

# Applying Artificial Neural Networks to Evaluate Export Performance: A Relational Approach

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## *Abstract*

*The paper applies artificial neural networks to investigate the effect of the exporter's relationship orientation on the export performance, mediated by the relationship quality, taking into account the supplier's strategic orientation and the foreign customer's approach to purchasing. The proposed model is supported mainly by the Second Networking Marketing Paradox, the Commitment-Trust Theory, the Relationship Marketing Paradigm and International Marketing fundamentals. The model developed, proposes that an exporter's relationship orientation influences the relationship quality with a foreign customer, which, in turn, influences the exporter's performance. Furthermore, the model proposes that the content of the relationship orientation is contingent on either the company's strategic orientation – internally defined – or the interface with the customer, which is external to the company's decision-making. The results of the empirical study generally confirm the theoretical hypotheses.*

**Keywords:** *export performance, relationship orientation, relationship quality, strategic orientation, interface*

**JEL classification:** M39

## **Introduction**

If “the research on export performance is more alive than ever” (Lages et al., 2005) it is also true that research on the relationship between market orientation and performance is a current investigation field (Deshpandé and Farley, 2004), particularly in international contexts (Cadogan et al., 2002). On the other hand, the research on market orientation in the context of other strategic orientations is also recent (Deshpandé et al., 2003), while the combination of the approaches to marketing and to purchasing, aiming to understand it at a dyad level, has not yet

been done (Hedaa and Ritter, 2005). Furthermore, the combination of the streams of research on market orientation and relationship marketing is recent (Baker et al., 1999). The scarcity of theorization and applications of the relationship marketing to international contexts therefore becomes quite clear (Samiee and Walters, 2003); besides, the implementation of a market orientation, at a supplier-customer dyad level, is still waiting for an answer (Lichtenthal and Iyer, 2003). These statements clearly highlight the research recency.

Literature review will be achieved sequentially in order to establish the hypotheses.

## **A - The effect of supplier's relationship orientation on relationship quality**

### **From market orientation to relationship orientation**

The question seems to be whether it is suitable to study separately the customer orientation from the other market orientation dimensions. In this regard Noble et al. (2002) argue that the study of customer orientation is justifiable since the market orientation construct breaking up may be supported methodologically and theoretically. With the growing interest that research has demonstrated for relationship marketing, it is rather obvious that market orientation has to be thought at the individual exchange relationships level. If the purpose is to study the market orientation effect on the export performance, at the individual relationship level, then the market orientation construct must be defined at this level, given that the results of previous studies about companies market orientation may not be applicable to the relationship level, since assuming that findings achieved at an analysis level holds at another level is to commit an ecologic fallacy (Hofstede, 1980). To Helfert et al. (2001), market orientation, to be effective must be translated to a relationship level. So do Hakansson and Ford (2002), supporting that "...marketing orientation is not in fact to a market". The usefulness of a "general" orientation to the market may be questioned by the relational approach to markets. Indeed there are some considerable differences with regard to the company effectiveness, at a specific customer relationship; since it is not possible or desirable to keep close relationships with every customer, every relationship becomes idiosyncratic. Market orientation, being mainly a matter of choosing and allocating resources, may be managed considering the current market conditions and the tactical company goals (Noble et al., 2002). More recently, Zhao and Cavusgil (2006) tried to extend the market orientation theory to the supplier-manufacturer relationships.

### **Relationship quality**

The "Commitment-Trust Theory" recommends that commitment and trust are vital to the relationship marketing success (Morgan and Hunt, 1994). It has been argued that the relationship quality has the power of building or destroying export relationships (Lages et al., 2004), and that it has an important role in the

manufacturers' export performance achievement (Bello et al., 2003), in decreasing the predisposition to abandon relationships (Morgan and Hunt, 1994), in increasing suppliers' sales and decreasing customers' risks (Peterson, 1995, quoted by Hewett et al., 2002), as well as increasing buyer's commitment to the relationship (Grayson and Ambler, 1999) and customers' satisfaction with their suppliers (Cannon and Perreault, 1999). Relationships' quality has been recently conceived as a higher order construct, formed by trust and commitment as first order constructs (Ulaga and Eggert (2006).

