharing of benefits and burdens over time (La Londe and Cooper 1989) to those who view them as relationships where buyers and suppliers work together closely in a long-term oriented manner (Gentry 1996). To provide a more comprehensive conceptualization, Lambert, Emmelhainz, and Gardner (1999, p.166) refer to cooperative relationship as “a tailored business relationship based on mutual trust, openness, shared risk, and shared rewards that yields a competitive advantage, resulting in business performance greater than would be achieved by the firms individually.” A *cooperative relationship portfolio* (CRP) refers to the entire spectrum of cooperative firm relationships that are being maintained by a firm (Bensaou 1999; Parise and Casher 2003; Reuer and Ragozzino 2006). In order to understand the different types of cooperative relationships that make up a portfolio, we will first review the existing cooperative relationship classification schemes.

Previous research on interorganizational relationships suggests that various levels of buyer-supplier relationships can be illustrated on a continuum where simple arm's length transactions are on the one end and vertical integration on the other (Contractor and Lorange 1988; Webster 1992). In between the two extremes are the cooperative relationships (Gardner, Cooper, and Noordewier 1994; Golicic, Foggin, and Mentzer 2003; Rinehart et al. 2004). A cooperative relationship may take the form of a joint venture, strategic alliance, franchising, licensing agreement, contractual outsourcing relationships (3PL/4PL), export-import agreements, etc. The distinction among the different types of interfirm relationships is mostly based on governance modes and levels of resource contributions (Golicic, Foggin, and Mentzer 2003). Lambert, Emmelhainz, and Gardner (1996, 1999) further classified the cooperative relationships into three types based on the drivers and facilitators or bridges (see Fawcett and Magnan 2002, 2004) of the relationship. Whereas the drivers represent motivations to collaborate such as cost efficiencies, marketing advantage, or profit growth, the facilitators refer to the desired conditions like cultural compatibility, resource complementarity, and reciprocity (Lambert, Emmelhainz, and Gardner 1996; Fawcett and Magnan 2002, 2004).

In an alternative approach yet to be examined in supply chain and logistics research, March (1991) refers to the distinction between relational exploration and exploitation strategy. Specifically, firms may be oriented towards a strategy of exploration of new resources or the exploitation of existing resources. Exploration captures terms such as search, variation, risk taking, experimentation, flexibility, discovery, and innovation. Exploitation includes such concepts as refinement, choice, production, efficiency, selection, implementation and execution. March additionally points out that “the problem of balancing exploration and exploitation is exhibited in distinctions made between refinement of an existing technology and the invention of a new one” (p.72).

Exploitation/exploitative relationships need not be viewed as short-term or in a negative connotation. As such, both an exploitative and an exploration relationship can be highly valued. Exploitation simply means the partner is using the resources, knowledge, and/or abilities of the other firm. As such, exploitation is related to relationships that are already in place, while exploration is more strategic and structural than process oriented. A summary of the characteristics of exploration and exploitation strategies is provided in Table 1.

TABLE 1
EXPLORATION VERSUS EXPLOITATION

	Exploration	Exploitation
Strategic Focus	Effectiveness	Efficiency
Type of Innovation	Discontinuous – Exploration of new resources and opportunities	Incremental – Exploitation of existing capabilities, resources and knowledge
Time Frame for Payoff	Longer-term	Shorter-term
Predictability of Returns	High Variance, Uncertain	Low Variance, Predictable
Outcomes	Discovery of new opportunities and innovations.	Systematic improvement and refinement of existing capabilities and technologies

When making strategic choices firms may develop cooperative relationships, either to exploit the resources they possess within the firm, or to explore new resources possessed by the cooperating firms (Park, Chen, and Gallagher 2002). Cooperative relationships, like joint ventures, equity investments, and long-term marketing agreements, imply exploration of new resources because these types of relationships are built to gain competitive advantage through new product and/or new market offerings (see Pfeffer and Nowak 1976; Webster 1992). For instance, British Steel, now Corus, has formed a joint venture with the Greek firm Kalpinis-Simos to manufacture metal composite panels for the industrial and commercial buildings market in Greece (Steel Times 1999). A relationship where Corus has an opportunity to explore the new Greek market and Kalpinis-Simos explores growth through a new product development. In fact, Hagedoorn (1993) found that cooperative relationships, like joint ventures, joint product research and development agreements, and equity investments, were highly related to long-term positions of innovation and market exploration. On the other hand, agreements targeting process improvements, just-in-time (JIT) type logistical operation efficiencies, and total quality management (TQM) agreements suggest exploitation of existing resources (Mosey, Woodcock, and Clare 2003). For example, Greek mattress manufacturer Coco-mat™ joins in TQM agreements with its supply chain partners to gain maximum efficiency from the use of its existing resources (Mudd 2002).

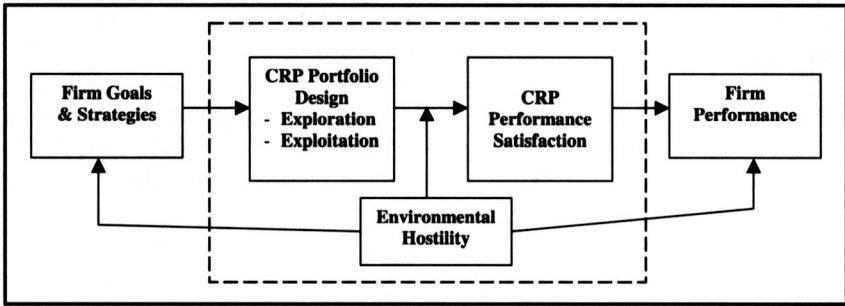
For the purposes of this study, we adopted the exploration – exploitation classification of cooperative relationships in order to examine the impact of strategic choices regarding CRPs on the firm's satisfaction with its CRP (March 1991). By strategic choices, we refer to the proportional make up of exploration-oriented and exploitation-oriented cooperative relationships. In order to grasp the relationship between CRP strategic choices and satisfaction with the CRP, we referred to the Strategic Behavior Theory. The basic tenant of Strategic Behavior Theory is that firms take specific actions (e.g., developing and implementing goals, strategies and tactics) to enhance their competitive position compared to rivals and thereby maximize firm performance (Kogut 1998). Strategic Behavior Theory is consistent with the strategic choice perspective (Child, 1972) in that it acknowledges that while a firm's choice of strategies and tactics are influenced by the external environment, they are not completely determined by it. For example, while a shipping company's strategies and tactics may be impacted by international regulations, the firm is still able to formulate and execute strategic initiatives that enable it to build a competitive advantage in the global shipping industry.