### **Relationship orientation and relationship quality**

When Friedland (1990) states that trust is more typically promoted when a part in the interaction exhibits a response to the partner's needs, he is clearly saying that, at least one of the market's orientation dimensions – the response – builds trust in the partner. More recently, Zhao and Cavusgil (2006) verified that a supplier's market orientation is related to the customer's trust, as Siguaw et al. (1998) had already done before. According to Argandoña (1999), in order to build a partner's trust it is necessary to firstly be seen as reliable, trustworthy; precisely to Zhao and Cavusgil (2006), the supplier's market orientation performs that role by "sending a strong message" to the customer. If the actions undertaken by a company in interdependent relationships are causal antecedents of trust (Anderson and Narus, 1990), then it is possible to anticipate that the exchange activities may be an antecedent of trust. Morgan and Hunt (1994) argue that commitment and trust are built when, among others, resources and benefits greater than those provided by competitors are made available. In the same way, Palmatier et al. (2007) conclude that communication is an important source of trust, while Hallen et al. (1991) suggest that adaptation also is a manner of trust building and relationships strengthening. Doney and Cannon (1997) mention five trust building processes to which they link factors that can evoke them. Several factors of the calculation process (supplier adaptation and information share) prediction (social contact) and intentionality (will to adapt and information share) are included in our proposal for the operationalization of the relationship orientation construct. According to Cannon and Homburg's (2001) findings, the practice of a relationship orientation may still be responsible for building customer commitment. Exchange activities, resources, communication and adaptation being variables included in the conceptualization of the construct relationship orientation, we restate our confidence in that relationship orientation should be connected to customer's trust and commitment and propose the following research hypothesis:

**H1: The exporter's relationship orientation level positively affects the relationship quality, evaluated by importer's trust and commitment levels.**

### **B -The effect of relationship quality on export performance**

There are three main paradigms underlying research on export performance (Francis and Collins-Dodd, 2000): 1º- The Resource-Based Paradigm

suggests that export performance is the result of activities at the company level; 2° - The Contingency Paradigm, which states that no single strategy is universally suitable, rather the effects of company's characteristics on export performance depend on the specific company's context; 3° - The Relational Paradigm which examines the network of business interactions and conceives export expansion through the sequential development of relationships with foreign customers (Styles and Ambler, 1994).

The Commitment-Trust Theory (Morgan and Hunt, 1994) is one of the theoretical views usually adopted to explain the sources of organizational relationships' performance. The export development may be conceived as a relationships management process; accordingly, Piercy et al. (1998) conclude that "the difference between high performance exporters and low performance exporters, as for customer relationships skills, is dramatic. Back in 1994, Cavusgil and Zou (1994) reported that it had frequently been mentioned that success was, in export markets, tied to the ability to develop strong and mutually profitable relationships with foreign partners. Leonidou et al. (2002) conclude that companies that keep harmonious relationships (vs. problematic ones) have three times more clients and more frequent orders, concluding that relationship atmosphere is even more crucial in cross-boarder activities. Palmatier et al. (2007) show that trust-commitment are key-determinants of companies' performance. Langerak (2001) proves the positive connection between customer's trust towards the relationship and supplier's financial performance. One may say then that business profitability builds on the company's ability to create customers' and other stakeholders' trust, in itself and in its performance (Grönroos, 1996). According to Cannon and Perreault (1999), literature shows the connection between long term relationships and suppliers' performance, namely as for sales growth, control costs decrease and inventory maintenance, profitability levels (Kalwani and Narayandas, 1995) and achievement of mutual financial results, costs reduction and repurchase (Andaleeb, 1996). Aulakh et al. (1996) show the "particular" importance of trust in achieving market performance in international relationships and Zaheer et al.'s (1998) findings reveal that inter-organizational trust is the main direct cause of exchange performance.

With regard to commitment, O'Reilly and Chatman (1986) argue that commitment may reduce the usual increase in costs of international channel through the alignment of partners' goals, interests and values. Besides, Skarmeas et al. (2002) conclude that inter-cultural relationships exhibit a strong link between commitment and performance. Before that, Anderson and Weitz (1992) showed the importance of channel commitment for supplier's profitability. Not only trust or commitment but rather the presence of both is necessary to promote instrumental results in the creation of efficiency, productivity and effectiveness (Morgan and Hunt, 1994); likewise, Palmatier et al. (2007) show that, together or separately, trust and commitment positively affect performance and relational behaviours.

Bearing in mind what was said, we propose the following research hypothesis:

**H2: Relationship quality, as defined by importer's trust and commitment levels, positively affects exporter's performance level in its relationship with the former.**

### **C - The effect of interfaces with customers on relationship orientation**

#### **Purchasing**

Buyer-seller relationships have two sides and, as a consequence, performance is determined by both sides' inputs and outputs (Gadde and Snehota, 2000); in fact, the idea that it is not possible to keep apart buying and selling processes dates back to the initial IMP Group project and also that marketing is not about actions taken by a supplier alone. On the contrary, the interaction process between organizations is beyond each partner's control. Any action taken by a partner produces results which are affected by the way it is perceived and by the other partner's reaction. According to Liang and Parkhe (1997), evidence shows that international business can better be conceived as an import coordinated by the customer rather than an export started by the supplier. As a matter of fact, a company's international behaviour is also affected by customers' purchasing strategies (Andersson, 2002); as Gadde and Persson (2004) state, the seller's role often is decided by the buyer's internal perspective.

Purchasing is currently seen as an important strategic activity, entailing cost reductions and value increase. (Baily et al., 1998). Gadde and Persson (2004) mention that purchasing may perform a development role, showing the supplier's capability to solve problems, by filling the buyer's gaps on specific domains. The outcome may be a strong connection between the purchasing role and the suppliers' role and an increase of the interdependence between specialists (Ford and Hakansson, 2006).

#### **Purchasing and supplier's orientation**

Suppliers' strategic options cannot ignore customers' orientations, assuring that both orientations match (Hedaa and Ritter, 2005). These authors support that there are five waves of business marketing and that, for a transaction to occur, the supplier's competences must be relevant to the customer's problem and the waves both partners are in need to be mutually complementary, that is, they need to be in the same wavelength; thus, customers may have to deal with situations of under-designed or over-designed relationships, both being unsuccessful (Gadde and Snehota, 2000). If a company has customers who are in different waves, that means that different communication and performance approaches must be adopted. Hedaa and Ritter (2005) suggest the existence of a connection between a customer's orientation and the supplier's orientation towards that customer. We believe that a customer orientation may perform the role of "reading" the customer's wavelength, selecting resources and implementing actions with the purpose of creating value to

the customer. According to Hakansson and Ford's (2002) Second Paradox of Business Networks, on one hand, a company's relationships are the result of its strategy and actions and, on the other hand, the company is itself the result of its relationships and of what happened within them; in that case, it is necessary to consider the position of the buying company from the premise that it forms its supplier relationships but also that it is itself formed by these; this is a reason why the idea of a selling company developing by itself a business strategy or constructing its marketing mix for an industrial customer is debateable (Ford and Hakansson, 2006). Gadde and Persson (2004) check the compatibility conditions between a buyer purchasing strategies and a seller marketing strategies, stating that the involvement level with each supplier is a buyer's strategic option; when the buyer's involvement is high, a voluntary dependence towards the supplier is created, aiming to access its resources and capabilities. For the development of an effective purchasing strategy it is then crucial to explore the competitive advantage which the buying company may reach through the supplier's resources and their creative use (Baily et al., 1998).

Being relationship oriented means to allocate resources and to perform relationship management tasks in order to satisfy each customer's needs. One can then expect that different customers may need different resources to be allocated and different tasks to be performed, depending on the offer requirements. Johnson and Selnes (2004) argue that it is necessary to differentiate each relationship according to the way value is created in that particular relationship. Mathieu and Zajac (1990) mention four studies whose authors found a relation between tasks interdependence and organizational commitment; so, since each of the four interfaces<sup>1</sup> (Araújo et al., 1999) requires, by definition, different tasks interdependence between suppliers and customers, one can expect that the exporter's commitment to the relationship will vary accordingly. Relationship orientation level expresses the supplier's commitment to serve a relationship's particular needs. A connection between the variable "interface" and the construct "relationship orientation" is then predictable and so we propose the following research hypothesis:

**H3: Different interfaces required by importers affect different exporter's relationship orientation dimensions.**

## **D - The effect of strategic orientation on relationship orientation**

### **Strategic orientation and market orientation**

If, as mentioned by Ngai and Ellis (1998), there are different ways available to a market oriented supplier to create value to the customers, then, market orientation may be useful as a support for different strategies. Market orientation affects strategy design and implementation (Dobni and Luffman, 2003) and a competitive advantage may be achieved through the practice of market

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<sup>1</sup> "Standardized Interface", "Specified Interface", "Translation Interface" and "Interactive Interface"

orientation, supporting a strategy implementation (Dobni and Luffman, 2000). To Day and Van den Bulte (2002), “the Customer-Relating Capability probably is unproductive unless it supports the competitive strategy”. Narver et al. (2000) argue that each value discipline has a single main goal, but it is also true that all disciplines require a deep understanding of customers’ needs, although, most probably, a particular market orientation form will prevail on each value discipline. Market orientation may then be used to design strategies, which enhances its usefulness whatever the chosen strategy is (Armario and Silva, 2001).