As explained by Strategic Behavior Theory, a firm's choice of behaviors to cope with the external environment is based not so much on an ambition to minimize transaction costs, but rather as a consequence of firm strategies and goals. Thus, in order to achieve firm goals and build a competitive advantage, firms must distinguish themselves from rivals by developing and employing strategies and tactics that will favorably position the firm in a given environment. One tactic that firms can be expected to employ – in an effort to build a competitive advantage – is the proactive establishment and management of a cooperative relationship portfolio that is consistent with the firms' goals and strategies. To the extent that the relationships meet key firm goals, including strategic positioning and financial performance, the firm can be expected to be more satisfied with CRP performance. A more effective CRP may be expected to enhance firm performance. In industry, firms like Hyundai and Mercedes keep CRPs of first and second tier suppliers that fit their strategic needs and provide stability and flexibility for their production and distribution strategy.

Still, managers recognize that firm strategies and tactics are influenced by the external environment. One element of the external environment that can be expected to impact firm strategic effectiveness is the hostility of the external environment. Environmental hostility is reflected by the relative amount of resources available to the firm, the market growth rate, and the market uncertainty. Environmental hostility can be expected to influence not only the strategies and tactics chosen by a firm, but also the relationships within a firm's CRP and the firm's satisfaction with its CRP as a whole. As noted, these relationships will likely have an impact on the CRP and firm performance in the long run. We detail this complex relationship in the extended conceptual model presented in Figure 1. The dashed-box highlighting the portion of the model is what we examine in this research.

FIGURE 1

CONCEPTUAL MODEL



In the case of SMEs in emerging markets like Greece, an important strategic goal would be to develop and maintain a satisfactory portfolio of cooperative relationships to secure access to a diverse set of valuable resources. This approach is a key to both competing and surviving in the new and ambiguous European environment. Overall satisfaction with a CRP is defined as the degree of an SME's overall affective evaluation of its cooperative relationships. This definition is consistent with previous conceptualizations of the construct in the literature on interfirm exchange relationships (e.g. Frazier 1983; Anderson and Narus 1984). The importance of studying satisfaction is emphasized by Hunt and Nevin (1974) who observed that satisfaction with business partners leads to increased cooperation and relationship stability. Other researchers like Walton (1996) and Stern and Reve (1980) also suggested that attitudes between supply chain partners (e.g. satisfaction) are important because they impact the efficiency of the cooperative relationship. Furthermore, Anderson and Narus (1990) argue that examining satisfaction with business partners should be given more attention since it provides a strong surrogate for perceived effectiveness of the cooperative relationships and may signify the future stability of cooperative relationships.

Strategic Behavior Theory provides several inferences regarding the relationship between strategic choices and satisfaction with the CRP. First, the choice to participate in cooperative relationships will depend on goal directed strategic behavior such as gaining access to new markets (Kogut 1988). For example, Starbucks Coffee expanded into new countries through cooperative relationships, moving into the airline industry with United Airlines and hotels with Marriott (Gomes-Casseres 2000). Second, the choice of cooperative relationship type will be based on the strategies and structures of the partners (Tallman and Shenkar 1994). For instance, British Telecom and AT&T chose to form a joint venture – an exploration oriented cooperative relationship – based on a shared vision of asset integration between the two firms (Gomes-Casseres 2000). Third, the choice of cooperative relationship strategies and types will be based on a desire to better the firm's compet-

itive position (McGee, Dowling, and Megginson 1995). For example, General Mills allied itself with a former online grocer to learn how to sell over the Internet (Gomes-Casseres 2000). In sum, if the firm's strategic objective is forming cooperative relationships to gain access to new resources, take advantage of interfirm synergies, and better the firm's competitive position through obtained knowledge through cooperative relationships, they will be more satisfied with a portfolio favoring exploration oriented cooperative relationships.

When SMEs make choices regarding formation of cooperative relationships, size related disadvantages including limited access to human resource talent, technology, financial resources, etc. cause SMEs to focus on gaining access to new and valuable resources, i.e. exploration (Spanos, Prastakos, and Papadakos 2001). On the other hand, large firms tend to join cooperative relationships with SMEs to take advantage of their flexibility and agility. This allows the larger firms to utilize their existing resources more effectively and efficiently (Marino, Strandholm, and Hultman 2005). Therefore according to Strategic Behavior Theory, SMEs that have a higher proportion of exploration oriented cooperative relationships as opposed to exploitation oriented ones would be more likely to be satisfied with the performance of their portfolio. This is because exploration oriented cooperative relationships provide SMEs with longer-term resource access for building competitive advantages through new products, technology, and/or markets. Thus,

H1: Portfolios that favor exploration oriented cooperative relationships will lead to higher levels of SME satisfaction with the cooperative relationship portfolio.