### **The Miles and Snow typology**

This typology was recently used by Shoham et al. (2002) for the purpose of investigating manufacturing companies’ export performance. McDaniel and Kolari (1987) said about it that it is unique because it views the organization as a complete system, dynamically interacting with the environment. The typology robustness and adequacy for researching on the connections between strategies and export performance was proved by Shoham et al. (2002). This typology was previously validated by studies concerning retail, forest products and sealing products. The evidence that different Miles and Snow’s (1978) strategic types show differences in respect of marketing orientation, customers’ needs satisfaction and marketing resources adequacy, is of great importance to the current study. Slater and Narver (1993) say that the typology seems to very well represent generic approaches to business strategy, being particularly appropriate for a market orientation (Matsuno and Mentzer, 2000). M&S strategic types represent a continuum of increasing internal or external adjustment adaptive capacity, ranked as follows: reactor, defender, analyzer and prospector. It then seems justifiable that each type’s adaptive capacity may be related to the capacity and will to adopt “behaviours and processes related to the continuous evaluation and serve customers’ needs” (Deshpandé and Farley, 1996), that is, to be market oriented. McDaniel and Kolari’s (1987) study demonstrates that each strategic type assigns different importance to different marketing tools and also that there are major differences in what marketing orientation is concerned and in the behaviours associated to it.

For a characterization of the four Miles & Snow types see Matsuno and Mentzer (2000), Conant et al. (1990), McDaniel and Kolari (1987), Shoham et al. (2002).

### **Strategic orientation and relationship orientation**

The next question is to know in what extent a company’s strategic orientation affects the content and level of the relationship orientation. To Dobni and Luffman (2003), market orientation makes the strategic implementation easier by providing the context for the implementation of specific marketing strategies (Dobni and Luffman, 2000); the market orientation level should then match the company’s implemented strategies, which are linked to operational behaviours that exhibit a market orientation. Dobni and Luffman’s (2003) findings support the

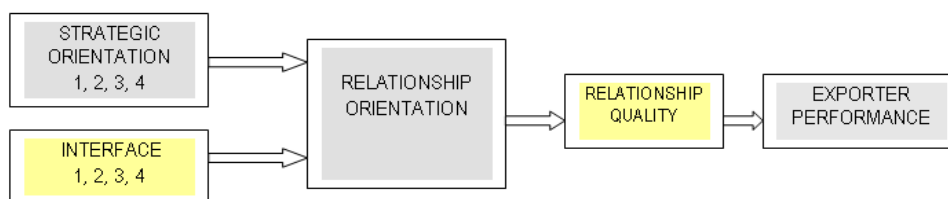
existence of ideal market orientation-strategy profiles, affecting performance, and the lack of which may stand for a reduction in market orientation results or for the inefficient use of resources. Matsuno and Mentzer (2000) found that M&S's strategic types moderate the relationship between market orientation and a company's financial performance. Enlightening is the statement made by Slater and Narver (1994) about the fact that different companies may find their competitive advantages in marketing capabilities or innovation and technology and, nevertheless, that doesn't mean that any of them is less market oriented than others. According to Lambin (2000), the market orientation will allow the company to identify and choose a defensible competitive advantage. Greenley (1995) concludes that it is possible that different companies showing the same market orientation level may exhibit different ways of being market oriented. Hällén and Johanson (1985) argue that the establishment of long-term relationships requires different resources, depending on the strategies adopted by the company, these being connected to the capabilities required by each of them. According to McNaughton's et al. (2002) proposal, market orientation may be useful to unveil the need to invest in assets which will be the foundation of a company's competitive advantage and customer value creation.

In conclusion, it is our belief that a relationship orientation may contribute to companies' performance whatever their strategic orientation may be; however the resources allocated and the tasks performed should vary according to customers' needs.

As a result, we propose the following research hypothesis:

**H4: Exporting companies, exhibiting different strategic orientations, emphasize different dimensions of relationship orientation.**

## THE MODEL



**Figure 1**

The model above synthesizes the four research hypotheses presented.

## Methodology and research methods

### The sample

In the current research, the unit of analysis is the relationship between an exporter and a well defined international customer. 5423 inquiries were sent by e-mail, from which two 206 answers were received, 203 being valid. Considering



that 4793 inquiries were delivered, the response rate was 4.3%. The sample was then formed by 203 companies.

### **Research instrument**

An inquiry was designed previously tested and sent by e-mail. The respondents were asked to select the third most important foreign customer to be the focus of their answers. This procedure which was expected to avoid potential deviations caused by the importance of the chosen customer and to prevent the possibility of a regular most important customer choice, was followed by Rokkan et al. (2003) and Zaheer et al. (1998).

### **Research method – Applying Artificial Neural Networks**

Artificial neural networks (ANN) with feed-forward architectures and trained by supervised learning algorithms have been successfully applied in the resolution of marketing and economics problems. They are particularly effective in regression and classification problems. Resilient backpropagation algorithm (RProp) was proposed by Riedmiller, (1994) and is an improved version of the original backpropagation algorithm. In general, RProp is faster and is more robust.

We used the JavaNNS software because it allows the implementation of neural networks with partially connected architectures and, therefore, we can represent the model defined previously. The defined ANN architecture had an input layer with 8 variables (4 – Interface; 4 – Strategic Orientation), a second layer with 9 variables (1 – Resources availability; 2 – Problems related to exchange activities; 3 – Exchange activities related to product/service; 4 – Exchange activities related to people involved; 5 – Coordination; 6 – Customer satisfaction orientation; 7 – Mechanisms for solving conflicts; 8 – Flexibility; 9 – Adaptability), a third layer with 1 variable (Relationship Orientation), a fourth layer with 1 variable (Relationship Quality) and an output layer with 11 variables (Export Performance).

The data was pre-processed, normalizing the inputs (targets weren't normalized) so that they have zero mean and unit standard deviation, the weights initialization followed the Nguyen and Widrow, (1989) initialization algorithm, the technique used to avoid over fitting was regularization and the number of epochs was limited to 30,000. The data set was divided in two parts: the training set – 75% of training pairs, 152 – and the test set – 25% of training pairs, 51. The test set was never used throughout the learning phase.

Several runs were executed in order to train and obtain the ANN with a new initialization procedure of Nguyen-Widrow for each run. Then, the RProp used the training set to adjust the weights connections of the network.

The weights connections represents the relation between the variables and because we used the Nguyen and Widrow initialization and regularisation method the weights values will be approximately between minus one and one. A weight connection with a value around zero means that the variables are not related and

otherwise the variables are related positively or negatively. One can say that the weight connection bears a resemblance to the correlation coefficient.

The error function used during the learning phase was the mean squared error:

$$e^2 = \frac{1}{N} \sum_{i=1}^N \sum_{j=1}^{S^M} \left( t_j \{i\} - a_j^M \{i\} \right)^2$$

Where  $N$  is the number of training pairs used during learning,  $S^M$  is the number of the output variables,  $a_j^M$  is the value of the  $j^{th}$  output variable produce by the ANN,  $a_j^M \{i\}$  is the value of the  $j^{th}$  output variable produce by the ANN when the  $i^{th}$  training pair is presented and the values of  $i$  have the same correspondence but they refer to the values that the ANN would have to produce.

In order to improve generalisation and avoid over fitting during the learning phase we use k-fold cross-validation, which consists in dividing k subsets from the training set (75% of the data, 152 data pairs) of more or less equal size and training the ANN k times and for each time one of the subsets is not used during learning. The chosen value for k was 8. In the learning phase, the algorithm minimizes the error function updating the weights of the connections, using only the training set.

The final error had a value of 0.2 with the training set and a value of 0.21 with the test set and therefore the overall results confirmed that the ANN is able to generalise to unseen data and simultaneously is able to forecast.

### Research hypotheses empirical evaluation

Table 1 below shows a very strong positive connection between the level of an exporter's relationship orientation and relationship quality, proving hypothesis 1.

#### Effect of relationship orientation on relationship quality

Table 1

<b>RELATIONSHIP ORIENTATION</b>	1.221	<b>RELATIONSHIP QUALITY</b>
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This demonstrates the influence of the exporter's relationship orientation on customer's trust and commitment development.

Table 2 below shows a strong positive connection between relationship quality and all export performance dimensions, which proves the second hypothesis.

**Effect of relationship quality on export performance**

**Table 2**

	RELATIONSHIP PERFORMANCE DIMENSIONS	
<b>Relationship quality</b>	0.49	Item 1 – Sales evolution (in value)
	0.494	Item 2 – Sales evolution (in volume)
	0.415	Item 3 – Profit margin evolution
	0.515	Item 4 – Global Performance
	0.549	Item 5 – Time/ effort spent
	0.44	Item 6 – Usefulness for generating new products
	0.417	Item 7 – Know-how’s usefulness for improving products
	0.499	Item 8 – Relationship expectations fulfilment
	0.487	Item 9 – Satisfaction with Sales
	0.473	Item 10 – Satisfaction with sales growth
	0.434	Item 11 – Satisfaction with profit margin

Table 3 below shows the results of the connections between each interface and each construct making up the superior order relationship orientation construct.