As suggested by Mentzer et al. (2000), there is not an ideal cooperative relationship type that provides a solution for every possible situation. Whereas exploration oriented cooperative relationships provide competitive advantages through access to new and valuable resources, they require long-term orientation, shared vision between the partnering firms, and high levels of resource contribution in a reciprocal manner (Vanhaverbeke, Beerkens, and Duysters 2004). However, SMEs that try to gain competitive advantages through cost leadership in intense or hostile competitive environments may be reluctant to make long-term resource commitments for exploration oriented cooperative relationships, and may prefer exploitation oriented cooperative relationships that provide operational efficiencies and effectiveness. This is because the efficiency provided by cooperative relationships that cultivate the SMEs' existing resources may help firms achieve their strategic objective of cutting down the cost of inventory, production, and transportation. Such cost reductions allow SMEs to be more flexible when competition is price oriented – that is when the competition is intense and/or hostile (Porter 1985; Baum and Korn 1996). Therefore,

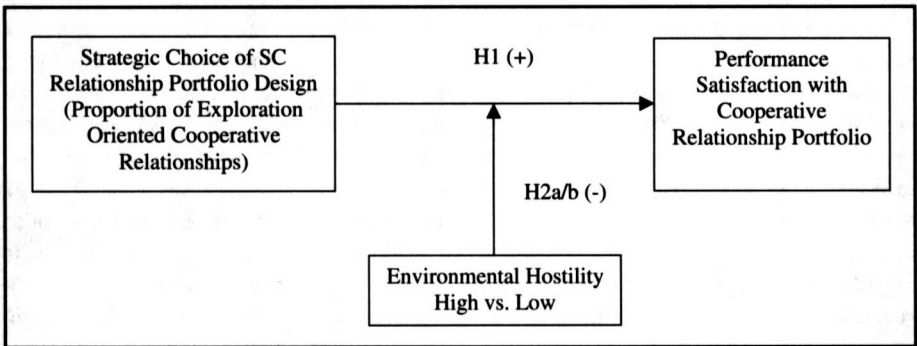
H2a: Under more intense/hostile competitive conditions, portfolios that favor exploitation oriented cooperative relationships will lead to higher levels of SME satisfaction with the cooperative relationship portfolio.

H2b: Under less intense/hostile competitive conditions portfolios that favor exploration oriented cooperative relationships will lead to higher levels of SME satisfaction with the cooperative relationship portfolio.

A summary of the hypotheses is presented in Figure 2.

FIGURE 2

HYPOTHESIZED RELATIONSHIPS



RESEARCH METHODOLOGY

Data Collection

Data used in this study were collected using a survey that was directed to owners and general managers of independent SMEs in Greece who were selected using a stratified random sampling technique. Greece was chosen for this study as it represents a particularly interesting context since it is an example of an economy in transition. The Greek economy relies heavily on SMEs for survival much as niche industries and 3PLs do for the United States and other more developed international markets (Salavou 2005). As part of the European Union, Greek firms – particularly SMEs – need to attain capabilities to cope with the formidable challenges associated with competing in the European Union and elsewhere (Spanos et al. 2001).

As indicated earlier, the focus of this study is the firm's set, or portfolio, of cooperative relationships. Supply chains are defined as "three or more organizationally distinct handlers of products, where products include physical goods, services, and information" (Cooper et al. 1997). As a result of its multi-organizational nature, supply chain management has emerged as a core firm strategy that focuses on building and maintaining interfirm relationships. Therefore in this study, the respondents were asked to consider cooperative relationships with their suppliers and/or buyers. In addition, relationship management of multiple organizations became a major part of supply chain management strategy, as firms realized that firm performance is increasingly driven by competition among cooperative supply chains rather than competition among individual firms (Achrol and

Kotler 1999). This trend suggests a portfolio analysis approach to management of multiple supply chain relationships. A supply chain relationship portfolio may imply such interfirm indicators as level of resource exchange, level of learning, geographic markets of exploration, new product categories of exploration, opportunities of operational efficiencies and effectiveness, etc. By analyzing such indicators in a portfolio, managers can develop an understanding of what specific types of relationships perform best for the company, opportunities for growth through building and maintaining cooperative relationships, specific stages in relationships where the company consistently stumbles, and/or areas of synergy where one partner may increase the firm's ability to cooperate with others (Bamford and Earnst 2002; Parise and Casher 2003).

The survey instrument employed in this study was developed in English and then underwent a double-back translation process that is consistent with the guidelines established by Brislin (1980) and Punnett and Shenkar (1996) in regards to the equivalence of language translations. Once the translation process was completed, pilot tests were conducted to ensure clarity and accuracy of survey translation. Two rounds of pilot tests were employed in developing the survey. In the first round of pilot testing, the survey was reviewed by academics in a partner university in Greece. Corrections were made to the wording of several questions based on this review. In the second round, the survey was pilot tested with a focus group of ten Greek managers at a conference in Greece. These managers reviewed the document to aid in assessing the face validity of the items and constructs. Minor changes were made based on their feedback. The survey method also employed a key decision maker focus as theoretical support exists for the proposition that firms of this size are the extensions of the individuals in charge (Lumpkin and Dess 1996). Thus, the questionnaire was addressed to the owner or general manager of each firm surveyed.

Consistent with the questions under consideration in this study, only independently owned firms that were consistent with the Greek Small Business Administration's definition of a SME (10-250 employees) were included in usable sample. Further, to ensure that the key respondent was a key supply chain decision-maker in the firm, the sample was also limited to include only independent firms in which the respondent held an equity stake. Surveys were mailed in a two-wave mailing process to 400 SMEs. The response rate for usable surveys was 39%, and follow-up phone calls with a random sample of non-respondents showed that there were no differences between respondents and non-respondents on demographic factors such as firm size and operational issues. Firms with incomplete surveys were eliminated using list-wise deletion. The final sample size was 103 supporting a usable response rate of 25.8%. Demographics of the final sample are reported in Table 2.

TABLE 2
SAMPLE FIRM DEMOGRAPHICS

Number of Employees (Median)	20
Number of Managers involved Interfirm Relationship Operations (Median)	2
<i>Firm Type</i>	
% Independent Organization	78
% Holding Organization	16
% Subsidiary Organization	6
<i>Relationship Orientation Type*</i>	
% Exploration	59
% Exploitation	41

* See Table 1 for the classification of relationship orientation types.

Measures

Satisfaction with Cooperative Relationship Portfolio. SME perceptions of satisfaction with their cooperative relationship portfolio was operationalized using a three-item five-point scale assessing general experience with the cooperative relationship portfolios, characterization of financial results produced by the cooperative relationship portfolio, and the overall assessment of the cooperative relationship portfolio performance compared to expectations. This approach is consistent with both Bucklin and Sengupta (1993) and Mohr and Spekman (1994). The face validity of these items was established in interviews with key executives from SMEs in which the executives were asked how they evaluate the success of their CRPs. The items were pre-tested prior to their use and demonstrated acceptable construct validity. The items were combined into a single scale by a mean calculation ($\alpha=.73$).