**Connection values between the interfaces and relationship orientation dimensions**

**Table 3**

- INTERFACE 1 – (“Standardized Interface” – purchase of a standard

<b>Interface 1</b>	<b>Interface 2</b>	<b>Interface 3</b>	<b>Interface 4</b>	<b>Relationship orientation dimensions</b>
-0.578	0.244	1.3	-0.093	Resources availability
1.715	0.567	0.675	-0.459	Problems related to exchange activities
0.492	-0.036	-0.575	-0.08	Exchange activities related to product/service
-1.216	1.012	0.762	1.057	Exchange activities related to people involved
-0.166	0.459	0.792	-0.159	Coordination
-0.103	0.085	0.339	0.183	Customer satisfaction orientation
0.449	-0.121	0.903	0.102	Mechanisms for solving conflicts
-0.449	0.619	0.515	0.063	Flexibility
-0.479	1.272	0.703	0.343	Adaptability

product, from those existing in the supplier’s product line). The purchase of a standard product, from the shelf, favours a transactional approach at the expense of a relational approach. In fact, the only connection values exhibiting a positive sign are those concerning “problems related to exchange activities”, “mechanisms for solving conflicts” and “exchange activities related to product/service”. The first two constructs presuppose a reactive behaviour, only occurring when problems or conflicts take place, which denotes not a real concern with customers’ needs but rather a concern with the need to stop situations that may harm the relationship continuity. As for the last, its strong positive connection with the construct relationship orientation probably means that the supplier’s concerns are focused on

the supply of functional products, exhibiting a good quality/price relation and eventually on customer service, that is, a focus on supply side issues rather than a concern with the customer's needs. All the other constructs exhibit a negative connection with interface 1, supporting the premise that a relationship orientation may be of little value when an interface 1 is required by the customer.

- INTERFACE 4 – (“Specified Interface” – a complete specification is provided by the supplier). In this case the supplier must accomplish the specification which prevents the customer to benefit from the specific capabilities the supplier has to offer; in this scenario, a relationship orientation may be of little value, which is confirmed by the results. This becomes rather noticeable in view of the near zero values found for the connections with the constructs flexibility, exchange activities related to product/service and resources availability or the weak positive values for the connections with the constructs customer satisfaction orientation and mechanisms for solving problems. The concern with customer satisfaction, although weak, may explain the lesser concern with problem solving. The fact that the connection value with the construct coordination is slightly negative shows the little importance attached to it. Apparently surprising is the moderate strong negative value found for the connection with the construct problems related to exchange activities. This construct incorporates items like logistic problem solving, bureaucratic problem solving and solving customer's doubts and uncertainties; frequently, when a customer provides a complete specification he is only buying the supplier's production capacity, assuming responsibility for the exporting logistic and bureaucratic issues.

- INTERFACE 2 – (“Translation Interface” – The supplier provides a functional specification). Except for the connection with the construct mechanisms for solving conflicts, all the other connections exhibit positive values, which confirms the suitability of a relationship orientation when an interface 4 is required, allowing for the exporter to make use of its capabilities and resources in order to design an offer that may satisfy the importer's needs. We emphasize the very strong values found for the connections with the constructs adaptability, flexibility and exchange activities related to people involved and the strong values for the connections with the constructs coordination and problems related to exchange activities

- INTERFACE 3 – (“Interactive Interface” – The product is specified and developed by the importer and the exporter together) It is no surprise to find strong connection values between this interface and the dimensions of the construct relationship orientation; this expectation was confirmed by the results because, except for the connection with exchange activities related to product/service, all the other connections show strong or very strong positive values. The exception may be explained by the likelihood that a product, being jointly designed, represents a “new buy” to the customer, which means that he will be more focused on “finding a good solution rather than on getting a low price” (Webster, Jr., 1991), that is, most probably quality will be more important than the relation quality-price.

Conclusion: Hypothesis 3 is proved, since it is clear that: 1) different interfaces activate different dimensions of the construct relationship; 2) the connection values that were found were expectable and theoretically justifiable; 3) the growing importance of a relationship orientation becomes clear as the interface content evolves from a transactional view to a relational view.

Table 4 below shows the results of the connections between each strategic orientation and each construct making up the superior order relationship orientation construct.

**Connection values between the strategic orientations and the relationship orientation dimensions**

**Table 4**

<b>Prospector</b>	<b>Analyzer</b>	<b>Defender</b>	<b>Reactor</b>	<b>Relationship orientation dimensions</b>
0.519	1.17	0.525	-0.50	Resources availability
-0.339	1.225	-0.18	1.609	Problems related to exchange activities
-0.217	0.527	0.393	-0.412	Exchange activities related to product/service
0.84	0.538	-0.05	-0.245	Exchange activities related to people involved
0.654	0.233	0.249	-0.99	Coordination
0.88	0.471	0.283	-0.456	Customer satisfaction orientation
0.25	0.528	0.795	0.149	Mechanisms for solving conflicts
0.912	0.477	-0.055	-0.422	Flexibility
0.937	0.27	-0.324	-0.169	Adaptability

- REACTORS: Not surprisingly, except for the connection with the constructs problems related to exchange activities and mechanisms for solving conflicts, all the other connections exhibit negative values, which is in line with this type depiction. Reactors represent the lowest level of “adaptive capacity” besides being those that possess the weakest marketing capabilities (Conant et al., 1990), seldom making any kind of adjustments (Shoham et al., 2002).