Relationship Portfolio Structure. Firms were asked to indicate on a six-point scale (from 0 to 5+) the extent to which they use eight different types of cooperative relationships including joint ventures, equity investments, licensing, long-term marketing agreements, process or product technology alliances, export management, or logistics alliances like just-in-time, TQM, MRP, etc. A "1" indicated that the firm had used only one of these types of agreements while a "5" indicated that the firm had used five or more of these agreements. Similar to the CRP satisfaction scale, this list of cooperative relationships was derived from past research (Hagedoorn 1993; Gulati 1995) and validated with interviews with SME executives. The upper-limit of five on the scale for the number of alliances of any one type that an SME employed was based on feedback from the executives interviewed that indicated that very few SMEs used more than five alliances of any single type.

For the purpose of this study, each type of relationship was classified as exploration or exploitation oriented based on the conceptualization of March (1991). Agreements were classified as exploration oriented if this type of agreement was generally intended to enhance an organization’s ability to identify and leverage new opportunities, resources, and products. Alternately, agreements were classified as exploitation oriented if this type of agreement was generally intended to enhancing operational process and procedural efficiency.² Interviews with executives were used to develop and validate the classification of agreements into their respective types. Consequently, a measure of cooperative relationship portfolio structure was computed using the following formula: Portfolio Structure = Number of Exploration Oriented Relationships / Number of All Relationships in a Portfolio (see Table 3).

TABLE 3

AN OPERATIONAL DEFINITION OF PORTFOLIO STRUCTURE

Portfolio Structure = (# of Exploratory / (# of Exploratory + # of Exploitation))	
Exploration Strategies (# of Exploratory)	Exploitation Strategies (# of Exploitation)
Defined as the total number of exploration oriented cooperative relationships. These agreements are focused on enhancing an organization’s ability to identify new opportunities, resources, and products and include:	Defined as the total number of exploitation oriented cooperative relationships. These agreements are focused on enhancing operational and procedural efficiency and include:
Equity Investments	JIT Logistical Alliances
Export Management	TQM Logistical Alliances
Joint Ventures	CPFR
Licensing Agreements	MRP/ERP Logistical Alliances
Long-term Marketing Agreements	Process R&D Agreements
New Product R&D agreements	

The score on this index could range from 0 to 1 with a high score indicating a portfolio favoring exploration oriented cooperative relationships and low score indicating a portfolio favoring exploitation oriented cooperative relationships.³

²It is important to note that the term “exploitation” is not intended to be interpreted in a pejorative, or judgmental manner. The term exploitation in no way signifies that opportunistic intentions or tendencies are associated with these agreements. Indeed, many of these agreements are highly valued relationships based on trust (e.g., process technology alliances and JIT agreements) that are key to the success of SME’s and their partners.

³The measure employed (as seen in the Appendix) to capture a firm’s involvement in cooperative agreements may under-report the number of total alliances a firm has since the upper-end of the scale is “5 or more.” Therefore a firm that has 5 exploration oriented agreements would have the same index score as one with 25.



Environmental hostility. Environmental hostility was operationalized using a four-item five-point semantic differential scale assessing perceptions regarding threats to the firm's survival, hostility in the competitive environment, ability to control/dominate environment, and level of competitive intensity. These items were derived from environmental perception scales developed by Khandwalla (1976/77) and Covin and Slevin (1989) and that have been used in the strategic management literature. The items were combined into a single scale through a mean computation ($\alpha=.72$).

Control Variables. As suggested by Pfeffer and Salancik (1978), the firm's resource base should be an important factor in determining the choice of cooperative relationship types that makes up a cooperative relationship portfolio. Three indicators of the firm's resources which have been used by past research include the firm size (# of employees), perceived firm financial performance ($\alpha=.81$), and firm level cultural orientation (individualism vs. collectivism, $\alpha=.72$) (Gulati 1993; Hagedoorn 1995). Firms that are bigger in size and better in financial performance are expected to have larger resource pools (Gulati 1993) and those firms with larger resource pools have been suggested to be more prone to cooperative relationships since they possess resources that may be attractive to others (Eisenhardt and Schoonhoven 1996). Moreover, Shane (1993) suggests that the firm's cultural orientation influences the perceptions of cooperative relationships. Wagner (1995) argues that individualism/collectivism is the most significant of those cultural orientations that influence the firm's attitude towards cooperation. More specifically, firms that embrace collectivism are generally characterized by strong social networks in which the cooperative firms look to the group to work together for the wellbeing of the entire supply chain (Hofstede 1980; Dickson and Weaver 1997).

Finally, research suggests that perceived opportunism plays an integral role in determination of interfirm relationship governance types (Williamson 1991). Transaction cost economics theorists argue that the fear of opportunistic behavior is significantly influenced by the social embeddedness of the interfirm relationships (Gulati 1993; Parkhe 1993; Ghoshal and Moran 1996). Granovetter's (1985) notion of embeddedness suggests that market and hierarchical relations are typically embedded in social relations. Social embeddedness is of particular importance in SME-based cooperative relationships because of the strong reliance upon non-contractual, interpersonal relationships (Birley 1985). The social embeddedness of an SME cooperative relationship is based on both former experiences and the strength of the alliance relationships maintained by the SME (Gulati 1993). Therefore, this study assumes that the SME's past experience across all cooperative relationships will have an important impact on satisfaction with alliance usage and we controlled for this experience by measure the perceived level of opportunism ($\alpha=.85$) that firms experienced with their alliance partners. We will now discuss the results of our analysis.

RESULTS

Descriptive statistics for the sample are presented in Table 4. Cronbach's alphas for each measure support the reliabilities of the measures, and the low inter-correlations presented in Table 4 provide an evidence of the discriminate validity of the constructs.

TABLE 4
MEANS, STANDARD DEVIATIONS, AND CORRELATIONS

	Mean	S.D.	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Firm Size (1)	39.33	41.34	1.00						
Financial Performance (2)	101.01	26.36	0.02	1.00					
Opportunism (3)	3.08	0.67	0.00	-0.10	1.00				
Individualism (4)	2.82	0.58	-0.10	-0.05	0.18*	1.00			
Strategic Choice (% Exploration) (5)	0.59	0.29	0.21**	0.08	-0.01	0.01	1.00		
Competitive Intensity (6)	3.21	0.80	0.03	-0.03	0.01	-0.06	-0.13	1.00	
Satisfaction with Alliance Portfolio (7)	3.60	0.58	-0.01	0.14	-0.32***	0.01	0.23**	-0.20*	1.00

*p<.10 **p<.05 ***p<.01

Listwise N=103

To test the hypotheses, hierarchical linear regression was employed. Hierarchical regression is especially appropriate for this study because it allows for the evaluation of incremental changes in R-squared as new variables are entered while controlling for the effects of other variables of interest. To capture the interaction between cooperative relationship portfolio structure and environmental hostility, these variables were multiplied to create an interaction variable (Daugherty, Myers, and Richey 2002). This interaction term, along with the main effect, were entered on the final step of the regression (Baron and Kenney 1986; Stone and Hollenbeck 1989). The results of the three-step regression analysis are reported in Table 5.

TABLE 5

**HIERARCHICAL REGRESSION MODELS FOR SATISFACTION WITH SUPPLY
CHAIN COLLABORATIVE RELATIONSHIP PORTFOLIO PERFORMANCE**

Dependent Variable – Firm Satisfaction with Cooperative Relationship Portfolio			
	Model 1	Model 2	Model 3
Controls			
Firm Size (# of Employees)	-0.004	-0.045	-0.057
Financial Performance	0.108	0.086	0.094
Opportunism	-0.325***	0.320***	0.309***
Individualism	0.079	0.060	0.033
Main Effects			
Strategic Choice (Proportion of Exploration Oriented Relationships)		0.210**	0.294***
Competitive Intensity		-0.162*	-0.247**
Interactions			
Strategic Choice X Competitive Intensity			-0.266**
R ²	0.120	0.198	0.252
Adjusted R ²	0.081	0.143	0.192
F	3.077**	3.621***	4.197***
Δ F	3.077**	4.265**	6.332**
Δ R ²	0.120**	0.078**	0.054**

N=103 *p<.10 **p<.05 ***p<.01

The first step included the control variables only and the model is significant ($F=3.077$, $p<0.05$) with an adjusted R^2 of 0.081. Aside from the effects from perceived opportunism, the control variables proved to be non-factors as sources of SMEs' satisfaction with alliance portfolio performance. In the second step, the main effects of portfolio structure and environmental hostility were introduced and the model is significant ($F=3.621$, $p<0.01$) with an adjusted R^2 of 0.143. The change in R^2 from Model 1 to Model 2 is also significant ($\Delta F=4.265$, $p<0.05$), implying that the main effects significantly improved the predictive ability of the model. In the third and final step, the full model with the two-way interaction was tested. Once again, the full model is significant ($F=4.197$, $p<0.01$) with an adjusted R^2 of 0.192. Moreover, Model 3 demonstrates a significant improvement over the first two models as measured by the change in R-squared ($\Delta F=6.332$, $p<0.05$).

Main Effects

The results of model 2 provide support for Hypotheses 1. Hypothesis 1 suggests portfolios favoring exploration oriented cooperative relationships lead to higher likelihood of satisfaction with cooperative relationship portfolio. The positive sign ($\beta=0.431$, $p<0.05$) between cooperative rela-

tionship portfolio structure and satisfaction with cooperative relationship portfolio tends to support for Hypothesis 1 – indicating a larger proportion of exploration oriented cooperative relationships in a firm’s cooperative relationship portfolio is associated with higher levels of satisfaction with the entirety of the cooperative relationships.

Interaction Effects

A two-way interaction term is calculated by multiplying the mean-centered variables to avoid collinearity (Jaccard, Turrisi, and Wan 1990). The results of model 3 provide support for Hypotheses 2a and 2b. Hypothesis 2a suggests that under more intense or hostile competitive conditions, portfolios that favor exploitation oriented cooperative relationships lead to higher levels of satisfaction with cooperative relationship portfolio. Alternatively, Hypothesis 2b suggests that under less intense or hostile competitive conditions, portfolios that favor exploration oriented cooperative relationships lead to higher levels satisfaction with cooperative relationship portfolio. The interaction term (strategic choice x environmental hostility) is significant in the expected direction ($\beta = -0.641$, $p < 0.05$) implying that the strategic choices regarding the cooperative relationship portfolio is an important determinant of satisfaction with cooperative relationship portfolio for those SMEs that operate under intense competition. For better understanding, these interaction effects are plotted to demonstrate the cell means for the satisfaction with cooperative relationship portfolio – as shown in Figure 3. To form the cells, we identified means as the cutoff points for the independent variable and recoded the variables as high (2) and low (1).