- DEFENDERS: Defenders, too, adopt a reactive market orientation, being those who exhibit the least adaptive capability, ranking immediately after the reactors; the values of the connections with the constructs flexibility and adaptability seem to confirm these arguments. As for the positive, moderately strong connection value with the construct exchange activities related to product/service, the result is compatible with defenders’ concern about production efficiency, a domain where they possess distinctive capabilities, emphasising the quality of the products (Shortell and Zajac, 1990); the concern with production efficiency may also justify the connection value with the construct resources availability. The fact that defenders are not marketing oriented (Shoham et al., 2002) may validate the near zero connection value with the construct exchange

activities related to people involved; on the contrary, the moderately positive value found for the connection with the construct customer satisfaction orientation is rather surprising, in view of this fact. However, the explanation may be found in the considerable weight that the variable “employee’s reward for their performance” has in the construct’s explanation, in line with the fact that the defender’s career progression is faster (Slocum et al., 1985). In the same way, the moderately positive value found for the connection with the construct coordination may be explained by the considerable weight of the variable “functional integration”, which is associated with an internal focus, precisely one of the defenders’ strengths.

**PROSPECTORS:** Prospectors are able to capture the environment dynamism and therefore they remain flexible to face changes (Parnell and Wright, 1993); therefore, it is not surprising that the connection values with the constructs flexibility and adaptability are positive and very strong. Parnell and Wright’s (1993) statement concerning the prospectors’ focus on interdepartmental cooperation, marketing orientation and customers’ needs satisfaction may explain the strong, positive connection values found for the constructs coordination, customer satisfaction orientation and mechanisms for solving conflicts. The prospectors’ external orientation may validate the strong positive connection value found for the relationship with the construct exchange activities related to people involved. As for the strong positive connection value with the construct resources availability, it may be traced back to the prospectors’ excellent financial management performance and general performance, which will allow a correct allocation of financial resources, time and effort to the more important relationships. The weak negative value exhibited by the connection with the construct exchange activities related to product/service may be justified by the importance of the variable “quality/price relation” for the construct explanation, and the fact that prospectors do not compete on a price basis (Miles and Snow, 1978). Considering that prospectors emphasize problem recognition rather than its solution (Miles and Snow, 1978), it is easy to explain the moderately negative connection value with the construct problems related to exchange activities.

- **ANALYZERS:** The moderately strong positive connection value with the construct coordination is lower than those found for the same defenders’ and prospectors’ connections, in line with Shoham et al.’s (2002) results for the construct interdepartmental cooperation. If “it is clear that analyzers are marketing oriented exporters” (Shoham et al., 2002), it is easy to understand the positive, moderately strong connection value with the construct customer satisfaction orientation and also the positive, strong connection value with the construct exchange activities related to people involved. Personal sales, training and sales staff supervision are considered more important by prospectors and analyzers than by defenders (McDaniel and Kolari, 1987), which explains the ranking of connection values with the construct exchange activities related to people involved. The strong positive connection with the construct exchange activities related to product/service probably is a consequence of analyzers strengths in engineering, production and marketing management (Idem). Analyzers try to capture

prospectors' flexibility, which may explain the moderately strong positive values (although lesser than those found for prospectors) found for the connection with the constructs flexibility and adaptability. The weight represented by the variables "financial resources" and "time and effort spent with the relationship" in the explanation of the construct resources availability may justify the strong positive value found for the connection with this construct. The strong positive connection value with the dimension resource availability may be understood bearing in mind the strong explanation weight of the variables "financial resources" and "time and effort spent with the relationship" on this dimension. In fact, analyzers avoid allocate resources to R&D which enables their growth through market penetration, product and market development (Miles and Snow, 1978), redeploing resources to the markets or to the relationships. The very strong and positive connection value with the dimension problems related to exchange activities can be explained by the analyzers' distinctive capability on distribution management (Shoham et al., 2002). The strong positive connection value found for the association with the dimension mechanisms for solving conflicts may be explained by analyzers' sales reps training and supervision which will allow them to solve many conflict situations.