FIGURE 3

INTERACTION EFFECTS

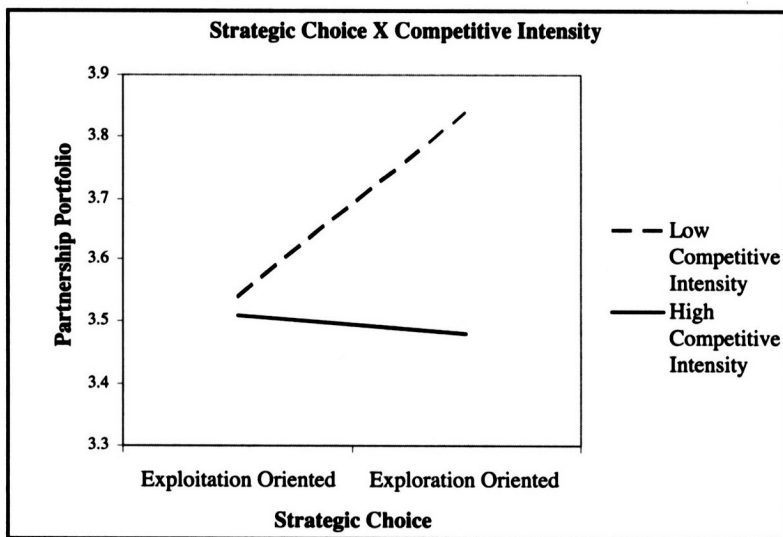


Figure 2 indicates that the SMEs are most satisfied with their cooperative relationship portfolios (CRPs) when their CRP is mostly made up of exploration oriented cooperative relationships and they are in a less intense competitive environment. Their satisfaction level with their CRP is less when they have a high proportion of exploitation oriented cooperative relationships accompanied by low environmental hostility. On the other hand, when the environmental hostility is high, SMEs' satisfaction level decreases slightly as companies move from exploitation oriented portfolios to exploration oriented CRPs. These findings suggest full support for Hypothesis 2b but only partial support for H2a. In sum, when the environmental hostility is low, the firm satisfaction with CRP is significantly higher for portfolios favoring exploration oriented cooperative relationships. On the other hand, when the environmental hostility is high, the SME's satisfaction with CRP is higher for portfolios favoring exploitation oriented cooperative relationships compared to exploration oriented ones – however the difference is not statistically significant.

DISCUSSION

Guided by Strategic Behavior Theory, the findings of this study indicate that a partner firm's strategic choice to explore or exploit resources through relationships is a critical determinant for firms when they make assessments of satisfaction with their CRP. In particular, when the external environment is less hostile, SMEs are more likely to be satisfied with CRPs that include a higher proportion of exploration oriented cooperative relationships. In these less hostile environments, SMEs are likely to perceive promising opportunities and exploration oriented cooperative relationships can allow SMEs to examine these opportunities without fully committing the resources needed to leverage them. This finding is consistent with previous research that indicates that exploration oriented relationships provide firms with access to highly sought after resources that they wouldn't be able to obtain alone otherwise (Park, Chen, and Gallagher 2002). Securing such valuable resources through multiple cooperative relationships, SMEs can develop longer-term positions in the marketplace. However, as environmental hostility increases and competition increasingly centers on issues like cost leadership, strategic choices regarding exploration/exploitation orientation become less of an issue and SMEs become more concerned with achieving operational effectiveness and efficiencies on their own. Under such circumstances, short-term survival becomes a priority over long-term ambitions of superior financial performance.

This research brings up some serious questions for supply chain relationship researchers. As we note in this study, firms in cooperative relationships can have vastly different relational orientations that are guided by their strategic goals or outcomes for cooperating in a supply chain context. This being said, one should note that satisfaction can be different across various supply chain relationships when researchers examine the portfolio of relationships (i.e. two similar SMEs may have two different orientations). Ultimately, one would expect similar implications on the measurement of trust, commitment, loyalty, and other traditional constructs studied in supply chain management research. Using a portfolio perspective, we confirm that higher level analysis is needed to assess the performance/satisfaction relationship. Environmental hostility, a subcomponent of environmental

uncertainty (Covin and Slevin 1989), is also an issue of consequence that researchers must examine. We support the premise that uncertainty impacts relational strategy choice and satisfaction ratings. Also, since satisfaction is influenced by environmental hostility, researchers should control or explain its impact when reporting relational results in supply chain research.

This study also develops important managerial implications for SMEs and larger firms that work with SMEs when managing portfolio satisfaction. When it comes to metrics, supply chain firms must assess cooperating firm's strategic motivation before comparing satisfaction ratings across firms. To simply say, "We expect all our partners to exceed a satisfaction rating of 90%" discounts individual firm differences and the dynamics of relationships across the portfolio. For instance, firms that are using an exploiting strategy across relationships will most likely report lower satisfaction ratings than firms employing an exploring strategy even when service and the external environment are similar. Hence, attempts to raise satisfactions across all firms and all alliance types may be ineffective for some firms and inefficient for others. Additionally, when examining satisfaction across a portfolio of relationships, uncertainty may have an impact on focal firm satisfaction. Specifically, we show that similar firms with different relational strategies experiencing varying levels of uncertainty will generate differing levels of satisfaction. This disparity may exist regardless of what managers do to influence portfolio satisfaction. Therefore, it makes sense for managers to consider categorizing relationships similar to the way they categorize inventory (c.f. ABC inventory analysis). This way cooperating firms across the portfolio can be segmented into groups where appropriate relationship maintenance can take place and where appropriate satisfaction goals can be defined in terms of operational metrics (An example of ABC analysis for cooperative relationship portfolios is provided at the end of the article).

Limitations and Future Research

This study presents several limitations as it is very exploratory in nature. Obvious limitations are restriction of the sample to one context, the use of cross sectional data, and a relatively weak R^2 in our hypotheses. Future research should look to address these issues in more generalizable populations and under more powerful conditions. Future research also should look into the categorization of the cooperative relationship types into exploration and exploitation oriented groups. A limitation not addressed in this study is that where one firm may view export management as exploitation oriented since they are relatively short-term oriented and less resource intense compared to joint ventures, another firm may rely solely on export management in order to access a new market to survive or grow in the marketplace and thus view it as an exploration oriented cooperative relationship involving a major commitment. Therefore, a more rigorous measure of the strategic choices regarding CRPs that allows firms to individually categorize agreements as exploration and exploitation orientation would contribute to future research.

This study focuses on the relationship portfolios of SMEs in the Greek context. Even though Greece represents a large population of SMEs in a highly competitive environment like the E.U., the findings are not necessarily generalized across all industry environments and situations.

Furthermore, the study examines a particular period in the ongoing relationships between SMEs and their relationship portfolio members. A longitudinal study may produce different results since satisfaction with relationships may be a function of how the relationships evolve over time. In addition, future research efforts may also obtain more reliable results by conducting the survey on multiple key informants from the same firm.

The implications of this research were not only meant to provide the managers of SMEs with a direction to assess the relationship between strategic choices regarding CRPs and satisfaction under various competitive environments, but also to stimulate a new research stream towards portfolios of cooperative relationships. Future research should also examine a more comprehensive set of outcomes related to supply chain relationship portfolio management. These may include stability of the CRP; specific operational and financial benefits attained through CRP management; and maybe even the size of the CRP. These could indicate the effectiveness and efficiency of a firm's CRP management capabilities.

Finally, from a methodological standpoint, portfolio analysis allows researchers to examine multiple supply chain relationships in the form of a simple equation. This contribution should allow for an increase in the robustness of results used to examine both past and future research in supply chain management while allowing some adherence to a more manageable single firm – key informant methodology. Additionally, portfolio analysis opens the door for future empirical designs including cluster analysis and multi-group structural equation modeling. In short, the method should make it easier for researchers to move from a dyadic view of firms to a more dynamic view of supply chain cooperative relationships.

An Example of ABC Analysis for Cooperative Relationship Portfolios

The results of this study demonstrate the need for supply chain managers to address different levels of satisfaction by portfolio and firm. Thus, given strategic intentions and environmental hostility, managers may be better able to commit time and resources to supporting dynamically different relationships. Would a manager want to provide a partner firm bent of exploiting the partnership with the same level of relationship support as a firm exploring the partnership for growth? Probably not. Wouldn't environmental hostility drive some partner firms to be less satisfied than similar partners in other industries? It is likely due to differing environmental conditions and levels of complexity. The following rubric in Table 6 provides an example of a tool that managers can adjust to evaluate their portfolio of cooperative relationships. As with implementing other supply chain metrics related to behaviors, each firm's tool would need to be a little different (Richey and Bachrach 2005). Ultimately, managers ask what their partners are motivated to do and how the market is impacting their partner before setting a satisfaction goal. This is because some partners may be picking strategies that are not structured to elicit higher levels of satisfaction or even require higher levels of satisfaction for utility to be maximized. The result is better commitment of resources and efforts to sustain portfolio relationships. We now provide the ten steps a manager should follow:

- Step 1 In the legend section of the matrix, use internal firm information/measures to develop satisfaction metric goals for categories A, B and C. (These will be firm specific and require some managerial intuition initially. Managers may consider using the scales in the appendix to develop and test these metric goals. Confidence levels can be set by surveying the existing portfolio, reviewing current mean scores, and setting limits).
- Step 2 List all portfolio members in the first column.
- Step 3 Check the appropriate relationship structures in the exploring and exploiting columns.
- Step 4 Rate the environmental hostility of where a firm operates. (Managers may consider using the scales in the appendix to develop and test market specific uncertainty.)
- Step 5 Categorize each firm using these metrics and the legend.
- Step 6 Insert the appropriate Satisfaction Metric Goal (SMG) that corresponds with the Portfolio Category in the Satisfaction Metric Goal (SMG) column.
- Step 7 Insert the actual satisfaction measurement for each relationship. (Again managers may consider using the scales in the appendix to survey the cooperating firms to develop these measures.)
- Step 8 Using the equation; develop an overall portfolio satisfaction rating.
- Step 9 Make strategic action comments for each account and follow-up.
- Step 10 Restart the process starting with Step 1 quarterly to semiannually.

TABLE 6
SCM PORTFOLIO MANAGEMENT MATRIX

Portfolio Member	Existing Relationship Strategy			Degree of Environmental Hostility	Portfolio Category	Satisfaction Metric Goal (SMG)	Actual Metric	Action Comments
	Exploring (check all that apply)	Exploiting (check all that apply)						
Manufacturer Name	Equity Investment	CPFR		High	C	85.00%	85.00%	Satisfaction rating met for criteria
	Export Management	JIT Alliance	✓					
	Joint Venture	MRP/ERP Alliance						
	Licensing Agreement	Process R&D Agreement		Low				
	LT Marketing Agreement	Technological Alliance	✓					
	New Product R&D	TQM/Quality Alliance	✓					
Retailer Name	Equity Investment	CPFR		High	B	90.00%	92.00%	Satisfaction rating exceeded for criteria
	Export Management	JIT Alliance	✓					
	Joint Venture	MRP/ERP Alliance						
	Licensing Agreement	Process R&D Agreement		Low				
	LT Marketing Agreement	Technological Alliance						
	New Product R&D	TQM/Quality Alliance						
3PL Name	Equity Investment	CPFR		High	A	95.00%	90.00%	Underperformance in satisfaction rating. Attention needed.
	Export Management	JIT Alliance	✓					
	Joint Venture	MRP/ERP Alliance						
	Licensing Agreement	Process R&D Agreement		Low				
	LT Marketing Agreement	Technological Alliance						
	New Product R&D	TQM/Quality Alliance						

TABLE 6 (CONT.)

SCM PORTFOLIO MANAGEMENT MATRIX

Portfolio Member	Existing Relationship Strategy		Degree of Environmental Hostility	Portfolio Category	Satisfaction Metric Goal (SMG)	Action Comments
	Exploring (check all that apply)	Exploiting (check all that apply)				
4PL Name	Equity Investment	CPFR	High	A	95.00%	Underperformance in satisfaction rating. Attention needed.
	Export Management	JIT Alliance				
	Joint Venture	MRP/ERP Alliance	Low			
	Licensing Agreement	Process R&D Agreement				
	LT Marketing Agreement	Technological Alliance				
	New Product R&D	TQM/Quality Alliance				
Overall Portfolio Rating	$(\sum \text{Category A SMG} + \sum \text{Category B SMG} \div \sum \text{Category C SMG}) /$ Total # of Portfolio Members			90.00%	88.75%	Underperformance in portfolio wide satisfaction rating. Attention needed.
Legend for Categories and Metrics						
		<i>Exploiting Strategy</i>		<i>Exploiting Strategy</i>		
		Category	SMG	Category	SMG	
<i>High Environmental Hostility</i>		A	95%	C	85%	
<i>Low Environmental Hostility</i>		B	90%			



Our example displays four different firms in different supply chain positions with different cooperative relationship agreements and levels of uncertainty. The three levels (A, B, & C) are set in accordance with the significant findings of this study. The global measure equation in Table 5 sets the metric for overall portfolio performance. The reader should notice that in using a global measure of 90%, only two of the firms are rated as satisfied. In our example of portfolio ABC categorization, we find that one of those firms is actually unsatisfied (the 3PL) and one not included in that set is satisfied (the Manufacturer). Considering that two of the four cooperative relationships are not satisfied and one is misclassified as unsatisfied, it is obvious that a global satisfaction metric will likely lead to the misappropriation of resources. Extend this example to 20 or 30 firms and the negative implications could become quite challenging. By using this tool supply chain managers should be able to fit firm resources to satisfaction initiatives enhancing firm efficiency, effectiveness, and long-term opportunities for success.