Conclusion: Hypothesis 4 is proved, since it is clear that: 1) companies adopting different strategic orientations activate different dimensions of relationship orientation construct; 2) the connection values found were to be expected and theoretically justifiable; 3) it becomes clear that prospectors and analyzers are more relationship oriented than defenders, which in turn are more relationship oriented than reactors.

### **Conclusions**

The model's forecasting capability clearly reveals the importance that its constructs have in the explanation of the relationship export performance; in that case, companies should pay attention to the performance that they can achieve on those constructs as a way to improve their export performance. In the main, the theoretical hypotheses were empirically proved. It was possible to confirm that the exporter's relationship orientation positively affects the relationship quality, which in turn is positively connected to the relationship's export performance. This becomes evident through the positive strong connection values with all the performance dimensions that could be observed. It is also clear that companies exhibit low levels of relationship orientation when they deal with the purchase by customers of standard products; also in accordance with the hypothesis, the connection values between the specified interface – often only representing the purchase of the supplier's manufacturing capacity - and the construct relationship orientation reveal a stronger relationship orientation than the former, although weaker than those with interfaces two and three. In fact, in these cases, a stronger effect of the interfaces on the relationship orientation is obvious; when a customer provides the supplier with a functional specification he expects to receive from him capability and competence, appropriate resources and adjustment to the specification, besides the required interaction to convert that specification into the

products that satisfy his needs, that is, relationship orientation. A similar situation, although more demanding, occurs when an interactive interface is at issue; the connection values with the construct relationship orientation are strong or very strong for all but one dimension. In conclusion, it was possible to empirically confirm that a supplier allocates different resources, capabilities and competencies that he “translates” into activities, that is, he emphasizes different relationship orientation’s dimensions, according to the customer’s interface, which evolve as interfaces requirements become more relational.

The results from the empirical study also confirm that exporters adopting different strategic orientations emphasize different relationship orientation dimensions. The analysis of the results shows a continuum of increasing adaptive capability of reactors, defenders, analyzers and prospectors. Being relationship oriented means to be able to allocate different resources, capabilities and competencies and “translate” them into activities to satisfy customers’ needs; this increasing adaptive capability validated by the study’s results therefore, shows that prospectors and analyzers are more relationship oriented than defenders, which in turn are more relationship oriented than reactors. If customer relationships management requires resources allocation to different relationships (Ford et al., 1998), its correct allocation becomes vital. Companies should be flexible about their relationship orientation’s level and content, considering not only their strategic orientation but also the current customer interface.

We consider an important conclusion the verification of the effect of the relationship quality on export performance, showing that an exporter may positively influence its own performance by adopting a relationship orientation, which in turn will affect export performance. This conclusion reinforces the importance of relationships with international customers.

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## CONSTRUCTS OPERATIONALIZATION

## A - RELATIONSHIP QUALITY

## TRUST

**Credibility:** 3 Items adapted from Siguaw et al. (1998); 1 Item adapted from Walter et al. (2003); **Benevolence:** 2 Items adapted from Siguaw et al. (1998); 1 Item adapted from Ulaga and Eggert (2006); 1 Item adapted from Johnson et al. (1996); 1 Item adapted from Sanzo et al. (2003); 1 Item adapted from McAllister, (1995); **Global trust:** 1 Item (Aulakh et al., 1996)

## COMMITMENT

**Affective commitment:** 3 Items adapted from Kim and Frazier (1997); **Continuity commitment:** 1 Item adapted from Kim and Frazier (1997); 1 Item adapted from Kumar et al. (1995); **Behavioural commitment:** 1 Item adapted from Kim e Frazier (1997)

## B – INTERFACE

4 Alternative interfaces: Standardized Interface; Specified Interface; Translation Interface; Interactive Interface (Araújo et al., 1999)

## C – STRATEGIC ORIENTATION

4 Miles and Snow strategic types: The Conant et al.'s (1990) multi-item scale was used

## D – RELATIONSHIP ORIENTATION

Dimensions: Resources availability, Problems related to exchange activities, Exchange activities related to product/service; Exchange activities related to people involved; Coordination; Mechanisms for solving conflicts; Flexibility; (adapted from Helfert et al., 2001); Adaptability; Customer satisfaction orientation (newly introduced)

## E - EXPORT PERFORMANCE

**Sales and profit change:** 3 Items adapted from Shoham and Rose (2001); **Satisfaction with sales, satisfaction with sales change and satisfaction with profit:** 3 Items adapted from Shoham and Rose (2001); **Relationship performance:** 1 Item adapted from Skarmeas et al. (2002); 2 Items adapted from Selnes and Sallis (2003); 1 Item adapted from Zou et al. (1998); **Relationship global success:** 1 Item adapted from Styles (1998).