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APPENDIX

SCALE ITEMS

I. Alliance Use (6 Point Scale from 0 to 5+)

Please circle the number of times your company has used each of the following types of strategic alliances:

1. Joint ventures with other small companies
2. Joint ventures with large companies
3. Outside contracting
 - a. Short Term
 - b. Long Term
4. Licensing
5. Long-term marketing agreements
 - a. Marketing
 - b. Distribution
 - c. Production
6. Equity Investments
 - a. From other small to medium sized companies
 - b. From large companies
7. Export management or trading companies
8. Technology alliances
 - a. Research and Development (Process)
 - b. Research and Development (Product)
9. Purchaser-supplier alliances
(Just-in-time, Total Quality Management)

II. Satisfaction with Cooperative Relationship Portfolio (5-point Likert scale) ($\alpha=.73$):

With respect to the entirety of your cooperative relationships:

1. In general, your company's experience with cooperative relationships has been (1-Extremely poor; 5-Extremely good)
2. In general how would you characterize the financial returns produced by your company's cooperative relationships? (1-Large loss; 5-Very profitable)
3. In your overall assessment, how has your cooperative relationships performed as compared to your expectations? (1-Very poorly; 5-Very Well)

III. Environmental Hostility (5-point Semantic Differential scale) ($\alpha=.72$):

How would you characterize the external environment within which your company functions?

1. Very safe, little threat to the survival and well-being of my company – Very risky, one false step can mean my company's undoing

2. Rich in investment and marketing opportunities – Very stressful, exacting, hostile; very hard to keep afloat
3. An environment that my company can control and manipulate to its own advantage – A dominating environment in which my company's initiatives count for very little against the tremendous political, technological, or competitive forces
4. The competitive intensity within our industry is minimal – The competitive intensity within our industry is extreme

IV. Opportunism (5-point Likert scale; 1- Strongly Disagree, 5-Strongly Agree) ($\alpha=.85$):

In general our cooperative relationship partners...

1. provide us with a truthful picture of their business (r)
2. have appeared to alter the facts slightly in order to get what they needed
3. seem to believe that honesty does not pay when dealing with partners
4. have sometimes promised to do things without actually doing them later
5. sometimes present factors to us in such a way as to make them look good
6. usually register a complaint if our company fails to meet our cooperative agreements
7. expect an equal exchange of benefits from our cooperative agreement (r)

V. Individualism/Collectivism (5-point Likert scale; 1- Strongly Disagree, 5-Strongly Agree) ($\alpha=.72$):

1. Employees like to work in a group rather than by themselves (r)
2. If a group is slowing me down, it is better to leave it and work alone
3. To be superior, a man must stand alone
4. One does better work working alone than in a group
5. I would rather struggle through a personal problem by myself than discuss it with a friend
6. Problem solving in groups gives better results than problem solving by individuals (r)

VI. Financial Performance (5-point Likert scale; 1- Highly dissatisfied, 5-Highly satisfied) ($\alpha=.81$):

Please indicate the extent to which your organization's top managers are currently satisfied with your business unit's performance on each of the following criteria.

1. Sales level (\$)
2. Sales growth rate (%)
3. Cash flow
4. Gross profit margin
5. Net profit from operations
6. Return on investment
7. Ability to fund business growth from profits

ABOUT THE AUTHORS

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1 Perspectives on Logistics vs. SCM: A Survey of SCM Professionals

Paul D. Larson, Richard F. Poist, and Árni Halldórsson

Despite some movement toward consensus on the definition of supply chain management (SCM), there are multiple perspectives on the concept – and its association with logistics. This paper reports results of a survey of SCM professionals regarding their views of SCM, along with its facilitators and barriers. In general, these executives prefer broad, multi-functional perspectives as opposed to more narrow perspectives of SCM. According to the survey, the leading facilitators of SCM implementation were relational rather than technological. In addition, internal or employee resistance appears to be more of a barrier to SCM implementation compared to external (customer and supplier) resistance.

Key Words: Logistics; Supply Chain Management; Survey Research

25 Exploration, Exploitation and Satisfaction in Supply Chain Portfolio Strategy

Mert Tokman, R. Glenn Richey, Louis D. Marino, and K. Mark Weaver

This manuscript addresses a gap in the supply chain literature by shedding light on firm satisfaction from a cooperative relationship portfolio perspective by examining the impact of a partner's choice of an exploration or exploitation relationship strategy. In doing so we examine the impacts of relational exploration (equity investments, export management, joint ventures, licensing agreements, long-term marketing agreements, new product R&D agreements) and exploitation strategies (JIT alliances, TQM alliances, CPFR, MRP/ERP alliances, process R&D agreements) on small to mid-sized enterprises. Results support the proposition that firm satisfaction with alliance usage is positively associated with the proportion of exploration oriented agreements in a firm's relationship portfolio, especially for firms in environments characterized by low levels of environmental hostility. However, when environmental hostility is high, the proportion of exploitation oriented relationships in a firm's portfolio is positively associated with the firm's satisfaction with alliance usage. We conclude with multiple directions for future research.

Key Words: Portfolio management; Exploration strategy; Exploitation strategy; Environmental hostility; Satisfaction